

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

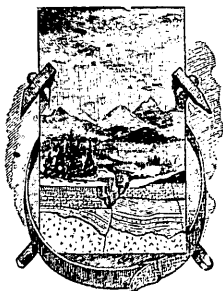
CHARLES D. WALCOTT, DIRECTOR

RESULTS
OF
PRIMARY TRIANGULATION AND
PRIMARY TRAVERSE

FISCAL YEAR 1905-6

BY

SAMUEL S. GANNETT



WASHINGTON
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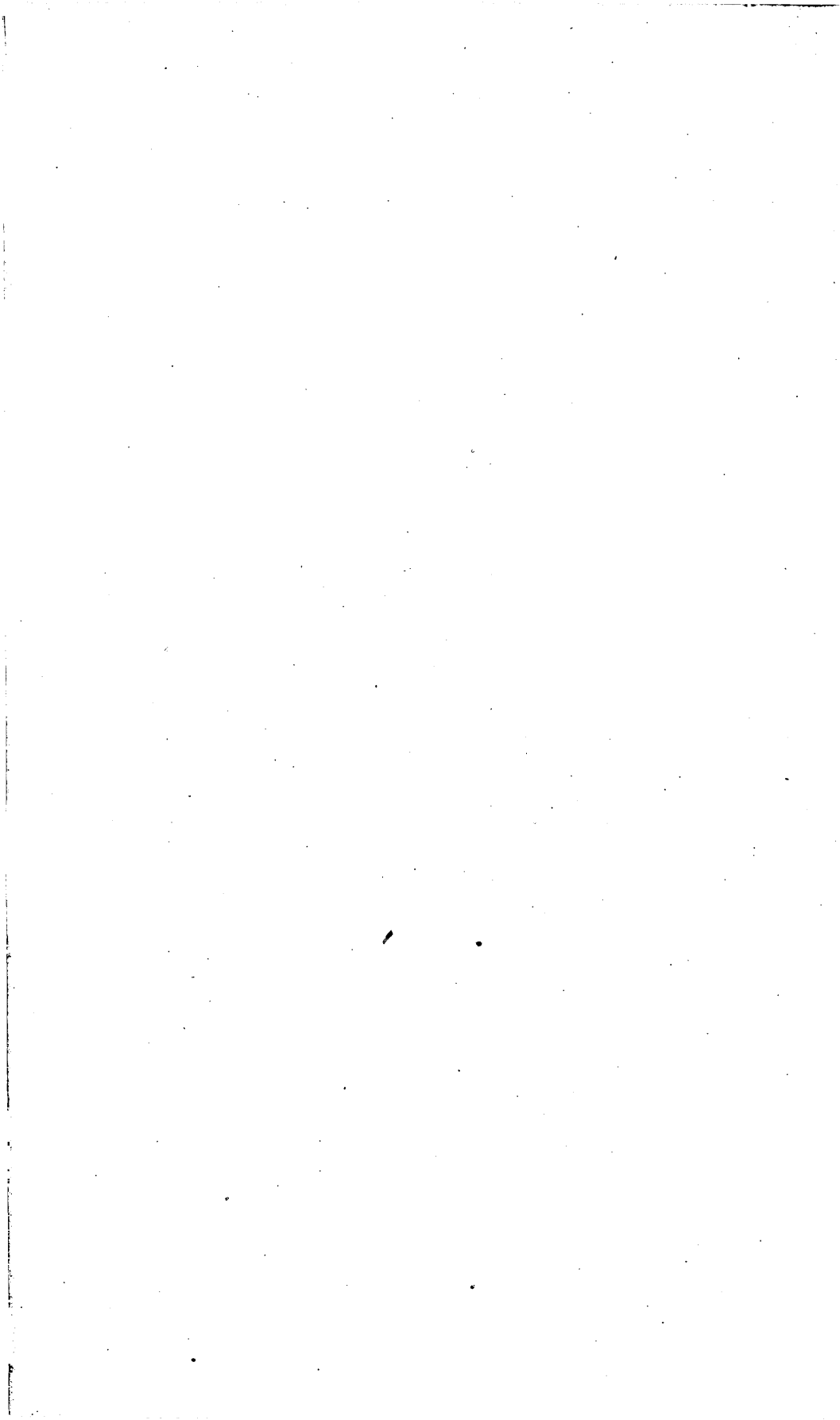
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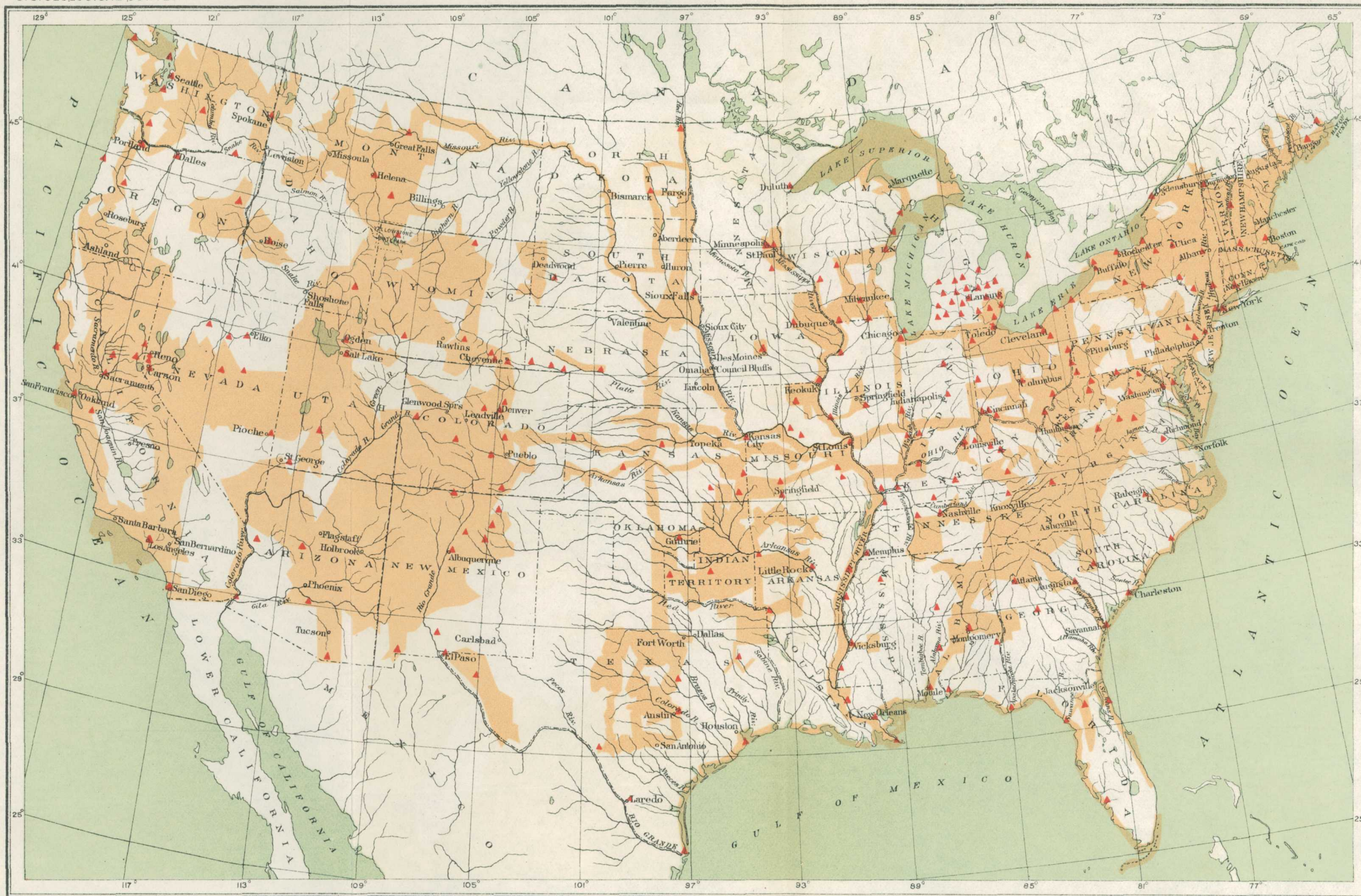
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MAP SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL
to April 30, 1906

Areas tinted are controlled by triangulation or traverse

▲ Astronomic station

100 0 100 200 300 400 500 600 MILES

RESULTS OF PRIMARY TRIANGULATION AND PRIMARY TRAVERSE, FISCAL YEAR 1905-6.

By SAMUEL S. GANNETT.

SUMMARY.

Summary of published results, 1905-6: Triangulation and primary traverse.

Locality.	Triangulation stations.	Traverse stations.
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EASTERN DIVISION OF TOPOGRAPHY.

H. M. WILSON, *Geographer in charge.*

ALABAMA.

PRIMARY TRAVERSE.

SHELBY COUNTY.

COALVILLE QUADRANGLE.

In June, 1906, C. B. Kendall, field assistant, ran a line of primary traverse across the southern border of this quadrangle from Longview to Teague bridge over Yellow Leaf Creek, connecting with points on the United States standard datum previously located by primary traverse.

Magnetic declination, 2° 51' 38" east.

Geographic positions along Louisville and Nashville Railroad near Longview.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Longview, at southwest corner of company's store, iron post stamped "Prim. Trav. Sta. No. 28, 1906".....	33	11	56.9	86	46	46.0
Longview, public-road crossing 0.5 mile north of, center of track.....	33	12	21.0	86	46	59.8
Saginaw station, public-road crossing 0.5 mile south of, center of trestle.....	33	12	47.3	86	47	22.6
Saginaw station, public-road crossing.....	33	13	01.9	86	47	57.5

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Saginaw, mail box at four corners 0.5 mile northwest of.....	33	13	14.3	86	48	20.7
Saginaw, about 1 mile north of, second-class road fork to south.....	33	13	29.8	86	47	43.1
Forks.....	33	14	52.1	86	46	41.7
Pine stump at east side of road at top of small ridge.....	33	15	41.6	86	45	31.3
Second-class forks to north at bend of main road to east.....	33	16	04.7	86	44	46.0
Forks at rail fence, 150 feet west of bridge over small stream, public road to west, second-class road to north uphill.....	33	16	10.1	86	44	04.3
Second-class north-south road.....	33	16	02.4	86	43	31.8
Forks of road 300 feet east of house, roads east to northeast.....	33	16	03.4	86	42	51.3
Four corners at vacant dwelling, public road northwest and southeast.....	33	16	10.2	86	42	28.7
Four corners, public and second-class crossroads.....	33	16	18.8	86	42	07.5
Section-line crossing (?).....	33	16	28.5	86	41	52.2
Yellow Leaf Creek, center of bridge over small branch of.....	33	16	46.1	86	41	30.2
Forks of road 0.75 mile southwest of box and 20 feet north of signboard "Calera 14 miles".....	33	17	00.3	86	41	12.8
Public roads northeast, north, and southwest.....	33	17	02.9	86	41	03.0
Calvary Baptist Church, forks 0.5 mile east of, public road to south.....	33	17	02.9	86	40	30.0
Section corner (number not obtained).....	33	17	00.7	86	40	29.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 20, R. 1 W., northeast corner sec. 20.....	33 17 02.2	86 39 26.4
Ransom station, four corners 150 feet south of cotton gin and 60 feet west of lumber railroad.....	33 17 05.2	86 39 27.5
Saginaw station, on Saginaw Lumber Co.'s railroad, 250 feet northeast of cotton gin, 200 feet northeast of railroad crossing, 100 feet southeast of dwelling, and about 8 feet south of water oak tree, aluminum tablet in sandstone bowlder, stamped "Prim. Trav. Sta. No. 1, 1906".....	33 17 07.8	86 39 26.6
Public-road forks, second-class road to southwest, 10 feet southwest to oak painted "USTP 549.8".....	33 17 24.0	86 38 44.2
Public-road forks, 15 feet south to signpost marked "Pelham 11.25 miles".....	33 17 29.5	86 37 55.1
Four corners, 300 feet southwest of church, 30 feet east to well, 15 feet southwest to oak.....	33 17 37.7	86 37 18.1
Forks of road southeast and northeast, stump painted "VA 551" on top of small ridge.....	33 18 17.5	86 36 53.0
T. 20 S., R. 1 W., sec. 11, center line of, public-road crossing.....	33 18 16.6	86 36 49.4
Secs. 12 and 13, quarter corner north of southeast corner sec. 12, forks of road south and east.....	33 18 10.9	86 36 02.1
Forks of road east and west, 20 feet northeast to dead pine snag.....	33 17 56.8	86 35 30.0
Yellow Leaf Creek, center of bridge over northern fork of.....	33 17 56.2	86 35 08.8
Public road west, forks of, 1.5 miles south of Teague bridge, second-class road to northwest, 10 feet east to pine, 30 feet west to pine stump	33 17 21.8	86 33 51.3
Four corners, crossroads, 1.5 miles south of Teague bridge, 20 feet west to bunch oak trees and signboard marked "Wilsonville".....	33 17 15.2	86 33 25.7
Public-road forks, south and southeast, 50 feet southeast to pine, 40 feet north to oak.....	33 17 40.2	86 33 21.7
Three corners, 0.5 mile south of Teague bridge, public T road west....	33 17 57.0	86 33 23.8
Yellow Leaf Creek, center of Teague bridge over, public roads south and southeast (located in 1904).....	33 18 22.9	86 33 06.8

CHAMBERS AND LEE COUNTIES.

OPELIKA QUADRANGLE.

The following geographic positions were determined by primary traverse run by E. L. McNair, topographer, in April, 1905. The line starts at West Point, Ga., and runs northerly and westerly along public roads via Fredonia and White Plains to Penton, thence south via Marcoot to Gold Hill station, on the Central of Georgia Railway. Another line starts at Auburn station, on the Western Railway of Alabama, and runs via highways south to Wrights Corners, thence easterly and northerly to Salem, Ala.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
GEORGIA.		
West Point, Atlanta and West Point R. R. station (Ellis, 1902).....	32 52 31.8	85 11 01.6
West Point, Atlanta and West Point R. R. bridge over Chattahoochee River, southwest end of, in capstone at north end of shore pier, bronze tablet stamped "Anniston 573 Ft.".....	32 52 46.4	85 10 50.1
Alabama-Georgia State line crossing of West Point and Fredonia road.....	32 54 09.3	85 11 28.7
ALABAMA.		
West Point, 3.5 miles northwest of, 0.12 mile east of house of E. L. Bailey (colored), on north side of road between two oak trees, iron post stamped "Anniston 695 ft. Prim. Trav. Sta. No. 14, 1905".....	32 54 46.5	85 12 56.1
Potts (Charles) mail box, T road northwesterly.....	32 55 08.9	85 13 21.6
Fredonia, 4.75 miles southeast of, forks of road.....	32 56 30.9	85 14 45.0
Fredonia, 3.5 miles southeast of, forks of road at signboard "West Point 7 miles".....	32 57 21.5	85 15 16.2
Fredonia, 1.5 miles southeast of, forks of road.....	32 58 37.7	85 16 16.5

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
ALABAMA—continued.						
Fredonia, 40 feet southwest of, crossroads, iron post stamped "Prim. Trav. Sta. No. 15, 1905"	32	59	21.1	85	17	14.4
Fredonia, 1.25 miles west of, forks of road at signboard	32	59	24.2	85	18	31.0
Fredonia, 2.25 miles northwest of, four corners	33	00	04.8	85	19	10.8
Five Points, 1.75 miles southeast of	33	00	38.2	85	19	44.2
Five Points, 0.5 mile south of, four corners	33	00	47.7	85	20	57.2
Five Points, 1.25 miles southwest of, highway and Central of Georgia Rwy. crossing	33	00	30.8	85	21	50.5
Central of Georgia Rwy. and Settlement road crossing	32	59	35.0	85	22	42.1
White Plains, four corners at McCarley's store	32	59	21.8	85	24	10.8
Chapel Hill, house of W. L. Wilson, center of road opposite	32	59	37.3	85	25	50.9
Jenkins (W. T.) house, center of road opposite west end of	33	00	07.7	85	27	02.1
Penton, four corners, 14 feet from corner of Storey's warehouse and 49 feet from post-office, iron post stamped "Prim. Trav. Sta. No. 16, 1905"	33	00	19.2	85	28	00.5
Penton, 1.75 miles south of, house of W. Lowe, jr., center of road opposite	32	58	53.8	85	28	12.2
Penton, 3.25 miles south of, house of J. B. Lashley, center of road opposite	32	57	31.4	85	28	03.2
Marcoot post-office, road corners 200 feet west of	32	57	21.8	85	29	06.7
Marcoot post-office, 1.5 miles south of, on top of ridge, center of road opposite W. T. Weldon's house	32	56	12.5	85	29	30.6
Marcoot, 3.25 miles south of, forks of road; roads north, south, and east	32	54	44.8	85	29	23.0
Lafayette, 5 miles west of, near house of S. M. Abernathy, four corners	32	53	54.4	85	29	13.9
Stills (H.) residence, roads north, south, and west	32	53	23.4	85	28	52.2
Jones store, 0.75 mile northeast of, four corners	32	52	03.2	85	28	22.9
T. 22 N., R. 26 E., in sec. 30, 3.5 feet from southeast corner of S. W. Jones's store, iron post stamped "Prim. Trav. Sta. No. 17, 1905"	32	51	43.3	85	29	01.6
Jones store, 1.5 miles southwest of, forks of roads	32	50	53.5	85	30	09.2
Lafayette and Camp Hill road, house of W. F. Royal, 0.25 mile southeast of, four corners	32	50	12.7	85	30	27.6
Forks of road	32	48	45.0	85	30	47.5
House of A. B. McKinney, 250 feet south of, forks of road	32	48	05.4	85	30	13.2
Forks of road	32	46	48.8	85	30	06.6
House of Alfred Johnson, 0.33 mile south of, four corners	32	46	20.1	85	30	08.4
Forks of road	32	45	23.2	85	30	08.4
Forks of road, east, west, and north	32	44	19.5	85	30	00.9
Gold Hill station (Hawkins, 1901)	32	43	25.8	85	30	29.2

Geographic positions south and east of Auburn, Ala.

Station.	Latitude.			Longitude.		
	°	'	''	°	'	''
Auburn station (Hawkins, 1901), road east of	32	36	37.1	85	28	48.0
Auburn station, 0.9 mile south of, roads east, west, and south	32	35	55.9	85	28	42.7
Auburn station, 2.25 miles south of, Society Hill road, 10 feet southeast of, iron post stamped "Prim. Trav. Sta. No. 18, 1905"	32	34	52.4	85	28	10.8
T road east	32	33	55.4	85	28	31.2
Chewacla Creek, center of covered bridge over	32	32	53.0	85	28	50.0
Wright (L. A.) house, four corners near	32	32	00.7	85	28	13.0
Wright's corners, 1.75 miles east of, forks of road	32	31	55.3	85	26	28.3
Roads north, south, and east	32	32	26.4	85	25	44.8
Mitchell's store, four corners	32	32	20.1	85	24	49.5
Chafin (H. C.) residence, center of road opposite	32	32	11.8	85	23	49.5
Four corners	32	32	16.9	85	22	19.8
Providence Church, road corners 0.5 mile south of	32	32	40.1	85	20	28.4
Forks of road	32	31	45.9	85	20	18.3
T road south	32	31	11.9	85	18	51.6
Prince (George) residence, four corners	32	30	37.2	85	16	19.9
Meadows, four corners	32	31	15.0	85	15	16.7
Salem station, 4.25 miles south of, 200 feet south of Butler house, 10 feet west of center of road, iron post stamped "Prim. Trav. Sta. No. 19, 1905, 526 ft."	32	32	08.6	85	15	23.9
Salem, 2.25 miles south of, forks of road	32	33	48.5	85	15	14.9
Salem, 0.75 mile south of, forks of road	32	35	07.0	85	14	32.8
Salem station (Ellis, 1902)	32	35	49.6	85	14	18.8
Salem station, 660 feet west of, 32 feet north of center of track of Central of Georgia Rwy., iron post stamped "Prim. Trav. Sta. No. 20, 1905, 686 ft."	32	35	51.3	85	14	26.3

ALABAMA-GEORGIA.

PRIMARY TRAVERSE.

RUSSELL COUNTY, ALA.; CHATTAHOOCHEE AND MUSCOGEE COUNTIES, GA.

COLUMBUS QUADRANGLE.

The following geographic positions were determined by C. B. Kendall, field assistant, in 1906. The line begins at Columbus, located by primary traverse in 1902 by J. R. Ellis, crosses Chattahoochee River to Girard, Ala., follows the Central of Georgia Railway to Fort Mitchell, thence along highways along the west, south, and east borders, tying to primary traverse station No. 3, established at Upatoi in 1905 by E. L. McNair, topographer.

Geographic positions along Central of Georgia Railway between Columbus, Ga., and Fort Mitchell, Ala.

Station.	Latitude.	Longitude.
GEORGIA.		
Columbus, First avenue crossing.....	32 28 39.1	84 59 29.8
Columbus, in west wall at north side of west entrance to post-office building, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1906," elevation 251 feet.....	32 28 06.4	84 59 29.6
Chattahoochee River, center of Central of Georgia Rwy. bridge over.....	32 27 43.8	84 59 50.9
ALABAMA.		
Girard station, 75 feet north of, road crossing.....	32 27 39.8	84 59 57.5
Milepost 2, road crossing 60 feet south of.....	32 27 15.8	84 59 50.3
Siding, road crossing 50 feet south of.....	32 26 04.6	84 59 33.5
Station notice post, second-class road crossing 50 feet north of.....	32 24 15.6	85 00 28.3
Brickyard station, east rail of main track at road crossing.....	32 23 49.8	85 00 33.3
Second-class road crossing.....	32 22 46.5	85 00 19.1
Flag station, 500 feet south of, road crossing near water mill.....	32 22 04.7	85 00 32.8
Second-class road crossing.....	32 21 06.7	85 00 49.4
Fort Mitchell station, road crossing.....	32 20 33.9	85 01 12.2
Fort Mitchell station, 100 feet south of, at northeast corner of store of G. L. Salas, iron post stamped "Prim. Trav. Sta. No. 2, Ala., 1906".....	32 20 33.0	85 01 12.5
Big Uchee Creek, west end of iron bridge over, forks of road southeast and southwest.....	32 18 57.6	85 01 02.6
Small stream crossing, second-class road west.....	32 18 18.6	85 00 37.2
Cotton gin, second-class road.....	32 17 39.9	85 00 27.4
Oswechee Church, three corners, T road east, 30 feet to tall pine.....	32 16 36.4	85 00 11.8
Oswechee Church, 0.5 mile south of, at southeast corner, at junction of north and south river road and road east to Hatchers Landing, iron post stamped "Prim. Trav. Sta. No. 3, 1906, Ga.".....	32 16 14.6	85 00 02.5
Three corners, T road north, 20 feet east to pine.....	32 16 09.8	84 59 26.5
T. 15, R. 30, corner sec. 19, pine log planted in small marsh 224 feet east of three corners, T road to west.....	32 16 10.9	84 58 00.5
Four corners, 40 feet southeast to pine, 50 feet north to pine.....	32 15 56.8	84 58 03.6
Triangle at road forks, southeast and southwest.....	32 15 09.9	84 56 53.2
Forks of road west, southwest, and northwest, 10 feet south to willow.....	32 14 56.1	84 56 30.7
Forks of road northeast, second-class road southeast leading to Fitzsimmons Ford.....	32 15 03.0	84 55 43.4
Chattahoochee River, Fitzsimmons Landing, on top of west bank at edge of field, 125 feet west of landing proper.....	32 14 51.4	84 55 30.9
Alabama-Georgia State line, center of Chattahoochee River, about 800 feet south of Fitzsimmons Landing.....	32 14 42.8	84 55 23.5
GEORGIA.		
Forks of road between two small houses, roads west and southwest, 40 feet east to small house, 40 feet south to house.....	32 14 19.8	84 54 19.8
Forks of road east and southeast, 100 feet east of top of ridge.....	32 14 15.1	84 53 56.8
St. Mark's Church (colored) at junction of Columbus-Florence and Florence-Cusseta roads, at southwest corner of church, iron post stamped "Prim. Trav. Sta. No. 2, Ga. 1906".....	32 14 40.6	84 52 52.8
Forks of road west and southwest, 10 feet north to cedar, 50 feet southeast to pine.....	32 14 50.9	84 51 11.2
Jamestown, forks of road north and northeast, 600 feet north of, 20 feet east to rail fence, 40 feet north to persimmon.....	32 15 53.8	84 50 45.6

Geographic positions along Central of Georgia Railway between Columbus, Ga., and Fort Mitchell, Ala.—Continued.

Station.	Latitude.			Longitude.		
GEORGIA—continued.						
	°	'	"	°	'	"
Cemetery, forks of road east and southeast.....	32	16	00.3	84	50	17.5
Stephens Creek, center of bridge over.....	32	15	59.3	84	49	37.0
Three corners, T road southwest.....	32	16	11.3	84	49	05.4
Forks of road northeast and southeast, 40 feet north to double oak, 30 feet south to clump of plum bushes.....	32	16	25.5	84	48	06.8
Cusseta, 3 miles south of, forks of road south and southeast.....	32	16	44.4	84	47	47.6
Cusseta, 3 miles south of, in angle at forks of road Cusseta-Lonvale, Cusseta-Jamestown, iron post stamped "Prim. Trav. Sta. No. 3, Ga. 1906".....	32	16	44.1	84	47	47.8
Forks of road northwest and north.....	32	17	26.4	84	47	28.1
Cusseta, 1 mile southwest of, forks of road north and northeast, 10 feet north to pine.....	32	18	12.1	84	47	16.8
Cusseta, forks of road at west edge of, 40 feet west to sign "Jamestown 6 mi.," 60 feet east to large oak stump.....	32	18	26.2	84	47	04.4
Cusseta, 0.75 mile northwest of, overhead road crossing Seaboard Air Line Rwy.....	32	18	30.7	84	47	18.6
Cusseta, 1.5 miles northwest of, road crossing Seaboard Air Line Rwy. Milepost C 16; road crossing 300 feet south of.....	32	18	46.8	84	47	38.7
Ochilles Creek, south end of bridge over.....	32	20	09.6	84	47	35.2
Halleck station, road crossing 500 feet east of water tank.....	32	20	42.8	84	47	09.2
Old store, four corners, roads north and south and west and east, 50 feet southwest to oak, 30 feet east to oak.....	32	20	53.7	84	47	02.1
Church and schoolhouse, 700 feet south of, four corners, 50 feet south to telephone pole, 20 feet west to double sweet gum.....	32	21	59.4	84	46	51.7
Church and schoolhouse, 700 feet south of, four corners, 50 feet south to telephone pole, 20 feet west to double sweet gum.....	32	22	21.7	84	46	43.8
Four corners, crossing of Cusseta-Greenville and Columbus-Buena Vista roads.....	32	23	26.1	84	46	08.4
Northwest corner of schoolhouse yard, in southeast corner of intersection of above roads, iron post stamped "Prim. Trav. Sta. No. 4, Ga. 1906".....	32	23	25.6	84	46	08.0
Four corners, second-class crossroads, 20 feet southwest to C. B. Underwood's mail box No. 16.....	32	24	17.5	84	46	11.2
Four corners at Cane Mill.....	32	24	54.2	84	46	04.9
Blair Branch, center of bridge over.....	32	25	33.6	84	45	52.8
Elbeck, 0.5 mile south of, three corners, 25 feet southeast to signboard "Cusseta 11 mi.," 20 feet south to oak.....	32	26	05.3	84	45	11.9
Muscogee and Chattahoochee county line, center of covered bridge over Uptoie Creek.....	32	26	42.3	84	45	24.2
Forks of road 0.3 mile northwest of bridge over Uptoie Creek.....	32	26	46.6	84	45	41.4
Forks of second-class road, 20 feet southeast to dead pine, 50 feet north to double oak.....	32	27	54.6	84	45	38.0
Forks of road south and southwest, 25 feet west to oak, 20 feet east to small persimmon tree.....	32	28	14.1	84	45	57.9
Four corners, 2 miles south of schoolhouse, 20 feet north to mail box No. 20, post painted "463".....	32	29	27.6	84	45	49.6
Three corners, T road west, 10 feet southwest to mail box.....	32	30	07.4	84	45	37.1
Forks of road south and southwest, 50 feet south to pine painted "490".....	32	30	50.3	84	45	15.6
Forks of road north and northeast, 10 feet north to persimmon painted "482".....	32	31	23.5	84	45	01.9
Uptoie, 0.75 mile south of, forks of road north and northwest.....	32	32	12.4	84	44	38.7
Uptoie station, at south wall in angle between wall and operator's office, Central of Georgia Rwy., iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	32	32	49.6	84	44	25.1

ARKANSAS.

PRIMARY TRAVERSE.

CRAWFORD, FRANKLIN, LOGAN, SCOTT, AND SEBASTIAN COUNTIES.

FORT SMITH 30' QUADRANGLE.

The following geographic positions on the United States standard datum were determined by primary traverse in 1905 by J. R. Ellis, assistant topographer. The line starts from the "initial point" at Fort Smith, runs northeast along the Missouri Pacific Railway to a point 5 miles northeast of Van Buren, thence along the Little Rock and Fort Smith Railroad to the east edge of the quadrangle, thence south on highways to Charleston, thence west on highways and the

Midland Valley Railroad to Hackett, thence along the St. Louis and San Francisco Railroad to the initial point. Another line starts from Hackett, follows the St. Louis and San Francisco and the Midland Valley railroads to Hartford, thence east along the Chicago, Rock Island and Pacific Railroad to Barber, thence north on highways to Charleston, and is tied to United States Geological Survey triangulation stations Peak and Pinnacle.

Geographic positions along Missouri Pacific Railway between Fort Smith and Lees Creek.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Fort Smith, at southwest corner of old fort about 50 feet from United States Coast and Geodetic Survey astronomical station, which was used as initial point. Station mark: A stone monument.....	35 23 16.91	94 25 51.35
Fort Smith, yard-limit post, private road crossing just north of.....	35 24 25.9	94 26 23.8
Arkansas-Indian Territory boundary post 74 M.....	35 25 56.7	94 26 16.2
Arkansas-Indian Territory boundary post 73 M, at Cherokee Junction.....	35 26 50.2	94 26 26 0
Milepost 509, private road crossing, 800 feet east of.....	35 27 08.2	94 25 17.0
Switch block to spur, road crossing northeast and southwest, 1,200 feet west of.....	35 27 05.8	94 23 53.0
Lees Creek, center of bridge over.....	35 27 03.7	94 22 56.0

Geographic positions along "Frisco" Railroad between Van Buren and Meadows.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Van Buren, in retaining wall to Doctor Kerr's front yard, 22 feet from corner of wall, aluminum tablet-stamped "Prim. Trav. Sta. No. 1, 1905".....	35 26 07.0	94 21 26.4
Van Buren, 1 mile north of, road crossing.....	35 26 32.2	94 20 15.7
Smeltzer station, road crossing just south of.....	35 27 22.6	94 19 37.4
Central pier of bridge No. 4071 over creek south.....	35 27 59.2	94 19 12.7
Milepost 406, road crossing north and south 810 feet east of.....	35 28 29.5	94 18 04.5
Meadows station, 0.66 mile west of, road crossing.....	35 29 09.0	94 16 35.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Meadows, 0.75 mile east of station, T lane, 16 feet due north to arrow on fence post.....	35 29 33.5	94 15 22.7
Alma, 1.5 miles northwest of, 1.75 miles east of Meadows, in southwest corner of J. W. Farris's field at crossroads, nail in root of black oak bears S. 50° 15' E., distant 34.7 feet; stone at crossroads bears S. 53° 20' W., distant 24.5 feet; iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	35 29 32.2	94 14 19.3

Geographic positions along Missouri Pacific Railway between Alma and Mulberry.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Alma, station.....	35 28 45.4	94 13 16.7
Alma, road crossing northeast and southwest, 1 mile east of station.....	35 28 55.7	94 11 56.0
Milepost 489, road crossing 0.25 mile west of.....	35 29 10.1	94 10 02.7
Dyer, center of trestle 0.33 mile west of.....	35 29 24.7	94 08 41.2
Dyer, in northeast corner of J. H. Selby's farm, on south side of railroad, 6 feet from right-of-way fence and 18 feet west of section line, iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	35 29 32.0	94 07 57.8
Milepost 486.....	35 29 46.3	94 06 41.2
Milepost 485, road crossing north and south 800 feet west of.....	35 29 47.3	94 05 46.7
Milepost 484, road crossing north and south 600 feet west of.....	35 29 40.3	94 04 42.8
Mulberry, on property of Oil Mill Co., 585 feet north to Main street crossing railroad, 10 feet east to north-south fence, in top of sandstone 30 by 10 by 10 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1905".....	35 29 35.9	94 03 06.5

Geographic positions along highways, Mulberry via Charleston to Greenwood.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rifle ford, Big Mulberry Creek, arrow painted on birch tree 80 feet north of.....	35 28 53.1	94 02 33.3
Cross and arrow painted on white-oak tree on north side of road and on north side of River Hill about 0.25 mile north of summit, about 1,000 feet southeast of gate to field.....	35 27 02.1	94 01 08.0
Junction of telephone lines, T road north, just east of.....	35 26 38.8	94 01 30.2
Oak Grove, schoolhouse, northwest corner of.....	35 26 36.5	93 59 52.5
Pauline store, 0.25 mile southeast of, cross on walnut tree at forks of road.....	35 25 58.2	93 59 51.6
Pauline store, 1.5 miles west of, crossroads 12 feet due north to cross on sapling, 33 feet west to arrow on tree.....	35 25 46.4	94 01 48.0
Pauline store, cross and arrow painted on black-oak tree just south of point where Charleston road leaves Fort Smith and Ozark road, 2.5 miles west of Pauline.....	35 25 29.8	94 02 45.5
Millcreek Mountain, T road north 0.5 miles south of summit, 39 feet northwest to east end of stone fence, 12 feet east to cross on black oak.....	35 24 42.1	94 02 38.5
Vesta, in southwest corner of stone coping to public well, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1905".....	35 22 44.4	94 02 28.4
T. 8 N., R. 29 W., corner secs. 11, 12, 13, and 14, at Vesta.....	35 22 44.2	94 02 28.4
T. 8 N., R. 29 W., corner secs. 13, 14, 23, and 24, T road west.....	35 21 50.0	94 02 29.7
Vesta crossroads, 2 miles south of, 22 feet northwest to nail in fence post, 39 feet southwest to cross on fence post.....	35 20 58.9	94 02 14.4
Peadget schoolhouse, 20 feet east to small bridge, 21 feet southeast to mail box.....	35 20 06.4	94 02 16.5
Charleston, "+ & →" painted on white-oak tree about 1 mile north of.....	35 18 41.1	94 02 16.5
Charleston, railway crossing, 65 feet east of station.....	35 17 39.7	94 02 10.3
Charleston, T road north, 1 mile south of.....	35 16 56.0	94 02 06.0
T. 7 N., R. 28 W., secs. 18, 19, west corner of.....	35 16 29.1	94 01 34.8
Charleston, 3 miles south and 0.5 mile east of, in southeast corner of field of Wirt Haines at T road north nail in black-oak tree in road bears S. 44° E., distant 37 feet, in top of sandstone 32 by 7 by 6 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1905".....	35 15 14.6	94 01 37.7
T. 7 N., R. 29 W., secs. 23, 24, 25, 26, T road south at corner of.....	35 15 37.1	94 02 40.8
T. 7 N., R. 29 W., secs. 22, 23, 26, and 27, crossroads south at corner of.....	35 15 38.2	94 03 45.1
T. 7 N., R. 29 W., secs. 21, 22, 27, and 28, Franklin-Sebastian county line.....	35 15 39.0	94 04 49.2
T. 7 N., R. 29 W., secs. 20, 21, 28, 29, crossroads at corner of.....	35 15 39.8	94 05 53.8
T. 7 N., R. 29 W., secs. 19, 20, 29, 30, T road east, corner of.....	35 15 40.8	94 06 58.0
Auburn, in northeast corner of Brown's store, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1905".....	35 15 14.7	94 07 37.8
Guideboard on tree at T road west, 1 mile west of Auburn.....	35 14 49.2	94 08 24.3
Hickory tree with iron ring at T road south, just south of white frame house.....	35 14 24.0	94 09 47.4
Black-oak tree, "+ " and arrow painted on it, east of T road north.....	35 14 01.6	94 11 03.4
Garden, cross and arrow painted on corner of fence.....	35 13 41.4	94 12 03.2
Liberty Church, forks of road, 20 feet southeast to cross on post 63 feet southwest to corner of cemetery.....	35 13 03.6	94 13 26.2
Greenwood, in southeast corner of foundation to court-house, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1905".....	35 12 43.5	94 15 17.9

Geographic positions along Midland Valley Railroad, Greenwood to Hackett.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 3, 1,300 feet west of, private-road crossing.....	35 11 55.4	94 16 23.6
Coal-mine shaft, crossing north and south 575 feet east of.....	35 11 39.4	94 18 24.8
Excelsior station.....	35 11 42.0	94 19 09.5
Milepost 2, road crossing 1,700 feet east of.....	35 11 40.2	94 20 55.3
Milepost 3, north-south road crossing 650 feet west of.....	35 11 22.7	94 22 24.6
Milepost 4, road crossing 600 feet west of.....	35 11 19.3	94 23 28.3
Midland Valley and "Frisco" R. R., crossing of.....	35 11 13.7	94 24 07.6
Hackett, in southwest corner of cotton gin owned by Clark & Johnson, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1905".....	35 11 25.9	94 24 33.8

Geographic positions along "Frisco" Railroad, Hackett to Fort Smith.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Switch block, private crossing 700 feet east.....	35 11 42.0	94 25 35.7
Arkansas-Indian Territory (Choctaw) boundary post at Jenson, marked "No. 13 M 1877".....	35 12 01.5	94 26 17.8
Tunnel, south end of.....	35 12 55.2	94 26 33.4
Arkansas-Indian Territory (Choctaw) boundary post marked "11 M 1877".....	35 13 46.0	94 26 13.7
Trestle 4262, road crossing under.....	35 14 26.2	94 25 51.9
Arkansas-Indian Territory (Choctaw) boundary post marked "9 M 1877".....	35 15 30.8	94 26 09.7
Cedars, station board.....	35 16 36.1	94 26 23.7
Milepost 422, road crossing east and west.....	35 17 49.9	94 26 22.2
Arkansas-Indian Territory (Choctaw) boundary post marked "5 M 1877".....	35 18 59.9	94 26 01.4
Milepost 419, road crossing east and west 300 feet south of.....	35 20 20.5	94 25 47.1
Ward Siding, road crossing east and west.....	35 21 13.8	94 25 42.7
T. 8 N., R. 32 W., secs. 16, 17, 20, and 21, corner of.....	35 22 18.0	94 25 15.8

Geographic positions along "Frisco" Railroad, milepost 434 to 438.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Trestle 4340 and milepost 434, crossing under.....	35 09 45.0	94 22 20.5
Milepost 436.....	35 08 27.0	94 21 55.8
Milepost 437, private-road crossing 400 feet south of.....	35 08 25.4	94 21 01.0
Milepost 438.....	35 07 39.9	94 20 51.4

Geographic positions along Midland Valley Railroad, Montreal to Hartford.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Montreal, 3,200 feet southwest of, road crossing.....	35 07 07.1	94 21 32.5
T. 5 N., Rs. 31 and 32 W., corner secs. 7, 12, 13, and 18.....	35 07 06.6	94 21 37.4
Coal shaft, road crossing 800 feet north of.....	35 06 29.5	94 21 53.5
Midland City, 240 feet west of section house, in north corner of stone culvert, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1905".....	35 05 45.7	94 21 46.4
Peak triangulation station, on a sharp summit of Sugarloaf Mountain, about 6 miles northeast of Sugarloaf Peak; station mark, a rock monument.....	35 04 25.24	94 22 21.85
Midland City, 1 mile south of, 700 feet north of milepost 10, road cross- ing.....	35 04 50.2	94 20 46.3
Milepost 11, road crossing just south of.....	35 03 53.4	94 20 25.0
Prairie Creek station.....	35 03 07.8	94 20 59.8
Trestle A 1311, road crossing under.....	35 02 24.7	94 21 38.5
Road crossing east and west.....	35 02 00.3	94 22 22.1
Hartford, road crossing 125 feet east of.....	35 01 44.3	94 22 58.5
Hartford, in southeast corner of stone step in front of Grand View Hotel, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1905".....	35 01 15.2	94 22 53.1

10 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along Chicago, Rock Island and Pacific Railroad between milepost 279 and Barber.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 279, road crossing 1,800 feet east of.....	35	01	30.6	94	21	52.4
Milepost 278, road crossing north and south 0.5 mile east of.....	35	01	45.9	94	20	16.4
Milepost 275, road crossing north and south 0.5 mile east of.....	35	02	24.9	94	17	25.0
Milepost 276, 950 feet west of.....	35	01	44.1	94	19	00.3
Road crossing north and south.....	35	03	03.1	94	16	20.8
T. 5 N., Rs. 30 and 31 W., south corner secs. 31 and 36.....	35	03	28.1	94	15	02.6
Mansfield, in northeast corner of restaurant yard opposite station, iron post stamped "Prim. Trav. Sta. No. 12, 1905"	35	03	28.8	94	14	38.0
Milepost 270, road crossing north and south 230 feet east of.....	35	04	00.4	94	13	07.3
Abbott station.....	35	04	29.9	94	11	39.4
Milepost 267, private-road crossing 1,000 feet east of.....	35	05	08.7	94	10	05.0
Milepost 266, 338 feet east of, 135 feet west of road crossing, in arch at south end of stone culvert, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1905".....	35	05	13.1	94	09	09.3
Echo station board.....	35	05	57.0	94	07	45.4
Milepost 262, 705 feet west of, private-road crossing.....	35	06	35.1	94	06	45.7
Milepost 261, road crossing 1,065 feet west of.....	35	07	10.4	94	04	52.6
Barber, road crossing 0.5 mile west of.....	35	07	26.5	94	03	46.4
Barber, railroad bridge over Petit Jean River, in top of east end of center concrete pier, aluminum tablet stamped "Prim. Trav. Sta. No. 14 1905".....	35	07	43.7	94	02	50.7

Geographic positions along highways, Barber to Pinnacle triangulation station.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Schoolhouse, forks of road just north of.....	35	08	29.1	94	02	39.7
Peach orchard, forks of road southeast at corner of, 15 feet southeast to corner rail fence near county line.....	35	08	52.1	94	02	03.6
Logan-Scott county line, road fork west on ridge 0.5 mile east of, 5 feet south to arrow painted on tree.....	35	09	07.6	94	01	33.4
Field on top of ridge, arrow and cross painted on tree at southeast corner of.....	35	09	39.5	94	01	08.1
Forks of road, arrow and cross painted on black oak 250 feet west of.....	35	10	11.7	94	00	46.1
Church, turn of road at north end of lane.....	35	10	35.4	94	01	09.0
Road north to schoolhouse, at turn of road 13 feet east to cross on fence post.....	35	10	40.2	94	02	15.5
Pleasant Ridge schoolhouse, in east face of bowlder which is partly overgrown by post-oak tree, aluminum tablet stamped "Prim. Trav. Sta. No. 15, 1905".....	35	11	12.9	94	02	33.1
T road west about 0.5 mile south of Washburn Mountain.....	35	12	00.9	94	02	32.2
Pinnacle triangulation station, knob on ridge about 5 miles south of Charleston, with all timber cleared from summit; station mark, lone tree blazed near foot.....	35	12	47.77	94	03	11.44
Zion schoolhouse, crossroads 0.25 mile south of.....	35	14	06.1	94	03	48.2
T. 7 N., R. 29 W., secs. 26, 27, 34, and 35, corner of.....	35	14	45.5	94	03	47.0

ILLINOIS.

PRIMARY TRAVERSE.

MADISON AND CLINTON COUNTIES.

BRESEE QUADRANGLE.

The following geographic positions on the United States standard datum were determined by primary traverse in 1905 by J. R. Ellis. The line starts from an adjusted position on the Belleville quadrangle 2 miles west of Highland and follows the Vandalia Railroad to Highland; thence east and south along highways to a point near the southeast corner of the quadrangle; thence west along highways to a point 3 miles east of New Baden, where it is run west over the

Southern Railway to primary traverse station No. 17. The line was tied to Breese and Damiansville triangulation stations, United States Coast and Geodetic Survey.

Geographic positions along Vandalia Railroad near Highland.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Highland, road crossing 2 miles west of.....	38	44	02.9	89	42	48.2
Highland, road crossing 1 mile west of.....	38	44	19.8	89	41	52.4
Highland, road crossing at station.....	38	44	38.5	89	40	50.5

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
German Cemetery, road in front of entrance, 70 feet due north to entrance.....	38	44	33.1	89	39	42.3
Tps. 3 and 4 N., R. 5 W., T road north near corner of secs. 2, 3, 34, and 35, 30 feet northwest to sycamore tree, 36 feet northeast to dead black oak.....	38	44	35.8	89	38	03.5
Tps. 3 and 4 N., R. 5 W., secs. 1, 2, 35, and 36, center of road at hedge fence north.....	38	44	34.7	89	36	56.8
Linenfiler (Fred) residence, 400 feet west of, in pasture, 5 by 5 by 24 inch stone; walnut tree bears N. 35° 45' E., distant 40.4 feet; aluminum tablet in top of stone, stamped "Prim. Trav. Sta. No. 22, 1905".....	38	44	35.1	89	36	40.3
Tps. 3 and 4 N., Rs. 4 and 5 W., corner secs. 1, 6, 31, and 36; also junction Madison, Clinton, and Bond counties; 19 feet southwest to west end of small bridge, 29 feet southeast to United States mail box.....	38	44	35.6	89	35	49.9
T road north, 15 feet north to center of small bridge.....	38	44	33.3	89	34	32.2
T road south, 27 feet northeast to William Frentiger's mail box.....	38	44	31.3	89	33	23.0
Jamestown, T road north, 1 mile west of, 27 feet southeast to dead locust tree.....	38	44	03.2	89	31	41.8
Jamestown public school grounds, near south line of, 57 feet east of southwest corner of grounds; southwest corner of school building bears N. 5° E., distant 144 feet; in top of dressed limestone 5 by 5 by 24 inches aluminum tablet stamped "Prim. Trav. Sta. No. 23, 1905".....	38	43	59.7	89	31	06.9
T. 3 N., R. 4 W., corner secs. 2, 3, 10, and 11, at crossroads, 37 feet northwest to corner yard fence, 36 feet southeast to cross on gatepost.....	38	43	36.1	89	31	07.2
T. 3 N., R. 4 W., corner secs. 14, 15, 22, and 23, at crossroads, 30 feet northeast to cross on corner fence post, 54 feet southeast to milk platform.....	38	41	51.1	89	31	03.6
T. 3 N., R. 4 W., west corner secs. 23 and 26, center of road at fence east just north of schoolhouse.....	38	40	58.7	89	31	02.3
T. 3 N., R. 4 W., corner secs. 26, 27, 34, and 35.....	38	40	06.5	89	31	01.0
H. Hinkam's farm, T road west, 42 feet east to wild cherry tree.....	38	38	56.9	89	31	00.1
State road crossing of north-south road, 24 feet north to cross on corner fence post, 63 feet southwest to cross on corner fence post.....	38	38	31.3	89	31	33.0
Breese, 1 mile north of, in northeast corner of Frank Budde's field, iron post stamped "Prim. Trav. Sta. No. 24, 1905".....	38	37	20.4	89	31	32.0
Breese, Catholic Church spire.....	38	36	32.0	89	31	44.3
Crossroads, 27 feet northwest to west end of stone culvert, 30 feet southeast to Hem Ahler's mail box.....	38	35	47.0	89	32	06.4
Crossroads, 20 feet northwest to west end of culvert, 35 feet southwest to cross on telephone pole.....	38	34	54.6	89	32	06.1
Germantown, crossroads 1 mile north of, 18 feet north to center of bridge.....	38	34	02.2	89	32	06.3
Germantown, Catholic Church spire.....	38	33	13.2	89	32	15.9

12 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along Southern Railway near Shoal Creek.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Shoal Creek, center of bridge over.....	38 32 46.4	89 30 47.5
Road crossing north and south.....	38 32 28.8	89 29 52.8

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south at large wooden cross.....	38 32 11.0	89 29 02.9
Bartelo, 1.25 miles southwest of, at T road north, in southeast corner of field owned by Herman Soole; nail in blaze on tree bears N. 76° 45' E., distant 39.8 feet; iron post stamped "Prim. Trav. Sta. No. 25, 1905".....	38 31 44.8	89 29 02.8
Murch's schoolhouse, T road east, just south of, 25 feet northeast to cross on wild-cherry tree, 31 feet southeast to corner wire fence.....	38 31 41.8	89 30 24.9
Germantown, T road south 1.5 miles south of, 33 feet southeast to cross on post.....	38 31 47.1	89 31 31.8
Center of private road.....	38 31 44.2	89 33 00.9
T. 1 N., R. 4 W., corner secs. 8, 9, 16, and 17, T road north.....	38 32 16.1	89 33 12.3
T. 1 N., R. 4 W., corner secs. 7, 8, 17, and 18, crossroads, 36 feet northeast to large apple tree, 37 feet southeast to locust tree.....	38 32 17.5	89 34 18.2
T. 1 N., R. 4 W., east corner secs. 18 and 19.....	38 31 24.9	89 34 17.0
T. 1 N., R. 4 W., corner secs. 18 and 19 (west corner), 24 feet west to cross on rail fence, T road east.....	38 31 27.1	89 35 34.9
T. 1 N., R. 5 W., east corner secs. 24 and 25, T road west, 50 feet northwest to cross on fence, 39 feet west to south end of tile culvert.....	38 30 35.2	89 35 34.9
T. 1 N., R. 5 W., southwest corner sec. 24, 0.5 mile east of Damiansville, iron post stamped "Prim. Trav. Sta. No. 26, 1905".....	38 30 36.3	89 36 42.2
Damiansville, Catholic Church spire.....	38 30 35.8	89 37 24.4
Damiansville schoolhouse, 1.25 miles west of T road east, 42 feet southwest to northwest corner of schoolhouse, 25 feet southwest to north end of small bridge.....	38 30 48.6	89 38 56.4

Geographic positions along Southern Railway near New Baden.

Station.	Latitude.	Longitude.
	° ' "	° ' "
New Baden, north-south road crossing about 3 miles east of, Southern Rwy. crossing.....	38 31 54.3	89 38 57.0
Milepost 34, private-road crossing.....	38 31 53.2	89 40 37.4
New Baden station.....	38 31 53.0	89 42 03.1
Milepost 31, road crossing north and south 170 feet west of.....	38 31 54.2	89 43 58.5
North-south road crossing of Southern Rwy. near southwest corner of field of J. B. Freese, iron post stamped "Prim. Trav. Sta. No. 17, 1905".....	38 31 55.6	89 45 38.9

MENARD AND SANGAMON COUNTIES.

TALLULA QUADRANGLE.

The positions in the following list were determined by primary traverse, run in June, 1905, by E. L. McNair, topographer. The line begins at Browns Crossing, on the Wabash Railroad, at the western boundary of Sangamon County, and runs north on or near the county line to about the center of T. 18 N., R. 8 W., Menard County, thence east to Petersburg:

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Browns Crossing flag station, center of track at railroad crossing.....	39 43 27.0	89 59 04.4
T. 15 N., R. 8 W., secs. 15 and 22, near quarter corner between, T road west.....	39 44 23.7	89 59 04.9
T. 15 N., R. 8 W., sec. 10, near center of, in triangle of roads, at T road east, iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	39 45 51.5	89 59 05.6
T. 16 N., R. 8 W., near center sec. 34, three corners, T road south.....	39 47 34.4	89 59 07.0
T. 16 N., R. 8 W., secs. 27 and 34, quarter corner between, T road east.....	39 48 00.5	89 59 02.6
T. 16 N., R. 8 W., secs. 21 and 22, quarter corner between, three corners, county-line road to north.....	39 49 19.1	89 59 37.2
T. 16 N., R. 8 W., secs. 9, 10, 15, and 16, corner of, T road east.....	39 50 37.4	89 59 37.8
T. 16 N., R. 8 W., secs. 3, 4, 9, and 10, corner, T road east.....	39 51 29.7	89 59 38.2
T. 16 N., R. 8 W., secs. 3 and 4, quarter corner between, three corners, T road to west.....	39 51 55.8	89 59 38.1
Ashland, 0.75 mile east of, T. 17 N., R. 8 W., secs. 27, 28, 33, and 34, corner of, at intersection of roads, at northwest corner, iron post stamped "Prim. Trav. Sta. No. 8, 1905".....	39 53 14.4	89 59 39.1
T. 17 N., R. 8 W., northwest corner of Sangamon County, T road to east.....	39 53 55.5	89 59 39.0
T. 17 N., R. 8 W., secs. 15, 16, 21, and 22, corner of.....	39 54 59.6	89 59 39.8
T. 17 N., R. 8 W., secs. 9, 10, 15, and 16, corner of, T road west.....	39 55 51.9	89 59 40.5
T. 17 N., R. 8 W., secs. 3 and 4, quarter corner between, four corners.....	39 57 10.3	89 59 41.0
Tps. 17 and 18 N., R. 8 W., secs. 4 and 33, quarter corner between.....	39 57 36.0	90 00 15.4
T road south, in western part sec. 28.....	39 58 53.8	90 00 43.6
T. 18 N., R. 8 W., secs. 27 and 28, quarter corner between, T road south, Menard and Cass county line.....	39 58 54.2	89 59 42.3
T. 18 N., R. 8 W., secs. 21, 22, 27, and 28, corner of.....	39 59 20.2	89 59 42.4
T. 18 N., R. 8 W., secs. 15 and 16, quarter corner between, in grass triangle in center of road south and 25 feet south of center of east-west road, 450 feet west of farm house of Amos Shoneweise, iron post stamped "Prim. Trav. Sta. No. 9, 1905".....	40 00 38.2	89 59 42.6
T. 18 N., R. 8 W., secs. 14 and 15, quarter corner between, T road to south.....	40 00 38.5	89 58 34.9
T road to north, in creek bottom.....	40 00 51.1	89 57 26.9
T. 18 N., Rs. 7 and 8 W., secs. 13 and 18, quarter corner between, four corners.....	40 00 38.6	89 56 17.9
T road south in western part of sec. 17.....	40 00 39.2	89 55 02.8
T. 18 N., R. 7 W., secs. 15 and 16, quarter corner between, T road south.....	40 00 39.2	89 53 03.3
Overhead crossing of Chicago and Alton R. R.....	40 00 39.5	89 51 36.8
Petersburg station, Chicago, Peoria and St. Louis Rwy., center of track.....	40 00 41.20	89 50 46.40

LAKE COUNTY.

WAUKEGAN QUADRANGLE.

In June, 1906, L. E. Tucker, topographic aid, ran a line of primary traverse around the borders of this quadrangle, starting at Benton triangulation station, United States Lake Survey, and tying to primary traverse post No. 1 of 1904.

Magnetic declination, north border, 3° 05' east; south border, 2° 34' east; west border, 3° 58' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Benton triangulation station, U. S. Lake Survey, in NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 7, Benton Township. Station mark: A stone post 2½ feet below surface, with another directly over it as a surface mark. Height of station used was 65 feet. Reference marks: Two stone posts, one S. 13° 04' W., distant 565.9 meters; one N. 68° 59' E., distant 19.65 meters. Height of ground at station above mean level of Lake Michigan, 212.6 feet.....	42 29 02.88	87 52 43.35
T. 46 N., R. 12 E., quarter corner secs. 7 and 8, four corners, North Prairie Church on northeast corner; schoolhouse on northwest corner.....	42 28 44.2	87 51 46.8
Chicago and Milwaukee Electric R. R. and Winthrop Harbor road, crossing of.....	42 28 43.9	87 50 41.9

14 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along Chicago and Northwestern Railway, Zion City to Lake Forest.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Zion City, corner of Shiloh boulevard and Elijah avenue, northeast corner of American Express office 90 feet southwest.....	42 26 59.2	87 49 31.0
Zion City, Shiloh boulevard and Chicago and Northwestern Rwy. crossing, west rail.....	42 26 59.0	87 49 04.4
East-west road crossing.....	42 23 04.8	87 49 26.3
Waukegan court-house.....	42 21 36.8	87 49 58.4
Chicago and Northwestern and Elgin, Joliet and Eastern Rws., crossing of.....	42 19 29.9	87 50 20.6
Road crossing, east and west.....	42 18 32.2	87 50 46.8
Chicago and Northwestern Rwy. and Chicago and Milwaukee Electric R. R., overhead crossing of.....	42 16 45.3	87 50 47.9
Chicago and Northwestern Rwy., overhead crossing.....	42 15 27.7	87 50 28.2
Lake Forest, in southeast corner of city hall yard, corner of Forest and Deerpath streets; southeast corner of city hall bears N. 63° 30' W., distant 34.5 feet; northwest corner of Chicago Telephone Co.'s building bears S. 41° 30' E., distant 77.3 feet; iron post stamped "Prim. Trav. Sta. No. 12, 1906".....	42 15 03.9	87 50 28.7
Chicago and Northwestern R. R. and highway crossing.....	42 14 49.4	87 51 42.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 43 and 44 N., Rs. 11 and 12 E.....	42 14 23.8	87 53 09.4
Tps. 43 and 44 N., R. 11 E., secs. 36 and 35 and 1 and 2.....	42 14 24.2	87 54 19.6
Tps. 43 and 44 N., R. 11 E., approximate corner secs. 35, 34, 3, and 2.....	42 14 24.7	87 55 30.0
Des Plaines River, on south side of town-line road, 9.8 feet southwest of corner of iron bridge across river; an 8-inch oak on opposite side of road is 22 feet north; iron post stamped "Prim. Trav. Sta. No. 13, 1906".....	42 14 25.6	87 56 21.5
Milwaukee road and town line, corner of.....	42 14 25.3	87 56 39.7
Four corners east of railroad crossing.....	42 14 25.3	87 58 36.2
Wisconsin Central Rwy., azimuth of, at station 69, 152° 01'.....		
Diamond Lake, in southwest corner of schoolhouse No. 76, Union, 5 feet north of school-yard corner; southwest corner of schoolhouse is 83.6 feet northeast; southeast corner of Wm. Einzwam's house is 20.5 feet northwest by west; iron post stamped "Prim. Trav. Sta. No. 14, 1906".....	42 14 29.1	88 00 13.4
Elgin, Joliet and Eastern Rwy., azimuth from station 77, 282° 51'.....		
Three corners, road east.....	42 15 18.5	88 00 05.0
Rockefeller, Hotel Cameron, center of street crossing.....	42 16 25.2	88 00 14.1
Wisconsin Central Rwy. and highway crossing.....	42 17 51.7	88 00 17.4
Four corners.....	42 18 21.5	88 00 15.2
Tps. 44 and 45 N., Rs. 10 and 11 E.....	42 19 39.9	88 00 16.3
Gages Corners.....	42 20 19.2	88 00 16.1
Three corners, road west.....	42 21 37.8	88 00 06.5
Druses Lake, at three corners 600 feet north of north shore of, opposite Brown's cottage; fence corner on west of road is 29.5 feet south; blazed oak is 26.7 feet north; W. C. Brewer's mail-box post No. 4 at corner is 22 feet southeast; iron post stamped "Prim. Trav. Sta. No. 15, 1906".....	42 22 17.8	88 01 12.8
Road crossing.....	42 23 09.6	88 00 14.5
T. 45 N., R. 10 E., secs. 1 and 12.....	42 24 02.1	88 00 14.1
T. 45 N., R. 11 E., corner secs. 6 and 7.....	42 24 02.1	88 00 14.1
Township corner.....	42 24 54.5	88 00 13.6
Four corners, road east and west, northwest and southeast.....	42 26 39.4	88 00 37.4
Hickory Corners, an oak tree is 35 feet northeast, Methodist Church is on southwest corner, mail box No. 69 is 35 feet northwest.....	42 27 58.1	88 01 01.4
Three corners, road west, schoolhouse on northwest corner.....	42 28 24.1	88 01 04.5
Pikeville, Wis., four corners, south side State-line road, west side north-south road; fence corner on southwest corner is 30 feet southwest.....	42 29 44.5	88 01 30.3
T. 1 N., R. 21 E., 50 feet northeast of south corner of secs. 34 and 35, north side State-line road, 800 feet northwest of Chas. Crawford's house; iron post stamped "Prim. Trav. Sta. No. 1, 1904".....	42 29 42.5	87 59 24.5

DUPAGE COUNTY.

WHEATON QUADRANGLE.

The following geographic positions were determined by primary traverse by E. L. McNair, topographer, in June, 1905. The line starts at Lombard triangulation station of the United States Lake Survey, near Lombard, Ill., and runs north to Itasca, on the Chicago, Milwaukee and St. Paul Railway; thence west along railway and highway to a point near the northwest corner of Dupage County; thence south along Elgin, Joliet and Eastern Railway and highway to a point about 1.5 miles east of the southwest corner of Dupage County; thence easterly via highways to quarter corner between secs. 27 and 28, Downers Grove Township; thence north to point of beginning.

Geographic positions from Lombard triangulation station North to Chicago, Milwaukee and St. Paul Railway.

Station.	Latitude.	Longitude.
Lombard triangulation station, U. S. Lake Survey, in NW. $\frac{1}{4}$ sec. 4, York Township. Station mark: A stone post 3 feet below surface. Reference marks: Three stone posts, one N. $8^{\circ} 52' W.$, distant 117.93 meters; one N. $85^{\circ} 11' E.$, distant 150.05 meters; and one at center of sec. 4, S. $13^{\circ} 05' E.$, distant 575.32 meters.....	<div>° ' "</div> <div>41 54 07.69</div>	<div>° ' "</div> <div>87 59 24.29</div>
T. 39 N., R. 11 E., four corners, quarter corner north side sec. 5.....	41 54 17.6	88 00 28.4
T. 40 N., R. 11 E., quarter corner north side sec. 32, four corners east, west, and south.....	41 55 10.3	88 00 29.5
T. 40 N., R. 11 E., sec. 20, four corners.....	41 56 18.4	88 00 11.8
Itasca, 0.06 mile southeast of station, road corners east, west, and south. Itasca, 400 feet southeast of Chicago, Milwaukee and St. Paul Rwy. station, vertical face of west wing wall, north abutment of highway bridge over creek, 100 feet south of railway tracks; aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1905".....	41 58 02.4	88 00 11.0
	41 58 16.2	88 00 46.8

Geographic positions along Chicago, Milwaukee and St. Paul Railway, Itasca to Bartlett.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Meacham, 0.75 mile east of station, road crossing.....	41 58 31.2	88 02 11.1
Meacham, center of south track opposite station.....	41 58 41.9	88 03 04.1
Roselle, center of south track opposite station.....	41 59 00.2	88 04 35.5
Roselle, 1.75 miles west of station, road crossing.....	41 59 22.4	88 06 34.9
Ontarioville, center of south track opposite station.....	41 59 18.6	88 09 11.8
Bartlett station, center of track opposite semaphore.....	41 59 32.9	88 11 09.2
Bartlett, 0.6 mile west of station, road crossing.....	41 59 41.0	88 11 51.5
Bartlett, 1.75 miles west of, on highway, four corners.....	41 59 40.0	88 13 03.8

Geographic positions along Elgin, Joliet and Eastern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing near water tank 0.5 mile south of Chicago, Milwaukee and St. Paul Rwy. junction.....	41 59 38.8	88 14 11.1
Illinois Central R. R. crossing, 0.5 mile north of, road crossing.....	41 58 32.7	88 14 12.0
Illinois Central R. R. crossing, in vertical face of south abutment of overhead bridge 10 feet south of Illinois Central track, in line with center of Elgin, Joliet and Eastern Rwy. track, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1905".....	41 58 05.0	88 14 12.4
Chicago, Aurora and Elgin Third Rail Electric Line.....	41 56 50.3	88 14 13.4
Chicago, Aurora and Elgin Third Rail Electric Line, road crossing 0.75 mile south of.....	41 56 09.7	88 14 14.0

16 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along highways in Wayne and Winfield townships.

Station.	Latitude.	Longitude.
Chicago Great Western Rwy. crossing, T. 40 N., R. 9 E., Wayne Township, in NW $\frac{1}{4}$ sec. 32.....	° ' " 41 54 33.0	° ' " 88 14 16.2
T. 40 N., R. 9 E., Wayne Township, near southwest corner sec. 32, road corners east, west, and south.....	41 53 58.0	88 14 34.1
T. 39 N., R. 9 E., Winfield Township, in northeast corner sec. 7, Chicago and Northwestern Rwy. crossing.....	41 52 58.7	88 14 36.4
Chicago, Burlington and Quincy Rwy. crossing of branch line in eastern part of sec. 18, T. 39 N., R. 9 E. (Winfield Township).....	41 51 57.3	88 14 36.1
T. 39 N., R. 9 E., near line between secs. 17 and 18, Chicago, Burlington and Quincy Rwy. branch line from West Chicago to Aurora, 672 feet northeast of north-south road, in north end of east abutment of open culvert, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1905".....	41 52 00.9	88 14 28.7
T. 39 N., R. 9 E., Winfield Township, in sec. 19, road corners east, west, and north.....	41 50 55.0	88 14 37.7
T. 39 N., R. 9 E., Winfield Township, near center sec. 32, four corners.....	41 49 13.0	88 13 49.8

Geographic positions along Elgin, Joliet and Eastern Railway in Naperville Township.

Station.	Latitude.	Longitude.
T. 38 N., R. 9 E., in eastern part of sec. 5, Naperville Township, road crossing.....	° ' " 41 48 39.1	° ' " 88 13 33.3
T. 38 N., R. 9 E. sec. 8, Naperville Township, Chicago, Aurora and Elgin Electric Rwy. crossing.....	41 47 49.3	88 13 48.6
Frontenac siding, 2 miles north of crossing Chicago, Burlington and Quincy Rwy. main line.....	41 46 36.1	88 13 54.2
Frontenac siding, 1 mile north of, road crossing.....	41 45 36.8	88 13 58.2
Frontenac siding, road crossing.....	41 44 41.3	88 13 59.0
Frontenac siding, 0.75 mile south of, road crossing.....	41 43 56.4	88 14 03.5

Geographic positions along highway from southwest corner of Naperville Township eastward to southern half of Downers Grove Township.

Station.	Latitude.	Longitude.
T. 38 N., R. 9 E., quarter corner between secs. 33 and 34, Naperville Township, Copenhagen Church on northeast corner, four corners....	° ' " 41 43 57.7	° ' " 88 12 21.0
T. 38 N., R. 9 E., quarter corner between secs. 34 and 35, Naperville Township, four corners.....	41 43 58.5	88 11 11.2
Road corners north, south, and west; quarter corner between secs. 35 and 36, Naperville Township.....	41 43 59.5	88 10 01.7
T. 38 N., R. 9 E., quarter corner between secs. 25 and 26, Naperville Township, road corners east, west, and south.....	41 44 52.0	88 10 01.2
T. 38 N., R. 10 E., in sec. 30, Lisle Township, road corners northwest, southeast, and south.....	41 45 22.7	88 08 30.9
T. 38 N., R. 10 E., sec. 30, 400 feet west of farmhouse of H. Haight, 400 feet east of iron truss highway bridge, in capstone at north end of stone arch culvert, Lisle Township; aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1905".....	41 45 05.6	88 07 44.2
T. 38 N., R. 10 E., north part of sec. 28, Lisle Township, road corners east, west, and north.....	41 45 23.1	88 05 55.9
T. 38 N., R. 10 E., in SW $\frac{1}{4}$ sec. 23, Lisle Township; schoolhouse on northeast corner; four corners.....	41 45 39.0	88 03 54.0
T. 38 N., R. 10 E., center sec. 25, Lisle Township; road corners north, south, and east.....	41 45 01.7	88 02 26.2
T. 38 N., Rs. 10 and 11 E., quarter corner between secs. 25 and 30, Lisle and Downers Grove townships, four corners.....	41 45 02.8	88 01 51.0
T. 38 N., R. 11 E., sec. 29, Downers Grove Township, road corners east, west, and north.....	41 45 04.5	88 00 27.7
T. 38 N., R. 11 E., quarter corner between secs. 28 and 29, Downers Grove Township; road corners.....	41 45 05.4	87 59 35.2
T. 38 N., R. 11 E., quarter corner between secs. 27 and 28, four corners.....	41 45 06.8	87 58 25.4

Geographic positions along highways north through Downers Grove Township to Lombard triangulation station.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 38 N., R. 11 E., corner secs. 15, 16, 21, and 22, four corners, Downers Grove Township.....	41 46 25.4	87 58 28.0
T. 38 N., R. 11 E., corner secs. 9, 10, 15, and 16, four corners, Downers Grove Township.....	41 47 17.6	87 58 30.0
Greggs flag station on Chicago, Burlington and Quincy Rwy., road crossing.....	41 47 44.2	87 58 30.9
Greggs flag station, 0.6 mile east of, in capstone at south end of arch culvert, 11 feet south of center of south track, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1905".....	41 47 44.1	87 57 49.5
T. 38 N., R. 11 E., quarter corner between secs. 3 and 4, Downers Grove Township, four corners.....	41 48 36.5	87 58 32.8
Road corners east, west, and north, sec. 33, York Township, T. 39 N., R. 11 E.....	41 49 27.1	87 59 27.5
T. 39 N., R. 11 E., sec. 28, York Township, four corners.....	41 50 35.7	87 59 26.0
York Center, four corners.....	41 51 38.2	87 59 33.4
T. 39 N., R. 11 E., on line between secs. 9 and 16, four corners.....	41 52 30.5	87 59 36.2

INDIANA—KENTUCKY.

PRIMARY TRAVERSE.

CLARK, FLOYD, AND HARRISON COUNTIES, IND.; BULLITT, JEFFERSON, AND OLDHAM COUNTIES, KY.

LOUISVILLE, NEW ALBANY, PROSPECT, AND RIVERVIEW QUADRANGLES.

The following geographic positions were determined by primary traverse run in 1904 by J. R. Ellis. The line starts from the Louisville Blind Asylum, a triangulation station of the United States Coast and Geodetic Survey, and runs southward on the Louisville and Nashville Railroad to Shepherdsville, thence eastward via highways to Mount Washington, thence northward via highways to Anchorage, thence westward over the Louisville and Nashville Railroad to the starting point at Louisville. A line was also run from Mount Washington southeast to Smithville and return. A spur line was run over highways from Shepherdsville west via Capiro to West Point; also one from Anchorage northeast over the Louisville and Nashville Railroad to Beard, and thence northward along highways via Brownsboro and Skylight to Westport.

In 1905 C. B. Kendall ran two lines of primary traverse—namely, from Anchorage to Hatton and from Smithville to Gudgel, on the Frankfort quadrangle—in order that the positions determined by Mr. Ellis on the Louisville astronomic datum could be reduced to the United States standard datum. A correction of $-2.38''$ in latitude and $+3.16''$ in longitude has therefore been applied to the original computed values to reduce them to the United States standard datum.

Mr. Kendall also ran lines of traverse in Indiana around the borders of the Prospect, New Albany, and Riverview quadrangles, tying to Westport and West Point, and thus closing circuits on traverse positions located by Mr. Ellis at those places.

18 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

LOUISVILLE AND PROSPECT QUADRANGLES (BULLITT, JEFFERSON, AND OLDHAM COUNTIES, KY.; CLARK AND FLOYD COUNTIES, IND.).

Louisville quadrangle (Bullitt and Jefferson counties, Ky.).

Geographic positions at Louisville.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Louisville, Blind Asylum triangulation station, center of cupola.....	38	15	23.07	85	42	47.40
Louisville, Story street crossing of Louisville and Nashville R. R. (Short Line division).....	38	15-	18.4	85	43	45.3
Louisville, Catholic Cathedral, Fifth and Walnut streets, triangulation station, center of spire.....	38	15	05.63	85	45	32.00
Louisville, Ohio River survey, United States Army Engineers (1903), station 602 M +285 feet.....	38	15	31.66	85	45	54.77

Geographic positions along Louisville and Nashville Railroad between Highland Park and Shepherdsville.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 179.....	38	09	37.4	85	44	57.8
Hoertz station, road crossing.....	38	08	16.9	85	44	36.2
Private road crossing east and west.....	38	07	34.5	85	44	24.9
South Park, road crossing at section house.....	38	06	57.0	85	44	14.9
South Park, in southwest corner of field owned by South Park Co., southeast corner of Louisville and Nashville R. R. station bears 7° W., distant 112 feet; cross on stone wall to south end of culvert bears N. 69° W., distant 19.7 feet; cemented in stone, aluminum tablet stamped "Prim. Trav. Sta. No. 31".....	38	06	34.9	85	44	08.4
Coral Ridge station, road crossing.....	38	05	32.7	85	43	32.1
Riley triangulation station, United States Coast and Geodetic Survey, on knob owned by W. H. Riley, Brooks post office station mark; a stone post 24 by 4 by 4 inches, set in ground above an earthenware pyramid.....	38	05	29.21	85	42	49.73
Brooks station, road crossing 1.5 miles north of.....	38	04	57.8	85	43	07.5
Brooks station, road crossing.....	38	03	39.3	85	42	37.8
Fox Ridge, station board.....	38	02	46.5	85	42	36.4
Hubers station.....	38	01	59.7	85	42	34.2
Pike crossing.....	38	00	58.0	85	42	14.4
Private-road crossing.....	38	00	21.2	85	42	30.3
Shepherdsville, in northwest corner of court-house yard, northwest corner of water table bears S. 23° 40' E., distant 77.7 feet; northwest corner of court-house yard is 2.2 feet northwest; iron post set 42 inches in the ground, stamped "Prim. Trav. Sta. No. 32".....	37	59	16.6	85	42	59.9

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Shepherdsville, 1.25 miles east of, T road northwest, 48 feet west to mail box, 40 feet north to cross on gatepost.....	37	59	53.2	85	41	44.9
Floyds Fork, center of bridge over.....	38	00	21.2	85	40	51.1
T road northwest, 40 feet west to cross on telephone pole, 25 feet south to cross on fence post.....	38	00	42.8	85	39	01.7
Pleasant Grove schoolhouse, T. Wise's mail box on telephone pole.....	38	01	14.7	85	38	05.1
Stallings's (William) garden, at northwest corner of, nail in blazed walnut tree, bears N. 33° 30' W., distant 44.2 feet; northwest corner of Stallings's house bears S. 78° 40' E., distant 153.4 feet; iron post set 40 inches in ground, stamped "Prim. Trav. Sta. No. 35".....	38	01	30.3	85	36	59.9
Bethel Church, T road north at, 37 feet west to W. Boss's mail box, 15 feet south to corner stone on south side of road.....	38	01	55.5	85	35	45.6
Road south, 18 feet southeast to R. H. Hall's mail box, 44 feet southwest to cross on corner fence post.....	38	02	11.7	85	34	15.6
Mount Washington, road southeast 0.5 mile southwest of, 15 feet north to cross on board fence, 50 feet east to cross on corner fence post....	38	02	33.5	85	32	53.8
Mount Washington, intersection of roads in south part of, 27 feet east to telephone pole, 48 feet north to telephone pole.....	38	02	49.9	85	32	31.8
Road southwest, 15 feet north to cross on fence post, 25 feet southwest to cross on corner post.....	38	03	24.8	85	30	59.8
Blacksmith shop, crossroads at, 33 feet southeast to corner fence post, 39 feet southeast to arrow on fence.....	38	03	57.1	85	30	08.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Ting post-office, 0.5 mile northeast of T road northwest, 24 feet east to cross on fence post 36 feet north to persimmon sapling.....	38 04 39.8	85 29 53.1
Road southeast at branch, 24 feet east to cross on picket fence, 36 feet southwest to arrow on fence.....	38 05 15.8	85 29 04.9
Whitfield, road west 1 mile southwest of, 900 feet northeast of school-house.....	38 05 35.5	85 28 31.8
Bullitt-Jefferson county line, stone platform in front of brick house.....	38 05 56.5	85 29 11.9
Forks of road, 30 feet south to walnut tree, 60 feet northwest to cross on large sycamore tree.....	38 06 27.1	85 30 05.7
Malott post-office, 1.2 miles south of, in corner of field of O. E. Georger; southeast corner of Georger's house bears N. 10° 40' E., distant 147.2 feet; cross on foundation to stable bears S. 60° 20' W., distant 53.6 feet; iron post stamped "Prim. Trav. Sta. No. 37".....	38 07 18.8	85 30 10.0
Floyds Fork, south end of covered bridge over.....	38 07 55.6	85 31 05.9
Bridwells's (Thomas) residence, small pasture in front of, center of gate to.....	38 09 02.3	85 30 33.2
Large white-oak tree, cross mark on.....	38 09 27.2	85 29 55.2
Crossroads, 50 feet south to corner stone of fence, 28 feet northwest to cross on corner fence post.....	38 09 59.6	85 31 09.6
Road west, 30 feet northwest to cross on corner rail fence, 16 feet east to small locust tree.....	38 10 36.6	85 32 02.9
Heddy road, south at Taylorsville pike, 18 feet north to cross on fence post, 43 feet southeast to cross on telephone pole.....	38 11 08.4	85 32 09.0
Tucker station, crossing of Southern Rwy. 0.25 mile east of.....	38 11 54.1	85 31 38.5
Center small bridge.....	38 12 32.0	85 31 43.3
T pike east, 25 feet southeast to mail box, 20 feet northeast to east end of tile culvert.....	38 13 52.8	85 31 49.6
Middletown, cross streets at Methodist Church, 41 feet southwest to iron pump, 30 feet southeast to cross on telephone pole.....	38 14 41.9	85 32 23.1
T road west, 34 feet southwest to stone gatepost, 19 feet southwest to cross on corner yard fence post.....	38 15 18.8	85 32 38.4

Geographic positions along highways between Mount Washington and Smithville.

[Double spur line.]

Station.	Latitude.	Longitude.
Mount Washington, road northeast 1.3 miles southeast of, 48 feet to cross on corner fence post, 42 feet southeast to cross on corner rail fence.....	38 01 53.0	85 31 39.9
Road south, 21 feet west to mail box, 30 feet southeast to cross on fence post.....	38 01 07.6	85 31 20.1
Smithville, in lot at north corner of J. W. Markwell's front yard; northwest corner of Markwell's house bears S. 8° 45' E., distant 86.9 feet; cross on corner of top corner stone to wall on opposite side of road bears N. 53° 15' E., distant 55.1 feet; iron bench-mark post set 36 inches in ground, stamped "Prim. Trav. Sta. No. 36".....	38 00 46.2	85 30 52.4

Prospect quadrangle (Jefferson and Oldham counties, Ky.; Clark and Floyd counties, Ind.).*Geographic positions along the Louisville and Nashville Railroad between Anchorage and Louisville, Ky.*

Station.	Latitude.	Longitude.
Anchorage, in circular park about 300 feet northwest of club house; top of east stone gatepost to entrance to Clark property bears N. 79° 15' W., distant 106.3 feet; south rail of south track at road crossing near park bears N. 55° 30' E., distant 61.8 feet; iron post stamped "Prim. Trav. Sta. No. 38".....	38 15 47.4	85 32 19.2
Lakeland station.....	38 16 10.8	85 33 16.2
Milepost 10, road crossing 540 feet west of.....	38 16 10.5	85 34 40.3
Lyndon, pike crossing 380 feet west of.....	38 15 41.7	85 36 25.1
Beechwood station, north track opposite.....	38 15 29.4	85 37 48.3
St. Matthews, in northeast corner of public school; northeast corner of schoolhouse bears S. 30° 40' E., distant 171.1 feet; south rail of L. and E. Electric R. R. bears N. 10.6 feet; in stone post set in ground, tablet stamped "Prim. Trav. Sta. No. 41".....	38 15 10.2	85 39 37.0
Louisville, road crossing at entrance to city reservoir.....	38 15 15.3	85 40 51.1

Geographic positions along Louisville and Nashville Railroad, Anchorage to Beard.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Forest station, road crossing 0.33 mile south of	38 15 58.9	85 31 34.0
O'Bannon station, road crossing 600 feet north of	38 17 18.8	85 30 48.0
Pewee Valley station, road crossing about 300 feet west of	38 18 31.8	85 29 22.1
Beard, road crossing at station	38 19 22.3	85 28 21.4

Geographic positions along highway, Beard to Westport (Kentucky).

Station.	Latitude.	Longitude.
	° ' "	° ' "
Beard, Y roads 2 miles north of, 20 feet east to cross on fence post, 46 feet northeast to cross on sycamore tree	38 20 39.7	85 29 29.9
Brownsboro, in southeast corner of schoolhouse yard; northeast corner of east stone gatepost to entrance to school yard bears N. 41° 50' W., distant 87.3 feet; cross cut on southeast corner of foundation to schoolhouse bears N. 36° 20' E., distant 262.3 feet; iron post stamped "Prim. Trav. Sta. No. 39"	38 21 27.9	85 30 00.4
Speers's (J. T.) residence, intersection of pikes, 16 feet southeast to cross on telephone pole, 27 feet north to mail box	38 21 56.0	85 30 40.1
Center of gate at north end of lane, county road enters gate	38 22 49.3	85 30 54.7
Turn of road at northeast corner of small bridge	38 24 26.4	85 32 04.5
T road southwest at two gates, corner stone	38 24 52.7	85 31 27.9
Crossing of Louisville pike and dirt road at church, 27 feet west to mail box, 37 feet east to cross on telephone pole	38 25 27.6	85 32 14.1
Skylight, road northwest, 30 feet north to corner fence post, 24 feet southeast to northwest corner blacksmith shop	38 25 56.6	85 31 18.2
Road south, 24 feet north to cross on board fence, 33 feet southwest to cross on beech tree	38 26 02.0	85 30 08.0
T road north, 15 feet southwest to cross on telephone pole, 27 feet northwest to cross on corner fence post	38 26 26.8	85 29 11.6
Westport, cross on face of south gatepost to gate across road	38 28 08.0	85 28 47.5
Westport, center of crossing of Main and Third streets	38 28 42.4	85 28 31.8
Westport, in northeast corner of public school grounds; cross on stone foundation at northeast corner of schoolhouse bears S. 15° 10' W., distant 140 feet; northwest corner wall to cemetery bears S. 32° 55' E., distant 130.3 feet; iron bench-mark post stamped "Prim. Trav. Sta. No. 40"	38 28 46.46	85 28 25.93

The following geographic positions on the United States standard datum were obtained from primary traverse run in 1905 by C. B. Kendall, field assistant. The line starts from Louisville, Ky., with position of cupola of the Catholic Cathedral, near corner of Fifth avenue and Walnut street and runs north along Fifth avenue to Ohio River, which was crossed by triangulation into Jeffersonville. The line then follows the Pittsburg, Cincinnati, Chicago and St. Louis Railway north to Chaney station, thence east along public highways to Westport, Ky., closing on traverse position at that place.

Geographic position at Jeffersonville, Ind.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jeffersonville, crossing Baltimore and Ohio Southwestern and Pennsylvania Inter-Urban R. Rs., center of tracks	38 16 26.6	85 44 52.6

*Geographic positions along Pittsburg, Cincinnati, Chicago and St. Louis Railway
(Indiana).*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Jeffersonville, crossing Baltimore and Ohio Southwestern R. R. and Pittsburg, Cincinnati, Chicago and St. Louis Rwy, center of.....	38	16	59.7	85	44	37.8
Jeffersonville, 2.2 miles north of, road crossing, center of track.....	38	18	13.5	85	45	05.2
Pennsylvania and Baltimore and Ohio R. Rs., crossing, 500 feet north of, center of track at road crossing.....	38	19	11.3	85	45	04.6
Cementville station, 0.7 mile south of, road crossing, center of track ..	38	20	23.4	85	44	52.5
Cementville station, 200 feet north of, pike crossing, center of main track.....	38	20	59.4	85	44	45.6
Cementville, 1.5 miles north of, road crossing, center of track.....	38	22	13.8	85	44	46.0
Sellersburg station, 150 feet south of, street crossing, center main track.	38	23	40.9	85	45	01.2
Sellersburg, at south end of station, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	38	23	42.5	85	45	01.6
Speeds station, 250 feet south of, road crossing, center of track.....	38	24	40.5	85	45	08.8
Speeds station, 1 mile north of, center of track at second-class road crossing.....	38	25	36.1	85	45	17.9
Milepost "L 14," 500 feet south of, road crossing and east-west township line, center of track.....	38	26	34.9	85	45	46.8
Milepost "L 15," 800 feet north of, road crossing, center of track.....	38	27	39.0	85	46	00.6
Milepost "L 16," 400 feet south of, second-class road crossing, center of track.....	38	28	18.4	85	45	52.5
Memphis station, 475 feet north of, Main street crossing, center of track.	38	29	00.8	85	45	42.1
Chaney station, road crossing, center of track.....	38	30	24.6	85	45	53.7
Chaney station, in northeast corner of intersection of public crossroads, 90 feet east of Chaney station signal tower, 95 feet northeast of road crossing, iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	38	30	25.2	85	45	52.9

Geographic positions along highways on north border of quadrangle (Indiana).

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Chaney, 1.7 miles northeast of station, in southeast corner of intersection of four corners, township line between Monroe and Union townships.....	38	31	50.2	85	45	26.6
Three corners at top of hill, public T road to northeast, 30 feet southeast to telephone pole, 20 feet southwest to telephone pole.....	38	31	41.7	85	44	17.6
Church and cemetery, 0.5 mile west of, four corners, 30 feet southeast to oak, 12 feet north to old gatepost.....	38	31	49.6	85	43	31.1
Church and cemetery, 1 mile east of, three corners, T road northwest, center of triangle.....	38	30	59.0	85	42	26.3
Three corners, public T road to southwest, 40 feet south to walnut, 40 feet northwest to walnut.....	38	30	15.2	85	41	42.2
Three corners at white house, 50 feet southeast to apple tree, 30 feet west to corner front yard fence.....	38	29	41.2	85	40	49.8
Three corners at small two-story house, about 3 miles north of Charlestown, T road to northwest, telephone pole at corners.....	38	29	09.0	85	40	06.1
Hughes milk station, 1 mile east of, four corners, 40 feet north to post, 40 feet south to post.....	38	28	54.8	85	39	03.5
Hughes milk station, 1.25 miles east of, four corners, 560 feet northeast of, stone set at west edge of road, carved on top "N R" and on east face "139".....	38	28	58.0	85	38	57.8
Greens Mill, 1.25 miles northwest of, three corners, public T road east, stone planted.....	38	29	19.6	85	38	19.8
Greens Mill, three corners, T road west up hill, 50 feet east to ice house, 30 feet west to sycamore.....	38	28	52.4	85	37	35.0
Runyan, store and post-office, 300 feet northeast of, at west edge of main road at second-class road to west and bend of main road to east, iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	38	29	21.4	85	36	29.0
Runyan, 1.5 miles northeast of, three corners, T road to southeast, 40 feet south to elm, 30 feet northwest to sweet gum.....	38	30	17.2	85	35	09.8
Vesta post-office, 2.1 miles northwest of, four corners, 20 feet south to corner post of wire fence, 40 feet west to corner of garden.....	38	30	41.6	85	34	30.8
Vesta post-office, 1 mile northwest of, four corners, intersection of secs. 103, 104, 123, and 124, Owens Township, stone planted.....	38	29	50.2	85	33	43.0
Vesta post-office, four corners, 25 feet north to corner of wire fence, 25 feet west to telephone pole.....	38	29	06.6	85	33	02.4
Solon post-office, well at four corners.....	38	30	06.1	85	31	32.8
Solon post-office, 0.9 mile southeast of, forks of public roads southeast and east, 30 feet south to corner of fence, 20 feet north to locust.....	38	29	26.6	85	30	56.1
Bull Creek, center of covered bridge over.....	38	29	22.7	85	30	06.3
Bull Creek, bridge, 0.6 mile southeast of, T road south, 40 feet southeast to locust, 60 feet west to sycamore.....	38	29	01.8	85	29	32.8
Westport, Ky., station 577 M+3200 feet, Ohio River survey, United States Army engineers.....	38	29	00.0	85	28	42.4

22 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

NEW ALBANY AND RIVERVIEW QUADRANGLES (FLOYD AND HARRISON COUNTIES, IND.;
BULLITT AND JEFFERSON COUNTIES, KY.).

The following geographic positions on the United States standard datum were obtained by primary traverse run in 1905 by C. B. Kendall, field assistant. The line starts with an adjusted position at Jeffersonville and follows the Pennsylvania Interurban Railroad to New Albany, thence west along the Southern Railway to a point 1.6 miles west of Georgetown, where the line turns south and follows public highways along the west border of the Riverview quadrangle and is tied to a primary-traverse position at West Point.

New Albany Quadrangle (Floyd County, Ind.).

Geographic positions along Pennsylvania Interurban Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jeffersonville, crossing Baltimore and Ohio Southwestern and Pennsylvania Interurban R. Rs., center of tracks	38 16 26.6	85 44 52.6
Jeffersonville, Beckett street crossing, center of tracks	38 16 38.8	85 45 27.3
New Albany, Baltimore and Ohio Southwestern R. R. station, 1.1 miles east of, road crossing, north rail of south track	38 17 41.6	85 47 06.6
New Albany, near Baltimore and Ohio Southwestern Rwy. station, center of railroad intersection of Main and Vincennes streets	38 17 21.9	85 48 16.1
New Albany, at end of Pennsylvania Interurban R. R., State street crossing, center of north main track	38 16 57.0	85 49 21.4

Geographic positions along Southern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
New Albany, at west edge of, Budd road crossing, center of track	38 16 23.9	85 50 19.4
New Albany, Southern Rwy. station, 2 miles west of, road crossing, center of track	38 16 38.9	85 51 17.6
Duncan Hill tunnel, 1.6 miles southeast of, pike crossing, center of track	38 17 04.6	85 52 32.2
Duncan Hill tunnel, 0.4 mile southeast of, pike crossing, center of track	38 17 11.4	85 53 47.6
Duncan station, 0.25 mile southwest of, Duncan post-office and store of J. B. Nichols, at southeast corner of store, on north edge of Edwardsville-Georgetown pike and 300 feet south of center of main track of Southern Rwy., iron post stamped "Prim. Trav. Sta. No. 4, 1905" ..	38 17 12.9	85 55 27.9
Duncan post-office, 100 feet east of, public-land survey corner, 229 feet south of Southern Rwy.	38 17 13.5	85 55 27.6
Georgetown station, 1.6 miles southeast of, pike crossing, center of track	38 17 34.3	85 56 45.8
Georgetown station, 680 feet east of, street crossing, center of track ..	38 17 36.9	85 58 20.8
Georgetown station, 1.6 miles west of, road crossing, center of track ..	38 17 12.3	85 59 55.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Georgetown, about 1.25 miles west of, T road south	38 17 06.1	85 59 32.9
Georgetown, 1.25 miles west of, 0.2 mile south of Southern Rwy., T road south on T. 3 S., R. 5 E., north-south county and section line between secs. 5 and 6, in southeast corner of junction, iron post stamped "Prim. Trav. Sta. No. 5, 1905"	38 17 05.9	85 59 32.6
T. 3 S., R. 5 E., corner secs. 5, 6, 7, and 8, stone at bend of road to west ..	38 16 21.6	85 59 33.0
Three corners, public T road to south, stone on north edge of road ...	38 16 21.7	86 00 06.7
Four corners, crossing of Georgetown-Lanesville road and New Albany-Corydon old stage road, 20 feet northwest to corner shop, 60 feet southeast to walnut tree	38 15 40.4	86 00 06.9

Riverview Quadrangle (Harrison County, Ind.; Bullitt and Jefferson counties, Ky.).*Geographic positions along Louisville and Nashville Railroad between Louisville and Highland Park (Kentucky).*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Louisville, Oak street crossing Louisville and Nashville R. R.	38	14	07.4	85	46	06.2
Louisville, crossing of Louisville and Nashville R. R. and Southern Rwy., Park avenue, west track.	38	12	52.6	85	45	50.2
South Louisville, station.	38	11	58.1	85	45	35.6
Highland Park, station.	38	11	15.2	85	45	24.0
Highland Park, road crossing 1 mile south of.	38	10	33.5	85	45	12.9

Geographic positions along highways from Shepherdsville to Riverview, in Kentucky.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Shepherdsville, road northwest 1.25 miles west of, 68 feet southwest to cross on pine tree, 42 feet northeast to cross on post-oak tree.	37	59	54.0	85	44	16.0
Bullitts Lick, crossroads, 33 feet north to cross on corner fence post, 42 feet east to cross on board fence.	38	00	05.9	85	45	18.0
Crossroads, at store and blacksmith shop, 70 feet southwest to front gate to church, 36 feet north to post with horseshoe nails in it.	38	00	02.8	85	45	52.7
Forks of road, at southeast corner of J. T. Martin's orchard, 25 feet to cross on small pine tree, 36 feet north to cross on telephone pole.	38	00	24.3	85	46	55.9
Miller (George) house, arrow painted on gatepost at entrance to lane.	38	01	33.8	85	48	26.9
Barralton, 1.5 miles southwest of, in yard to R. D. Snellen's residence; southeast corner of house bears N. 75° 15' W., distant 121.5 feet; nail in blaze on south face of sycamore tree 30 inches in diameter bears N. 42° 10' E., distant 130.8 feet; iron post stamped "Prim. Trav. Sta. No. 33".	38	01	38.6	85	49	12.1
Miller (Harden) farm, arrow on gatepost to entrance.	38	01	09.2	85	50	42.7
Moore's store, T road south, 18 feet south to northwest corner of porch to store, 32 feet north to cross on gatepost.	38	00	28.2	85	51	36.2
Cupio, center of small bridge 0.25 mile northeast of, at road southwest.	38	00	31.2	85	52	29.1
Griffin (John) residence, cross on telephone pole on south side of road.	38	01	00.1	85	53	38.9
Road crossing, under trestle to new railroad.	38	00	59.4	85	54	17.6

Geographic positions along Louisville and Nashville Railroad, Riverview to West Point (Kentucky).

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Riverview, road crossing.	38	01	28.4	85	54	57.6
Riverview, private road crossing 1 mile south of.	38	00	45.5	85	55	38.5
West Point, in northwest corner of public school grounds, northwest corner of brick foundation to schoolhouse bears S. 27° 10' E., distant 26.9 feet; southwest corner of stone foundation to Christian Church bears N. 13° 35' E., distant 13.6 feet; iron post stamped "Prim. Trav. Sta. No. 34".	37	59	52.7	85	56	58.8
West Point, center of crossing of Bach and Carter streets.	37	59	55.5	85	56	47.4

Geographic positions along highways (Indiana).

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Lanesville, 1.3 miles north of, forks second-class road to southeast, 40 feet east to oak tree at gate.....	38	14	52.2	85	59	44.9
Lanesville, 0.8 mile north of, iron gas pipe driven in ground at bend of road to south, 250 feet southeast of ford of small creek.....	38	14	35.9	85	59	33.3
Lanesville, crossing of New Albany-Corydon pike (main street), and Georgetown-Black Creek road, 25 feet southwest to northeast corner of Jacob Facfinger's store, 30 feet southeast to maple tree at corner.....	38	14	14.2	85	59	09.8
Lanesville, 1.2 miles south of, at top of hill, forks, public roads southwest and southeast, 20 feet west to walnut, 60 feet south to old stump.....	38	13	03.8	85	59	03.7
Fellow schoolhouse, three corners at, public T road to west, 20 feet northwest to corner wire fence, 50 feet south to corner schoolhouse.....	38	11	57.5	85	58	52.8
Buck Creek ford, 300 feet north of, forks, roads north and northeast, 20 feet north to maple, 50 feet south to maple.....	38	11	04.5	85	58	35.8
Black Creek post-office, 300 feet east of, at foot of hill, forks of roads southeast and west.....	38	10	41.7	85	58	49.3
Kerr schoolhouse, No. 3, Posey Township, four corners, 30 feet south to gate, 40 feet northeast to telephone pole.....	38	10	13.6	85	58	27.2
Kerr schoolhouse, 0.6 mile south of, stone at three corners, second-class T road to west.....	38	09	48.9	85	58	35.8
Elizabeth, 2.2 miles north of, forks at top of hill, second-class road to northeast, 25 feet north to telephone pole.....	38	08	47.2	85	58	36.0
Elizabeth, 0.5 mile northwest of, three corners, T road north, 30 feet east to locust, 30 feet north to locust.....	38	07	36.7	85	58	36.9
Elizabeth, street crossing 250 feet east of public school building, center of intersection.....	38	07	15.4	85	58	27.0
Elizabeth, 250 feet west of Main street crossing, at southeast corner of public school, iron post stamped "Prim. Trav. Sta. No. 6, 1905".....	38	07	15.8	85	58	30.1
Elizabeth, 1 mile south of, large oak at three-corner public T road to west.....	38	06	22.9	85	58	34.4
T. 5 S., R. 5 E., corner secs. 8, 9, 16, and 17, also east-west township line between Posey and Taylor townships (civil), corner is stone in center of road 200 feet south of three-corner public T road to west.....	38	04	50.6	85	58	34.4
Convenience, 1 mile north of, forks of public roads south and west, 60 feet south to maple, 20 feet west to rail fence.....	38	04	14.8	85	58	25.3
Convenience, Catholic Church, 200 feet west of, four corners, public crossroads, 40 feet south to corner garden, 100 feet east to oak.....	38	03	30.7	85	58	47.8
Convenience, 1.2 miles south of, three corners, second-class T road west, two mail boxes.....	38	02	35.7	85	58	51.5
Convenience, 1.7 miles south of, Rosehill schoolhouse, 1,150 feet northeast of, stone planted in center of road.....	38	02	18.1	85	59	02.6
Rosehill schoolhouse, 1 mile southwest of, forks of public roads northeast and north, 10 feet south to mail box, 35 feet north to mail box.....	38	01	35.7	85	59	35.7
Evans Landing post-office, 0.6 mile west of, forks, public roads northwest and west, center of triangle at forks.....	38	00	27.8	85	59	35.0
Evans Landing post-office, small stream, center of iron bridge over.....	38	00	11.6	85	59	04.3
Evans Landing post-office, 1.1 miles northeast of, three corners, second-class road to south, 50 feet west of barn.....	38	00	25.6	85	58	01.8

KENTUCKY.

PRIMARY TRAVERSE.

CALDWELL, CRITTENDEN, HOPKINS, AND WEBSTER COUNTIES.

CLAY QUADRANGLE.

The line starts from primary traverse station No. 10, 1904, at Sullivan, Ky., follows the Illinois Central Railroad to Repton, thence southerly along highways through Tribune and Starr to Enon, thence easterly over county roads through Creswell to Dalton, thence north over highways to Providence, thence to Lisman railroad station, connecting with road crossing at that place; located by primary traverse in 1904. The field work was done by J. R. Ellis in 1906.

Magnetic declination, east border, 3° 47' east; south border, 4° 13' east; west border, 4° 27' east.

Geographic positions along Illinois Central Railroad, Sullivan to Repton.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sullivan, primary traverse station No. 10, 1904.....	37 29 58.8	87 56 37.1
Sullivan, road crossing 0.75 mile southeast.....	37 29 21.5	87 56 14.4
Road crossing under trestle at milepost 60.....	37 28 03.9	87 55 47.8
Blackford railroad station, road crossing.....	37 27 02.6	87 56 04.1
Blackford, 1.25 miles south of, road crossing north and south.....	37 26 15.9	87 56 50.1
Gladstone post-office, road crossing.....	37 25 46.6	87 58 06.0
Hood siding, road crossing at south end of.....	37 25 23.2	88 00 03.2
Road crossing 150 feet north of milepost 62.....	37 24 22.0	88 00 34.0
Repton, railroad station.....	37 23 24.8	88 00 56.0
Repton and Tribune, crossroads half way between, in northwest corner of R. Newcomb's farm, nail in blaze on walnut tree bears S. 81° 45' E., distant 112.9 feet; nail in blaze on small oak bears S. 89° W., distant 34 feet; iron post stamped "Prim. Trav. Sta. No. 15, 1906".....	37 22 35.1	87 59 48.1

Geographic positions along highways from Repton through Tribune and Starr to Enon, thence easterly over county road; through Creswell to Dalton.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads on top of hill, 15 feet west to blaze on black oak, 33 feet east to blaze on sapling.....	37 21 37.9	87 59 38.8
Tribune, crossroads, 16 feet northwest to store, northeast corner, 24 feet northeast to corner of coal house.....	37 20 56.8	87 59 26.0
Widow Brantley's residence, crossroads, 16 feet northwest to walnut tree, 38 feet north to mulberry tree.....	37 19 55.4	87 59 37.0
Wilson's Creek, 0.66 mile south of, T road southeast, 15 feet east to corner fence post, 22 feet southeast to corner orchard fence.....	37 18 53.2	88 00 22.4
Starr, crossroads, 32 feet east to Brucher's mail box, 21 feet southeast to west corner of shed to blacksmith shop.....	37 17 36.0	88 00 10.2
Crittenden-Caldwell county line stone, center of road opposite, 18 feet southwest to stone.....	37 16 21.8	88 59 31.0
Enon, Walnut Grove Church, at corner of old Polk farm at T. lane northeast, about 0.75 mile northeast of Enon, nail in small black oak bears S. 79° 25' E., distant 13.3 feet; T road northeast bears S. 28° 30' E., distant 35 feet; iron post stamped "Prim. Trav. Sta. No. 16, 1906".....	37 15 34.1	87 58 43.9
Oliver (L. L.) residence, at road northwest, arrow painted on tree....	37 15 56.5	87 57 40.6
How Ridge schoolhouse, forks of road, 19 feet south to W. R. Briggs's mail box, 27 feet northwest to cross on elm tree.....	37 16 32.7	87 57 19.5
Forks of road, arrow cut on black-oak tree.....	37 16 19.4	87 55 30.2
Creswell, forks of road, 18 feet northwest to J. T. Brown's mail box, 20 feet southwest to arrow on rail fence.....	37 16 13.3	87 54 40.6
T lane northwest.....	37 16 25.2	87 53 29.4
Junction of branches at point where road crosses.....	37 16 54.8	87 52 44.1
Walnut Hill school grounds, southeast corner of foundation to schoolhouse bears N. 85° W., distant 18.6 feet; nail in blaze on east face of walnut tree bears S. 28° 45' W., distant 23.5 feet; iron post stamped "Prim. Trav. Sta. No. 17, 1906".....	37 17 11.4	87 52 09.2
J. N. Castleberg's barn, forks of road, 31 feet northeast to stump, 24 feet east to southwest corner of barn.....	37 17 28.3	87 51 19.7
Quinn, T road south at blacksmith's shop, 18 feet southwest to northeast corner of shop, 58 feet east to hickory tree.....	37 17 43.6	87 50 07.9
Quinn, forks of road about 1 mile east of, 22 feet southeast to mulberry tree, 24 feet north to west end of bridge.....	37 17 40.0	87 48 56.8
Caldwell-Hopkins county line, center of Tradewater river.....	37 18 00.4	87 48 25.8
Crossroads, stump.....	37 17 56.7	87 46 39.5
Dalton, in front of public school, 3 feet from school building, iron post stamped "Prim. Trav. Sta. No. 18, 1906".....	37 17 49.7	87 45 55.6

Geographic positions north along highways to Providence, thence to Lisman railroad station, connecting with road crossing at that place, located by primary traverse of 1904.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Dalton, T road 0.5 mile north of, 21 feet northwest to cross on post, 27 feet northeast to end of picket fence.....	37	18	28.2	87	45	31.0
Dalton, T road 1.5 miles north of, 19 feet southeast to gum tree, 35 feet southwest to cross on rail fence.....	37	19	33.1	87	45	13.1
Stony Ridge Church, T road west 0.33 mile north, 28 feet northwest to corner fence post, 21 feet northeast to telephone pole.....	37	20	18.0	87	45	29.6
Providence, T road south about 3.5 miles south of, 24 feet southeast to corner fence, 45 feet southwest to elm tree.....	37	21	52.3	87	44	55.5
Hopkins-Webster county line, bridge.....	37	23	04.3	87	44	53.5
Providence, in retaining wall of T. B. Paine's front yard, aluminum tablet stamped "Prim. Trav. Sta. No. 19, 1906".....	37	23	57.9	87	45	41.5
Road east and west under bridge.....	37	24	51.0	87	45	25.8
Crab Orchard Creek, T road west 0.75 mile south of, 25 feet northwest to corner of rail fence, 18 feet southwest to corner fence post.....	37	26	01.5	87	45	10.6
Road southeast, 6 feet west to stump, 27 feet southwest to south end of bridge.....	37	26	56.0	87	44	40.4
Lisman railroad station, road crossing 120 feet west of.....	37	28	13.5	87	43	45.3

JEFFERSON COUNTY.

LOUISVILLE CITY SURVEY.

In the spring of 1906 J. R. Ellis, assistant topographer, was detailed to the commissioners of sewerage of the city of Louisville, for the purpose of extending lines of primary control throughout the city. The area of the city was divided into 12 rectangular blocks approximately 1.5 by 2 miles, around the borders of which lines of primary traverse were run: Particular care was taken to have the work done accurately, the deflection angles being measured four times, and distances being measured twice with a steel tape under a constant tension, the temperature also being noted. At intervals of 2,000 feet along the route of traverse a permanent station mark, consisting of a bronze tablet 3.5 inches in diameter, was countersunk and cemented into the top of a stone post 3 feet in length, dressed 6 inches square on top, set in the ground flush with surface.

Positions are given on the United States standard datum and are based on North Base and Blind Asylum triangulation stations of the United States Coast and Geodetic Survey.

Geographic positions at Louisville.

Station.	Latitude.	Longitude.
<p>Louisville north base triangulation station, on the land of Joseph Lee. The station is situated in the field lying immediately south of the place of Mr. Murray, who knows the location of the station; so does Mr. Beutel, who rents Mr. Lee's place. The station is in an open, cultivated field with no trees near it. Station mark: An earthenware pyramid base 6 by 6 inches, height 5 inches, placed 3 feet 7 inches below surface as underground mark. The apex of the pyramid marks the exact center of the station. The letters U. S. C. S. are cut in the face of the pyramid. Above this was placed a granite post 4 feet 10 inches long, rough at bottom and dressed to 10 inches at top, the south side of which the following is cut:</p> <p style="text-align: center;">U. S. C. & G. S. North Base 1879</p> <p>The top of the post is in the form of a pyramid, in the apex of which a copper bolt was driven in a hole drilled in the post, and the intersection of the rectangular cross lines cut in the top of the bolt marks center of station. Reference marks: Three other stones, 2 feet 6 inches long, rough at bottom and dressed to 4 by 4 inches at the top, were used as additional surface marks, one in prolongation of base line to the north of the station, one on the base line to the south of the station, and the other at right angles to this line to the east of the station. Each of these posts has cross lines cut in the top, with an arrow pointing to the station. The intersection of these cross lines in each case is 6 feet distant from the center of the station. The center post projects 1 foot 6 inches above ground, the others 4 inches.</p>		
B. M. 1, on south side of Bell's lane 3 feet north of east-west fence, nail in blaze of tree, azimuth 174°, distance 173.8 feet; gatepost, azimuth 3° 03', distance 62.1 feet.	38 13 27.84	85 49 47.29
B. M. 2, in top of bank on south side of road in Bell's lane, 1,100 feet west of Cane Run road, Louis Plochner's house, azimuth 242° 27', distance 144.1 feet; tree, azimuth 212° 16', distance 46.6 feet.	38 13 22.02	85 49 34.37
B. M. 3, on east side of Cane Run road, 820 feet northeast of Bell's lane, 9 feet west of fence, 41.7 feet southwest to nail in telephone pole, 37.4 feet south to cross on north end of stone culvert, nail in telephone pole, azimuth 112° 18', distance 41.7 feet.	38 13 17.41	85 49 06.11
B. M. 4, at intersection of Cane Run road and Beech street, pump, azimuth 113° 32', distance 19.5 feet; Cramer's saloon, azimuth 177° 49', distance 26.5 feet.	38 13 20.97	85 48 38.77
B. M. 5, at northwest corner of Beech street and Woodward avenue, gas pipe on corner, azimuth 280° 07', distance 50.6 feet; house, azimuth 117° 32', distance 39 feet.	38 13 40.54	85 48 20.54
B. M. 6, at southwest corner of Danesville and Amber streets at foot of Twenty-eighth street; drug store azimuth 139° 00', distance 50.2 feet; corner of store, azimuth 205° 26', distance 43.3 feet.	38 14 02.91	85 48 17.68
B. M. 7, at northeast corner of Twenty-eighth and Kentucky streets, northwest corner grocery store, azimuth 1° 53', distance 62.1 feet; corner bakery, azimuth 212° 12', distance 20 feet.	38 14 10.83	85 48 01.82
B. M. 8, at southeast corner of Twenty-eighth street and Broadway, corner of post-office station H, azimuth 192° 13', distance 85.6 feet; northwest corner of curb, azimuth 144° 04', distance 61.8 feet.	38 14 35.89	85 47 57.40
B. M. 9, at southeast corner of Twenty-eighth and Madison streets, grocery store, azimuth 310° 29', distance 7 feet; corner residence No. 1600, azimuth 91° 36', distance 60.9 feet.	38 14 56.89	85 47 53.69
B. M. 10, on north side of Market street at head of Twenty-eighth street; grocery store, azimuth 355° 22', distance 66.9 feet; corner of saloon, azimuth 52° 04', distance 79.1 feet.	38 15 14.43	85 47 50.60
B. M. 11, at northeast corner of Twenty-sixth and Rowan streets, corner of saloon, azimuth 227° 00', distance 9.1 feet; south end of fence, azimuth 135° 22', distance 61.9 feet.	38 15 34.26	85 47 47.22
B. M. 12, at northeast corner of Twenty-sixth and Slevin streets, corner of Ohlman's exchange, azimuth 100° 28', distance 47 feet; Hochstrass azimuth 258° 28', distance 9.8 feet.	38 15 42.43	85 47 36.13
B. M. 13, at southeast corner of Twenty-sixth street and Portland avenue, grocery store, azimuth 108° 09', distance 46.6 feet; Struby's pump, azimuth 352° 46', distance 7.9 feet.	38 15 55.83	85 47 34.62
B. M. 14, on Portland avenue, 65 feet west of west curb to Thirtieth street, and 8 feet east of center of Kentucky and Indiana Bridge R. R.	38 16 14.26	85 47 23.93
B. M. 15, at northwest corner of Thirty-third and Rudd streets, grocery store, azimuth 136° 45', distance 9.3 feet; pump, azimuth 260° 08', distance 81.5 feet.	38 16 22.60	85 47 47.27
B. M. 16, at southeast corner of Thirty-fifth and Water streets, corner of saloon, azimuth 817° 50', distance 15.5 feet; manhole in Water street, azimuth 199° 03', distance 10.7 feet.	38 16 34.11	85 48 04.77
B. M. 17, at southwest corner of Thirty-fifth and High streets, south corner of wall of academy grounds, azimuth 130° 15', distance 129 feet; cement foundation, azimuth 55° 48', distance 13.7 feet.	38 16 42.91	85 48 17.85
B. M. 18, on south side of High street, 446 feet west of west curb to Thirty-eighth street, corner of brick house, azimuth 191° 33', distance 91.9 feet; corner of warehouse, azimuth 132° 03', distance 131 feet.	38 16 27.26	85 48 16.03
	38 16 25.53	85 48 41.84

Geographic positions at Louisville—Continued.

Station.	Latitude.	Longitude.
B. M. 19, on south side of Bark street extended and on north side of Mrs. Annie Findlay's farm, 300 feet from Ohio River, nail in sycamore tree, azimuth 267° 40', distance 59.5 feet; nail in tree, azimuth 132° 27', distance 73.4 feet.....	° ' " 38 16 22.75	° ' " 85 49 23.34
B. M. 20, at southwest corner of Fountain Ferry road and boulevard at northwest corner of Fountain Ferry Park, nail in pole azimuth, 295° 26'; nail in tree, azimuth 258° 56'.....	38 15 53.13	85 49 33.09
B. M. 21, at junction of east-west road and road north in west part of Shawnee Park, water plug azimuth, 47° 35', distance 46 feet; lamp-post, azimuth 324° 28', distance 4.5 feet.....	38 15 29.25	85 49 46.42
B. M. 22, on West Broadway, nail in tree, azimuth 120° 09', distance 72.8 feet; urn, azimuth 303° 55', distance 174 feet.....	38 15 01.34	85 49 50.25
B. M. 23, on Broadway at head of Forty-second street, telephone pole, azimuth 314° 44', distance 71 feet; telephone pole, azimuth 48° 28', distance 76 feet.....	38 15 00.30	85 49 19.70
B. M. 24, on northeast corner of Broadway and Thirty-seventh street, corner of red brick house, azimuth 220° 49', distance 47.9 feet; southeast corner of yellow brick house, azimuth 104° 31', distance 188.5 feet.....	38 14 59.35	85 48 51.64
B. M. 25, on north side of Broadway at Thirty-second street south, corner of church, azimuth 317° 47', distance 164.9 feet, post, azimuth 19° 45', distance 81.5 feet.....	38 14 58.30	85 48 20.76
B. M. 26, on south side of Greenwood avenue and just east of Spring Bank Electric Rwy. station, nail in cherry tree, azimuth 87° 07', distance 18.3 feet; nail in gum tree, azimuth 205° 46', distance 64.5 feet.....	38 14 41.00	85 49 54.53
B. M. 27, on Dr. B. A. Garr's farm, in northeast corner of barn lot, corner house, azimuth 203° 28', distance 77.4 feet.....	38 14 21.59	85 49 57.96
B. M. 28, on south side of Gibson's lane, just east of Little Paddys Run, nail in sycamore tree, azimuth 146° 24', distance 75.5 feet; nail in cherry tree, azimuth 260° 13', distance 81.7 feet.....	38 13 56.72	85 49 47.16
B. M. 29, on south bank of Little Paddys Run, about 400 feet southwest of house rented by Frank Meyers.....	38 13 41.77	85 50 09.89
B. M. 30, in Bell's lane about 300 feet east of bank of Ohio River, 4 feet north of fence, nail in walnut tree, azimuth 272° 12', distance 203.1 feet; tree, azimuth 75° 52', distance 46.2 feet.....	38 13 23.91	85 50 34.80
B. M. 31, on north side of Bell's lane, just east of entrance to Christ Gilchrist's farm, corner of his house, azimuth 168° 13', distance 101.2 feet; nail in gum tree, azimuth 62° 27', distance 82.1 feet.....	38 13 22.99	85 49 56.91
B. M. 32, on east side of Cane Run road, just north of Woodlawn avenue, nail in tree, azimuth 81° 59', distance 107.6 feet; southeast corner of house, azimuth 121° 38', distance 52.7 feet.....	38 14 00.46	85 47 50.02
B. M. 33, on east side of Eighteenth street at Ormsby avenue west; water plug, azimuth 27° 53', distance 21.8 feet; southeast corner of saloon, azimuth 125° 52', distance 57.5 feet.....	38 14 03.65	85 47 16.21
B. M. 34, on southeast corner of Sixteenth street and Ormsby avenue, center of manhole, azimuth 206° 02', distance 5.2 feet; southeast corner of house No. 1545, azimuth 147° 43', distance 99.5 feet.....	38 14 03.27	85 46 50.29
B. M. 35, on southeast corner of Twelfth street and Ormsby avenue, northeast corner of house, azimuth 83° 52', distance 56.3 feet; southwest corner of box factory, azimuth 190° 52', distance 67.6 feet.....	38 14 01.05	85 46 26.26
B. M. 36, on southeast corner of Seventh street and Ormsby avenue, water plug, azimuth 249° 59', distance 22.9 feet; northeast corner of Kentucky Heating Co.'s porch, azimuth 48° 51', distance 62.5 feet.....	38 13 58.32	85 45 56.73
B. M. 37, on southwest corner of Third street and Ormsby avenue, corner fence post, azimuth 169° 54', distance 69.9 feet; north point of gate post at No. 1400, azimuth 46° 08', distance 38.2 feet.....	38 13 56.21	85 45 33.09
B. M. 38, northeast corner Ormsby avenue and Preston street, southeast corner McGee's drug store, azimuth 155° 23', distance 101.9 feet; northwest corner store building southeast corner Ormsby avenue and Preston street, azimuth 2° 29', distance 54.6 feet.....	38 13 50.49	85 44 59.78
B. M. 39, northwest corner Ormsby avenue and Shelby street, southwest corner of Kentucky Refining Co.'s office, azimuth 211° 15'; northeast corner of car barn, azimuth 12° 05', distance 56.5 feet.....	38 13 47.58	85 44 31.69
B. M. 40, west side of Shelby street, opposite St. Catherine street east, southwest corner of residence No. 1741, azimuth 248° 28', distance 77.9 feet; center of pump, azimuth 324° 42', distance 64 feet.....	38 14 06.07	85 44 28.47
B. M. 41, northwest corner Breckenridge and Shelby streets, southwest corner of drug store, azimuth 272° 10', distance 54.4 feet; southeast corner of grocery store and saloon, azimuth 137° 16', distance 7.4 feet.....	38 14 22.62	85 44 25.62
B. M. 42, northwest corner of Broadway and Shelby avenue, southeast corner of saloon, azimuth 168° 46', distance 15.8 feet; southwest corner of Neider Bros.' grocery store, azimuth 259° 46', distance 42.5 feet.....	38 14 40.03	85 44 22.63
B. M. 43, northwest corner Shelby and Green streets, southeast corner of Scott's hardware store, azimuth 135° 47', distance 6.9 feet; southwest corner of Herman's saloon, azimuth 273° 37', distance 53.3 feet.....	38 15 00.62	85 44 19.08
B. M. 44, northwest corner Main and Shelby streets, southwest corner of Methodist Church corner stone, azimuth 261° 32', distance 60.3 feet; southeast corner of roofing store, azimuth 140° 07', distance 6.4 feet.....	38 15 15.58	85 44 16.47
B. M. 45, north corner of Story avenue and Louisville and Nashville R. R. crossing, north corner of post-office, station A, azimuth 7° 29', distance 75 feet; south corner National Leather Co.'s building, azimuth 189° 57', distance 7.8 feet.....	38 15 18.77	85 43 45.09

Geographic positions at Louisville—Continued.

Station.	Latitude.	Longitude.
B. M. 46, north side of Story avenue and Frankfort avenue southeast, northwest corner of grocery store, azimuth 300° 17', distance 62.9 feet; corner of saloon, azimuth 226° 48', distance 12.9 feet.....	38 15 30.71	85 43 17.64
B. M. 47, west corner of Frankfort avenue and Haldeman street north, northeast corner of store, azimuth 53° 18', distance 86.6 feet; corner post to B. I. grounds, azimuth 137° 08', distance 10.7 feet.....	38 15 18.90	85 42 46.00
B. M. 48, southwest corner of Frankfort avenue and Keats street south, water plug, azimuth 105° 20', distance 5.9 feet; northwest corner of house, azimuth 272° 15', distance 30.2 feet.....	38 15 10.95	85 42 07.29
B. M. 49, southeast corner Frankfort avenue and Park avenue south, corner Crescent Hill Pharmacy, azimuth 74° 24', distance 55.8 feet; corner Crescent Drug Co., azimuth 327° 07', distance 8.6 feet.....	38 15 15.25	85 41 34.47
B. M. 50, south side Frankfort avenue, north of wall to waterworks, water tank nearest corner, azimuth 57° 18', distance 42.5 feet; corner of stone wall at waterworks, azimuth 348° 28', distance 7 feet.....	38 15 14.75	85 40 57.28
B. M. 51, northwest corner of crossing of Brownsboro road and Pipe Line avenue, north corner of westernmost gate post to entrance to reservoir grounds, azimuth 332° 02', distance 68.8 feet; center of water plug, azimuth 299° 09', distance 48.2 feet.....	38 15 38.87	85 41 03.75
B. M. 52, west side of Pipe Line avenue or cinder road 3,750 feet south of Prospect Electric R. R. and 950 feet north of T road east; nail in locust tree, azimuth 18° 37', distance 21.8 feet; nail in locust tree, azimuth 126° 06', distance 26.7 feet.....	38 15 52.37	85 41 21.81
B. M. 53, west side of Pipe Line avenue or cinder road just north of Prospect Electric R. R., tree, azimuth 217° 45', distance 28.7 feet; tree, azimuth 86° 22', distance 22.1 feet.....	38 16 23.97	85 41 46.82
B. M. 54, south side of River road about 600 feet west of entrance to golf links, nail in tree, azimuth 78° 32', distance 92.6 feet; nail in hollow tree, azimuth 154° 12', distance 40 feet.....	38 16 30.93	85 42 06.65
B. M. 55, south side of River road opposite G. Hooper's residence, iron pump, azimuth 125° 20', distance 55 feet; north corner of brick house, azimuth 356° 59', distance 58.6 feet.....	38 16 16.59	85 42 31.21
B. M. 56, east side of River road 678 feet northeast of Louisville and Nashville R. R., nail in telephone pole, azimuth 94° 55', distance 69.4 feet; north corner of house, azimuth 15° 50', distance 64.1 feet.....	38 16 03.59	85 43 00.24
B. M. 57, north corner Van Buren and Marion streets, east corner of house, azimuth 82° 54', distance 60.3 feet; center of pump, azimuth 23° 33', distance 58.8 feet.....	38 15 55.69	85 43 24.64
B. M. 58, north corner Fulton and Adams streets, corner of saloon and grocery, azimuth 337° 11', distance 11.9 feet; northwest corner of sawmill office, azimuth 205° 08', distance 68.8 feet.....	38 15 48.27	85 43 49.17
B. M. 59, northeast corner Fulton and Shelton streets, center of fire plug, distance 61.1 feet; center of westernmost boiler, distance 42.5 feet.....	38 15 36.24	85 44 21.41
Story street crossing of Louisville and Nashville R. R. (Ellis, 1904).....	38 15 18.43	85 43 45.03
B. M. 60, southwest corner of Seventh and Shipp streets, center of pump, azimuth 121° 33', distance 6.4 feet; northwest corner of saloon, azimuth 336° 20', distance 5.5 feet.....	38 13 32.85	85 46 09.39
B. M. 61, west side of Seventh street road about 720 feet south of Southern Rwy., nail in small tree, azimuth 64° 42', distance 48.9 feet; nail in telephone pole, azimuth 353° 24', distance 54.1 feet.....	38 13 19.50	85 46 26.21
B. M. 62, on west side of Seventh street road, 680 feet south of Thompson's road, northeast corner of Jacob Schafflin's residence, azimuth 57° 17', distance 97.1 feet; nail in telephone pole, azimuth 259° 14', distance 67.6 feet.....	38 13 05.72	85 46 44.60
B. M. 63, west side of Seventh street road, at Arcade avenue southeast, northeast corner of brick dwelling, azimuth 132° 01', distance 65.9 feet; southwest corner of G. J. Schmidt's saloon and grocery, azimuth 316° 33', distance 63 feet.....	38 12 33.56	85 47 13.71
B. M. 64, on west side of Sand River road opposite entrance to Bohemian farm, nail in telephone pole, azimuth 171° 34', distance 30.4 feet; nail in large beech tree, azimuth 266° 33', distance 79.1 feet.....	38 12 34.57	85 47 52.61
B. M. 65, on east side of Eighteenth street or Sand River road, at schoolhouse lane west, center of stone post at corner of schoolhouse lane, azimuth 108° 31', distance 47.2 feet; southwest corner of schoolhouse, azimuth 254° 04', distance 80.7 feet.....	38 12 51.66	85 47 45.27
B. M. 66, on south side of schoolhouse lane just west of entrance to W. T. Hartledge's farm, nail in west gate post of Hartledge road, azimuth 276° 46', distance 54.4 feet; nail in pear tree, azimuth 33° 25', distance 5.3 feet.....	38 12 53.49	85 48 14.52
B. M. 67, on west side of road 0.33 mile south of intersection of Cane Run road and Bell's lane, nail in gate post south side of schoolhouse lane, azimuth 324° 36', distance 22 feet.....	38 12 56.94	85 48 46.73
B. M. 68, on east side of Taylor boulevard at Arcade avenue northwest, south corner of house, azimuth 164° 16', distance 119.6 feet.....	38 12 06.07	85 46 53.36
B. M. 69, on Taylor boulevard at junction with Berry boulevard, southeast corner of saloon, azimuth 123° 10', distance 98 feet; northeast corner of blacksmith shop, azimuth 64° 55', distance 108.4 feet.....	38 11 45.42	85 46 58.49
B. M. 70, on east side of Taylor boulevard, at Woodland Grove, southeast corner of grocery store, azimuth 106° 41', distance 79.2 feet; nail in elm tree, azimuth 265° 19', distance 79.6 feet.....	38 11 15.09	85 47 00.76

Geographic positions at Louisville—Continued.

Station.	Latitude.	Longitude.
B. M. 71, on east side of Taylor boulevard, nail in locust tree, azimuth 130° 57', distance 63.8 feet; nail in small sycamore tree, azimuth 57° 04', distance 43 feet.	° ' "	° ' "
B. M. 72, on west side of Taylor boulevard at Joseph App's house, northeast corner of house, azimuth 61° 16', distance 94.8 feet; nail in telephone pole, azimuth 351° 54', distance 10.6 feet.	38 10 52.77	85 47 00.79
B. M. 73, on south side of Taylor boulevard, at Third street boulevard northeast corner of Boone cabin, azimuth 203° 25'; south corner of arch, azimuth 316° 35', distance 139.5 feet.	38 10 28.95	85 46 57.78
B. M. 74, on west side of parking to Third street, about 2,400 feet northeast of end of boulevard, center of lamp-post, azimuth 39° 06', distance 56.8 feet; nail in box-elder tree, azimuth 118° 31' distance, 55.2 feet.	38 10 10.06	85 46 53.16
B. M. 75, on west side of parking to Third street, 812 feet south of street-car line, nail in blaze on tree, azimuth 188° 11', distance 69 feet; center of lamp-post, azimuth 295° 03', distance 54.7 feet.	38 10 26.86	85 46 30.51
B. M. 76, on west side of parking at milepost 14, northeast corner of porch to residence opposite milepost, azimuth 112° 18', distance 123.8 feet; center of lamp-post, azimuth 192° 58', distance 102.4 feet.	38 10 47.75	85 46 14.79
B. M. 77, on west side of Third street boulevard at milepost 2, blaze on sycamore tree, azimuth 102° 02', distance 42.7 feet; center of lamp-post, azimuth 289° 54', distance 54.7 feet.	38 11 08.50	85 46 02.70
B. M. 78, on west side of boulevard, southeast corner of mottled brick residence, azimuth 147° 41', distance 108.9 feet, center of lamp-post, azimuth 240° 09', distance 61 feet.	38 11 34.46	85 46 00.89
B. M. 79, on west side of Third street, 229 feet south of south curb of P street, nail in poplar tree, azimuth 198° 49', distance 11.8 feet; Christain Mission, southwest corner of, azimuth 268° 07', distance 103.4 feet.	38 11 53.65	85 46 01.35
B. M. 80, on southwest corner of Third avenue and L street west, southeast corner of Gass's drug store, azimuth 164° 47', distance 114.1 feet; center of water plug, azimuth 286° 59', distance 58 feet.	38 12 14.05	85 45 51.02
B. M. 81, on north end of Triangie Park, southwest corner of Confederate monument, azimuth 195° 50', distance 127.8 feet; Louisville reform school, center of tablet, azimuth 243° 19', distance 89 feet.	38 12 35.02	85 45 47.34
B. M. 82, on northwest corner of Third and Hill streets, northeast corner of residence No. 1700, azimuth 59° 49', distance 80.5 feet; northwest corner of residence No. 1801, azimuth 303° 33', distance 113.2 feet.	38 13 05.30	85 45 42.01
B. M. 83, on southwest corner of Main and Jackson streets, northeast corner of retaining wall to yard, azimuth 43° 40', distance 13.7 feet; northwest corner of American machine shops, azimuth 290° 14', distance 52.4 feet.	38 13 31.89	85 45 37.35
B. M. 84, on southeast corner of Main and First streets, northeast corner of Bill Dryer Co.'s building, azimuth 93° 34', distance 53.3 feet; northwest corner of James Thompson & Bros.' liquor store, azimuth 299° 30', distance 10.2 feet.	38 15 17.24	85 44 38.32
B. M. 85, on northwest corner of Main and Seventh streets, northwest corner of post-office station 23, azimuth 340° 03', distance 105 feet; southwest corner of drug store, azimuth 282°, distance 49.2 feet.	38 15 20.14	85 45 05.61
B. M. 86, on northeast corner of Main and Eleventh streets, southeast corner of Doyle's saloon, azimuth 99° 04', distance 50.1 feet; northeast corner of J. V. Reed & Co.'s store, azimuth 37° 30', distance 101.6 feet.	38 15 24.98	85 45 41.70
B. M. 87, on northeast corner of Main and Fifteenth streets, southeast corner of R. F. Avery & Sons' store, azimuth 109° 11', distance 52.8 feet; northwest corner of J. B. Gibson's store, azimuth 1° 56', distance 80.2 feet.	38 15 27.50	85 46 05.04
B. M. 88, on northeast corner of Main and Nineteenth streets, pump at southwest corner, azimuth 37° 56', distance 87.3 feet; saloon at northwest corner, azimuth 100° 53', distance 50.5 feet.	38 15 30.08	85 46 28.88
B. M. 89, on northeast corner of Main and Twenty-fourth streets, dry-goods store, southeast corner, azimuth 108° 56', distance 53.6 feet; northwest corner of American Tobacco Co.'s warehouse, azimuth 2° 45', distance 80.2 feet.	38 15 32.82	85 46 52.69
B. M. 90, on southeast corner of Preston and Burnett streets, crossing gate Louisville and Nashville R. R., azimuth 91° 31', distance 42.2 feet; switch block to railroad, azimuth 218° 22', distance 35.3 feet.	38 15 36.08	85 47 22.47
B. M. 91, on south corner of Preston and Vandise streets, United Brethren Church, north corner, azimuth 50° 01', distance 142.6 feet; R. Nussbaum's saloon, southeast corner, azimuth 135° 29', distance 52.9 feet.	38 13 32.58	85 45 02.87
B. M. 92, on southwest corner of Jackson and F streets, southwest corner of Williams's store, azimuth 220° 04', distance 105.4 feet; northeast corner of residence No. 536 F street, azimuth 86° 31', distance 50 feet.	38 13 09.55	85 44 52.82
B. M. 93, on east side of Ash Bottom road, 515 feet north of Southern Rwy.; nail in fence post, elevation 483 feet, azimuth 113° 17', distance 38.7 feet; nail in blaze on west face of locust tree, azimuth 184° 28', distance 121.9 feet.	38 12 54.21	85 45 03.09
	38 12 33.23	85 45 04.07

Geographic positions at Louisville—Continued.

Station.	Latitude.	Longitude.
B. M. 94, on east side of Ash Bottom road just south of entrance to Henry Harphage's farm, nail in blaze on locust tree, azimuth 79° 19', distance 46 feet; cross on top of corner stone, azimuth 215° 20', distance 29.6 feet.	38 12 14.14	85 45 02.70
B. M. 95, on east side of Ash Bottom road, just south of bridge, nail in blaze on small tree, azimuth 81° 05', distance 24.9 feet; southeast corner of foundation to bridge, azimuth 205° 46', distance 22 feet.	38 11 53.96	85 45 03.21
B. M. 96, on west side of Ash Bottom road, small frame house, azimuth 191° 50', distance 180.2 feet; nail in blaze on wild cherry tree, azimuth 317° 54', distance 53.7 feet.	38 11 30.88	85 45 03.71
B. M. 97, on east side of Ash Bottom road at Wanona avenue, southeast corner of frame house, azimuth 104° 34', distance 51.8 feet; nail in blaze on water oak tree, azimuth 217° 10', distance 48.3 feet.	38 11 07.78	85 45 01.96
B. M. 98, on sidewalk at southeast corner of Pocahontas avenue and Louisville and Nashville R. R. right of way, southeast corner of retaining wall of culvert abutment, azimuth 76° 51', distance 38 feet; southwest corner of C. T. Johns's saloon, azimuth 170° 53', distance 71 feet.	38 10 52.39	85 45 16.42
B. M. 99, on north side of Woodlawn street at top of hill, elm tree, nail in blaze, azimuth 143° 32', distance 18 feet; nail in small cottonwood tree, azimuth 67° 02', distance 73.7 feet.	38 10 50.08	85 45 36.23
B. M. 100, on north side of Phillips lane, about 200 feet southeast of old Phillips house, nail in hackberry tree, azimuth 250° 32', distance 50.5 feet; nail in apple tree, azimuth 131° 06', distance 10.3 feet.	38 11 35.28	85 44 23.17
B. M. 101, on east side of Preston street road at Phillips lane west, nail in elm tree, azimuth 18° 26', distance 67.4 feet; nail in locust tree, azimuth 321° 04', distance 49.9 feet.	38 11 50.48	85 43 53.74
B. M. 102, on west side of Preston Street road, at Hess lane northeast, southeast corner of schoolhouse, azimuth 30° 54', distance 63.4 feet; southeast corner of culvert at junction of Hess lane, azimuth 258° 48', distance 35.3 feet.	38 12 16.48	85 44 10.87
B. M. 103, on east side of Hess lane at Prindell avenue northwest, nail in telephone pole at corner, azimuth 186° 47', distance 45.3 feet; nail in blaze of wild cherry tree, azimuth 144° 47', distance 140.6 feet.	38 12 27.56	85 43 46.03
B. M. 104, on southwest corner of Hess lane and Poplar level pike, nail in corner of fence post, azimuth 312° 52', distance 51.2 feet; nail in blaze on locust tree, azimuth 280° 27', distance 103.5 feet.	38 12 41.80	85 43 16.13
B. M. 105, Poplar level pike and Gray's lane, nail in blaze on small elm tree, azimuth 176° 34', distance 43.7 feet; nail in blaze on large sycamore tree, azimuth 272° 25', distance 54.7 feet.	38 12 22.22	85 42 48.56
B. M. 106, on south side of Newburg pike at lane south at bridge, northeast corner of stone culvert, azimuth 152° 40', distance 2.9 feet; nail in blaze on sycamore tree, azimuth 336° 15', distance 17.5 feet.	38 12 56.66	85 42 20.96
B. M. 107, south side of Newburg pike at Ropewalk lane north, nail in blaze on maple tree, azimuth 212° 30', distance 75.9 feet; nail in blaze on locust tree, azimuth 144° 17', distance 37.4 feet.	38 13 21.31	85 42 38.66
B. M. 108, on north side of Taylorsville road at Ropewalk lane south, nail in blaze on large sycamore tree, azimuth 129° 41', distance 71.4 feet; nail in blaze on maple tree, azimuth 56° 04', distance 78.4 feet.	38 13 41.52	85 42 03.90
B. M. 109, on southeast corner of Baxter and Edmunds avenues, center of hydrant, azimuth 96° 50', distance 57.1 feet; center of manhole, azimuth 295° 40', distance 10 feet.	38 13 56.42	85 42 38.76
B. M. 110, on southeast corner of Baxter and Lucia avenues, corner of grocery store, azimuth 42° 55', distance 20.8 feet; center of hydrant, azimuth 293° 40', distance 8.9 feet.	38 14 11.72	85 43 06.53
B. M. 111, on northwest corner of Baxter and Christy avenues, east corner of saloon, azimuth 141° 20', distance 15.1 feet; J. E. Kirchdorfer's hardware store, azimuth 331° 27', distance 55.2 feet.	38 14 30.34	85 43 33.23
B. M. 112, on southwest corner of Baxter avenue and Underhill street, corner of saloon, azimuth 141° 19', distance 9.2 feet; corner of brick building, azimuth 329° 20'.	38 14 50.90	85 43 49.32
B. M. 113, north end of parking of Cherokee parkway at Willow avenue west, northeast corner of porch of Belvoir apartments, azimuth 113° 55', distance 77.7 feet; hydrant, azimuth 240° 33', distance 88.9 feet.	38 14 10.84	85 42 35.21
B. M. 114, on Cherokee Park and Longest avenue, northwest corner of drive along west side of, corner of Cherokee Park, nail in elm tree, azimuth 54° 37', distance 64.9 feet; corner of stone wall, azimuth 132° 11', distance 19.9 feet.	38 14 24.04	85 42 23.68
B. M. 115, on Workhouse road and Long Cliff avenue north, on southeast corner, center of fire plug, azimuth 214° 19', distance 47.2 feet; southeast corner of warehouse, azimuth 147° 33', distance 62.6 feet.	38 14 42.30	85 42 05.54
B. M. 116, on Long Cliff and Peterson avenues, on northwest corner, nail in elm tree, azimuth 144° 28', distance 52.2 feet; nail in blaze on small sycamore tree, azimuth 274° 21', distance 56.5 feet.	38 14 53.86	85 41 49.50
B. M. 117, on Shelbyville road at Cannon's lane, south, on south side, nail in blaze on locust tree, azimuth 141° 55', distance 162.6 feet; center of pump, azimuth 293° 03', distance 69.6 feet.	38 15 13.11	85 40 13.76
B. M. 118, at east corner of Workhouse and Shelbyville roads, at St. Matthews, southwest corner of brick foundation to house, azimuth 147° 24', distance 49.2 feet; center of millstone No. 5, azimuth 34° 58', distance 32.6 feet.	38 15 09.50	85 39 25.38

Geographic positions at Louisville—Continued.

Station.	Latitude.			Longitude.		
B. M. 119, on Workhouse road and Cannon's lane, at southwest corner, nail in blaze on large tree, azimuth 68° 16', distance 104.4 feet; southwest corner of stone culvert, azimuth 337° 30', distance 11 feet.	38	14	57.04	85	40	01.13
B. M. 120, on Workhouse road, south side of, 1,935 feet west of Cannon's lane, nail in blaze on large tree, azimuth 81° 42', distance 67.8 feet; nail in telephone pole, azimuth 126° 46', distance 86.4 feet.	38	14	53.33	85	40	24.03
B. M. 121, south side of Workhouse road, 400 feet west of Stiltz lane, telephone post, azimuth 54° 43', distance 25.9 feet; nail in tree, azimuth 285° 12', distance 39 feet.	38	14	51.93	85	40	54.57
B. M. 122, on J. M. Atherton's farm, at gate about 700 feet south of his house, center of stone lot monument, azimuth 162° 38', distance 130.9 feet; nail in small hackberry tree, azimuth 111° 25', distance 12.5 feet.	38	14	22.17	85	40	56.51
B. M. 123, on north end of road near Alexander's residence and about on Alexander and Cown's property line, nail in blaze on locust, azimuth 136° 41', distance 67 feet; west corner of Alexander's porch, azimuth 265° 01', distance 146.9 feet.	38	13	50.11	85	40	40.25
B. M. 124, on Woodbourne avenue, 2,770 feet northeast of Baxter avenue, nail in blaze on hackberry tree, azimuth 110° 46'; nail in blaze on hackberry, azimuth 239° 06'.	38	13	40.25	85	40	59.56
B. M. 125, on Taylorsville road at Woodbourne avenue northeast, south side, nail in blaze on cottonwood, azimuth 153° 18', distance 72.4 feet; nail in blaze on cottonwood tree, azimuth 242° 10', distance 103.7 feet.	38	13	25.33	85	41	28.68
B. M. 126, on Taylorsville road, north side, at east end of siding to electric railroad, telephone pole on Taylorsville road, azimuth 70° 46'; tree, azimuth 132° 36', distance 44 feet.	38	13	24.50	85	40	45.11
B. M. 127, on farm of Doctor Dermatt, north end of private lane, 0.5 mile southeast of Duck's Point, nail in blaze on maple tree, azimuth 40° 36', distance 101.1 feet; nail in blaze on beech tree, azimuth 3° 15', distance 73.7 feet.	38	13	06.21	85	40	55.90
B. M. 128, on Adams place, south side of road, northwest at entrance to, north corner of stone gatepost, azimuth 41° 29', distance 8.9 feet; nail in blaze on small cherry tree, azimuth 162° 48', distance 38.2 feet.	38	12	53.32	85	41	18.02
B. M. 129, on Newburg pike at lane north to Adams place, north side of, west corner of barn, azimuth 254° 10', distance 121.1 feet; west corner of stone gatepost, azimuth 316° 24', distance 64.9 feet.	38	12	37.91	85	41	40.79
B. M. 130, on Newburg pike, south side at Mrs. Wilder's private road, northeast, nail in blaze on locust tree, azimuth 259° 48', distance 59.6 feet; nail in blaze on elm tree, azimuth 331° 04', distance 32.2 feet.	38	12	45.81	85	42	00.79
B. M. 131, on southwest corner of Gass avenue and Hoertz street, southeast corner of retaining wall, azimuth 263° 31', distance 77.4 feet; store No. 1200, azimuth 349° 31', distance 9.2 feet.	38	13	38.62	85	44	11.11
B. M. 132, north side of Poplar level road, 700 feet southeast of Texas street, nail in locust tree, azimuth 334° 28', distance 100.6 feet; small locust tree, azimuth 50° 53', distance 41.2 feet.	38	13	28.14	85	43	53.06
B. M. 133, west side of Poplar level pike just north of Clark's lane, west corner of stone culvert, azimuth 306° 42', distance 59.8 feet; nail in blaze on white-oak tree, azimuth 66° 08', distance 37 feet.	38	13	11.38	85	43	45.45
B. M. 134, south side of Poplar level pike, tree, azimuth 335° 18', distance 31.6 feet; tree, azimuth 112° 52', distance 13.5 feet.	38	12	54.70	85	43	31.69
South meridian stone, regulation stone post with tablet in top, in south part of Shawnee Park, 209 feet north of driveway marked "South Stone"	38	15	04.80	85	49	48.09
North meridian stone, 1,227.3 feet north of south stone, same size and marked "North Stone"	38	15	16.93	85	49	48.00

RUSSELL AND WAYNE COUNTIES.

MONTICELLO QUADRANGLE.

The following geographic positions were determined by primary traverse run in the spring of 1906 by J. R. Ellis, topographic aid. The line starts at Jacks Knob triangulation station and follows highways around the borders of the quadrangle, closing on Jacks Knob:

Geographic positions along highways.

Station.	Latitude.	Longitude.
Jacks Knob triangulation station, 1.5 miles southwest of Cartwright post-office, best ascended from the divide on Monticello road, about 1 mile west of post-office, on land of Nathan Ballenger, who lives northwest of Knob on main road. Station mark: A stone post with brass plug inserted, stamped "U. S. G. S".....	° ' " 36 44 17.46	° ' " 85 05 25.96
Cartwright post-office, forks of road 400 feet west of.....	36 45 05.0	85 04 46.7
Cartwright post-office, 1 mile east of arrow on gate to field on south side of road.....	36 45 28.5	85 03 37.6
Schoolhouse No. 1, T road north, just east of.....	36 45 37.6	85 02 26.9
Alpha post-office, T road north, in southwest corner of H. T. Denny's field, northeast corner of drug store and post-office, bears S. 56° 20' W. distant 58 feet; nail in small walnut tree bears N. 19° 00' W., distant 8.7 feet; in limestone 30 by 8 by 10 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1906".....	36 46 01.4	85 00 34.6
Alpha post-office, 600 feet east of Denny's store and post-office, stone between Clinton and Wayne counties, on south side of road.....	36 45 58.1	85 00 29.0
Wait post-office, T road north, just east of, 30 feet northwest to corner yard fence.....	36 46 11.5	84 59 13.2
Zula post-office, 300 feet north of, 58 feet west to telephone pole, cross cut in blaze on northeast face of cedar tree south side of road.....	36 46 18.7	84 58 52.8
Old Glory schoolhouse, 0.25 mile north of, T road southeast, 27 feet west to cross on fence post, 21 feet southeast to corner rail fence....	36 46 32.0	84 57 29.8
Turkey Ridge schoolhouse, No. 28, large cross cut on gum tree about 200 feet north of.....	36 46 06.9	84 55 49.4
Shearer Valley post-office, 0.2 mile north of, just south of church at T road west, north azimuth mark, 6 feet northwest of mark cross cut on tree; 10.4 feet northwest, nail in blaze on tree.....	36 46 07.7	84 55 20.8
Forks of road on top of ridge, 7 feet due east to cross on small cedar....	36 45 56.6	84 54 17.6
Cooper, crossroads at Hurt's farm, 1 mile west of, 20 feet south to corner rail fence.....	36 46 30.0	84 52 56.9
Cooper, in northeast corner of foundation of public school, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1906".....	36 46 16.8	84 51 44.6
Sumpter post-office, 0.5 mile north of, cross on gatepost to farm owned by George Coffee, in Sumpter's lane.....	36 45 31.2	84 50 49.7
Harriman oil lease, arrow painted on northeast corner of tool house at crossroads on top of Coffee Hill.....	36 45 35.5	84 49 03.4
Coffee Hill, forks of road on east side of, 22 feet northwest to stump, 11 feet east to cross on small tree.....	36 45 42.6	84 48 32.4
Oil Valley post-office, large white-oak tree near center of road and about 40 feet west of blacksmith shop.....	36 46 31.8	84 48 05.4
Barrier post-office, forks of road 0.2 mile northeast of, in limestone boulder near northwest corner of triangle formed by forks of road, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1906".....	36 46 07.8	84 45 57.2
Medekle (P.) residence, T road south, 22 feet west to small stump, 36 feet southeast to guidepost.....	36 45 30.4	84 44 29.3
Coopersville post-office, arrow painted on southeast corner of store.....	36 45 46.5	84 43 52.2
Ash tree, top of hill, arrow painted on tree (blazed on four sides).....	36 46 13.1	84 43 17.4
Pilot Rock, T road north, 1 mile west and 0.5 mile south of, 27 feet south to cross on rail fence, 52 feet west to arrow on rail fence.....	36 47 44.9	84 42 40.5
Dick & Lovell's store, forks of road, cross cut on northwest side of oak tree.....	36 48 44.6	84 42 17.7
Gregory post-office, forks of road 500 feet east of, 21 feet southeast to cross on rail fence, 25 feet west to arrow painted on stone.....	36 49 47.4	84 42 02.9
Boston store, T road northwest, 24 feet south to north corner of store, 55 feet west to southeast corner of board fence.....	36 49 33.7	84 43 58.4
Sawmill site, arrow painted on telephone pole southeast of.....	36 49 52.4	84 45 03.4
Smith's store, 700 feet east of, road east, 9 feet southwest to large stump.....	36 50 36.1	84 45 51.6
Spann post-office, 0.5 mile west of, north side of crossroads on top of ridge, nail in blaze on black gum tree bears N. 79° 45' E., distant 5.7 feet; nail in blaze on hickory tree bears S. 11° 3' W., distant 78.7 feet; in sandstone 30 by 7 by 15 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1906".....	36 51 08.2	84 46 18.0
Sawmill and spring, T road west, 29 feet southwest to cross and arrow on small sycamore, 42 feet southeast to southwest corner sawmill....	36 52 13.6	84 46 38.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Steuenville post-office, 700 feet north of, T road east at Monticello and Burnside pike, 16 feet northwest to telephone pole, 27 feet northeast to post at corner fence	° ' "	° ' "
Steuenville post-office, 1 mile northeast of, southwest corner of porch to tollgate house	36 53 16.3	84 48 08.6
Shepherd's store, road southeast about 600 feet northeast of, 25 feet north to cross on telephone pole, 45 feet northwest to large black-oak tree	36 53 39.3	84 47 24.0
Metcalf (G. C.) residence, T road west, 18 feet northeast to large walnut tree, 21 feet southeast to corner yard fence	36 54 12.2	84 46 55.8
Millsprings, T road west, 12 feet due east to northwest corner of Lanier's store	36 55 03.7	84 46 42.4
Beechwood schoolhouse, private road south, 7 feet west to cross on small black-oak tree	36 55 59.9	84 46 43.8
Millsprings and national-cemetery road, about 100 feet south of crossroads at corner of Shepherd, Rousseau & Marcum's farm, nail in walnut tree at crossroads bears N. 1° 45' E., distant 111.2 feet; nail in walnut tree bears N. 37° 30' W., distant 104.6 feet; cemented in top of blue limestone 26 by 9 by 9 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1906"	36 57 42.2	84 46 49.7
Whiteoak Creek, gate about 150 feet west of, 0.4 mile south of, grist mill	36 58 15.2	84 46 51.4
Trimble and Merrick's store, T road northwest about 400 feet southwest of, 15 feet east to arrow on stump, 30 feet northwest to cross on small walnut	36 58 11.6	84 47 31.4
Richardson's residence, cross on small cedar tree at road	36 58 14.3	84 48 56.3
Forbush Creek, arrow painted on large dead elm about 200 feet west of ford on	36 57 58.5	84 49 56.8
Dell post-office (formerly Ferris), 300 feet south of, in large bowlder in southwest corner of field of M. H. Hatfield, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1906"	36 58 08.7	84 50 30.4
Dell and Jabez, T road east halfway between, 18 feet southwest to cross on white-oak sapling, 15 feet northeast to cross on white-oak sapling	36 57 55.3	84 52 26.0
Jabez post-office, crossroads	36 58 38.7	84 53 09.5
Military Springs, Baptist Church, T road south 0.25 mile southwest of, 21 feet west to cross on white-oak tree, 19 feet northwest to cross on board fence	36 59 14.2	84 53 35.8
Jamestown road and Wolf Creek crossing, forks of road just east, 33 feet north to cross on cottonwood tree, 53 feet west to cross on telephone pole	36 58 53.8	84 54 34.7
Ono, crossroads, cross and arrow painted on corner of yard fence	36 58 59.0	84 57 03.2
McFarland Creek, 350 feet above junction with Caney Fork, in east face of ledge of stone on west side of, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1906"	36 59 21.2	84 57 59.4
Hickory tree at point where road leaves creek bottom, arrow painted on	36 59 18.9	84 59 33.3
Caney Fork and Wolf Creek, junction of T road west just north of, 24 feet north to post with auger hole, 24 feet southwest to cross on corner fence post	36 58 15.6	85 00 14.0
McFall's store, at mouth of Wolf Creek, north side of Cumberland River, cross and "U. S. G. S." cut on northwest corner of large stone	36 57 12.7	85 00 05.0
Stokes post-office, south gatepost to gate across road about 450 feet east of	36 56 29.1	85 00 33.1
Clyde post-office, just west of, center of road where Russell-Wayne county line crosses	36 55 44.1	85 01 32.3
Stringer's store, road east	36 53 56.3	84 59 38.5
Stephen Sullivan's residence, road west, cross painted on chestnut tree	36 53 24.8	84 59 54.0
Poor (Eph.) farm, road northeast to	36 53 04.6	84 59 52.9
Road southwest, 12 feet east to stump	36 52 48.4	84 58 30.7
Old store building, center of road opposite	36 52 55.9	84 58 08.0
Parnell post-office, 0.5 mile west of, northwest corner of foundation to schoolhouse, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1906"	36 52 37.1	84 57 27.3
Beaver Creek, forks of road, 500 feet north of Cooper residence, 27 feet southeast to blaze on large cottonwood tree, 21 feet west to large stump	36 51 54.8	84 57 07.4
Wild Goose road at road north, 1 mile south of Cooper farm, 30 feet west to cross on dogwood tree, 27 feet southeast to arrow on rail fence	36 50 25.6	84 58 18.8
Susie post-office, road southwest, 9 feet south to ring nailed to tree, 42 feet northeast to center of yard gate	36 49 14.1	84 58 15.3
Otter Creek, at Dug Ford, middle of	36 47 49.2	84 57 55.8
Wait post-office, 1 mile north of, crossroads 50 feet south of gate, 45 feet northeast to stone corner at gate, 34 feet south to large white-oak tree	36 47 23.3	84 58 33.3
	36 46 55.2	84 59 02.2

FRANKLIN AND OWEN COUNTIES.

SADIEVILLE QUADRANGLE.

The line starts from the railroad crossing at Switzer and follows highways north near the west border of the Sadieville quadrangle and the east border of the Lockport quadrangle to the intersection of the Monterey, Overton, and Georgetown pikes, at Hesler. The field work was done by J. R. Ellis, assistant topographer, in May, 1906.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road up branch, 20 feet southwest to J. Stafford's mail box, 27 feet northwest to corner of rail fence	38 16 07.3	84 44 49.0
Franklin-Scott county line, large sugar-maple tree on	38 16 43.9	84 44 04.0
Yates schoolhouse, pike southwest at, 24 feet southeast to corner fence post, 24 feet southwest to mail box	38 17 22.7	84 42 47.8
Hall's store, T road southwest, on Franklin-Scott County line, 33 feet northwest to corner of store, 54 feet north to W. Baldwin's mail box. Elmville, center of pike just west of road, up creek, 27 feet west to Wash's shop, 24 feet north to corner of fence	38 18 32.7	84 44 15.5
Corner Franklin, Scott, and Owen counties, corner stone	38 20 28.3	84 45 40.8
Major Anderson's house, east corner of bridge over branch southwest just north of	38 21 08.4	84 44 25.3
Sleterville, post on Scott-Owen county line near	38 21 37.6	84 43 16.1
Mr. Bender's house, pike west at, 20 feet southeast to corner of porch, 30 feet west to cross on hickory tree	38 22 12.0	84 42 21.7
North corner of W. T. Watson's barn, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1906"	38 22 41.2	84 42 31.0
Beechwood, T pike east, 21 feet northeast to corner of store and post-office, 42 feet southeast to corner of garden fence	38 23 22.0	84 43 00.8
J. A. Watson's house, T pike southwest to Bethany, 21 feet northeast to southwest corner of barn, 69 feet northwest to center of small bridge	38 23 38.9	84 43 15.3
Old toll gate, pike northeast, 10 feet northwest to corner of yard fence. Fairbanks store and post-office, pike west, 27 feet west to southeast corner of store, 25 feet southeast to cross on fence post	38 24 50.7	84 43 42.8
East Eagle post-office, dirt road southwest about 450 feet south of, 24 feet northwest to cross on tree, 30 feet northeast to stump	38 25 21.0	84 43 45.1
Hesler, intersection of pikes	38 25 58.5	84 43 57.3
	38 26 54.2	84 45 30.9
	38 27 48.0	84 46 36.7

ANDERSON, JEFFERSON, SHELBY, AND SPENCER COUNTIES.

SHELBYVILLE AND TAYLORSVILLE QUADRANGLES.

The following geographic positions on the United States standard datum were determined by primary traverse in 1905 by C. B. Kendall, field assistant. The north line begins with an adjusted position at Hatton and follows the Chesapeake and Ohio Railway, public roads, and the Louisville and Nashville Railroad west along the north border of the quadrangles to Anchorage. The south line starts from an adjusted position at Smithville and follows highways via Taylorsville to an adjusted position at Gudgel.

SHELBYVILLE QUADRANGLE (SHELBY, SPENCER, AND ANDERSON COUNTIES).

Geographic positions along Louisville and Nashville Railroad between Hatton and Bagdad.

Station.	Latitude.	Longitude.
Hatton, in front yard of G. W. Stockton's tenement house, opposite Roberts & Wright's general store on north side of Louisville and Nashville R. R., southeast corner brick chimney to house bears N. 3° 10' E., distant 78.5 feet; nail in sycamore tree on railway property bears S. 33° E., distant 29.8 feet; lower hinge to front-yard gate bears S. 86° 30' W., distant 23.5 feet, iron post stamped "Prim. Trav. Sta. No. 24"	° ' "	° ' "
Hatton, 1.1 miles west of, second-class road crossing, center of track ..	38 13 35.4	85 00 23.6
Hatton, 1.7 miles west of, second-class road crossing, center of track ..	38 13 45.8	85 01 48.0
Consolation station, 0.9 mile southeast of, second-class road crossing, center of track	38 13 47.5	85 02 13.2
Consolation station, overhead-pike crossing, center of track	38 14 41.3	85 02 16.5
Bagdad station, 250 feet south of, pike crossing, center of track	38 15 43.2	85 03 23.9

Geographic positions along public highways between Bagdad and Shelbyville.

Station.	Latitude.	Longitude.
Bagdad station, 1.6 miles northwest of, T road south, 15 feet southwest to corner post of wire fence, 25 feet southeast to corner post of wire fence	° ' "	° ' "
Christiansburg station, 1 mile south of, at junction of Shelbyville-Christiansburg pike and pike leading east, at old toll gate, in northwest corner of junction; iron post stamped "Prim. Trav. Sta. No. 3, 1905"	38 15 53.6	85 05 06.0
Shelbyville-Christiansburg pike crossing Chesapeake and Ohio Rwy., center of track	38 16 00.3	85 06 19.4
Blacksmith shop, three corners, T road north, 40 feet north to car shop, 10 feet south to wire fence	38 15 58.1	85 07 22.8
Four corners, second-class crossroads, 60 feet southeast to Chesapeake and Ohio Rwy. 25 feet northwest to red gate	38 15 56.0	85 08 40.9
Chesapeake and Ohio Rwy. milepost "Lou 34", 900 feet northeast of T road to southeast, 60 feet southeast, to railroad crossing, 25 feet south to walnut tree	38 15 08.4	85 09 36.6
Shelbyville, 2.1 miles east of, T road south, 25 feet southwest to corner post of wire fence, 30 feet southeast to corner post of wire fence	38 14 15.4	85 10 31.8
Shelbyville, Shelby County court-house, 10 feet east of southeast corner, iron post stamped "Prim. Trav. Sta. No. 2, 1905"	38 13 50.0	85 11 21.3
Shelbyville, intersection of Washington and Seventh streets	38 12 39.2	85 12 57.1
	38 12 42.0	85 13 07.5

Geographic positions along Louisville and Nashville Railroad between Shelbyville and Anchorage.

Station.	Latitude.	Longitude.
Shelbyville, 1.3 miles west of; Smithfield pike crossing of Louisville and Nashville R. R. at milk station, center of track	° ' "	° ' "
	38 13 11.4	85 14 06.3

Geographic positions along highways on south border of quadrangle.

Station.	Latitude.	Longitude.
Little Mount, four corners, 30 feet south to telephone pole, 36 feet north-west to stonewall, 90 feet east to corner of blacksmith shop	38 03 40.1	85 15 05.3
Big Beech Creek, east end of covered bridge over, roads northeast, east, and south	38 03 15.0	85 13 27.3
Old Marratoy post-office, three corners, T road to east	38 02 33.7	85 13 00.6
Old Marratoy post-office, in forks of road, in northwest corner of front yard to residence of W. M. Welch; iron post stamped "Prim. Trav. Sta. No. 5, 1905"	38 02 33.4	85 13 00.4
Briar Ridge Reformed Church, three corners at, three trees in triangle	38 01 14.7	85 12 27.3
Briar Ridge Reformed Church, 1.4 miles southeast of, T road to north-east, junction of Van Buren and Mount Eden roads, 12 feet east to gate, 18 feet northwest to corner of rail fence	38 00 55.0	85 11 01.5
Little Beech Creek, center of, at second-class fork up valley	38 01 36.5	85 10 40.6
Mount Eden, about 1.25 miles southwest of, four corners, center of road opposite barn, 20 feet west to barn door, 25 feet east to step at rock wall	38 02 06.1	85 09 34.4
Mount Eden, about 2 miles south of, forks of roads south, southeast, and east, 60 feet northwest to old stump, 30 feet west to sycamore, 90 feet southeast to dead tree	38 01 48.7	85 08 31.4
Wycoff's old mill place, 1 mile northwest of, forks second-class road to southwest 25 feet southwest so gate, 10 feet north to barn	38 01 01.0	85 08 15.5
Wycoff's old mill place, forks at roads northwest up hill and north-east of Crooked Creek, center of triangle at forks	38 00 31.2	85 07 27.1
Wycoff's old mill place, 1.2 miles southeast of, forks of roads north-west and southeast, 50 feet north to oak in yard, 15 feet southwest to rail fence	37 59 48.5	85 07 29.2
Vandyke post-office, 0.5 mile east of, junction of Pleasant Grove Ridge road and Vanburen-Lawrenceburg pike, 375 feet west of, in north-east corner of front yard to residence of J. T. Edwards, iron post stamped "Prim. Trav. Sta. No. 6, 1905"	37 59 05.7	85 06 40.4
Vandyke post-office, 0.5 mile east of, junction of Pleasant Grove Ridge road and Vanburen-Lawrenceburg pike, south edge of pike at junction	37 59 08.5	85 06 37.2
Vandyke post-office, about 2.5 miles east of, junction of Vanburen-Lawrenceburg and Mount Eden Lawrenceburg pikes, 20 feet north-west to stone wall, 50 feet southwest to large elm	38 00 22.4	85 05 12.6
Timber Creek, center of covered bridge over	38 00 15.0	85 04 31.3
Glensboro, three corners at blacksmith shop, pike to south, 40 feet south to corner of yellow store, 40 feet southwest to corner of yellow dwelling	38 00 16.1	85 03 35.5
Glensboro, 1.4 miles east of, forks of second-class road to northeast, 30 feet northwest to corner of stonewall, 50 feet east to apple tree	38 00 29.6	85 02 10.4
Petty post-office, 0.25 mile north of, T road south, 50 feet southeast to telephone pole, 35 feet southwest to corner post of wire fence, 350 feet south to covered bridge	38 00 30.8	85 01 31.0
Petty, 1 mile west of, forks of second-class road to southeast, 15 feet north to telephone pole painted "682," 60 feet east to oak tree	38 00 33.4	85 00 30.5
Gudgel, blue-limestone post 28 by 6 by 6 inches, with hole drilled and "U. S. G. S." cut in top, in front yard of Lizzie Burgess's house, 1.2 feet from front fence, 19 feet west of gate, corner of buggy shed bears N. 77° 30' W., distant 26.6 feet	38 00 34.7	84 59 27.6

38 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

TAYLORSVILLE QUADRANGLE (JEFFERSON, SHELBY, AND SPENCER COUNTIES).

Geographic positions along Louisville and Nashville Railroad between Shelbyville and Anchorage.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milk station, second-class road crossing, center of track.....	38 13 52.8	85 16 11.1
Scotts station, pike crossing, center of track.....	38 14 01.3	85 17 08.9
Scotts station, 1.3 miles west of, second-class road crossing, center of track.....	38 13 29.6	85 18 24.5
Simpsonville station, 0.7 mile east of, second-class road crossing, center of track.....	38 13 33.6	85 20 35.9
Simpsonville, in southeast corner of grounds of Simpsonville Masonic lodge, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	38 13 20.8	85 21 33.4
Simpsonville, at west edge of, State pike crossing of Louisville and Nashville R. R., center of track.....	38 13 21.4	85 21 44.7
Connors station, road crossing, center of track.....	38 13 23.8	85 23 26.7
Longrun station, road crossing, center of main track.....	38 13 48.0	85 25 30.0
Floyds Fork, 0.25 mile east of, road crossing, center of main track.....	38 14 25.8	85 27 37.0
Beckleys station, road crossing, center of track.....	38 15 02.6	85 28 32.3
Avoca station, road crossing, north rail, main track.....	38 15 22.1	85 30 01.0
Anchorage, 1 mile east of, road crossing at milepost "Lou 13," center of track.....	38 15 38.3	85 31 24.7

Geographic positions along highways on south border of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Smithville, 0.9 mile southeast of, junction of Salt River road and pike, 10 feet northeast to rock wall, 90 feet south to crooked oak tree.....	38 00 41.3	85 29 53.3
Smithville, 1.7 miles east of, three corners, second-class T road to south, 10 feet south to gate.....	38 00 29.8	85 29 10.3
Lucas ford of Salt River, 0.75 mile west of, T road to south, 35 feet south to red gate.....	38 00 40.6	85 28 14.7
Lucas ford of Salt River, 600 feet north of, forks of road south and west, 10 feet north to corner of crib, 40 feet southwest to fence.....	38 01 19.2	85 28 11.1
Waterford, 1.7 miles southwest of, loop in main road, second-class road to south at white barn, 70 feet north to large oak, 40 feet west to lot gate.....	38 01 07.6	85 27 06.6
Waterford, 0.8 mile southwest of, three corners at bend of road north-east, second-class T road to southwest, 15 feet southwest to gate, 20 feet south to corner of house.....	38 01 50.1	85 26 56.4
Waterford, at north edge of, junction of Taylorsville, Waterford, and Elk Creek pikes, at blacksmith shop, 70 feet north to center of small bridge, 130 feet east to center of Plumb Creek.....	38 02 20.3	85 26 13.9
Waterford, 1 mile east of, forks, pike to west, public road to south, 15 feet north to mail box, 40 feet southwest to corner of wire fence.....	38 02 03.9	85 25 22.5
Waterford, 2 miles west of, four corners near top of hill, second-class crossroads, 5 feet north to wire gate, 40 feet south to white gate.....	38 01 47.6	85 24 16.8
Taylorsville, 2.4 miles west of, forks, roads east and south, 30 feet west to corner of wire and rail fence, 35 feet northeast to farm gate, 90 feet southeast to two walnut trees.....	38 01 49.3	85 23 18.9
Taylorsville, 1.4 miles west of, forks, second-class road to northwest, 15 feet north to wire fence, 35 feet south to board and wire fence, 60 feet southeast to telephone pole.....	38 01 42.2	85 22 29.8
Taylorsville, at west edge of, forks of pike north and west, 15 feet south to stonewall, 40 feet north to telephone pole.....	38 01 48.0	85 21 09.4
Taylorsville, Spencer County court-house, southwest corner of, iron post stamped "Prim. Trav. Sta. No. 4, 1905".....	38 01 51.0	85 20 41.8
Taylorsville, 1.6 miles east of, forks, second-class road to south.....	38 02 00.5	85 19 00.8
Taylorsville, 2.1 mile east of, T road south, 35 feet southeast to corner post of wire fence, 35 feet west to corner post of wire fence.....	38 01 57.0	85 18 23.2
Three corners, second-class T road to north, 15 feet north to gate.....	38 02 22.7	85 17 31.3
Little Mount, 1.7 miles west of, three corners, second-class road to northwest, 25 feet northwest to gate, 40 feet east to locust tree.....	38 02 55.3	85 16 24.6

LOUISIANA.

PRIMARY TRAVERSE.

ASCENSION, EAST BATON ROUGE, AND IBERVILLE PARISHES.

BATON ROUGE QUADRANGLE.

The following geographic positions were determined by primary traverse in November, 1905, by C. B. Kendall, field assistant.

The line starts at Baton Rouge and runs northeasterly via highways to Comite post-office, thence southerly via Foreman, Hopeville, and Dutchtown to Geismar, on the Yazoo and Mississippi Valley Railroad, thence northwesterly along said railroad to St. Gabriel.

Positions are based on the Baton Rouge astronomic datum as given in the report of the Chief of Engineers, United States Army, for 1887, Part IV, page 2783.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Baton Rouge, brick tower on penitentiary.....	30	27	04.2	91	10	55.6
Cowboys' Exchange, road north.....	30	27	14.9	91	10	00.8
Three corners, road north.....	30	28	11.6	91	07	38.9
Three corners, road north.....	30	29	04.6	91	05	21.8
Comite, store and post-office, 160 feet northeast of, marble post 30 by 6 by 3 inches set 28 inches in ground, "G. S." cut in top of post.....	30	30	29.3	91	01	55.6
Comite, store and post-office, 300 feet southwest of, marble post 30 by 6 by 3 inches set 28 inches in ground, "G. S." cut in top of post; the two posts are 453 feet apart, azimuth between them is 34° 25' 35".....	30	30	25.6	91	01	58.6
Rosehill Baptist Church, T road south.....	30	29	41.2	91	03	37.2
Rosehill Baptist Church, 1.5 miles south of, four corners, township line, 20 feet northeast to corner of wire fence, 45 feet west to oak tree.....	30	28	28.0	91	03	28.2
Harelsion's store, 1.25 miles northwest of, road forks, second-class road northwest, 40 feet northeast to bush, 50 feet southeast to bush.....	30	27	12.0	91	04	15.3
Harelsion's store, three corners, T road north, 60 feet northeast to corner of store porch, 60 feet east to T road south.....	30	26	08.0	91	03	56.8
Jones Creek Church, 250 feet southeast of, three corners.....	30	25	56.1	91	02	25.6
Jones Creek Church, 1.75 miles southeast of, three corners near J. B. Cooper's mail box, 80 feet northwest to large oak, 90 feet south to corner wire fence.....	30	25	40.1	91	00	50.7
Phillips's (F. M.) mail box, three corners near, 20 feet northeast to cedar, 20 feet northwest to mail box.....	30	24	34.2	91	00	56.6
Clay Gut road, three corners at junction with T road north, 35 feet northwest to corner of wire fence, 60 feet southeast to large live oak.....	30	23	32.8	91	01	05.7
Foreman post-office, 1.5 miles north of, three corners, T road south, 40 feet southwest to rail fence, 35 feet south to sweet gum.....	30	23	26.4	91	00	25.6
Foreman post-office, 1,000 feet east of, three corners, T road north.....	30	22	12.0	91	00	34.0
Foreman post-office, 1,000 feet southeast of, at northeast corner of St. Luke's Baptist Church, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	30	22	09.4	91	00	35.1
Hopeville, 1 mile northwest of, three corners, T road northeast, 15 feet northeast to small bridge, 90 feet west to oak tree.....	30	21	23.4	90	59	33.3
Hopeville, center of Bayou Manchac at Hampton Ferry.....	30	20	42.0	90	58	58.0
Hopeville, 0.75 mile south of, three corners, T road west, 25 feet southwest to corner of yard fence, 25 feet northwest to corner of rail fence.....	30	20	07.2	90	58	54.2
Three corners, 200 feet southeast of store, T road east, 25 feet northeast to corner of fence, 30 feet southwest to front-yard gate.....	30	19	17.5	90	58	32.9
Forks of road, north and northeast, 30 feet southwest to thorn tree, 110 feet northeast to locust tree.....	30	18	48.9	90	58	21.4
Township line, three corners on, T road east.....	30	17	58.2	90	58	28.9
Forks of road at store, north and northeast, 70 feet east to store, 20 feet west to wire fence.....	30	17	29.0	90	58	42.0
Goodhope, four corners at, second-class road crossing.....	30	16	20.0	90	59	02.6
T. 9 S., R. 2 E., corner of secs. 14, 15, 22, and 23, 5 feet south of, four corners at Dutchtown.....	30	15	20.2	90	59	19.9
Dutchtown, southeast corner of intersection of public roads, in north face of corner of brick foundation of Picard, Geismar & Co.'s warehouse, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1905".....	30	15	19.8	90	59	19.5
Dutchtown, 1.25 miles south of, center of Moore's bridge over New River.....	30	14	23.8	90	59	19.2
Three corners, T road west, 40 feet west to large oak, 60 feet northwest to gate.....	30	13	23.9	91	00	13.0
Three corners, T road southeast.....	30	12	32.8	91	01	05.8

40 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE,

Geographic positions along Yazoo and Mississippi Valley Railroad, Geismar to St. Gabriel.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Geismar station, road crossing 150 feet southeast of.....	30 12 18.4	91 01 21.0
Geismar, 125 feet southeast of station, 50 feet south of center of Yazoo and Mississippi Valley R. R., main track, in angle between railway and public road, Mississippi River Commission bench mark post "1891 P. B. M.," stamped "Prim. Trav. Sta. No. 3, 1905." A United States Geological Survey iron post was also set 1 foot west of Mississippi River Commission bench mark and stamped "Prim. Trav. Sta. No. 3, 1905".....	30 12 18.3	91 01 21.9
Southwood station, 50 feet northwest of, center of main track, at road crossing.....	30 13 09.9	91 02 56.9
Ascension-Iberville parish line, center of track.....	30 13 22.6	91 03 20.7
Ascension-Iberville parish line, 0.6 mile northwest of, road crossing, 100 feet northwest of cotton gin.....	30 13 40.4	91 03 53.8
Bruns, 50 feet southeast of, road crossing.....	30 13 44.9	91 04 02.3
Bruns, 1.25 miles northwest of, second-class road crossing, point 10 feet west of.....	30 14 23.3	91 05 13.8
St. Gabriel station, 150 feet west of center of main track, on south edge of sidewalk leading west from station, Mississippi River Commission bench mark marked "U. S. P. B. M. 1891." A United States Geological Survey iron post was set near and stamped "Prim. Trav. Sta. No. 4, 1905".....	30 15 30.7	91 05 58.0
St. Gabriel, 0.75 mile southwest of, chimney on old Bagatelle sugar house.....	30 14 32.3	91 06 22.3

ASCENSION, ASSUMPTION, IBERVILLE, AND WEST BATON ROUGE
PARISHES.

GROSSETETE AND WHITECASTLE QUADRANGLES.

The following geographic positions were determined by primary traverse run by C. B. Kendall, field assistant, in December, 1905. For the control of the Whitecastle quadrangle the line begins with the position of the east tower of the old Catholic Church at Donaldsonville and follows the Texas and Pacific Railway to Plattenville, thence along public roads west and northwest to the Whitecastle Lumber Company's railroad at Lake Natchez, thence along this railroad and public roads northeast to Whitecastle, thence along Texas and Pacific Railway to Plaquemine, where it is tied to the position of the Catholic Church spire

For the control of the Grossetete quadrangle the line begins with the position of the Catholic Church spire at Plaquemine and follows Bayou Plaquemine to its junction with Bayou Grossetete, thence along Bayou Grossetete northwest to Grossetete, thence along the Texas and Pacific Railway to Old Rosedale station, where it turns east along the old Louisiana Central Railroad grade to Baton Rouge and is tied to the position of the northwest tower of the Louisiana statehouse, also to primary traverse position as determined by E. L. McNair, topographer, in 1903.

A checked spur line was run from Old Rosedale station northwest along the Texas and Pacific Railway to Maringouin station.

Positions are based on the Baton Rouge datum, as given in the report of the Chief of Engineers, United States Army, for 1887, pages 2779-2784.

GROSSETETE QUADRANGLE (BATON ROUGE AND IBERVILLE PARISHES).

Geographic positions along highways.

Station.	Latitude.	Longitude.
Plaquemine, west edge of, junction of Court street and Bayou road, 25 feet southwest to center of small bridge, 20 feet northwest to corner of store porch.....	° ' " 30 17 05.2	° ' " 91 14 40.0
Plaquemine, 2.2 miles southwest of, 600 feet east of oil-pumping station, three corners, second-class T road to south, 40 feet south to railroad.....	30 16 23.1	91 15 30.9
Le Blanc's store, 1.1 miles northeast of, three corners, T road to south, 10 feet south to gate, 40 feet southwest to oak tree, 50 feet north to center of railroad.....	30 15 52.4	91 15 55.8
Le Blanc's store, three corners, T road to south, 30 feet south to gate, 30 feet southwest to corner store porch.....	30 15 00.8	91 16 17.3
Cockleburr lumber mill, center of water tank.....	30 14 51.6	91 16 54.8
Crescent post-office, 0.7 mile southwest of, three corners, T road to south, 20 feet southwest to corner of yard fence, 40 feet southeast to corner of yard fence.....	30 14 54.1	91 17 17.9
Ferguson's private ferry, three corners, road north to south landing of, 35 feet south to store door, 30 feet northeast to telephone pole...	30 15 15.1	91 18 03.7
Seymour Ferry across Bayou Plaquemine, east landing of.....	30 15 30.2	91 19 10.3
Seymour Ferry, 150 feet north of east landing, at bend of road to south, at southwest corner of front-yard fence to residence of Frank Seymour, iron post stamped "Prim. Trav. Sta. No. 10, 1905".....	30 15 31.6	91 19 09.7
Seymour Ferry, 0.6 mile northwest of, three corners, T road east to Joe Carter's ferry, 40 feet northeast to sweet gum, 50 feet south to sycamore stump.....	30 15 55.7	91 19 21.6
Seymour Ferry, 1.7 miles northwest of, center of bridge over small bayou.....	30 16 50.7	91 19 09.3
Seymour Ferry, 2.6 miles northwest of, point of land at junction of bayous Choctaw and Grossetete.....	30 17 30.1	91 18 56.4
Bayou William, 0.4 mile southeast of, three corners, second-class T road to west, at northeast corner of clearing, stake at west edge of road, marked "9-10".....	30 18 01.5	91 19 29.6
Bayou William, center of bridge over.....	30 18 23.2	91 19 39.3
Bayou William, 0.9 mile northwest of, three corners, second-class T road to west, 100 feet south of southeast corner of clearing, 100 feet north of northeast corner of clearing.....	30 19 05.2	91 19 53.4
Bayou Catfish, 1.3 miles southeast of, second-class road to south, 10 feet west to locust, 90 feet north to edge of Bayou Grossetete.....	30 19 49.6	91 20 45.4
Bayou Catfish, center of bridge over.....	30 20 23.9	91 21 49.5
Bayou Catfish, 1.6 miles northwest of, three corners, second-class T road west, 150 feet south of southeast corner of clearing, 25 feet southwest to gum tree, 50 feet east to edge of Bayou Grossetete.....	30 21 33.6	91 22 29.3
Bayou Catfish, 2.5 miles northwest of, three corners, second-class T road to southwest, 10 feet northwest to corner of wire fence, 10 feet southwest to corner of wire fence, 100 feet northeast to Bayou Grossetete.....	30 22 09.8	91 22 46.9
Grossetete, about 4.3 miles southeast of, at bend of bayou to northwest, forks of roads northwest and southwest, 60 feet southeast to maple tree, 50 feet north to edge of Bayou Grossetete.....	30 22 08.0	91 23 52.5
Grossetete, 3 miles southeast of, three corners, second-class T road to southwest, 30 feet southwest to chinaberry tree, 30 feet south to corner of wire fence, 15 feet northeast to top of levee.....	30 22 48.8	91 24 42.8
Grossetete, 1.6 miles southeast of, three corners, second-class T road leading over old drawbridge, 50 feet northwest to large live oak, 20 feet west to end of fence.....	30 23 48.7	91 25 02.2
Grossetete, 0.6 mile east of station, road crossing Texas and Pacific Rwy., 125 feet northwest of bridge over Bayou Grossetete, center of track.....	30 24 28.9	91 25 26.6

Geographic positions along Texas and Pacific Railway near Grossetete.

Station.	Latitude.	Longitude.
Grossetete station, 100 feet northeast of, at edge of railroad right of way at corner of street, 50 feet north of center main track Texas and Pacific Rwy., iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	° ' " 30 24 38.9	° ' " 91 26 03.0
Grossetete station, 0.9 mile northwest of, railroad crossing, Texas and Pacific Rwy. and lumber road leading west, center of track.....	30 25 08.1	91 26 48.3
Old Rosedale station at crossing Texas and Pacific Rwy. and Old Louisiana Central R. R. grade, public road crossing, center of track.....	30 26 04.9	91 27 51.1

Geographic positions along old Louisiana Central Railroad grade.

Station.	Latitude.	Longitude.
Rosedale post-office, four corners, 60 feet northwest to corner store, 30 feet southeast to corner of old platform, 180 feet east to center of bridge over Bayou Grossetete.....	30 26 34.5	91 27 08.1
Rosedale post-office, 1.2 miles east of, small bayou, center of bridge over.....	30 27 12.0	91 26 06.1
Rosedale post-office, 2.5 miles east of, center of bridge.....	30 27 46.8	91 25 01.5
Lake Crocodile, center of iron bridge over.....	30 28 41.2	91 23 15.1
Lake Crocodile, 1.6 miles east of, small bayou, center of bridge over.....	30 28 17.0	91 21 48.3
Lake Crocodile, 2.6 miles east of, second-class wood road to north, center of old grade.....	30 28 10.5	91 20 50.5
Four corners at old sawmill place, 2.6 miles west of, three corners, second-class T lane to south, 10 feet south to small bridge.....	30 28 11.5	91 19 21.8
Four corners at old sawmill place, 2.1 miles west of, three corners, second-class T road to south, 40 feet south to dead oak, 10 feet west to small bridge.....	30 28 11.0	91 18 49.6
Four corners at old sawmill place, 1 mile west of, four corners, second-class T road to south, cane-field road to north, 20 feet south to corner of wire fence, 40 feet southwest to gum tree.....	30 28 09.1	91 17 45.3
Old sawmill place, on Selvy plantation, about 5 miles west of Port Allen, four corners, crossroads, 15 feet north to small bridge, 35 feet south to wire fence.....	30 28 10.0	91 16 44.0
Port Allen, about 5 miles west of, four corners at west end of old plank road on Savoy plantation, in southwest corner of intersection, iron post stamped "Prim. Trav. Sta. No. 13, 1905".....	30 28 09.6	91 16 44.5
Port Allen, 3.8 miles west of, forks, roads southwest and southeast at schoolhouse, center of old grade, 100 feet southwest to front door of schoolhouse.....	30 27 44.1	91 15 46.1
Port Allen, about 3 miles west of, second-class road crossing, center of old grade.....	30 27 35.6	91 14 56.8
Port Allen, 1.5 miles west of, second-class road crossing, 50 feet east of old trestle across three streams, center of old grade at road crossing.....	30 27 39.5	91 13 27.3
Port Allen, at west edge of, crossing of Texas and Pacific Rwy. and old grade of Louisiana Central R. R., center of track.....	30 27 42.0	91 12 35.8
Port Allen, West Baton Rouge court-house, in angle formed by east wall and north wall of porte-cochère, iron post stamped "Prim. Trav. Sta. No. 14, 1905".....	30 27 40.7	91 12 21.2
Baton Rouge, intersection of Main and Lafayette streets, center of car track.....	30 27 08.6	91 11 20.9
Baton Rouge, northwest tower of Louisiana statehouse, United States Engineers' triangulation station.....	30 26 51.56	91 11 20.29
Baton Rouge post-office, 150 feet east of, in park at foot of Church street, Mississippi River Commission P. B. M.....	30 26 52.87	91 11 15.28
Baton Rouge, intersection of North boulevard and Dufocq street, center of street-car track.....	30 26 55.6	91 10 07.9
Baton Rouge, Cowboys' Exchange, three corners, T road to northwest.....	30 27 14.9	91 10 00.7

Geographic positions along Texas and Pacific Railway, Rosedale to Maringouin.

[Checked spur line.]

Station.	Latitude.	Longitude.
New Rosedale station, 1,000 feet northwest of, road crossing, center of track.....	30 26 30.9	91 28 19.6
New Rosedale, 1.7 miles northwest of, at cotton gin, crossing of West Oak lane, center of track.....	30 27 30.1	91 29 21.9
Slack's cotton gin, 400 feet northwest of, road crossing, center of track.....	30 27 56.0	91 29 45.5
Maringouin, 1 mile southeast of, road crossing, center of track.....	30 28 44.2	91 30 29.3
Maringouin station, 50 feet southeast of, street crossing, center of main track.....	30 29 30.5	91 31 11.4
Maringouin station, 200 feet north of, at south corner of Joseph Wolf's department store, iron post stamped "Prim. Trav. Sta. No. 12, 1905".....	30 29 32.0	91 31 09.9

WHITECASTLE QUADRANGLE (ASCENSION, ASSUMPTION, AND IBERVILLE PARISHES).

Geographic positions along Texas and Pacific Railway between Donaldsonville and Plattenville.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Donaldsonville, east tower of old Catholic Church.....	30	06	18.05	90	58	58.25
Donaldsonville, cross on Catholic convent.....	30	06	14.36	90	59	05.47
Donaldsonville, freight station, 50 feet south of, Texas and Pacific Rwy. main line, overhead crossing of St. Patrick street.....	30	05	54.1	90	59	21.9
Donaldsonville, 1.7 miles south of, second-class road crossing at trestle over small stream.....	30	05	12.1	90	59	35.9
Sugarhouse, 400 feet west of, center of track at road crossing.....	30	04	11.9	91	00	16.8
Belle Alliance, 0.75 mile north of, at Halfway station, road crossing, center of track.....	30	03	36.9	91	00	47.3
Belle Alliance station, 100 feet south of, road crossing.....	30	03	08.6	91	01	12.0
Belle Alliance, 1.1 miles south of, center of track; crossing signpost stands 15 feet west of track.....	30	02	14.8	91	01	32.1
Belle Alliance station, 1.8 miles south of, at sugarhouse, road crossing, center of track.....	30	01	37.3	91	01	38.9
Sweet Home sugarhouse, tramroad crossing, 550 feet south of, road crossing, center of track.....	30	00	47.5	91	01	38.9
Plattenville, 100 feet north of station, road crossing, center of main track.....	29	59	41.9	91	01	06.4

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Plattenville, Catholic Church, in south face at southeast corner, alu- minum tablet stamped "Prim. Trav. Sta. No. 5, 1905".....	29	59	29.4	91	01	23.3
Paincourtville, at junction of Bayou Lafourche and Lake Natchez roads, 400 feet northeast of Catholic Church, brick warehouse in northwest corner of intersection, east corner.....	29	59	38.3	91	03	14.9
Paincourtville, 0.6 mile north of, at Magnolia store, three corners, pub- lic T road to west, 60 feet southwest to corner of fence, 40 feet north to corner of store, 80 feet east to Bayou Lafourche levee.....	30	00	07.8	91	03	12.0
Paincourtville, 1 mile northwest of, Texas and Pacific and Southern Rwys. crossing, center of track.....	30	00	10.3	91	03	50.8
Paincourtville, about 2.5 miles northwest of, three corners, second- class road to south at bend of main road to northwest, 10 feet south to small bridge, 40 feet northeast to telephone pole.....	30	00	16.6	91	05	31.5
Paincourtville, about 3.75 miles northwest of, three corners, second- class T road to west, at bend of main road to north.....	30	00	24.2	91	06	32.0
Paincourtville, about 3.75 miles northwest of, second-class T road west at bend of main road to north, at corner of fence at northeast corner of intersection, iron post stamped "Prim. Trav. Sta. No. 6, 1905".....	30	00	24.4	91	06	31.7
Grand Bayou, at old bridge site (1905), about 700 feet north of store, center of stream.....	30	00	59.5	91	07	51.1
Bayou Corne, center of bridge over.....	30	00	56.8	91	09	14.7
Small bayou, center of bridge over.....	30	00	48.7	91	09	56.9
Bayou Pierrepas, east end of bridge over.....	30	00	37.2	91	11	16.1
Bayou Pierrepas, bridge over, 0.6 mile southwest of, three corners, sec- ond-class T road west to Lake Natchez, 25 feet northeast to small bridge, 70 feet west to corner plank and wire fence, 35 feet east to hickory.....	30	00	16.2	91	11	40.8
Bayou Pierrepas, bridge over, 0.6 mile southwest of, three corners, sec- ond-class T road west to Lake Natchez, at fence corner at southwest corner of intersection, iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	30	00	16.1	91	11	41.6
Bayou Natchez, 0.75 mile east of, forks, second-class roads west to Bayou Natchez and north to Whitecastle Lumber Co.'s railroad, 35 feet south to live oak, 25 feet west to beech tree.....	30	00	42.8	91	13	04.0
Whitecastle Lumber Co.'s railroad, dwelling of Mr. Blanchard, on east edge of Lake Natchez, chimney at south end of dwelling.....	30	01	51.8	91	13	06.4

Geographic positions along Whitecastle Lumber Company's railroad.

Station.	Latitude.	Longitude.
Lake Natchez, east edge of, center of railroad, at edge of lake, 25 feet north to cypress tree with cross cut on face, 25 feet south to cypress tree with cross cut on face.....	° ' "	° ' "
Second-class road crossing, 1,400 feet north of end of long trestle.....	30 02 42.4	91 13 07.3
Branch railroad northwest, 250 feet east of, road crossing, center of track.....	30 05 06.7	91 13 10.4
	30 06 20.8	91 12 42.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
Richland lane, junction of railroads about 1,000 feet north of store, bridge over small stream crossing lane, center of bridge.....	° ' "	° ' "
Three corners, T road west, 20 feet west to field gate, 260 feet north to second-class T road east.....	30 06 56.1	91 11 27.7
Three corners, T road northwest, 30 feet west to corner of wire fence, 80 feet northeast to gum tree.....	30 08 06.0	91 10 44.1
Cane railroad crossing, center of track.....	30 08 34.2	91 10 26.5
	30 09 19.5	91 09 57.8

Geographic positions along Texas and Pacific Railway between Whitecastle and Plaquemine.

Station.	Latitude.	Longitude.
Whitecastle station, 0.36 mile northwest of, road crossing, north rail.....	° ' "	° ' "
Whitecastle station, 0.36 mile northwest of, at crossing of Richland lane and Texas and Pacific Rwy., at corner of fence, 65 feet west of crossing, 30 feet south of center of Texas and Pacific Rwy., iron post stamped "Prim. Trav. Sta. No. 8, 1905".....	30 10 24.0	91 09 17.1
Dorseyville station, 125 feet southeast of, road crossing, center of track.....	30 10 23.9	91 09 17.8
Dorseyville station, 1.2 miles northwest of, road crossing, center of track.....	30 10 35.7	91 09 43.8
Bayou Goula, 50 feet southeast of, road crossing, center of track.....	30 11 22.7	91 10 30.5
Bayou Goula, 1.6 miles northwest of, road crossing at platform at trestle No. 80 D, center of track.....	30 12 22.9	91 11 06.2
Seymourville station, 1.4 miles southeast of road crossing and cane railroad crossing Texas and Pacific Rwy., center of tracks.....	30 13 36.1	91 11 49.8
Seymourville, road crossing, center of tracks.....	30 15 34.8	91 13 00.5
Plaquemine station, 50 feet south of, main street crossing, center of main track.....	30 16 42.1	91 13 40.6
Plaquemine, in north face at northwest corner of Iberville Parish court-house, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1905".....	30 17 30.6	91 14 12.0
Plaquemine, Catholic Church spire, United States engineers' triangulation point.....	30 17 33.8	91 14 01.3
	30 17 31.97	91 14 02.85

BOSSIER, CADDO, AND DE SOTO PARISHES.

MANSFIELD AND SHREVEPORT QUADRANGLES.

The following geographic positions were obtained by primary traverse run by Sledge Tatum in 1905, incidental to the primary-traverse control in northeastern Texas. These positions form a portion of the circuit extending from Marshall, Tex., via Shreveport, La., to Atlanta, Tex., and are given on the United States standard datum.

MANSFIELD QUADRANGLE DE SOTO (PARISH).

Geographic positions along Texas and Pacific Railway near Greenwood.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Louisiana-Texas State line, road north and south	32	28	22.6	94	02	33.2
Road crossing	32	27	55.9	94	01	36.7
Road crossing	32	27	25.6	94	00	30.1
Cattle guard	32	27	10.2	93	59	05.0
Greenwood, 30 feet east of station, road crossing	32	26	56.0	93	58	24.7
Greenwood, 600 feet east of station, in concrete abutment, Coast and Geodetic Survey bench-mark tablet	32	26	54.9	93	58	18.2
Greenwood, 0.25 mile east of, 36 feet south of track, east side of cattle guard, iron post	32	26	53.4	93	58	11.4
Road crossing	32	26	53.1	93	57	13.2
Missouri, Kansas and Texas Rwy. crossing	32	26	39.6	93	56	16.4

Geographic positions along Missouri, Kansas and Texas Railway between Flourney and Jewella.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Flourney flag station, road crossing	32	26	52.2	93	54	04.8
Cattle guard, 38 feet south of track, iron post stamped "Prim. Trav. Sta. No. 117"	32	27	01.0	93	52	30.2
Road crossing	32	27	26.8	93	50	33.2
Jewella flag station, road crossing	32	28	19.5	93	47	47.6
Shreveport, near Kansas City Southern Rwy. crossing	32	29	34.9	93	45	36.2
Cattle guard, Kansas City Southern Rwy., 40 feet east of track, iron post stamped "Prim. Trav. Sta. No. 153"	32	29	57.5	93	47	16.6

SHREVEPORT QUADRANGLE (BOSSIER AND CADDO PARISHES).

Geographic positions along Kansas City Southern Railway, Shreveport to Bloomsburg.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing	32	31	22.6	93	49	04.8
Milepost 552, road crossing	32	32	35.5	93	50	43.8
Milepost 550	32	33	46.3	93	52	11.8
Milepost 549, road crossing 500 feet north of	32	34	24.5	93	52	59.4
Blanchard, 1,900 feet north of, 35 feet west of track, at south side of wagon road crossing, iron post stamped "Prim. Trav. Sta. No. 184"	32	35	12.4	93	53	43.1
Road crossing	32	37	04.0	93	54	46.2
Milepost 544, road crossing	32	38	05.4	93	55	32.3
Milepost 542	32	39	21.4	93	56	54.6
Thirty-six feet east of track, 340 feet north of road crossing, iron post stamped "Prim. Trav. Sta. No. 213"	32	40	39.3	93	57	15.2
Mooringsport, 100 feet north of station, road crossing	32	41	37.7	93	57	27.6
Caddo flag station, road crossing, 30 feet west of track, south of road, iron post stamped "Prim. Trav. Sta. No. 234"	32	45	28.9	93	58	25.8
Ananias flag station, road crossing	32	44	40.1	93	58	14.7
Milepost 532	32	47	52.5	93	58	46.3
Milepost 530	32	49	37.1	93	58	51.8
Road crossing	32	51	40.5	93	59	09.1
Vivian station, 500 feet south of, road crossing, 30 feet west of track, on east side of wagon road, iron post stamped "Prim. Trav. Sta. No. 259"	32	52	15.4	93	59	07.4
Milepost 524	32	54	38.9	93	58	50.3
Myrtistown, 32 feet west of track, 8 feet south of milepost 523, iron post stamped "Prim. Trav. Sta. No. 273"	32	55	23.4	93	59	23.1

MICHIGAN.

PRIMARY TRAVERSE.

LIVINGSTON COUNTY.

HOWELL QUADRANGLE.

The line begins at an adjusted position near the northwest corner of the Milford quadrangle, follows highways west and south near the borders of the quadrangle, and is tied to the end of a spur line at Anderson run in 1901 by Mr. G. T. Hawkins.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 4 N., R. 6 E., corner secs. 19, 20, 29, and 30, crossroads.....	42	43	17.9	83	46	59.3
T. 4 N., R. 6 E., west corner secs. 19 and 30.....	42	43	15.6	83	48	08.5
T. 4 N., R. 5 E., east corner secs. 24 and 25.....	42	43	15.2	83	48	08.5
T. 4 N., R. 5 E., corner secs. 23, 24, 25, and 26, crossroads.....	42	43	13.0	83	49	18.9
T. 4 N., R. 5 E., corner secs. 22, 23, 26, and 27, T road east.....	42	43	10.5	83	50	29.6
T. 4 N., R. 5 E., corner secs. 21, 22, 27, and 28, crossroads.....	42	43	08.2	83	51	40.6
T. 4 N., R. 5 E., corner secs. 21, 22, 27, and 28, 20 feet southwest of; iron post stamped "Prim. Trav. Sta. No. 16, 1905, Mich.".....	42	43	05.5	83	52	51.4
Schoolhouse, four corners.....	42	43	03.9	83	54	02.8
T. 4 N., Rs. 4 and 5 E., corner secs. 19, 30, 25, and 24.....	42	43	00.5	83	55	08.9
Railroad, T road east 0.25 mile west of.....	42	43	10.8	83	56	55.2
Cemetery, crossroads 0.25 mile west of.....	42	42	30.0	83	58	04.0
Autcliff (E. D.), house, 140 feet west of; on west side north-south road; iron post stamped "Prim. Trav. Sta. No. 17, 1905, Mich.".....	42	42	14.7	83	59	49.8
T. 4 N., R. 4 E., corner secs. 28, 29, 32, and 33, crossroads.....	42	42	02.2	83	59	49.0
T. 4 N., R. 4 E., south corner secs. 32 and 33, T road north.....	42	41	09.6	83	59	46.4
T. 3 N., R. 4 E., quarter corner between secs. 8 and 9, crossroads.....	42	39	55.2	83	59	41.6
T. 3 N., R. 4 E., corner secs. 16, 17, 20, and 21, crossroads.....	42	38	35.7	83	59	38.6
T. 3 N., R. 4 E., quarter corner between secs. 28 and 29, crossroads.....	42	37	17.5	83	59	36.7
Corner secs. 4, 5, 32, and 33, 1,025 feet north of, east side of north-south road, large oak across road bears S. 80° W., distant 46 feet; iron post stamped "Prim. Trav. Sta. No. 18, 1905, Mich.".....	42	36	09.0	83	59	34.8
Tps. 2 and 3 N., R. 4 E., corner secs. 4, 5, 32, and 33, crossroads.....	42	35	58.9	83	59	34.7
T road north, large house 100 feet northwest, large barn 150 feet north-east.....	42	35	21.9	84	00	22.1
T. 2 N., R. 4 E., quarter corner between secs. 6 and 7, T road south.....	42	34	56.2	84	01	13.4
T. 2 N., R. 4 E., quarter corner between secs. 7 and 18, T road east.....	42	34	03.7	84	01	09.0
Church and store, crossroads.....	42	32	45.7	84	01	21.4
T road east.....	42	32	06.9	84	01	07.9
Tps. 1 and 2 N., R. 4 E., quarter corner between secs. 6 and 31, crossroads.....	42	30	36.3	84	01	08.7
Quarter corner between secs. 6 and 7, T road east at, 40 feet southeast of, on east side of north-south road; iron post stamped "Prim. Trav. Sta. No. 19, 1905, Mich.".....	42	29	46.9	84	01	04.6
T. 1 N., R. 4 E., quarter corner between secs. 7 and 18, crossroads.....	42	28	54.5	84	01	00.4
Anderson station.....	42	28	02.6	84	00	40.2

LAPEER, MACOMB, AND OAKLAND COUNTIES.

LEONARD QUADRANGLE.

This line starts from an adjusted position near the northwest corner of the Rochester quadrangle and follows highways north to Oxford, thence along the Michigan Central Railway to Hunters Creek, thence east and south along highways to an adjusted position near the northeast corner of the Rochester quadrangle.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 4 N., R. 10 E., quarter corner between secs. 14 and 23, crossroads...	42 45 06.5	83 14 48.7
Orion, crossroads 1 mile south of.....	42 46 02.5	83 16 22.3
Orion, crossroads at Commercial Hotel.....	42 47 04.1	83 14 24.0
Orion, railway crossing under track 1 mile northwest of.....	42 47 49.6	83 14 47.8

Geographic positions along Michigan Central Railway, Oxford to Hunters Creek.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Oxford, crossing Michigan Central Rwy. and Pontiac, Oxford and Northern R. R.....	42 49 39.4	83 15 49.4
Oxford, railway crossing 1.25 miles north of.....	42 50 32.5	83 16 30.1
Thomas, 0.75 mile south of, railway crossing east and west.....	42 52 07.5	83 17 41.5
Thomas, 0.25 mile north of, railway crossing east and west, on county line.....	42 52 59.6	83 17 51.0
Thomas, 0.25 mile north of, on west edge of railway right of way, north side of east-west road; iron post stamped "Prim. Trav. Sta. No. 6, 1905, Mich.".....	42 52 59.9	83 17 51.4
Milepost 59, east-west road crossing 800 feet south of.....	42 54 43.5	83 18 09.1
Milepost 58, east-west road crossing overhead 800 feet south of.....	42 55 35.1	83 18 03.9
Matamora, crossing just north of station.....	42 56 28.4	83 17 17.4
Matamora, 1 mile north of, east-west crossing.....	42 57 21.7	83 17 02.2
Township line, east-west road crossing on.....	42 58 15.3	83 17 07.9
Hunters Creek, east-west road crossing.....	42 59 07.0	83 17 33.4

Geographic positions along highways near north and east borders of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 7 N., R. 10 E., corner secs. 27, 28, 33, and 34, T road north.....	42 59 07.9	83 16 53.0
T. 7 N., R. 10 E., corner secs. 26, 27, 34, and 35, crossroads.....	42 59 09.1	83 15 42.5
Corner secs. 26, 27, 34, and 35, 120 feet east and 20 feet north of, north side of east-west road, iron post stamped "Prim. Trav. Sta. No. 7, 1905, Mich.".....	42 59 09.1	83 15 40.8
T. 7 N., R. 10 E., corner secs. 25, 26, 35, and 36, crossroads.....	42 59 11.0	83 14 32.3
T. 7 N., R. 10 E., corner secs. 25 and 36, T road west at east corner of.....	42 59 12.7	83 13 21.3
T. 7 N., R. 11 E., corner secs. 28, 29, 32, and 33, three corners.....	42 59 16.0	83 11 00.3
T. 7 N., R. 11 E., corner secs. 27, 28, 33, and 34, T road east.....	42 59 17.9	83 09 50.2
T. 7 N., R. 11 E., corner secs. 27, 28, 33, and 34, 875 feet east of, on south side of east-west road; iron post stamped "Prim. Trav. Sta. No. 8, 1905, Mich.".....	42 59 18.1	83 09 38.5
T. 7 N., R. 11 E., corner secs. 26, 27, 34, and 35, T road east.....	42 59 20.3	83 08 39.5
T. 7 N., R. 11 E., corner secs. 25, 26, 35, and 36, crossroads.....	42 59 21.8	83 07 29.0
T. 7 N., R. 12 E., west corner secs. 30 and 31, T road east.....	42 59 24.7	83 06 18.2
T. 7 N., R. 12 E., corner secs. 29, 30, 31, and 32.....	42 59 26.9	83 05 08.5
T. 7 N., R. 12 E., south corner secs. 33 and 34, crossroads.....	42 58 43.1	83 02 44.2
T. 7 N., R. 12 E., south corner secs. 33 and 34, west side of north-south road 600 feet south of, 50 feet southeast of E. Harrington's house; iron post stamped "Prim. Trav. Sta. No. 9, 1905, Mich.".....	42 58 37.1	83 02 44.1
T. 6 N., R. 12 E., corner secs. 3, 4, 9, and 10, crossroads.....	42 57 46.8	83 02 51.8
T. 6 N., R. 12 E., corner secs. 9, 10, 15, and 16, crossroads.....	42 56 54.6	83 02 49.1
T. 6 N., R. 12 E., corner secs. 15, 16, 21, and 22, crossroads.....	42 56 05.0	83 02 46.4
T. 6 N., R. 12 E., corner secs. 21, 22, 27, and 28, crossroads.....	42 55 11.2	83 02 42.8
T. 6 N., R. 12 E., corner secs. 27, 28, 33, and 34, crossroads.....	42 54 18.7	83 02 40.0
Tps. 5 and 6 N., R. 12 E., corner secs. 3, 4, 33, and 34, crossroads.....	42 53 21.7	83 02 36.5
Almont, 3 miles south of, 1,050 feet south of Karl Schroder's house, 250 feet south of fork to southeast, east side of north-south road; iron post stamped "Prim. Trav. Sta. No. 10, 1905, Mich.".....	42 52 35.1	83 02 32.0
T. 5 N., R. 12 E., corner secs. 3, 4, 9, and 10, crossroads.....	42 52 25.2	83 02 31.8
T. 5 N., R. 12 E., corner secs. 9, 10, 15, and 16, crossroads.....	42 51 33.3	83 02 28.9
T. 5 N., R. 12 E., corner secs. 15, 16, 21, and 22, T road north.....	42 50 41.4	83 02 26.9
T. 5 N., R. 12 E., corner secs. 27, 28, 33, and 34, crossroads.....	42 48 56.9	83 02 22.8
T. 5 N., R. 12 E., south corner secs. 33 and 34, T road north.....	42 48 04.0	83 02 21.1
T. 4 N., R. 12 E., north corner secs. 3 and 4, T road south.....	42 48 04.0	83 02 19.8
T. 4 N., R. 12 E., corner secs. 3, 4, 9, and 10, crossroads.....	42 47 07.9	83 02 18.4
T. 4 N., R. 12 E., corner secs. 9, 10, 15, and 16, crossroads.....	42 46 15.2	83 02 16.5
T. 4 N., R. 12 E., corner secs. 15, 16, 21, and 22, crossroads.....	42 45 22.8	83 02 14.7

LIVINGSTON AND OAKLAND COUNTIES.

MILFORD QUADRANGLE.

This line starts from an adjusted position at New Hudson, follows highways west, north, and east near the borders of the quadrangle, and is tied to an adjusted position near the northwest corner of the Pontiac quadrangle.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
New Hudson station.....	42	30	31.4	83	36	43.4
County line, road south $\frac{1}{2}$ mile east of.....	42	30	58.8	83	39	34.7
County line, north road on.....	42	31	01.4	83	40	14.4
Church, crossroads.....	42	31	03.4	83	41	25.4
Tps. 1 and 2 N., R. 6 E., quarter corner secs. 3 and 34.....	42	30	59.5	83	43	11.1
T. 2 N., R. 6 E., quarter corner between secs. 27 and 34, three corners.....	42	31	52.1	83	43	14.8
T. 2 N., R. 6 E., corner secs. 21, 22, 27, and 28, crossroads.....	42	32	44.0	83	43	53.6
T. 2 N., R. 6 E., corner secs. 20, 21, 28, and 29, T road east.....	42	32	41.3	83	45	04.6
Schoolhouse, five corners.....	42	34	53.8	83	45	12.2
East side of north-south road, Mr. Bueck's house bears northwest, distant 250 feet, and his barn bears northeast, distant 100 feet; iron post stamped "Prim. Trav. Sta. No. 13, 1905, Mich.".....	42	36	31.5	83	44	53.2
Schoolhouse, T road west.....	42	37	05.1	83	45	00.6
Hartland, crossroads 1.5 miles south of.....	42	37	58.2	83	45	10.8
Hartland, T road east at hotel.....	42	39	24.1	83	45	16.4
T. 3 N., R. 6 E., corner secs. 4, 5, 8, and 9, crossroads.....	42	40	36.4	83	45	37.7
T. 4 N., R. 6 E., south corner secs. 32 and 33, T road north.....	42	41	34.5	83	45	42.6
T. 4 N., R. 6 E., corner secs. 28, 29, 32, and 33, crossroads.....	42	42	27.5	83	45	45.9
T. 4 N., R. 6 E., corner secs. 20, 21, 28, and 29, crossroads.....	42	43	20.3	83	45	49.1
T. 4 N., R. 6 E., corner secs. 16, 17, 20, and 21, crossroads.....	42	44	12.8	83	45	52.1
T. 4 N., R. 6 E., corner secs. 16, 17, 20, and 21, 300 feet east of, on south side of east-west road; iron post stamped "Prim. Trav. Sta. No. 14, 1905, Mich.".....	42	44	12.8	83	45	48.1
T. 4 N., R. 6 E., corner secs. 15, 16, 21, and 22, crossroads.....	42	44	15.0	83	44	40.1
T. 4 N., R. 6 E., corner secs. 14, 15, 22, and 23, crossroads.....	42	44	17.3	83	43	29.7
T. 4 N., R. 6 E., corner secs. 13, 14, 23, and 24, T road west.....	42	44	19.5	83	42	17.2
T. 4 N., R. 6 E., quarter corner between secs. 13 and 14, T road east.....	42	44	45.9	83	42	18.6
County line, crossroads.....	42	44	40.4	83	41	07.0
County line, crossroads 1 mile east of.....	42	44	21.7	83	39	58.6
On south side of road 1 foot north of cemetery fence and 30 feet east of cemetery gate; iron post stamped "Prim. Trav. Sta. No. 15, 1905, Mich.".....	42	44	18.4	83	38	47.8
Rose Center, railway crossing north of station.....	42	43	53.7	83	37	03.4
T. 4 N., R. 7 E., quarter corner between secs. 14 and 23, T road south.....	42	44	28.6	83	35	48.9
T. 4 N., R. 7 E., quarter corner between secs. 13 and 24, crossroads.....	42	44	30.5	83	34	37.8
T. 4 N., R. 7 E., east sixteenth corner secs. 13 and 24.....	42	44	32.2	83	34	02.6
T. 4 N., R. 8 E., center sec. 20, T road north.....	42	44	09.5	83	32	13.2

OAKLAND COUNTY.

PONTIAC QUADRANGLE.

The following geographic positions were determined by primary traverse in 1905 by George T. Hawkins, topographer. The line starts from a point near the northeast corner of the quadrangle, follows highways west and south, and connects with an adjusted position on a line determined by J. R. Ellis in 1903.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T road west.....	42	44	08.0	83	14	41.5
T. 4 N., R. 10 E., near center sec. 27, road south.....	42	43	58.0	83	15	48.0
T. 4 N., R. 10 E., near northwest corner sec. 28, T road south.....	42	44	11.0	83	17	18.0
T. 4 N., R. 10 E., near northwest corner sec. 29, T road east; sign "Orion 7 miles".....	42	44	09.3	83	18	29.6
T. 4 N., R. 10 E., quarter corner west side sec. 30, elbow north and west.....	42	43	41.5	83	19	48.3
T. 4 N., R. 9 E., corner secs. 25, 26, 35, and 36, crossroads.....	42	43	10.8	83	20	57.8
T. 4 N., R. 9 E., corner secs. 26, 27, 34, and 35.....	42	43	08.7	83	22	09.2
T. 4 N., R. 9 E., corner secs. 27, 28, 33, and 34.....	42	43	06.8	83	23	20.3
Junction of east-west road with northwest-southeast pike.....	42	43	03.7	83	24	56.4
T road south.....	42	43	22.8	83	27	42.5
T. 4 N., R. 8 E., corner secs. 22, 23, 26, and 27, T road north.....	42	43	46.9	83	29	13.4
T. 4 N., R. 8 E., corner secs. 21, 22, 27, and 28, 0.25 mile west of, on west side of north-south road, 40 feet north of T road east, 200 feet south of elbow west and south, 0.25 mile west of W. E. Neal's house and same distance west of C. F. Cross's house, 1 mile west of Andersonville, iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	42	43	43.5	83	30	42.3
Tps. 3 and 4 N., R. 8 E., between secs. 4 and 33, T road north.....	42	41	59.9	83	30	47.2
Crossroads north, southwest, and southeast.....	42	41	01.8	83	30	51.9
T. 3 N., R. 8 E., in sec. 15, four corners.....	42	40	04.5	83	29	18.8
T. 3 N., R. 8 E., T road north on south side of sec. 22.....	42	38	31.9	83	29	39.0
T. 3 N., R. 8 E., quarter corner between secs. 27 and 34, crossroads.....	42	37	38.8	83	29	30.3
T. 3 N., R. 8 E., quarter corner south side sec. 34, T road north.....	42	36	47.2	83	29	27.7
Bradley (J.) house, 300 feet southeast of, 3 feet from north-south picket fence; iron post stamped "Prim. Trav. Sta. No. 12, 1905".....	42	36	30.2	83	29	30.3
T. 2 N., R. 8 E., in center sec. 10, T road north, in west part of Commerce.....	42	35	26.6	83	29	26.5
Commerce, in east part of, T. 2 N., R. 8 E., quarter corner between secs. 10 and 11, at crossroads.....	42	35	27.6	83	28	51.3
T. 2 N., R. 8 E., corner secs. 14, 15, 22, and 23, T road north.....	42	34	09.5	83	28	45.5
T. 2 N., R. 8 E., corner secs. 22, 23, 26, and 27, elbow east and south.....	42	33	17.4	83	28	42.5
Cemetery, road west-south of.....	42	31	31.4	83	29	28.8
T. 1 N., R. 8 E., corner secs. 4, 5, 8, and 9, crossroads.....	42	30	31.0	83	30	59.4
Novi, crossing of Green River road and north-south road 2 miles west of	42	29	22.2	83	30	55.9

MACOMB AND OAKLAND COUNTIES.

ROCHESTER QUADRANGLE.

The following geographic positions were determined by primary traverse in 1905 by George T. Hawkins, topographer. The line starts from an adjusted position determined by J. R. Ellis in 1903, follows highways north, west, and south near the borders of the quadrangle, and is connected with a position on the same adjusted line as starting point.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 1 N., R. 12 E., corner secs. 10, 11, 14, and 15.....	42	30	24.6	83	00	25.1
T. 1 N., R. 12 E., corner secs. 2, 3, 10, and 11, crossroads.....	42	31	16.7	83	00	27.6
Tps. 1 and 2 N., R. 12 E., corner secs. 2, 3, 34, and 35.....	42	32	13.3	83	00	30.1
Tps. 1 and 2 N., R. 12 E., corner secs. 3, 4, 33, and 34, crossroads.....	42	32	10.9	83	01	46.0
T. 2 N., R. 12 E., corner secs. 27, 28, 33, and 34 crossroads.....	42	33	03.4	83	01	44.5
T. 2 N., R. 12 E., corner secs. 21, 22, 27, and 28 crossroads.....	42	33	55.9	83	01	46.9
T. 2 N., R. 12 E., corner secs. 15, 16, 21, and 22, T road west at school-house.....	42	34	48.4	83	01	49.0
T. 2 N., R. 12 E., corner secs. 9, 10, 15, and 16, crossroads.....	42	35	41.2	83	01	51.2
Utica, 1.5 miles south of, at August Gash's residence, on west side of north-south road, 5 feet from fence; iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	42	36	21.2	83	01	53.6
Tps. 2 and 3 N., R. 12 E., corner secs. 2, 3, 33, and 34, T road north.....	42	37	31.8	83	01	56.8
T. 3 N., R. 12 E., corner secs. 27, 28, 33, and 34 crossroads.....	42	38	25.3	83	01	58.8
T. 3 N., R. 12 E., corner secs. 21, 22, 27, and 28, crossroads.....	42	39	17.4	83	02	00.5
T. 3 N., R. 12 E., corner secs. 15, 16, 21, and 22, crossroads.....	42	40	09.5	83	02	02.0

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 3 N., R. 12 E., corner secs. 9, 10, 15, and 16, crossroads at Disco.....	42	41	01.6	83	02	04.3
T. 3 N., R. 12 E., corner secs. 3, 4, 9, and 10, crossroads.....	42	41	53.8	83	02	05.4
Tps. 3 and 4 N., R. 12 E., corner secs. 3, 4, 33, and 34, crossroads.....	42	42	48.7	83	02	07.5
T. 4 N., R. 12 E., corner secs. 27, 28, 33, and 34, T road east.....	42	43	40.3	83	02	10.2
T. 4 N., R. 12 E., 18 feet southeast of southeast corner sec. 21, two mail boxes at southeast corner of square, marked "Mary Keeler" and "Fred G. Bravner," 36 feet from bench mark, iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	42	44	33.1	83	02	12.3
T. 4 N., R. 12 E., corner secs. 20, 21, 28, and 29.....	42	44	31.6	83	03	24.7
Mount Vernon crossroads, T. 4 N., R. 12 E., quarter corner between secs. 19 and 30.....	42	44	28.9	83	05	12.7
T. 4 N., R. 11 E., quarter corner between secs. 23 and 26, T road south.....	42	44	26.3	83	07	34.7
T. 4 N., R. 11 E., corner secs. 22, 23, 26, and 27, crossroads.....	42	44	25.6	83	08	10.0
T. 4 N., R. 11 E., secs. 22, 23, 26, and 27, 100 feet west and 15 feet south of corner, iron post stamped "Prim. Trav. Sta. No. 4, 1905".....	42	44	25.4	83	08	11.2
T. 4 N., R. 11 E., crossroads between secs. 21 and 28.....	42	44	23.6	83	09	41.8
T. 4 N., R. 11 E., corner secs. 19, 20, 29, and 30, crossroads.....	42	44	20.6	83	11	49.2
T. 4 N., Rs. 10 and 11 E., corner secs. 19, 30, 24, and 25, T road east.....	42	44	19.2	83	12	55.4
T. 4 N., R. 10 E., crossroads between secs. 23 and 24.....	42	44	33.0	83	14	07.5
T. 4 N., R. 10 E., in sec. 23, 660 feet north of T road west, in front of George Porritt's house, on west side of north-south road, iron post stamped "Prim. Trav. Sta. No. 5, 1905".....	42	44	16.7	83	14	43.2
T road west.....	42	44	08.0	83	14	41.5
T. 4 N., R. 10 E., quarter corner between secs. 26 and 35, crossroads.....	42	43	22.1	83	14	34.2
T road west.....	42	42	30.8	83	14	33.0
Schoolhouse, road east.....	42	41	23.0	83	14	29.0
Schoolhouse, crossroads 0.75 mile south and 0.25 mile west of.....	42	40	41.2	83	14	46.1
Large brick house, three corners.....	42	39	38.4	83	14	52.6
Brick schoolhouse, crossroads.....	42	38	56.5	83	14	34.2
T. 3 N., R. 10 E., corner secs. 23, 24, 25, and 26, T road north.....	42	38	57.6	83	13	45.4
Auburn, T road south, 1 mile northeast of.....	42	38	47.5	83	12	38.1
T. 3 N., Rs. 10 and 11 E., corner secs. 25, 30, 31, and 36, crossroads.....	42	38	01.4	83	12	36.0
Tps. 2 and 3 N., Rs. 10 and 11 E., corner secs. 1, 6, 31, and 36, crossroads.....	42	37	14.4	83	12	33.5
T. 2 N., Rs. 10 and 11 E., corner secs. 1, 6, 7, and 12, crossroads.....	42	36	16.8	83	12	30.8
Birmingham, 4 miles north of, T. 2 N., Rs. 10 and 11 E., corner secs. 1, 6, 7, and 12 bears N. 3° 30' W., distant 420 feet; oak tree on west side of road bears N. 80° W., distant 55 feet, on east side of north-south road iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	42	36	12.4	83	12	30.5
T. 2 N., Rs. 10 and 11 E., corner secs. 7, 18, 13, and 12, T road east.....	42	35	23.4	83	12	28.6
T. 2 N., Rs. 10 and 11 E., corner secs. 13, 18, 19, and 24, crossroads.....	42	34	32.0	83	12	26.1
T. 2 N., Rs. 10 and 11 E., corner secs. 24, 25, 19, and 30, crossroads.....	42	33	37.5	83	12	23.6
T. 2 N., Rs. 10 and 11 E., corner secs. 25, 30, 31, and 36, crossroads 0.5 mile east of Birmingham.....	42	32	47.9	83	12	21.2
Tps. 1 and 2 N., R. 10 E., corner secs. 1, 2, 35, and 36.....	42	31	52.0	83	13	28.5
T. 1 N., R. 10 E., corner secs. 1, 2, 11, and 12, crossroads.....	42	31	00.5	83	13	24.2
T. 1 N., R. 10 E., corner secs. 11, 12, 13, and 14.....	42	30	07.8	83	13	21.4

MISSISSIPPI.

PRIMARY TRAVERSE.

COPIAH, HINDS, MADISON, RANKIN, SIMPSON, AND WARREN COUNTIES.

BRANDON, EDWARDS, FLORENCE, JACKSON, RAYMOND, TERRY, AND VICKSBURG QUADRANGLES.

The following geographic positions were determined from primary traverse by J. R. Ellis in 1902 and 1903. The line between Vicksburg and Jackson was run and duplicated, giving a checked value for Jackson which was based on United States Mississippi River Commission triangulation station Trinity Church spire, as given on page 2805 in the report of the Chief of Engineers, United States Army, 1887. This line follows the Alabama and Vicksburg Railway. A spur line was run northward from Jackson along the Yazoo and Mississippi Valley Railroad to Pocahtontas. A spur line was also run southward from Jackson, following the Illinois Central Railroad to the line

between Hinds and Copiah counties. Another line was run eastward from Jackson along the Alabama and Vicksburg Railway to the range line between Rs. 3 and 4 E.

In 1905 C. B. Kendall, field assistant, extended lines around the borders of the Florence, Jackson, Raymond, and Terry 15' quadrangles, starting at Pocahontas, tying to the positions at Bolton, county-line post near Crystal Springs and Brandon, and closing at Pocahontas.

BRANDON QUADRANGLE (RANKIN COUNTY).

Geographic positions along Alabama and Vicksburg Railway from Brandon station to T. 5 N., Rs. 3 and 4 E., secs. 7 and 12.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south.....	32 17 28.6	89 58 39.3
T. 5 N., Rs. 3 and 4 E., quarter corner between secs. 7 and 12.....	32 17 25.4	89 56 15.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Brandon, 1 mile south of, forks of roads south and southwest, 30 feet north to double oak and signboard "Brandon 1 mile".....	32 15 27.1	89 59 23.1
Brandon, four corners at church, street crossing.....	32 16 06.9	89 59 22.8
Brandon, Rankin County court-house, set in southwest corner of iron picket fence around, iron post stamped "Prim. Trav. Sta. No. 12, 1905".....	32 16 22.5	89 59 13.6
Brandon, at northwest edge of, public roads north and west, 30 feet southwest to telephone pole, 20 feet northeast to plank walk.....	32 16 35.9	89 59 37.6
Brandon, Alabama and Vicksburg Rwy., center of main track opposite telegraph office.....	32 17 08.0	89 59 44.4
Brandon, 0.5 mile north of station; three corners, public T road to northwest, 40 feet northwest to gate, 50 feet south to persimmon tree.	32 17 37.9	89 59 51.6
Brandon, 1.7 miles north of station, forks of roads north and northwest, 30 feet north to oak and signboard "Fanning 8 mi." 20 feet west to oak.....	32 18 31.2	89 59 28.6
Brandon, 2.6 miles north of station, forks of second-class roads to east.	32 19 07.4	89 59 56.7

EDWARDS QUADRANGLE (WARREN COUNTY).

Geographic positions along Alabama and Vicksburg Railway from Bovina station eastward.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bovina station.....	32 21 04.2	90 44 06.5
Road crossing east and west.....	32 20 42.3	90 42 52.0
T. 6 N., R. 5 W., corner secs. 22, 23, 26, and 27.....	32 20 31.7	90 41 23.3
Smith station.....	32 20 21.1	90 40 24.9
Road crossing north and south.....	32 20 07.3	90 39 19.7
Road crossing north and south.....	32 19 54.6	90 38 06.3
Edwards, Main street, crossing of.....	32 19 46.3	90 36 21.7
Road crossing northwest and southeast.....	32 19 55.1	90 34 58.2
T. 6 N., Rs. 4 and 3 W., corner secs. 19, 24, 25, and 30.....	32 20 29.0	90 33 22.1
T. 6 N., R. 3 W., quarter corner between secs. 20 and 21.....	32 20 56.7	90 31 11.3

52 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

FLORENCE QUADRANGLE (HINDS, RANKIN, AND SIMPSON COUNTIES).

Geographic positions along highways.

Station.	Latitude.	Longitude.
Mohaffeys Ferry, Pearl River, 350 feet west of, three corners, public T road to south, 30 feet south to gate.....	° ' " 31 59 44.5	° ' " 90 13 32.7
Pearl post-office, 0.25 mile south of, at junction of Georgetown-Jackson and Pearl-Crystal Springs roads, at northeast corner of store of Barron & Co., iron post stamped "Prim. Trav. Sta. No. 8, 1905".....	32 00 05.1	90 11 56.4
Pearl post-office, 1 mile southeast of, forks of roads south and east, 25 feet north to oak and signboard "Harrisville 7 miles," 30 feet west to oak.....	31 59 46.8	90 11 30.7
Top of low hill, forks of second-class road to northeast, 10 feet north to pine, 10 feet south to two pines.....	31 59 50.6	90 10 20.3
Forks in small hollow, second-class road to northwest, 10 feet southeast to pine, 30 feet southwest to oak.....	31 59 34.9	90 08 49.2
Harrisville, 3.2 miles northwest of, at east edge of pine forest, four corners, 25 feet south to corner of front-yard fence, 15 feet north to pine stump.....	31 59 20.8	90 07 33.8
Harrisville, 2 miles northwest of, at junction of Harrisville-Barrows Ferry and Harrisville-Mohaffeys Ferry roads, near southeast corner sec. 29, T. 2 N., R. 2 E., in angle at junction of roads, iron post stamped "Prim. Trav. Sta. No. 9, 1905".....	31 58 47.9	90 06 41.3
Harrisville, 1.25 miles north of, four corners, public roads, 30 feet south to oak stump, 30 feet west to oak.....	31 59 10.4	90 05 43.5
Four corners, public crossroads, 40 feet north to dead pine, 10 feet southwest to dead pine.....	31 59 32.7	90 04 26.8
Big Creek, 0.6 mile west of, four corners, public crossroads, 30 feet northwest to signboard "Braxton 6.5 miles," 15 feet southeast to corner rail fence.....	31 59 26.9	90 03 51.6
Big Creek, 1.140 feet west of, on north edge of road, stake, T. 2 N., R. 2 E., corner secs. 23, 24, 25, and 26.....	31 59 24.7	90 03 27.3
Touchstone post-office, store of L. M. Kelly, 1,500 feet south of, T. 2 N., Rs. 2 and 3 E., corner secs. 13, 18, 19, and 24, at southwest corner of store, iron post stamped "Prim. Trav. Sta. No. 10, 1905".....	32 00 03.5	90 02 22.7
Touchstone post-office, 1,500 feet north of, T. 2 N., Rs. 2 and 3 E., corner secs. 13, 18, 19, and 24.....	32 00 18.1	90 02 22.1
Touchstone post-office, 1 mile north of, four corners second-class east-west crossroads, 10 feet southwest to corner of wire fence, 35 feet northeast to black gum.....	32 00 58.2	90 02 31.0
Big Creek, center of bridge over.....	32 01 34.1	90 03 06.1
Rexford, 1 mile southeast of, forks of roads north and northeast, 15 feet south to oak, 15 feet west to oak.....	32 02 05.0	90 03 19.7
Rexford, 1.25 miles northeast of, Tps. 2 and 3 N., R. 2 E., secs. 1, 2, 35, and 36, one-sixteenth corner east of Rankin-Simpson county line.....	32 02 55.5	90 03 08.4
Star, 2 miles southwest of, forks of roads south and west to pine, 50 feet east to pine.....	32 04 00.4	90 03 17.7
Star, 1 mile southwest of, at top of hill, three corners, second-class T road to west, 20 feet west to gate, 10 feet northeast to corner of old house.....	32 04 47.2	90 03 07.8
Star station, 700 feet west of, road crossing, center of main track Gulf and Ship Island R. R.....	32 05 34.9	90 02 47.2
T. 3 N., Rs. 2 and 3 E., secs. 7, 12, 13, and 18, corner of, 1.6 miles north of Star, second-class T road to east.....	32 06 26.1	90 02 19.2
T. 3 N., R. 3 E., sec. 6, southwest corner of, 2.25 miles north of Star, 2.7 miles south of Thomasville, in northwest corner of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	32 07 25.8	90 02 03.9
Thomasville, 1.7 miles south of, four corners, second-class crossroads, 10 feet north to corner post of fence.....	32 08 03.1	90 01 35.0
Thomasville, 0.25 mile west of, at old store, four corners, crossroads, 40 feet northwest to corner of old store, 40 feet northeast to oak.....	32 09 26.9	90 01 10.4
Pat post-office, 0.25 mile northeast of, four corners, 35 feet west to pine, 40 feet east to double pine.....	32 10 41.0	90 00 36.6
Tumballs Creek, east prong, center of bridge over.....	32 11 15.3	90 00 02.2
Tumballs Creek, 1.9 miles northeast of three corners, public T road to east, 40 feet south to oak, 50 feet east to oak.....	32 12 38.4	89 59 14.5
Brandon, 3 miles south of, three corners, T road to northwest, 30 feet west to corner of wire fence, 60 feet northeast to dead oak.....	32 13 55.6	89 59 18.8

Geographic positions along Illinois Central Railroad between Pearl and Byram.

Station.	Latitude.	Longitude.
	° ' " 32 14 51.6	° ' " 90 12 38.8
Road crossing east and west.....	32 13 12.2	90 13 12.2
Pearl, road crossing east and west.....	32 11 45.3	90 13 47.5
Road crossing east and west.....	32 10 44.7	90 14 41.4
Byram station.....		

Geographic positions along Alabama and Vicksburg Railway from Pearson eastward.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Pearson, road crossing.....	32	14	48.8	90	07	56.4
Road crossing north and south.....	32	14	33.1	90	06	47.4
Road crossing north and south.....	32	14	06.0	90	05	33.1
Road crossing north and south.....	32	14	09.5	90	04	22.5
Greenfield, road crossing east and west.....	32	14	53.9	90	03	13.7

JACKSON QUADRANGLE (HINDS, MADISON, AND RANKIN COUNTIES.)

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Union Church, 2.1 miles south of forks of second-class road to south, 35 feet west to oak, 40 feet south to oak.....	32	20	03.4	90	00	47.3
Union Church, 1.4 mile south of, forks of roads north and northwest 30 feet northwest to double oak, 40 feet northeast to oak.....	32	20	47.6	90	01	04.0
Lucknow, 1.5 miles east of, Union Church, at southeast corner of, 300 feet northwest of four corners, iron post stamped "Prim. Trav. Sta. No. 13, 1905".....	32	21	50.5	90	01	03.4
Union Church, 0.7 mile north of, forks, second-class road to east.....	32	22	30.1	90	01	06.2
Union Church, 2.1 miles north of, four corners public crossroads, 50 feet southwest to oak and signboard "Jackson 12.25 mi." 15 feet west to oak stump.....	32	23	14.2	90	02	03.4
Pelahatchee Creek, center of iron bridge over.....	32	23	56.1	90	02	04.4
Pelahatchee Creek, 1.5 miles north of, T. 7 N., R. 3 E., secs. 31 and 32, section line between, three corners, T road to north.....	32	24	25.4	90	01	17.0
T. 7 N., R. 3 E., corner of secs. 29, 30, 31, and 32.....	32	24	48.8	90	01	16.7
Johnsons Ferry, 3.2 miles east of, four corners, crossroads, T. 7 N., R. 3 E., quarter corner between secs. 29 and 30, 40 feet northeast to oak pointer with + carved, 30 feet northwest to oak pointer with square (□) carved.....	32	25	15.0	90	01	16.7
Johnsons Ferry, 2 miles east of, forks of roads west and north, 10 feet north to oak, 30 feet southwest to live oak.....	32	25	36.5	90	02	37.9
Johnsons Ferry, 0.5 mile east of, forks of road east and south of log pen, 30 feet northeast to oak, 25 feet west to pine.....	32	25	42.6	90	03	32.4
Pearl River, Johnsons Ferry, top of bank at east landing of.....	32	25	48.5	90	04	09.8
Johnsons Ferry, 1.1 miles west of, three corners, T road to east, 12 feet west to double oak, 40 feet northeast to telephone pole.....	32	26	04.3	90	05	12.1
Madison station, 2 miles southeast of, three corners, T road to west, 30 feet northeast to oak, 30 feet southeast to hickory.....	32	26	46.9	90	05	22.9
Madison station, 1.5 miles east of, in southwest corner of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 14, 1905".....	32	27	52.2	90	05	30.0
Madison station, 0.5 mile northeast of, three corners, T road to north 10 feet north to small bridge, 12 feet southwest to telephone pole.....	32	27	52.7	90	06	24.9
Madison station, 200 feet south of, road crossing, center of main track Illinois Central R. R.....	32	27	40.3	90	06	56.7
Madison station, 1.7 miles west of, forks of road west and southwest, 30 feet northeast to two sweet gums, 70 feet southwest to telephone pole.....	32	28	19.5	90	08	25.3
Madison station, 2.25 miles west of, forks of roads west and north-west, 40 feet northwest to telephone pole, and signboard "Madison station 2 mi." 30 feet northeast to oak.....	32	28	41.8	90	08	41.7
Small stream, center of bridge over.....	32	28	48.5	90	09	44.1
China Grove Church, 400 feet southeast of, at junction of Jackson-Canton and Madison Station-Pocahontas roads, set in sandstone slab at north edge of road, aluminum tablet stamped "Elevation 415, Prim. Trav. Sta. No. 15, 1905".....	32	28	59.8	90	10	35.4
China Grove Church, 1.4 miles west of, at top of hill, four corners, second-class north-south road, 25 feet north to gate 30 feet south to oak.....	32	29	00.6	90	11	52.6
Robinsons Springs, 1.7 miles east of, three corners, T road to south, second-class road to east.....	32	29	19.3	90	12	35.3
Robinsons Springs, 0.5 mile east of, at white church, three corners, second-class T road to south, 90 feet southeast to corner of church, 15 feet south to oak.....	32	29	39.5	90	13	37.3
Robinsons Springs, 1.1 miles west of, forks of road at store, second-class road to southwest, 30 feet northeast to corner of store, 60 feet southwest to corner of fence.....	32	29	40.9	90	14	59.8

Geographic positions along Alabama and Vicksburg Railway near Jackson.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 N., R. 1 E., corner secs. 29, 30, 31, and 32.....	32 19 37.1	90 13 43.2
Jackson, north-south road crossing 1 mile northwest of.....	32 19 05.9	90 12 39.0

Geographic positions along Illinois Central Railroad near Jackson.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jackson station.....	32 18 01.3	90 11 30.6
Jackson, crossing of Illinois Central R. R., and Alabama and Vicks- burg Rwy.....	32 17 54.9	90 11 30.0
T. 5 N., R. 1 E., corner of secs. 3, 4, 9, and 10.....	32 17 48.2	90 11 35.6
Road crossing east and west.....	32 16 19.3	90 12 26.3

Geographic positions along Alabama and Vicksburg Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west.....	32 16 31.6	90 09 59.2
Road crossing north and south.....	32 15 33.3	90 09 12.0
Rice, station board.....	32 15 59.0	90 02 18.7
Road crossing north and south.....	32 16 43.5	90 00 17.9

Geographic positions along Yazoo and Mississippi Valley Railroad in the vicinity of Cynthia.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west.....	32 19 33.9	90 11 15.3
Road crossing northeast and southwest.....	32 20 24.3	90 11 54.1
T. 6 N., R. 1 E., corner secs. 16, 17, 20, and 21.....	32 21 19.3	90 12 37.4
Road crossing northeast and southwest.....	32 21 59.9	90 13 15.5
Road crossing north and south.....	32 23 09.8	90 14 01.4
Cynthia, road crossing.....	32 24 03.5	90 14 55.2

RAYMOND QUADRANGLE (HINDS COUNTY).

Geographic positions along Yazoo and Mississippi Valley Railroad from Greene Crossing to Hinds-Madison county line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Greene Crossing, road east and west.....	32 26 12.5	90 16 00.3
Road crossing east and west.....	32 27 22.3	90 16 46.3
Hinds-Madison county line, crossing of.....	32 29 12.9	90 17 19.0
Tps. 7 and 8 N., R. 1 W., corner secs. 2, 3, 34, and 35.....	32 29 13.5	90 16 43.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
Pocahontas station, road crossing 80 feet north of, center of main track Illinois Central R. R.	° ' " 32 28 19.3	° ' " 90 17 16.9
Pocahontas, 1.75 miles west of, at bend of main road to north at gate, second-class road forks to west.	32 28 25.8	90 17 44.5
Pocahontas, 1.75 miles west of, bridge over small stream 800 feet west of, second-class T road to south.	32 28 47.4	90 18 30.8
Bogue Chitto Creek, 1 mile east of, four corners, 40 feet west to large live oak.	32 28 48.2	90 20 19.2
Bogue Chitto Creek, bridge over, center of.	32 28 59.7	90 21 14.1
Church, 300 feet south of, forks of road southeast and south, 30 feet southwest to oak tree.	32 28 53.5	90 22 23.5
Lula Church, Hinds-Madison county line, center of road, crossing.	32 29 14.7	90 22 49.6
Lula Church, 300 feet north of, in angle at junction of Pocahontas-county line and Vicksburg-Canton roads, iron post stamped "Prim. Trav. Sta. No. 1, 1905"	32 29 17.6	90 22 50.6
Lula Church, 1.4 miles southwest of, at bend of main road to south, second-class T road to west thru farm lot, 40 feet northeast to dead peach tree, 25 feet south to wire fence.	32 28 38.7	90 23 48.5
Lula Church, 1.75 miles west of, at forks of public road northeast and southwest, second-class road southeast at crossing of Madison-Hinds county line, county-line tree on east edge of road.	32 29 14.6	90 24 34.1
Lula Church, 2.75 miles west of, forks of road north, second-class road northwest, 30 feet west to dead oak, 50 feet southeast to old dwelling.	32 28 58.3	90 25 28.2
Brownsville, 1 mile north of, four corners, 15 feet south to two old gateposts.	32 27 50.5	90 26 21.4
Brownsville, 1.75 miles northwest of, forks of road north and northwest, 60 feet west to dead oak tree, 40 feet south to corner of wire fence.	32 28 14.2	90 26 49.4
Hinds-Madison county-line corner, forks of road north and west, 90 feet northwest to large oak, 30 feet north to sweet-gum tree.	32 29 15.1	90 27 01.1
County-line corner, 1 mile west of, second-class T road north, 15 feet north to large dead oak, 50 feet west to willow.	32 29 15.2	90 27 56.2
Orangeville post-office, 1 mile north of, T. 7 N., R. 3 W., near corner of secs. 1, 2, 11, and 12, at junction Coxs Ferry-Bolton road and T road east, iron post stamped "Prim. Trav. Sta. No. 2, 1905"	32 29 19.8	90 29 11.7
Orangeville Post-Office, second-class T road to east, 20 feet northeast to large oak, 50 feet southwest to small building.	32 28 36.9	90 29 09.4
Orangeville, 0.25 mile east of, forks of road south and southeast, 30 feet west to wire fence.	32 28 22.0	90 28 51.3
Orangeville, 1.6 miles south of, at top of hill, 0.25 mile south of small stream crossing, four corners, second-class crossroads, 30 feet north to oak stump.	32 27 26.4	90 29 05.8
Coxs Creek, center of bridge over.	32 26 36.9	90 29 06.1
Brownsville, 3 miles southwest of, forks of road southwest and southeast, center of triangle at, 30 feet south to cedar tree, 50 feet east to oak tree.	32 25 40.5	90 29 06.2
Three corners, T road east at top of hill, 25 feet west to wire fence, 30 feet southwest to water oak.	32 24 39.1	90 29 06.1
Bolton, 3.6 miles north of, four corners, crossroads, 25 feet east to gate.	32 23 30.7	90 28 58.4
Bolton, 2.5 miles north of, second-class T road southwest, 20 feet northwest to corner of wire fence.	32 22 35.1	90 28 34.7
Bolton, 2 miles north of, forks of roads north and west, 25 feet southwest to oak tree on bank, 50 feet northwest to oak tree on bank.	32 22 12.9	90 28 05.3
Bolton, at northeast corner of and inside of foundation to city water tower, iron post stamped "Prim. Trav. Sta. No. 3, 1905"	32 20 52.8	90 27 41.1
Bolton station, center of main track opposite telegraph office.	32 20 50.2	90 27 29.1
Bolton, 0.75 mile south of, forks of roads south, east, and west, 60 feet east to telephone pole, 80 feet west to telephone pole.	32 20 07.6	90 27 38.3
Bolton, 1.1 miles south of, three corners, second-class T road to west 10 feet south to bridge, 30 feet east to double willow.	32 19 37.5	90 27 33.8
Bolton, 2.7 miles south of, three corners, T road to west, 5 feet west to center of bridge.	32 18 18.5	90 27 48.2
Bolton, 3.6 miles south of, forks of second-class road to west, 25 feet west to gate.	32 17 36.3	90 27 37.7
Raymond, 1.25 miles northwest of, three corners, T road to north, center of triangle, 40 feet northeast to large oak, 50 feet west to oak.	32 16 19.5	90 26 23.5
Raymond, 0.75 mile northwest of, three corners, T road to northeast, 30 feet west to front yard gate, 20 feet east to fence corner.	32 16 04.3	90 25 53.2
Raymond, Hinds County court-house, at southwest corner of iron fence around, iron post stamped "Prim. Trav. Sta. No. 4, 1905"	32 15 53.7	90 25 25.8

56 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along Alabama and Vicksburg Railway between Bolton station and Dixon.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Section corner (no numbers).....	32	20	56.6	90	29	07.5
Bolton station.....	32	20	50.2	90	27	29.1
Road crossing north and south.....	32	21	03.1	90	25	45.3
T. 6 N., R. 2 W., corner secs. 15, 16, 21, and 22.....	32	21	22.9	90	23	58.9
Stoneculvert, United States Coast and Geodetic Survey bench mark on T. 6 N., R. 1 W., corner secs. 19, 20, 29, and 30.....	32	20	50.1	90	20	19.9
Road crossing northeast and southwest.....	32	20	29.3	90	19	50.3
Dixon, north-south road crossing.....	32	20	02.6	90	17	40.3
	32	19	30.4	90	15	12.2

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Robinson Springs, 1.7 miles west of, forks of roads northwest and southwest, 30 feet southeast to old chinaberry tree.....	32	29	56.1	90	15	38.4
Pocahontas, 1.25 miles northeast of, second-class road to south at bend of main road to west, Madison-Hinds county line.....	32	29	14.0	90	16	14.2
Pocahontas, 1 mile north of, roads north and east, 100 feet south to oak, 60 feet northeast to telephone pole.....	32	29	14.0	90	16	49.2
Pocahontas, at southwest corner of Pocahontas Methodist Church, iron post stamped "Prim. Trav. Sta. No. 16, 1905".....	32	28	25.4	90	17	11.9
Pocahontas station, 80 feet north of center of main track Illinois Central R. R.....	32	28	19.3	90	17	16.9

TERRY QUADRANGLE (COPIAH AND HINDS COUNTIES).

Geographic positions along Illinois Central Railroad from Terry to Hinds-Copiah county line.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing east and west.....	32	09	30.5	90	15	26.4
Road crossing east and west.....	32	07	13.8	90	16	15.3
Road crossing east and west.....	32	06	03.7	90	17	14.6
Terry station.....	32	05	38.8	90	17	38.0
Road crossing east and west.....	32	04	52.5	90	18	21.3
Road crossing east and west.....	32	04	02.3	90	19	08.3
Tps. 2 and 3 N., R. 1 W., corner secs. 5, 6, 31, and 32.....	32	02	56.3	90	19	52.8
Hinds-Copiah county line, crossing of.....	32	02	56.9	90	20	04.2

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Raymond, 1.9 miles south of, three corners, second-class T road to west, 30 feet north to small bridge.....	32	14	21.9	90	26	03.0
Raymond, 2.5 miles south of, at top of hill, four corners, second-class crossroads, 35 feet west to gate, 35 feet east to gate.....	32	13	45.3	90	25	54.5
Perch Creek, 0.8 mile south of, three corners, T road west, 35 feet north to small bridge, 30 feet southeast to corner of wire fence.....	32	12	47.9	90	26	18.0
Newmans Creek, 0.5 mile south of, at top of hill, three corners, second-class T road east, 30 feet east to corner of garden fence.....	32	12	13.4	90	26	33.4
Palestine, 1.5 miles west of, four corners, cross-roads, 40 feet north to oak tree on bank.....	32	11	10.6	90	26	44.2
Schoolhouse, forks at, public roads southeast and southwest, 35 feet south to B. T. Wade's mail box, 20 feet west to oak.....	32	10	23.5	90	26	50.1
Tallahala Creek, center of bridge over.....	32	09	19.1	90	26	34.1
Tallahala Creek, 0.5 mile south of, at top of hill, three corners, T road to east, 90 feet north to oak, 35 feet west to wire fence.....	32	08	55.2	90	26	17.0
Drygrove, store of J. W. Grantham & Co., in forks of road at southeast corner of store, iron post stamped "Prim. Trav. Sta. No. 5, 1905".....	32	07	42.9	90	26	15.0

62 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along highways near north and east borders of quadrangle.

Station.	Latitude.	Longitude.
T. 60 N., R. 12 W., corner secs. 15, 16, 21, and 22, T road south, at center of small bridge.....	39 59 50.2	92 13 57.2
T. 60 N., R. 12 W., corner secs. 14, 15, 22, and 23, at cross roads 34 feet northwest to cross on corner fence post, 30 feet southwest to cross on telephone pole.....	39 59 51.8	92 12. 49.2
T. 60 N., R. 12 W., corner secs. 13, 14, 23, and 24, at T road south, 21 feet east to center of small bridge, 35 feet southeast to cross on corner fence post.....	39 59 53.4	92 11 42.6
T. 60 N., R. 12 W., stone to east corner secs. 13 and 24, at T road west, road jogs south 80 feet, then east again.....	39 59 54.7	92 10 32.9
T road south, 48 feet southwest to cross on corner fence post, 30 feet southeast to F. E. Browning's mail box.....	39 59 32.6	92 09 22.0
Plevna, T road north, about 1 mile north by 2 miles west of, 33 feet northeast to J. L. Saler's mail box, 42 feet northwest to corner of hedge fence.....	39 59 23.7	92 07 56.7
Plevna, 1 mile north by 1 mile west of, in northeast corner of J. W. Hayden's field at T road south, 3.5 feet southwest of corner fence post, iron post stamped "Prim. Trav. Sta. No. 4, 1905".....	39 59 20.8	92 06 31.8
Plevna, 1 mile north and 0.25 mile west of, stone at crossroads.....	39 59 18.7	92 05 23.3
Little Fabins River, west end of bridge over.....	39 59 15.3	92 03 58.3
Mount Salem Church, 0.25 mile east of, T road north, 18 feet southeast to W. E. Anderson's mail box, 22 feet northeast to east end of small bridge.....	39 59 13.5	92 02 45.0
Mount Salem Church, 1.5 miles east of, at crossroads, stone.....	39 59 12.2	92 01 19.8
Newark, 1.5 miles southwest of, near southeast corner of yard to log house at forks of road on land of John Vaden, southeast corner of log house bears N. 79° 30' W., distant 56.7 feet; nail in blaze on east face of white-oak tree bears S. 66° W., distant 49.7 feet; iron post stamped "Prim. Trav. Sta. No. 5, 1905".....	39 59 12.8	91 59- 49.2
T. 60 N., R. 10 W., corner secs. 26, 27, 34, and 35, stone to, at crossroads.....	39 57 52.1	91 59 24.3
T. 60 N., R. 10 W., south corner secs. 34 and 35, 0.25 mile west of, Knox-Shelby county line, stone at T road.....	39 57 00.8	91 59 42.1
Shiloh Church, T road east, 14 feet east to cross on telephone pole, 34 feet southeast to corner of rail fence.....	39 55 34.5	92 00 01.2
T. 59 N., R. 10 W., center of sec. 15, T road north, 27 feet southeast to W. A. Smith's mail box, 20 feet south to J. E. Wilson's mail box.....	39 54 50.4	92 00 02.4
T. 59 N., R. 10 W., T road south, stone at center of sec. 16.....	39 54 51.2	91 01 10.1
T. 59 N., R. 10 W., center of sec. 21, in southeast corner of field of Mr. Bowers, 1.25 miles north of Bethel, southwest corner of J. H. Moore's residence bears N. 40° 40' E., distant 117 feet, iron post stamped "Prim. Trav. Sta. No. 6, 1905".....	39 53 58.6	92 01 11.6
Bethel, center of iron bridge over North River.....	39 52 31.3	92 01 25.2
Bethel, T road north 1 mile south of, 28 feet south to cross on board fence, 26 feet northwest to cross on telephone pole.....	39 51 48.4	92 01 31.5
T. 58 N., R. 10 W., secs. 4, 5, 8, and 9, T road west, 19 feet east to cross on corner fence post, 24 feet west to center of small bridge.....	39 50 56.8	92 01 50.5
T. 58 N., R. 10 W., corner secs. 8, 9, 16, and 17, crossroads, 18 feet west to center of small bridge, 21 feet south to C. G. Bowers's mail box.....	39 50 04.7	92 01 51.8
T. 58 N., R. 10 W., corner secs. 16, 17, 20, and 21, crossroads, 15 feet east to center of small bridge, 40 feet northwest to advertisement "1 mile to Shelbyville".....	39 49 12.6	92 01 53.0
Shelbyville, crossing of Main and Jackson streets, southwest corner of court-house bears N. 28° 10' E., distant 184 feet; northwest corner of Miller's hardware store bears S. 22° 30' E., distant 41 feet.....	39 48 22.2	92 02 28.2
Shelbyville, 1 mile south of, center of steel bridge over Black Creek.....	39 47 32.9	92 02 28.1
Shelbyville, crossroads 2 miles south of, 30 feet northeast to cross on corner fence post, 25 feet southeast to Wilbur Simen's mail box.....	39 46 35.3	92 02 29.5
Shelbyville, 4 miles south of, in northwest corner of field of C. J. Anderson, at T road east, 1.5 feet southeast of corner fence post, iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	39 45 18.0	92 02 30.3

Geographic positions along Chicago, Burlington and Quincy Railroad between Clarence and Shelbyville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 56, north and south road crossing near.....	39 43 53.2	92 12 07.0
Lentner station.....	39 43 07.3	92 08 49.9
T. 57 N., R. 11 W., corner secs. 20, 21, 28, and 29.....	39 43 14.8	92 08 49.3
T. 57 N., Rs. 10 and 11 W., corner secs. 30, 31, 36, and 25.....	39 42 16.0	92 04 18.7

SHELBYVILLE QUADRANGLE (KNOX AND SHELBY COUNTIES).

Geographic positions along highways near west border of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Perry schoolhouse, southwest corner of J. W. Inderman's field, iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	39 59 49.5	92 14 47.4
T road east, 40 feet southwest to "elevation 822" painted on mail-box post, 32 feet southeast to telephone pole.....	39 58 31.7	92 13 58.6
T road east, 33 feet northeast to cross on corner fence post, 33 feet southeast to cross on corner fence post.....	39 57 39.4	92 14 00.1
T. 60 N., R. 12 W., south corner secs. 33 and 34, Knox-Shelby county line, 5 feet due south to nail in top of fence post.....	39 57 13.3	92 14 00.8
T. 59 N., R. 12 W., corner secs. 3, 4, 9, and 10, center of road 27 feet north of hedge-fence line.....	39 56 21.7	92 14 02.9
T. 59 N., R. 12 W., corner stone to secs. 9, 10, 15, and 16, at crossroads at Cherrybox.....	39 55 30.2	92 14 04.0
T. 59 N., R. 12 W., corner stone to secs. 15, 16, 21, and 22, at crossroads.....	39 54 36.9	92 14 05.2
T. 59 N., R. 12 W., corner stone to secs. 21, 22, 27, and 28, crossroads at church.....	39 53 44.4	92 14 06.5
T. 59 N., R. 12 W., sec. 27, corner stone to southwest corner bears S. 42° 30' W., distant 33.5 feet, iron post stamped "Prim. Trav. Sta. No. 14, 1905".....	39 52 52.5	92 14 07.3
T. 59 N., R. 12 W., just east of south corner of secs. 33 and 34, 12 feet northeast to stone, 30 feet southeast to "820 elev." painted on fence.....	39 52 00.0	92 13 51.6
Hagers Grove, 1 mile north of, in southwest corner of school yard, iron post stamped "Prim. Trav. Sta. No. 15, 1905," elevation 797 feet.....	39 50 42.1	92 13 19.0
Hagers Grove, T road north in northeast part of, 21 feet west to guideboards, 35 feet southwest to "740" painted on telegraph pole.....	39 49 52.5	92 13 21.0
Hagers Grove, 0.5 mile south by 0.5 mile west of, in orchard at top of hill, iron post stamped "Prim. Trav. Sta. No. 16, 1905," elevation 769 feet.....	39 49 15.0	92 14 13.8
T. 58 N., R. 12 W., corner stone to secs. 21, 22, 27, and 28, near crossroads.....	39 48 29.9	92 14 15.0
T. 57 N., R. 12 W., north quarter corner to sec. 4, in southeast corner of field, near iron post stamped "Prim. Trav. Sta. No. 17, 1905," elevation 808 feet.....	39 46 45.3	92 14 52.9
T. 57 N., R. 12 W., north corner secs. 4 and 5, T road southeast, 33 feet southeast to E. E. Hopkins's advertisement, 42 feet southwest to guidepost.....	39 46 44.6	92 15 24.0
T. 57 N., R. 12 W., corner secs. 4, 5, 8, and 9, crossroads, 21 feet west to center of bridge, 31 feet northeast to bench mark 813.....	39 45 54.1	92 15 25.9
Clarence, T road west at A. O. U. W. cemetery in north part of.....	39 45 01.8	92 15 27.6

Geographic positions along Hannibal and St. Joseph Railroad between Macon and Clarence.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Anabel station.....	39	44	45.1	92	20	03.0
T. 57 N., R. 13 W., corner secs. 10, 11, 14, and 15.....	39	45	01.1	92	19	52.3
Rs. 12 and 13 W., line between.....	39	44	38.8	92	17	39.1
Clarence station.....	39	44	33.5	92	15	39.0

SHELBYNA QUADRANGLE (MONROE AND SHELBY COUNTIES).

Geographic positions along highways near east and south borders of quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Salt River, north end of bridge over.....	39	44	30.8	92	02	24.6
Shelbina, 1.5 miles north of, crossroads, 30 feet southeast to cross on telephone pole, 40 feet southwest to cross on telephone pole.....	39	43	07.0	92	02	14.4
Shelbina, Main street crossing Hannibal and St. Joseph R. R.....	39	41	37.1	92	02	23.5
Catholic cemetery, T road south just south of, 16 feet southwest to cross on corner fence post, 22 feet southeast to east end of box culvert.....	39	40	56.3	92	02	04.2
T. 56 N., R. 10 W., corner secs. 8, 9, 16, and 17, Shelby-Monroe county line, 18 feet southwest to cross on black-oak tree.....	39	39	38.0	92	02	05.5
Shelby-Monroe county line, 1.5 miles south of, at T road east on Shelbina-Paris road, in southwest corner of pasture of William Tournay, nail in blaze on elm bears N. 33° 15' E., distant 11.2 feet; nail in blaze on elm bears S. 25° 30' E., distant 5.1 feet, iron post stamped "Prim. Trav. Sta. No. 8, 1905".....	39	38	19.9	92	02	06.6
Caldwell (J. W.) residence, T road south just east of, 30 feet southwest to H. S. Witt's mail box, 16 feet southwest to arrow painted on telephone pole.....	39	37	00.3	92	01	17.7
Hawkins post-office, T road north about 1.75 miles west of, 27 feet south to cross on rail fence, 27 feet northwest to cross on corner fence post.....	39	35	26.2	92	01	15.3
Hawkins post-office, 1 mile west of, T road south, 33 feet southeast to cross on corner fence post, 30 feet west to north end of small bridge.....	39	35	24.8	92	00	22.2
T. 55 N., R. 10 W., sec. 10, stone, T road north.....	39	33	55.2	92	00	24.6
T. 55 N., R. 10 W., corner secs. 9, 10, 15, and 16, 20 feet due west to northeast corner of garden fence.....	39	33	28.6	92	01	02.0
T. 55 N., R. 10 W., corner secs. 15, 16, 21, and 22, T road north, just east of, 38 feet northeast to cross on telephone pole, 37 feet northwest to cross on birch tree.....	39	32	36.3	92	00	55.0
T. 55 N., R. 10 W., T road south, corner secs. 27, 28, 33, and 34.....	39	31	43.8	92	01	06.3
T. 55 N., R. 10 W., southeast corner sec. 28, 2.7 feet southeast to nail in large corner fence post, iron post stamped "Prim. Trav. Sta. No. 9, 1905".....	39	30	51.8	92	01	08.6
T. 55 N., R. 10 W., north corner secs. 32 and 33, T road south, 27 feet southeast to cross on corner fence post, 30 feet west to center of small bridge.....	39	30	52.4	92	02	16.4
T. 55 N., R. 10 W., south corner secs. 29 and 30, stone, T road north.....	39	30	52.1	92	03	24.2
T. 55 N., R. 10 W., corner secs. 19, 20, 29, and 30, T road west, 28 feet southwest to cross on gatepost, 28 feet northwest to cross on gatepost.....	39	31	44.4	92	03	22.0
T. 55 N., R. 10 and 11 W., corner secs. 19, 24, 25, and 30, stone.....	39	31	46.6	92	04	30.0
T. 55 N., R. 11 W., stone at center sec. 23, T road south.....	39	32	15.1	92	06	10.2
T. 55 N., R. 11 W., quarter corner between secs. 21 and 22, 0.25 mile west of, in southwest corner of W. J. Williams's pasture, stone at crossroads bears S. 35° 10' W., distant 30.3 feet, iron post stamped "Prim. Trav. Sta. No. 10, 1905".....	39	32	17.4	92	07	36.2
Forest Grove Church, T road north 0.75 mile east and 0.25 mile south of, 18 feet south to cross on rail fence.....	39	32	20.1	92	09	16.9
T. 55 N., R. 11 W., corner secs. 7, 8, 17, and 18, crossroads, 15 feet southeast to south end of tile culvert, 36 feet southwest to C. Sanders's mail box.....	39	33	41.1	92	10	08.4
T. 55 N., Rs. 11 and 12 W., corner secs. 7, 12, 13, and 18, stone, T road north.....	39	33	42.5	92	11	05.8
Woodlawn, 1 mile south of, in northeast corner of Oak Grove Church yard, cross cut on northeast corner of stone foundation to church bears S. 39° 15' W., distant 77.3 feet, iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	39	33	48.7	92	12	30.7
Woodlawn, T road south 0.25 mile east of, 22 feet north to cross on fence post, 30 feet southeast to cross cut on corner fence post.....	39	34	42.2	92	12	28.2
Woodlawn, I. crossroads 0.75 mile west of, stone.....	39	34	45.6	92	13	35.2
Woodlawn, T road south 2 miles west of, 11 feet south to west end of bridge, 30 feet west to center of small bridge.....	39	34	49.7	92	14	59.8
Duncans Bridge, center of.....	39	34	27.6	92	15	53.1

MACON QUADRANGLE (MONROE, RANDOLPH, AND SHELBY COUNTIES).

Geographic positions along highways near east and south borders of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Clarence, Chicago, Burlington and Quincy R. R. station.....	39 44 33.5	92 15 39.0
Clarence, 120 feet south of Hannibal and St. Joseph R. R., in park, iron post stamped "Prim. Trav. Sta. No. 18, 1905"	39 44 32.4	92 15 39.0
T. 57 N., R. 12 W., corner secs. 16, 17, 20, and 21, T road west, 18 feet due west to center of small bridge.....	39 44 09.1	92 15 29.3
T. 57 N., R. 12 W., corner secs. 20, 21, 28, and 29, crossroads, 18 feet northwest to north end of small bridge, 3.9 feet northeast to arrow on gate.....	39 43 16.5	92 15 31.2
T. 57 N., R. 12 W., corner secs. 28, 29, 32, and 33, crossroads, 25 feet northwest to Ed. Ryan's mail box, 21 feet east to center of small bridge.....	39 42 23.8	92 15 33.2
T. 57 N., R. 12 W., southwest corner sec. 33, iron post stamped "Prim. Trav. Sta. No. 19, 1905," elevation 787 feet.....	39 41 31.5	92 15 34.7
T. 56 N., R. 12 W., corner secs. 4, 5, 8, and 9, crossroads, 9 feet west to center of small bridge, 18 feet south to west end of small bridge.....	39 40 41.8	92 15 33.8
Otter Creek Bridge, T road east just north of, 6 feet west to cross on board fence, 65 feet south to north end of bridge.....	39 39 51.4	92 15 35.2
Enterprise, at crossroads, T. 56 N., R. 12 W., southeast corner sec. 17, iron post stamped "Prim. Trav. Sta. No. 20, 1905," elevation 811 feet.....	39 38 57.1	92 15 37.0
T. 56 N., R. 12 W., corner secs. 20, 21, 28, and 29, crossroads, stone.....	39 38 04.2	92 15 38.3
T. 56 N., R. 12 W., corner secs. 28, 29, 32, and 33, crossroads, 27 feet northeast to "791" painted on post, 30 feet northwest to cross on corner fence post.....	39 37 11.6	92 15 39.8
T. 56 N., R. 12 W., south corner secs. 32 and 33, T road north, Shelby-Monroe county line.....	39 36 19.0	92 15 41.5
Duncans Bridge, 1 mile north of, T road west, 21 feet east to cross on fence post, 29 feet northwest to cross on corner fence post.....	39 35 31.7	92 15 49.5
Duncans Bridge, in southeast corner of Ford Wedd's yard, iron post stamped "Prim. Trav. Sta. No. 21, 1905," elevation 717 feet.....	39 34 32.2	92 15 49.0
Duncans Bridge, center.....	39 34 27.6	92 15 53.2
Cap Branch, center of bridge over.....	39 33 52.5	92 16 26.9
Cap Branch Bridge, 1 mile south of, center of small bridge at T road north.....	39 33 08.0	92 16 44.9
T. 55 N., R. 12 W., center sec. 19, stone.....	39 32 42.1	92 17 37.0
Ash post-office, 2.5 miles north of, 0.5 mile west of Monroe-Randolph county line, at T road north, in southeast corner of Ewing Alexander's field, nail in hickory tree bears S. 55° 30' W., distant 17.2 feet, iron post stamped "Prim. Trav. Sta. No. 12, 1905".....	39 32 17.7	92 18 44.8
T. 55 N., R. 13 W., quarter corner between secs. 26 and 27, stone.....	39 31 54.8	92 20 28.2
T. 55 N., R. 13 W., quarter corner between secs. 27 and 28, crossroads, 16 feet northeast to S. Kindell's mail box, 30 feet southeast to J. W. Manning's mail box.....	39 31 56.6	92 21 36.9
T. 55 N., R. 13 W., quarter corner between secs. 28 and 29, crossroads, 27 feet northeast to cross on telephone pole, 27 feet southeast to cross on corner fence post.....	39 31 58.0	92 22 44.6
T. 55 N., R. 13 W., quarter corner between secs. 29 and 30, T road south 27 feet southeast to cross on telephone pole.....	39 31 59.6	92 23 51.6
T. 55 N., R. 14 W., quarter corner between secs. 19 and 30, stone at crossroads, 1,000 feet east of.....	39 32 26.4	92 24 26.2
T. 55 N., R. 14 W., in northeast corner sec. 26, 2 miles north of Cairo, at crossroads, iron post stamped "Prim. Trav. Sta. No. 13, 1905".....	39 32 28.3	92 26 19.8
Milepost 182, road crossing, 1,400 feet north of.....	39 33 49.0	92 27 38.3
Jacksonville station.....	39 35 17.2	92 28 13.9

Geographic positions along Wabash Railroad between Macon and Jacksonville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Macon station, Wabash R. R.....	39 44 18.1	92 28 35.1
Macon, Hannibal and St. Joseph R. R. crossing.....	39 44 16.4	92 28 35.4
T. 57 N., R. 14 W., quarter corner between secs. 27 and 28.....	39 42 58.8	92 27 50.5
Road crossing east and west.....	39 40 48.0	92 28 32.4
Excello station.....	39 38 11.6	92 28 28.8
Tps. 55 and 56 N., corner secs. 3, 4, 33, and 34.....	39 36 28.5	92 28 08.8
Jacksonville station.....	39 35 17.2	92 28 13.9

MISSOURI.

PRIMARY TRAVERSE.

KNOX, MACON, MONROE, RANDOLPH, AND SHELBY COUNTIES.

ATLANTA, MACON, SHELBY, AND SHELBYVILLE QUADRANGLES.

The following geographic positions were determined in 1905 by J. R. Ellis, assistant topographer. The line starts from a section corner near Laplata located by primary traverse in 1901, follows the borders of four 15-minute quadrangles, and is connected with points at Shelbyville and Jacksonville also located in 1901 by primary traverse. Positions in northeastern Missouri previously published, based on Mississippi River Commission triangulation (see report of that commission for 1883, p. 37), agree in latitude with the United States standard, but longitudes are 1.4" greater than those by the United States standard. Positions given herewith have been reduced to the United States standard datum.

ATLANTA QUADRANGLE (KNOX AND MACON COUNTIES).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 60 N., R. 14 W., corner secs. 17, 18, 19, and 20.....	39	59	57.9	92	29	36.2
T. 60 N., R. 14 W., in northeast corner of NW $\frac{1}{4}$ sec. 20, in northeast corner of field at T road south, in top of concrete post, aluminum tablet stamped 'Prim. Trav. Sta. No. 1, 1905'.....	39	59	57.1	92	29	02.8
T. 60 N., R. 14 W., corner secs. 16, 17, 20, and 21, T road north, 24 feet south to cross on fence post.....	39	59	57.0	92	28	29.1
T. 60 N., R. 14 W., north corner secs. 21 and 22, T road north, 28 feet northwest to telephone pole, 33 feet northeast to cross on telephone pole.....	39	59	55.9	92	27	21.4
T. 60 N., R. 14 W., north corner secs. 22 and 23, T road south, 38 feet southwest to mail box, 32 feet southeast to telephone pole.....	39	59	54.8	92	26	13.6
T. 60 N., R. 14 W., south corner secs. 13 and 14, center of road at hedge fence north, 14 feet south to cross on fence post.....	39	59	54.0	92	25	05.6
Titus Creek, course south, center of iron bridge over.....	39	59	53.6	92	23	33.9
Near quarter corner, at southeast corner of field owned by R. J. Collins at T road west, iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	39	59	52.4	92	22	16.9
Road north, W. R. Collins's mail box.....	39	59	39.0	92	21	09.3
Knox-Macon county line, center of road.....	39	59	37.1	92	20	35.2
T road west, cross cut on telephone pole.....	39	59	23.0	92	19	26.9
T road south, 24 feet northeast to J. O. Bowers's mail box, 36 feet north to cross on board fence.....	39	59	21.6	92	18	02.4
Browning (Robert) residence, T road south, 600 feet west of 7 feet northwest to cross on fence post.....	39	59	59.8	92	16	46.2
De Moss (John) residence, T road west, just east of, 49 feet northwest to Joseph Porter's mail box, 16 feet northeast to post.....	39	59	56.5	92	15	55.5

Geographic positions along Wabash Railroad between Laplata and Macon.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Laplata station.....	40	01	27.2	92	29	22.1
T. 60 N., R. 14 W., corner secs. 17, 18, 19, and 20.....	39	59	57.9	92	29	36.2
T. 59 N., R. 14 W., quarter corner between secs. 5 and 8.....	39	56	26.8	92	29	10.0
Atlanta station.....	39	53	58.7	92	28	49.2
T. 59 N., R. 14 W., corner on township line, south side secs. 32 and 33..	39	52	06.5	92	28	36.5
T. 58 N., R. 14 W., corner secs. 8, 9, 16, and 17.....	39	50	21.8	92	28	39.7
Tps. 57 and 58 N., township line between.....	39	46	49.9	92	28	36.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Drygrove, 0.75 mile south of, three corners, second-class T road to east, 50 feet east to gate, 40 feet west to large cherry tree.....	32 07 04.4	90 25 48.3
Drygrove, 2.5 miles south of, second-class road to west, 10 feet west to gate.....	32 05 45.5	90 26 03.2
Mount Wade Church, four corners, 60 feet east to schoolhouse, 100 feet west to corner of store.....	32 05 08.3	90 25 42.4
Mount Wade Church, 1.5 miles south of, at top of hill, four corners, second-class crossroads.....	32 03 55.9	90 25 29.0
Little White Oak Creek, 0.6 mile south of, near county line, forks of roads north and northeast, 30 feet northeast to pine, 30 feet south to crooked pine.....	32 02 52.9	90 25 09.3
Whiteoak Creek, 0.9 mile north of, forks of roads west and north, 35 feet east to telephone pole, 60 feet southeast to oak.....	32 02 14.3	90 25 17.3
Whiteoak Creek, center of bridge over.....	32 01 34.0	90 25 32.9
Whiteoak Creek, 0.25 mile south of, forks of roads southeast and southwest, 40 feet south to pine, 30 feet west to sweet gum.....	32 01 21.9	90 25 21.6
Goddys Corners, 4 miles northwest of Crystal Springs, in triangle at junction of Gallatin-Raymond and Pine Bluff-Crystal Springs roads, iron post stamped "Prim. Trav. Sta. No. 6, 1905".....	31 59 43.7	90 25 04.1
Goddys Corners, 1.1 miles east of, three corners, T road to south, 25 feet northeast to oak, 40 feet south to pine.....	31 59 48.8	90 23 59.5
Forks, second-class road to north.....	32 00 06.2	90 23 12.8
Crystal Springs, 1.75 miles north of, forks of roads north and west, telephone pole in triangle.....	32 00 08.5	90 22 36.4
Crystal Springs, 2.25 miles north of, forks of roads north and east.....	32 00 33.8	90 22 40.0
Three corners, T road southwest, 25 feet south to pine stump, 50 feet west to elm.....	32 01 03.5	90 22 19.5
Lockwood schoolhouse, 1 mile west of, four corners, second-class north-south crossroads, 10 feet northeast to mail box, 20 feet south to small pine.....	32 00 39.5	90 21 50.2
Lockwood schoolhouse, 2.1 miles north of, overhead road crossing, center of east track under.....	32 01 56.1	90 20 03.2
Hinds-Copiah county line crossing, center between tracks Illinois Central R. R.....	32 02 56.9	90 20 04.2
Crystal Springs, 1.5 miles north of, on Port Gibson road 100 feet east of bridge over Illinois Central R. R., at southwest corner of Lockwood schoolhouse, iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	32 00 26.2	90 20 49.1
Lockwood schoolhouse, 0.9 mile east of, three corners, second-class T road to north, 30 feet northwest to small bridge.....	32 00 31.1	90 19 52.3
Pilgrims' Rest Church, stake at center of north building line of, T. 2 N., R. 1 W., secs. 16 and 21, quarter corner between.....	32 00 15.1	90 18 34.3
Pilgrims' Rest Church, 200 feet east of, four corners, 50 feet southeast to oak, 25 feet northeast to telephone pole.....	32 00 16.9	90 18 34.7
Pilgrims' Rest Church, 0.5 mile southeast of, three corners, 30 feet northeast to corner of store, 35 feet southeast to dead oak.....	32 00 03.1	90 18 16.3
Mount Pleasant Church, 0.25 mile southeast of, forks of roads southeast and northeast, 20 feet southwest to oak, 35 feet northwest to small pine.....	31 59 12.7	90 16 57.8
Beechgrove Church post-office, 0.25 mile east of, four corners.....	31 59 33.6	90 15 30.6

VICKSBURG QUADRANGLE (WARREN COUNTY).

Geographic positions along Alabama and Vicksburg Railway, Vicksburg to Newman.

Station.	Latitude.	Longitude.
Vicksburg, Trinity Church spire.....	32 20 49.2	90 52 49.5
Overhead road crossing north and south.....	32 20 24.2	90 50 58.5
Beechwoods, road crossing.....	32 19 44.1	90 48 49.2
Overhead road crossing north and south.....	32 20 12.6	90 47 38.1
Newman, north-south road crossing.....	32 20 43.9	90 46 15.3
Road crossing north and south.....	32 20 50.7	90 45 29.3

NORTH CAROLINA.

PRIMARY TRAVERSE.

SAMPSON COUNTY.

SALEMBURG QUADRANGLE.

The following geographic positions were determined by C. B. Kendall in 1905: The line starts from a position at the southwest corner of the Four Oaks quadrangle, follows highways south, east, and north near the borders of the Salemburg quadrangle, and is connected with a position at the southeast corner of the Four Oaks quadrangle.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Church, forks of road, 60 feet southeast to hickory tree, 20 feet north-east to pine.....	35	16	03.7	78	34	10.7
T road east, 15 feet west to gate, 10 feet southeast to pine stump.....	35	15	02.8	78	33	21.6
Church, four corners, 20 feet northeast to oak, 40 feet south to oak.....	35	14	32.3	78	32	58.9
Forks of road, 50 feet west to persimmon, 10 feet east to fence corner.....	35	13	59.0	78	33	17.8
Forks of second-class road, 400 feet east of sandhill swamp, 200 feet north of sawmill.....	35	13	22.4	78	33	15.7
Dwelling, four corners, 20 feet west to fence corner, 30 feet northeast to pine.....	35	12	42.0	78	33	39.1
T road west, at end of lane, 10 feet southeast to fence corner, 10 feet southwest to fence corner.....	35	12	01.4	78	33	49.2
Four corners, at northeast corner of field, 20 feet southwest to fence corner.....	35	11	36.5	78	33	51.1
Hawley's store, four corners, 300 feet east of, 40 feet southeast to gate, 40 feet northeast to gate.....	35	10	23.6	58	33	05.2
Forks of road, 15 feet northeast to persimmon, 10 feet west to rail fence.....	35	08	52.3	78	32	58.8
Four corners, 40 feet southwest to oak, 20 feet north to dead oak.....	35	08	36.8	78	33	17.8
Yard fence, northwest corner of, at old store.....	35	07	53.5	78	32	33.0
Orange post-office, at northeast corner of, store of Charles Hall, iron post stamped "Prim. Trav. Sta. No. 24, 1905".....	35	06	50.5	78	31	57.8
Williams mill, forks of road, 30 feet northeast to bridge, 30 feet southwest to pine.....	35	05	57.6	78	32	08.8
Four corners.....	35	05	12.9	78	32	40.4
Forks of road, 40 feet west to corner of garden.....	35	04	15.8	78	32	31.1
Forks of road just north of stream, 20 feet east to oak, 80 feet south to stream.....	35	03	05.7	78	32	50.8
Old Chance post-office, T road south 0.25 mile west of.....	35	02	52.8	78	33	10.2
Four corners, 20 feet west to oak, 5 feet northeast to oak.....	35	01	54.7	78	32	45.0
Four corners, 40 feet north to pine, 40 feet west to two oaks.....	35	01	00.2	78	32	50.6
Four corners, 30 feet east to oak, 10 feet southeast to pine.....	35	00	08.0	78	32	52.9
Forks of road, 300 feet southeast of house, 30 feet east to pine.....	34	59	25.4	78	33	02.5
Bethel Church, four corners, 20 feet northeast to oak painted "P.T.".....	34	58	42.3	78	33	12.3
Hayne post-office, 1 mile east of, at southwest corner of Bethel Church, iron post stamped "Prim. Trav. Sta. No. 25, 1905".....	34	58	44.3	78	33	12.4
Sawmill, four corners, 10 feet south to corner of plank fence, 30 feet north to oak.....	34	58	52.1	78	32	08.7
Junction of roads, 40 feet west to sign "Fayetteville 22 mi. Dain 30 mi.".....	34	58	57.0	78	32	28.7
T road south, 30 feet south of pine and sign "Rosehorn 1½ miles," 50 feet west to oak.....	34	58	24.0	78	30	24.9
Four corners, 20 feet southwest to pine, 20 feet north to pine.....	34	58	29.6	78	29	39.9
Four corners, 20 feet northwest to pine, 15 feet southwest to mail box.....	34	58	14.8	78	28	24.0
T road north, 25 feet northwest to gate, 25 feet northeast to paling fence.....	34	57	49.4	78	26	59.3
Four corners, 20 feet southeast to J. H. Faircloth's mail box, 60 feet northeast to pine.....	34	58	17.4	78	26	04.5
Clinton, 5.5 miles west of, southeast corner Concord Methodist Church, iron post stamped "Prim. Trav. Sta. No. 26, 1905".....	34	58	59.7	78	24	58.6
Four corners, 30 feet south to pine stump, 40 feet north to plank fence.....	34	59	18.6	78	23	36.3
Great Coharie Creek, center of bridge over.....	34	59	38.9	78	22	45.8
T road south, 10 feet west to bridge, 30 feet north to gate.....	34	59	29.2	78	21	08.6
T road south, 25 feet southwest to double oak, 10 feet north to plank fence.....	34	59	37.0	78	20	25.5
Clinton, Sampson County court-house, flagstaff on cupola.....	34	59	52.0	78	19	23.8
Clinton, end of Atlantic Coast Line tracks, stop blocks, 100 feet east to station.....	34	59	45.0	78	19	25.8
Second-class road crossing.....	34	59	43.4	78	17	35.1
Second-class road crossing at new house and fork of road.....	34	59	33.6	78	16	12.8

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
Mottenville, 0.25 mile west of, at junction of roads, iron post stamped "Prim. Trav. Sta. No. 27, 1905"	°	'	"	°	'	"
Four corners at southwest corner of clearing, 15 feet north to pine, 40 feet east to fence.	34	59	25.8	78	15	08.0
Clinton, 4 miles northeast of, forks of road, 30 feet southeast to sweet gum, 40 feet north to pine.	35	00	30.7	78	15	56.9
Second-class crossroads, 25 feet east to gate, 25 feet west to bridge.	35	01	56.9	78	16	09.3
Second-class T road east, 10 feet south to mail box, 20 feet northeast to corner rail fence.	35	02	44.4	78	16	02.2
T road west, 500 feet north of milepost "8 miles to Clinton," 30 feet west to oak, 30 feet southeast to fence corner.	35	03	41.0	78	15	22.2
Forks of road, 10 feet northeast to Thornton and King's mail box, 30 feet east to plank fence.	35	04	39.2	78	14	57.1
Four corners, 25 feet southwest to corner of garden, 15 feet east to post.	35	05	40.7	78	15	56.4
Second-class T road west, 10 feet east to fence, 25 feet southwest to fence corner.	35	06	11.1	78	16	46.1
Hobton, 5 miles southeast of, 11 miles north of Clinton, in northeast corner of intersection of roads, iron post stamped "Prim. Trav. Sta. No. 28, 1905"	35	07	36.3	78	16	30.9
T road north, 100 feet northeast to forks of road, 20 feet north to pine stump.	35	08	07.1	78	15	59.5
Hobton, T road north, 3 miles east of, 15 feet west to corner of fence, 20 feet north to fence corner.	35	08	40.1	78	14	22.2
Goshen Church, T road east, 1.5 miles southeast of, 15 feet east to gate, 30 feet north to W. B. Bayett's mail box.	35	09	40.0	78	14	58.3
Goshen Church, forks of road, 50 feet south to door of church.	35	10	24.0	78	15	58.6
Goshen Church, forks of road, 1 mile northwest of, 40 feet northeast to gum tree.	35	11	12.8	78	16	58.6
T road south, 200 feet east to three corners at tobacco barn, 25 feet west to small bridge.	35	11	19.9	78	17	59.6
Forks of second-class road to west.	35	12	08.0	78	18	13.1
Three corners, 3 feet west to fence post, 30 feet northeast to post.	35	12	40.4	78	18	34.8
Forks of road, 10 feet east to rail fence, 20 feet west to small bridge.	35	13	08.4	78	19	04.7
T road south, 0.25 mile east of Thornton's store and 300 feet east of Bayett Schoolhouse, 10 feet southeast to sign "Clinton 20 miles"	35	13	55.9	78	18	17.2
	35	14	48.9	78	18	18.1

NORTH CAROLINA-SOUTH CAROLINA.**PRIMARY TRAVERSE.**

CLEVELAND AND GASTON COUNTIES, N. C.; CHEROKEE AND YORK COUNTIES, S. C.

BELMONT, GAFFNEY, KINGS MOUNTAIN, AND SHELBY QUADRANGLES.

The following geographic positions were determined by C. B. Kendall, field assistant, in May, 1906. The line starts at Yorkville, located by primary traverse in 1905, follows the Carolina and Northwestern Railway to Gastonia, thence along the Southern Railway to Kings Mountain station, thence along highways to Patterson Springs, thence along the Southern Railway to Blacksburg, thence along highways, and is tied to a primary-traverse position near the northwest corner of the Sharon quadrangle.

Another line continues around the north, west, and south borders of the Gaffney quadrangle and is tied to a point near the northwest corner of the Sharon quadrangle.

BELMONT QUADRANGLE (GASTON COUNTY, N. C.; YORK COUNTY, S. C.).

Geographic positions along Carolina and Northwestern Railway between Yorkville and Gastonia.

Station.	Latitude.	Longitude.
SOUTH CAROLINA.		
Neely Manufacturing Co.'s cotton mills, public-road crossing over spur track	34 59 56.0	81 14 09.5
Milepost 25, second-class road crossing, 50 feet southeast of	35 00 40.1	81 14 28.7
Milepost 26, second-class road crossing 230 feet north of, center of track	35 01 21.5	81 15 08.5
Filbert station, Carolina and Northwestern Rwy., road crossing, center of track	35 02 57.5	81 14 50.0
Second-class road crossing, center of railroad track	35 03 39.1	81 14 11.5
Public-road crossing, 400 feet south of trestle over Allison Creek, center of track	35 03 56.5	81 13 31.2
Public-road crossing, 1 mile north of Allison Creek, center of track	35 05 01.8	81 13 35.4
Clover station, second-class road crossing, 0.75 mile south of	35 05 49.4	81 13 57.3
Clover station, road crossing 75 feet south of, center of track	35 06 39.3	81 13 34.8
Clover station, front face of store in Doctor Campbell's block opposite, bronze tablet stamped "Prim. Trav. Sta. No. 1, 1906"	35 06 40.7	81 13 34.4
Milepost 35, second-class road crossing 1,300 feet south of	35 07 53.3	81 12 52.0
Milepost 36, public-road crossing at cotton factory	35 08 57.1	81 12 41.7
Bowling Green station, public-road crossing 500 feet southwest of	35 09 12.0	81 12 22.0
NORTH CAROLINA.		
North Carolina-South Carolina State line, second-class road crossing at	35 09 28.4	81 11 52.0
Crowders Creek, public-road crossing 700 feet southeast of trestle over	35 10 02.2	81 11 40.8
Crowders Creek, public-road crossing, one-half mile north of trestle over	35 10 26.0	81 11 46.4
Crowders station, in face of chimney at north end of residence of W. D. Guillem, bronze tablet stamped "Elev. 777 Columbus 1900" and "Prim. Trav. Sta. No. 2, 1906"	35 10 59.3	81 12 21.4
Ridge station, public-road crossing 1 mile south of	35 11 54.6	81 12 32.9
Ridge station, public-road crossing 1,000 feet north of	35 12 45.2	81 12 01.2
Ridge station, public-road crossing 1.25 miles north of	35 13 57.8	81 11 39.1
Catawba Creek, trestle over	35 14 47.6	81 11 09.5
Gastonia, crossing of Carolina and Northwestern and Southern Rwys. at	35 15 51.8	81 10 40.3
Gastonia, set in southwest corner of public square about 300 feet southwest of passenger station at, P. B. M. post stamped "Prim. Trav. Sta. No. 3, 1906"	35 15 49.6	81 11 01.2

KINGS MOUNTAIN QUADRANGLE (CLEVELAND AND GASTON COUNTIES, N. C.; CHEROKEE AND YORK COUNTIES, S. C.).

Geographic positions along Southern Railway between Gastonia and Kings Mountain, N. C.

Station.	Latitude.	Longitude.
Torny cotton mills, public-road crossing 500 feet north of	35 15 47.2	81 11 59.2
Arlington cotton mill, second-class road crossing 50 feet east of spur track	35 15 52.3	81 12 39.8
Milepost 405, second-class road crossing 200 feet west of	35 16 43.7	81 13 58.7
Public-road crossing	35 17 04.0	81 14 23.6
Bessemer City, 0.75 mile northeast of, second-class road crossing	35 16 56.9	81 16 18.1
Bessemer City station, 50 feet southeast of, crossing of main track	35 17 03.3	81 17 02.6
Bessemer City station, overhead road crossing 0.75 mile west of	35 16 58.0	81 17 42.6
Vantines station, public-road crossing 1,200 feet west of	35 16 52.9	81 18 22.8
Milepost 411, second-class road crossing 40 feet northeast of	35 16 17.1	81 19 07.3
Alula Mills, public-road crossing just east of station	35 15 06.1	81 19 58.0
Kings Mountain station, road crossing 300 feet north of	35 14 21.0	81 20 41.2
Kings Mountain, four corners at east edge of	35 14 26.7	81 20 11.4
Kings Mountain triangulation point, forks of road about 1 mile west of	35 13 08.2	81 20 03.7
Intersection of second-class roads east and north and public road southeast, 10 feet north to mail box at pine tree	35 12 52.0	81 19 42.2
Kings Mountain triangulation station, on highest point of Kings Mountain, 3 miles southeast of station and postoffice of same name and 31 miles west-southwest of Charlotte, N. C. Height of station, 1,700 feet. Station mark: A glass lamp shade filled with ashes, plugged at both ends, with a brick platform 5 feet square laid in cement, over it, with the diagonal of the square north, south, east, and west (true), a square hole 8 inches on a side being left at station center	35 12 27.72	81 18 45.52
Kings Mountain, set at east building line at corner where porch joins street crossing and about 250 feet north of passenger station, iron post stamped "Prim. Trav. Sta. No. 4, 1906"	35 14 20.3	81 20 42.3

Geographic positions along highways, North Carolina.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Kings Mountain station, 1.25 miles west of, forks, public roads north-east and southeast, 35 feet north to black gum, 60 feet east to telegraph pole.....	35	14	26.4	81	21	54.3
Second-class road to south at new dwelling, 30 feet southwest to oak tree, 25 feet west to pine stump.....	35	14	18.2	81	23	11.9
Second-class north-south crossroads, 30 feet northwest to J. W. Shart's mail box, No. 14, 25 feet northeast to small pine.....	35	14	35.1	81	24	10.1
Public roads northwest and west, fork of pine trees at, line turns west.	35	14	58.4	81	24	40.2
Second-class road to northwest, 10 feet northeast to oak stump.....	35	14	49.8	81	25	45.2
Public roads, east and south forks of, 35 feet northwest to telegraph pole, 40 feet north to oak bush on bank.....	35	14	39.1	81	26	35.3
Buffalo Creek, 900 feet east of bridge over, forks of road south uphill, 40 feet south to oak tree, 30 feet north to telegraph pole.....	35	15	14.1	81	27	25.5
Four corners, second-class crossroads southwest and northeast, 40 feet east to double oak tree, 35 feet northwest to double oak tree.....	35	15	46.3	81	28	16.8
Shelby, 3 miles southeast of, public crossroads, four corners, 24 feet east to telegraph pole, 36 feet southwest to signpost.....	35	16	29.8	81	29	48.5
Four corners, public crossroads at blacksmith's shop, 50 feet southwest to H. M. Byer's mail box, 40 feet southeast to small apple tree.	35	15	18.2	81	30	19.4
Four corners, public crossroads, 25 feet east to old peach-tree stump.	35	14	46.3	81	30	33.8

Geographic positions along Southern Railway between Patterson Springs and Blacksburg.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
NORTH CAROLINA.						
Patterson Springs station, 75 feet north of, public-road crossing of Southern Rwy.....	35	13	59.7	81	30	57.9
Patterson Springs station, 1.25 miles south of, public-road crossing.....	35	13	05.3	81	31	44.9
Public-road crossing.....	35	12	18.4	81	31	52.7
Earl station, 250 feet north of, public-road crossing.....	35	11	45.8	81	32	02.9
Earl station, 1 mile south of, second-class road crossing.....	35	10	55.6	81	32	04.4
SOUTH CAROLINA.						
North Carolina-South Carolina State line crossing.....	35	10	17.8	81	32	17.1
Second-class road crossing.....	35	09	29.7	81	32	43.3
Water mill, public-road crossing just south of.....	35	08	47.4	81	32	11.6
Blacksburg, public-road crossing north of (telegraph road), 37 feet northwest to nail in tie at road crossing.....	35	08	09.2	81	31	53.7
Blacksburg, southwest corner of Southern Rwy. park, 200 feet southwest of railroad station and 60 feet south of center of main track, iron post stamped "Prim. Trav. Sta. No. 12, 1906".....	35	07	22.8	81	30	52.9
Blacksburg, main track of Southern Rwy., at west end of girder span over Ohio River and Charleston R. R.....	35	07	31.1	81	30	36.1
Blacksburg, 0.75 mile southeast of, public-road crossing.....	35	06	30.2	81	30	22.1
Blacksburg, 1 mile southeast of, public-road crossing Ohio River and Charleston R. R., spur line to Gaffney.....	35	06	04.5	81	30	52.5

Geographic positions along highways, South Carolina.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Blacksburg, 2 miles southeast of, public crossroads, forks of.....	35	05	22.9	81	30	28.0
Hopeville Church, forks of road 200 feet west of, 251 feet northeast to oak.	35	04	43.1	81	30	03.6
Forks of public roads west and northwest, on Southwest slope of Jefferson Mountain, 30 feet north to small pine.....	35	04	10.3	81	29	46.2
Four corners at public crossroads, 60 feet south to oak tree, 50 feet west to oak, 40 feet northeast to mail box.....	35	03	27.6	81	29	00.3
Forks of public roads south and southeast, 0.50 mile north of bridge over Kings Creek, 25 feet south to bunch of plum bushes.....	35	02	49.2	81	28	41.9
Forks of second-class road to west, 10 feet west to post, 20 feet east to small pine tree.....	35	02	24.0	81	28	29.0
Wolf Creek, 0.25 mile northwest of, second-class road to east, 25 feet northeast to small pine tree, 800 feet southeast to house on top of hill.	35	02	29.7	81	28	00.2
Wolf Creek, center of bridge over.....	35	02	27.8	81	27	44.1
Broad River schoolhouse, three corners at, 10 feet south to oak tree, 20 feet north to center main road.....	35	01	36.7	81	27	24.2
Forks of roads southwest and south, 30 feet southwest to pine.....	35	00	49.1	81	27	34.9
Four corners at second-class crossroads, 0.50 mile north of Mud Creek, 25 feet southeast to four mail boxes.....	35	00	21.5	81	27	35.4
Forks of roads northwest and northeast, 10 feet north to stake painted "632," 15 feet east to pine stump.....	34	59	50.0	81	27	29.8

SHELBY QUADRANGLE (CLEVELAND COUNTY, N. C.).

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Shelby, 3 miles east of, four corners, crossroads, 24 feet east to telephone pole, 36 feet southwest to signpost.....	35 16 29.8	81 29 48.5
Shelby, 3 miles east of, 50 feet northwest of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 5, 1906".....	35 16 30.1	81 29 48.9
Second-class forks of road to southwest, 30 feet southwest to small oak, 15 feet east to B. M. Habright's mail box.....	35 16 46.1	81 31 13.5
Shelby, intersection of Washington and Warren streets.....	35 17 26.9	81 32 20.5
Shelby, 100 feet southeast of southeast corner of Cleveland County court-house, south meridian stone, "Prim. Trav. Sta. No. 6, 1906".....	35 17 27.9	81 32 22.0
Shelby, T road west of, center of grass plot, 25 feet east to oak, 2.25 miles to Zonar, 30 feet west to cedar.....	35 17 21.4	81 33 46.8
Broad River, center of iron bridge over.....	35 17 40.4	81 34 14.7
Forks of road, 0.12 mile west of bridge over Bushy Creek, roads west and southwest, 60 feet northeast to small bridge, 60 feet southwest to small stream.....	35 17 39.0	81 34 56.9
Bushy Creek, 1 mile west of, four corners, 40 feet southwest to corner of front-yard fence, 50 feet northeast to potato house.....	35 17 42.3	81 35 52.2
Three corners, second-class T road south, 30 feet southeast to new garden fence, 80 feet northwest to oak.....	35 17 51.2	81 36 57.3
Three corners, second-class T road south, 25 feet southwest to northeast corner of store, 25 feet north to telephone pole.....	35 17 32.2	81 38 14.2
Lattimore, 2.5 miles south of, 7 miles west of Shelby and 3 miles east of Mooresboro, in southeast corner of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	35 17 43.9	81 39 14.6
Second-class crossroads, 30 feet west to two small oaks, 5 feet south to oak stump.....	35 17 49.8	81 40 11.4
Forks at Sandy Run Creek, crossroads northeast and southeast, east end of bridge over creek.....	35 17 53.9	81 40 56.9
Mooresboro, east edge of, forks at top of hill, crossroads northwest and west, 50 feet northeast to corner of front-yard fence, 30 feet southwest to front gate of 2-story white dwelling.....	35 17 51.2	81 41 45.4
Mooresboro station, 600 feet north of, road crossing Southern Rwy., center of track.....	35 17 50.5	81 42 05.9
Crossroads at cotton gin, four corners 70 feet southwest to northeast corner of boiler house.....	35 17 36.2	81 43 20.9
Second-class forks of road to south, 30 feet north to telephone pole, 25 feet south to two mail boxes.....	35 17 10.8	81 44 03.4
Four corners, crossroads, 20 feet southwest to oak tree, 30 feet east to pine tree.....	35 16 46.4	81 44 52.6
Oak tree at forks, roads southwest to Henrietta and northwest to Caroline Mills.....	35 16 29.9	81 46 08.4
Henrietta, 0.5 mile east of, four corners, 44 feet southeast to primary-traverse station No. 8.....	35 15 56.8	81 46 56.3
Henrietta, 0.5 mile east of, in southeast corner of intersection of crossroads, at northwest corner of residence of Thos. Harris, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	35 15 56.5	81 46 56.0
Road crossing, 1 mile east of Henrietta, center of track.....	35 15 22.1	81 46 36.6

GAFFNEY QUADRANGLE (CLEVELAND COUNTY, N. C.; CHEROKEE COUNTY, S. C.).

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
NORTH CAROLINA.		
Cliffside, north edge of, 200 feet southwest of church and schoolhouse, roads north and east, 40 feet northwest to telephone pole.....	35 14 40.9	81 46 03.2
Forks of roads south and southeast, 10 feet north to signboard "New-ferry 1 mile," 40 feet south to signboard.....	35 13 50.9	81 46 10.1
North landing of New or Snug's ferry across Broad River, 2 miles south of Cliffside.....	35 13 21.1	81 45 48.5
New Ferry, forks 0.75 mile south of, roads south and southeast, 50 feet north to oak, 10 feet west to pine stump, 30 feet east to Richard White's mail box.....	35 12 50.2	81 45 35.3
Luck Creek, 0.5 mile south of, forks of road, roads south and southeast, 20 feet southwest to telephone pole, 30 feet east to pine.....	35 12 14.8	81 45 14.7
Prospect Church, four corners 700 feet east of, 20 feet east to telephone pole, 10 feet southeast to pine.....	35 12 01.7	81 45 12.2
Small oak tree at second-class T road west.....	35 10 55.0	81 45 45.3
Oak tree at three corners, T road east.....	35 10 08.7	81 45 34.4

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
SOUTH CAROLINA.						
Maud post-office, crossroads, 30 feet southeast to oak, 35 feet west to pine.....	35	08	45.8	81	44	47.1
Maud post-office, 1.4 miles southwest of, forks of roads east and south-east, 25 feet north to oak tree, 15 feet south to double oak.....	35	07	56.7	81	46	05.7
Forks of roads east and southeast, New Cut road to southeast, 30 feet southeast to oak, 10 feet north to small double oak.....	35	07	39.3	81	46	45.7
Large oak at forks, roads south and southwest.....	35	07	22.0	81	46	25.7
Maud post-office, 3.5 miles southwest of, 0.75 mile west of Thickety Mountain, in northwest corner of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	35	06	50.2	81	47	05.3
Thickety Mountain, highest point on top of.....	35	06	47.9	81	46	08.8
Four corners north and southeast, second-class road southwest and northwest, 40 feet south to corner of log crib, 40 feet northwest to oak in corner of barnyard.....	35	06	34.8	81	47	05.8
Forks, 200 feet south of new schoolhouse, roads northwest and southwest, 40 feet west to two mail boxes, 10 feet south to pine.....	35	06	08.7	81	46	07.5
Forks of road to south, second-class road to southeast, 10 feet west to Lender's mail box No. 34.....	35	05	57.4	81	45	32.6
Thickety Creek, center of bridge over.....	35	05	06.2	81	45	27.8
Four corners, 15 feet north to small bridge, 60 feet southwest to well, 25 feet east to cherry tree.....	35	04	13.9	81	45	38.3
Four corners, 20 feet north to small double oak, 30 feet northwest to four mail boxes.....	35	03	29.5	81	45	07.0
Forks of second-class road to northeast, 100 feet north of red house, 10 feet east to oak, 15 feet northeast to oak.....	35	02	17.0	81	44	41.8
Thickety, 1 mile northwest of, center of triangle grass plot.....	35	01	16.4	81	44	07.5
Road crossing Southern Rwy. 0.25 mile west of Thickety station, center of track.....	35	00	58.3	81	43	29.6
Forks of second-class road to southeast, 20 feet northeast to small oak.....	35	00	33.8	81	42	55.9
Little Thickety Creek, center of, at ford.....	35	00	04.5	81	42	30.2
Goucher post-office, forks of road 1 mile northwest of, 10 feet southwest to small pine, 30 feet east to small pine.....	34	59	14.4	81	42	32.1
Four corners 125 feet southeast of C. E. Smith's store (Goucher post-office).....	34	58	52.8	81	41	47.5
Goucher post-office, southeast corner of store and post-office, iron post stamped "Prim. Trav. Sta. No. 10, 1906".....	34	58	52.6	81	41	48.6
South end of covered bridge over Thickety Creek, 0.75 mile north of Goucher.....	34	59	25.4	81	41	27.4
Three corners, second-class T road to south, near top of hill and opposite two-room log dwelling.....	34	59	27.5	81	40	29.3
Second class fork to west, 50 feet northeast to pine.....	35	00	07.8	81	39	34.7
Gaffney, 5 miles south of, four corners at cotton gin, 1.5 miles northwest of church at crossroads, 5 feet south to small bridge.....	35	00	37.0	81	38	51.4
Corinth Church, 0.5 mile southeast of, forks of roads south and southeast, 30 feet east to oak and pine, 4 feet northeast to oak.....	35	00	23.7	81	38	00.4
Triangle grass plot at forks of roads northeast and southeast, 5 feet west to M. C. and C. A. Spencer's mail box, 10 feet east to clump of small ash trees.....	35	00	28.5	81	37	19.3
Forks 100 feet north of house on hill, second-class road to northeast, 50 feet north to corner of garden, 50 feet south to corner of garden.....	35	00	05.3	81	36	31.4
Four corners, crossroads, 900 feet west of brick house, 30 feet east to small oak, 20 feet south to small pine.....	34	59	38.3	81	35	42.8
Forks 0.5 mile northeast of Gilker Creek, roads northeast and southeast.....	34	59	34.7	81	35	03.2
Wilkinsville, 3.25 miles northwest of, T road southwest, 20 feet southwest to oak stump, 15 feet southeast to oak snag.....	34	59	56.7	81	34	00.3
Forks of second-class road north, 20 feet east to oak, 25 feet northwest to I. G. Patrick's mail box, No. 22.....	34	59	34.6	81	32	58.4
Wilkinsville, 0.75 mile northwest of, four corners, second-class crossroads, 50 feet west to cedar.....	34	58	39.4	81	32	26.2
Wilkinsville, at southeast corner of C. W. Whesonant's store, iron post stamped "Prim. Trav. Sta. No. 11, 1906".....	34	58	18.4	81	31	54.7
Forks, 350 feet east of ford of creek, roads east and southeast to bunch of ash trees.....	34	58	34.8	81	30	43.1
Forks of roads southwest, 25 feet northeast to large oak, 30 feet southeast to double pine.....	34	59	17.0	81	29	57.9
West bank of landing of Broad River at Smith's ford.....	34	59	43.2	81	29	05.1
Large tree at forks of road 300 feet east of east bank of Broad River at Smith's ford.....	34	59	41.8	81	28	53.8
Smith's ford, 1 mile east of, at northeast corner of front-yard fence of residence of T. Smith, on top of hill, iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	34	59	03.4	81	28	08.9

OHIO.

PRIMARY TRAVERSE.

COSHOCTON, DEFIANCE, FAIRFIELD, FULTON, GUERNSEY, HENRY, LICKING, LUCAS, MORGAN, MUSKINGUM, NOBLE, PAULDING, PERRY, WILLIAMS, AND WOOD COUNTIES.

BRYAN, BUTLER, CALDWELL, CAMBRIDGE, CONESVILLE, CONTINENTAL, COSHOCTON, CUMBERLAND, DEFIANCE, DESHLER, EDON, FRAZEYSBURG, GRANVILLE, LOGAN, M'CLURE, MONTPELIER, NEWARK, NEW COMERSTOWN, NEW LEXINGTON, OTTAWA, PAULDING, PHILO, STRYKER, SUGARGROVE, SWANTON, THORNVILLE, THURSTON, WAUSEON, AND ZANESVILLE QUADRANGLES.

During the season of 1905, J. R. Ellis, assistant topographer, ran 658 miles of primary traverse to control the above-mentioned quadrangles. These quadrangles are situated in two general localities—one group being in the northwest corner of the State, the other near the central portion of the State, immediately east of Columbus.

The lines were tied to points previously located by primary traverse and also to triangulation stations Correy, Sago, and Widder.

BRYAN QUADRANGLE (DEFIANCE AND WILLIAMS COUNTIES).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
The Bend, railroad crossing 60 feet east of station.....	41	16	57.1	84	30	55.1
T. 4 N., R. 3 E., corner secs. 15, 16, 21, and 22, cross pikes.....	41	17	46.6	84	30	55.6
T. 4 N., R. 3 E., corner secs. 9, 10, 15, and 16, crossroads.....	41	18	38.8	84	30	56.0
T. 4 N., R. 3 E., corner secs. 3, 4, 9, and 10, crossroads.....	41	19	31.1	84	30	56.2

Geographic positions along Cincinnati Northern Railroad near east border of quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Moats, railway crossing 0.5 mile north of.....	41	20	22.8	84	31	30.4
Moats, railway crossing 1.5 miles north of.....	41	21	15.3	84	31	31.1
Ney, 0.5 mile south of, in northwest corner of pasture owned by John Burt, at east-west crossing of Baltimore and Ohio Rwy.; nail in north face of walnut tree bears S. 6° W., distant 18 feet; east rail of track at north-south crossing bears N. 74° W., distant 51 feet; iron post stamped "Prim. Trav. Sta. No. 14, 1905".....	41	22	33.7	84	31	31.5
Ney, railway crossing east and west 1 mile north of.....	41	23	52.2	84	31	33.0
Ney, railway crossing east and west 2 miles north of.....	41	24	44.2	84	31	33.6
Defiance-Williams county line, east-west road crossing of Cincinnati Northern R. R.....	41	25	36.8	84	31	34.2
Defiance-Williams county line, east-west road crossing 1 mile north of.	41	26	29.3	84	31	34.9
Bryan, east-west crossing 1.25 miles south of.....	41	27	21.9	84	31	37.9
Bryan, crossing 400 feet south of tank on Cincinnati Northern R. R.....	41	28	06.8	84	32	31.1

Geographic positions near south border of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 N., R. 3 E., northeast corner sec. 11, in northwest corner of field owned by S. J. Bowman, southwest corner of schoolhouse bears N. 26° 30' E., distant 161 feet; iron post stamped "Prim. Trav. Sta. No. 15, 1905".....	41 29 58.7	84 28 38.2
T. 3 N., R. 2 E., northeast corner of sec. 3, in northeast corner of field of Henry Martin, iron post stamped "Prim. Trav. Sta. No. 7, 1905"....	41 15 09.0	84 36 39.8
T. 4 N., R. 2 E., south corner secs. 33 and 34, T road north.....	41 15 08.9	84 37 48.1
T. 4 N., R. 2 E., south corner secs. 32 and 33, T road north.....	41 15 08.6	84 38 57.7
Tps. 3 and 4 N., Rs. 1 and 2 E., corner secs. 1, 6, 31, and 36, crossroads..	41 15 07.9	84 41 19.9

Geographic positions near west border of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 3 N., R. 1 E., north corner secs. 1 and 2, T road south.....	41 15 07.8	84 42 29.2
T. 4 N., R. 1 E., south corner secs. 34 and 35.....	41 15 07.8	84 43 38.8
Edgerton, 3 miles north of, in southwest corner of yard to schoolhouse No. 22, St. Joseph township, southwest corner of schoolhouse bears N. 62° 40' E., distant 61 feet; iron post stamped "Prim. Trav. Sta. No. 21, 1905".....	41 29 38.3	84 44 55.9
T. 6 N., R. 1 E., corner secs. 9, 10, 15, and 16, T road west.....	41 29 01.7	84 44 53.1
T. 6 N., R. 1 E., secs. 15, 16, 21, and 22, T road east.....	41 28 09.5	84 44 52.3
T. 5 N., R. 1 E., corner secs. 3 and 4, Defiance-Williams county line.....	41 25 33.1	84 44 54.7
T. 5 N., R. 1 E., corner secs. 3, 4, 9, and 10, crossroads.....	41 24 40.6	84 44 54.3
T. 5 N., R. 1 E., corner secs. 9, 10, 15, and 16, crossroads.....	41 23 48.7	84 44 53.4
T. 5 N., R. 1 E., corner secs. 15, 16, 21, and 22, crossroads.....	41 22 56.3	84 44 52.6
T. 5 N., R. 1 E., corner secs. 21, 22, 27, and 28, crossroads.....	41 22 04.3	84 44 51.8
T. 5 N., R. 1 E., 4 miles north of Hicksville, northwest corner sec. 34, northwest corner of yard to school yard No. 9, limestone post 38 by 6 by 4 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 22".....	41 21 11.8	84 44 50.6
Tps. 4 and 5 N., R. 1 E., corner secs. 3, 4, 33, and 34, crossroads.....	41 20 20.0	84 44 50.2
T. 4 N., R. 1 E., corner secs. 3, 4, 9, and 10, crossroads.....	41 19 28.6	84 44 49.8
Hicksville, Bryan-Hicksville pike at road north, 1 mile northeast of Hicksville, High street at Antwerp pike south, in southwest part of Hicksville, crossroads 2 miles south of, 25 feet northwest to north end of culvert, 45 feet southeast to cross cut on telephone pole.....	41 18 10.7	84 44 48.8
Antwerp, 5 miles north of, in northwest corner of field of Everett Longsworth, at crossroads, 1.5 feet southeast of large corner fence post, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	41 17 23.3	84 45 58.5
	41 15 07.6	84 45 28.2

BUTLER QUADRANGLE (DEFIANCE AND WILLIAMS COUNTIES).

Geographic positions along highways near Ohio-Indiana State line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 4 N., R. 1 E., south corner secs. 31 and 32, T road north.....	41 15 07.9	84 47 07.2
T. 5 N., R. 1 E., corner secs. 29, 30, 31, and 32, crossroads.....	41 21 11.8	84 47 08.7
T. 5 N., R. 1 E., corner secs. 19, 20, 29, and 30, crossroads.....	41 22 04.0	84 47 08.7
T. 5 N., R. 1 E., corner secs. 17, 18, 19, and 20, crossroads.....	41 22 56.1	84 47 08.6
Ohio-Indiana State line, center of road.....	41 23 10.8	84 48 12.6
Edgerton, 3 miles southwest of, T road west near schoolhouse, 40 feet southeast to walnut tree on fence line 30 feet northwest to cross on corner fence post.....	41 24 44.6	84 47 25.1
Tps. 5 and 6 N., R. 1 E., corner secs. 1, 6, 31, and 36, T lane east.....	41 25 32.8	84 48 12.6
Ohio-Indiana State line, post on, near Lake Shore and Michigan Southern Rwy.....	41 26 17.8	84 48 12.7
Astronomic value.....	41 26 13.7	84 48 08.6
Edgerton, road crossing, south rail of north track Lake Shore and Michigan Southern Rwy., 1.5 miles southwest of.....	41 26 33.2	84 46 38.2
Edgerton, T road south 1.5 miles west and 1 mile north of, 25 feet southeast to cross on corner fence post, 27 feet southwest to cross on corner fence post.....	41 27 43.6	84 46 38.5
Ohio-Indiana State line, stone at turn of road and 600 feet south of T road west.....	41 27 43.2	84 48 13.0
T. 6 N., R. 1 E., secs. 7 and 18, T road east at west corner of.....	41 29 01.4	84 48 13.7

CALDWELL QUADRANGLE (NOBLE COUNTY).

Magnetic declination, north border, 2° 21' west.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Correy triangulation station, in Olive Township, on summit of hill locally known as Correy Knob, on land of John Hughes, covered with a peach orchard. Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in center of top of which is cemented a bronze triangulation tablet.....	° ' " 39 43 27.31	° ' " 81 32 47.22
Sharon, T. 6 S., R. 9 W., corner secs. 5, 6, 7, and 8, crossroads.....	39 44 10.1	81 33 53.9
Sharon, 1.5 miles west of, Nicolas (J.) residence, just south of, T road southwest, 9 feet west to J. Wallace's mail box.....	39 44 22.9	81 35 29.9
Olive Green, T road south, 11 feet due south to center of small bridge.	39 44 38.7	81 36 53.0

CAMBRIDGE QUADRANGLE (COSHOCOTON AND MUSKINGUM COUNTIES).

Magnetic declination, north border, 1° 57' west; west border, 2° 09' west; 2° 10' west.

Geographic positions along highways.

Station.	Latitude.	Longitude.
West Lafayette, 2.5 miles south of, McClain's schoolhouse, forks of road at, 24 feet southeast to guidepost, 22 feet northwest to cross on corner fence post.....	° ' " 40 14 37.3	° ' " 81 44 30.4
West Lafayette, 3 miles south of, at guidepost "Lafayette 3 mi. Plainfield 4 mi.," T road north, 37 feet northwest to guidepost, 39 feet northeast to cross on telegraph pole.....	40 13 53.0	81 44 41.2
Bridge over Bacon Run, 0.18 mile north of, T road west, 30 feet northeast to front-yard gate, 34 feet southeast to mail box.....	40 13 12.8	81 43 40.6
Plainfield, 0.5 mile west of, crossroads, 30 feet northeast to cross on corner fence post, 24 feet southeast to sandstone boulder.....	40 12 13.1	81 43 30.1
Flowing well, T road northwest at, 14 feet east to flowing well, 21 feet west to cross on corner fence post.....	40 11 22.2	81 44 10.0

CONESVILLE QUADRANGLE (COSHOCOTON AND MUSKINGUM COUNTIES).

Magnetic declination, north border, 0° 34' east; east border, 2° 09' west, 2° 10' west; south border, 1° 52' west.

Geographic positions along Wheeling and Lake Erie Railroad near Ellis.

Station.	Latitude.	Longitude.
Milepost 5, north-south road crossing.....	° ' " 40 00 25.6	° ' " 81 58 59.9
Lane's poultry farm, private road crossing at spur.....	40 01 46.9	81 59 36.7
Ellis station, center of track opposite.....	40 02 46.4	81 58 58.4
Trestle 135A, north-south road crossing under.....	40 03 33.1	81 58 49.7

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
McCleary (Seth) residence, 0.25 mile east of, T road north, 16 feet north to mail box, 24 feet northeast to cross on corner fence post.....	40	10	23.9	81	45	37.9
Wills Creek, W. Roderick's bridge over, north end of.....	40	10	00.7	81	46	20.0
T. 4 N., R. 5 W., quarter corner between secs. 23 and 24, stone.....	40	09	41.5	81	46	22.2
Otsogo, 2 miles north of, crossroads, 9 feet southeast to J. E. Simons's mail box, 18 feet east to cross on fence post.....	40	08	55.5	81	46	07.7
Otsogo, in southwest corner of public school grounds, iron post stamped "Prim. Trav. Sta. No. 59, 1905".....	40	07	04.3	81	45	59.0
Otsogo, 2.5 miles south of, 0.25 mile northeast of covered bridge, crossroads, 27 feet northwest to cross on telegraph pole, 22 feet southwest to cross on gatepost.....	40	05	06.4	81	46	01.2
D. W. Ross's mail box, T road west.....	40	03	29.8	81	46	26.3
Corner of sections (no numbers),.....	40	02	10.8	81	46	11.0
Sago triangulation station, on a bald hill 4 miles southwest of Sago, on land of J. W. Carnes. Station mark: A limestone post 40 by 7 by 7 inches set 39 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet (Ohio)....	40	00	42.40	81	46	55.70

CONTINENTAL QUADRANGLE (PAULDING COUNTY).

Geographic positions along highways near west border of quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 1 N., R. 3 E., at crossroads 1 mile north and 1 mile west of Grover Hill, in southeast corner of field owned by F. M. Saul, iron post stamped "Prim. Trav. Sta. No. 4, 1905".....	41	02	02.5	84	29	44.8
T. 1 N., R. 3 E., corner secs. 10, 11, 14, and 15, crossroads.....	41	02	54.6	84	29	44.5
T. 1 N., R. 3 E., corner secs. 2, 3, 10, and 11, crossroads.....	41	03	46.9	84	29	44.8
T. 1 N., R. 3 E., north corner secs. 2 and 3, T road south.....	41	04	39.6	84	29	44.7
T. 2 N., R. 3 E., corner secs. 26, 27, 33, and 34, crossroads.....	41	05	31.9	84	29	44.4
T. 2 N., R. 3 E., corner secs. 22, 23, 26, and 27, crossroads.....	41	06	24.6	84	29	44.6
T. 2 N., R. 3 E., southeast corner sec. 15, in southeast corner of field of Geo. Older, northeast corner of C. Stutsman's house bears S. 37° E., distant 188 feet; iron post stamped "Prim. Trav. Sta. No. 5, 1905".....	41	07	17.2	84	29	45.0
T. 2 N., R. 3 E., corner secs. 10, 11, 14, and 15, crossroads.....	41	08	09.4	84	29	44.6
T. 2 N., R. 3 E., corner secs. 2, 3, 10, and 11, crossroads.....	41	09	01.8	84	29	44.7
T. 2 N., R. 3 E., corner secs. 3, 4, 9, and 10, crossroads.....	41	09	01.3	84	30	54.6
T. 2 N., R. 3 E., north corner secs. 3 and 4, jog in road.....	41	09	54.6	84	30	54.9
T. 3 N., R. 3 E., corner secs. 27, 28, 33, and 34, crossroads.....	41	10	47.1	84	30	52.3
T. 3 N., R. 3 E., corner secs. 26, 27, 34, and 35, crossroads.....	41	10	47.6	84	29	42.4
T. 3 N., R. 3 E., corner secs. 22, 23, 26, and 27, center of bridge over canal.....	41	11	39.4	84	29	42.6
Sixmile Creek, center of bridge over.....	41	12	27.7	84	29	43.1
T. 3 N., R. 3 E., east corner secs. 10 and 15, T road west.....	41	13	24.6	84	29	43.7
T. 3 N., R. 3 E., corner secs. 2, 3, 10, and 11, crossroads.....	41	14	17.0	84	29	44.7
T. 3 N., R. 3 E., 30 feet west and 30 feet south of quarter corner between secs. 2 and 3, in northeast corner of field owned by Saul Meyer & Co., south rail of Wabash R. R. at section line crossing bears N. 19° E., distant 70 feet; iron post stamped "Prim. Trav. Sta. No. 6, 1905"....	41	14	42.9	84	29	45.5

COSHOCKTON QUADRANGLE (COSHOCKTON COUNTY).

*Magnetic declination, south border, 0° 34' east.**Geographic positions along highways.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Guidepost "Coshockton 7 miles," road south, 60 feet southeast to guidepost, 24 feet northeast to cross on corner of rail fence.....	40	15	10.8	81	59	07.4
Center of Sixmile bridge at crossroads.....	40	15	03.7	81	57	40.7
Pleasant Hill Church, 1 mile east of, road to southwest, 42 feet southwest to A. C. Warren's mail box, 28 feet northwest to peach tree....	40	15	01.2	81	56	12.2
Coshockton, 3.5 miles west of, just northwest of Joseph Kirker's residence, T road north, 21 feet southeast to cross on fence post, 21 feet west to cross on rail fence.....	40	15	47.7	81	55	07.8
Junction of Mount Vernon and Tyrone roads, 300 feet south of, center of iron bridge over creek.....	40	16	18.6	81	53	31.2
Roscoe, center of bridge over Ohio Canal.....	40	16	45.2	81	52	33.0
Coshockton, in southeast corner of Coshockton County court-house, aluminum tablet stamped "Prim. Trav. Sta. No. 57, 1905".....	40	16	28.0	81	51	57.4

Geographic positions along Pennsylvania Railroad.

Station.	Latitude.	Longitude.
Milepost 71, 0.25 mile west of, road crossing, siding on south of main track.....	° ' " 40 17 17.2	° ' " 81 50 08.3
Milepost 72, just west of, private-road crossing, north track of main line.....	40 17 03.7	81 48 52.3
Morgan Run station, crossing of Pennsylvania and Wheeling and Lake Erie R. Rs.....	40 16 52.5	81 47 44.8
West Lafayette, 1 mile west of, overhead road crossing, south track.....	40 16 42.7	81 46 07.4

CUMBERLAND QUADRANGLE (MORGAN COUNTY).

Magnetic declination, south border, 2° 21' west; west border, 1° 38' west.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Morgan County, at northeast corner of, stone corner on west side of road opposite cemetery and about 2 feet from corner of rail fence.....	° ' " 39 45 09.8	° ' " 81 38 24.5
Renrock, crossroads, 90 feet east to center of covered bridge, 27 feet south to center of culvert.....	39 45 28.8	81 40 20.4
Dickerson's mill, just east of, T road north, 24 feet northwest to cross on gatepost, 19 feet northeast to corner of rail fence.....	39 45 49.6	81 41 28.2
Oak Grove cemetery, on east side of, at rail fence, stone, Muskingum-Margrove county line.....	39 45 22.5	81 42 55.6
Knight, on Knight-Young Hickory road, 1 mile northwest of, J. H. Dingley's mail box.....	39 46 13.2	81 44 03.0
Young Hickory, T road east, 22 feet north to public mail box, 18 feet southeast to arrow on fence.....	39 46 46.0	81 44 57.9

DEFIANCE QUADRANGLE (DEFIANCE COUNTY).

Geographic positions along Wabash and Baltimore and Ohio Railroads near south border of quadrangle.

Station.	Latitude.	Longitude.
Ashwood, 1 mile west of station, road crossing north and south (section line).....	° ' " 41 15 02.6	° ' " 84 28 34.5
Ashwood, road crossing at station.....	41 15 21.0	84 27 25.1
Ashwood, 1 mile east of, road crossing north and south (section line).....	41 15 39.2	84 26 16.5
Defiance Junction, crossing of Wabash and Baltimore and Ohio R. Rs. Defiance, in water table at southwest corner of Defiance County jail.....	41 16 39.0	84 22 43.4
aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1905".....	41 17 11.3	84 21 38.9
Defiance, in southeast part of, Ottawa avenue, crossing of Baltimore and Ohio Southwestern R. R.....	41 16 46.8	84 21 03.4
Midway, 1,300 feet east of telegraph office, road crossing north and south.....	41 16 45.5	84 18 49.7
Midway, overhead crossing 1.25 miles east of.....	41 16 44.8	84 17 41.0
Milepost 82, north-south section line, road crossing 150 feet west of.....	41 16 29.2	84 15 57.1
T. 3 N., R. 3 E., secs. 2 and 3, T road south at north corner of.....	41 15 10.7	84 29 45.7
T road east.....	41 16 03.1	84 29 45.0
The Bend, north-south road crossing Baltimore and Ohio R. R. 1 mile east of.....	41 16 58.2	84 29 33.8

DESHLER QUADRANGLE (HENRY AND WOOD COUNTIES).

Geographic positions along highways on north border of quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 3 N., R. 8 E., northwest corner of sec. 7, in northwest corner of field, iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	41	14	21.9	83	59	50.9
T. 3 N., R. 8 E., corner secs. 5, 6, 7, and 8, crossroads, 48 feet north to center of bridge over ditch.....	41	14	22.7	83	58	41.8
T. 3 N., R. 8 E., secs. 4, 5, 8, and 9, crossroads.....	41	14	23.0	83	57	32.7
T. 3 N., R. 8 E., west corner secs. 3 and 10, T road east at schoolhouse, stone.....	41	14	23.6	83	56	23.3
T. 3 N., R. 8 E., corner secs. 2, 3, 10, and 11, crossroads at, 25 feet west to center of bridge.....	41	14	24.4	83	55	13.8
T. 3 N., R. 8 E., corner secs. 1, 2, 11, and 12, 28 feet northwest to John Sher's mail box, 30 feet southwest to end of iron bridge.....	41	14	25.1	83	54	04.4
T. 3 N., R. 9 E., west corner secs. 6 and 7, T road east, 15 feet northwest to small coffee-bean tree, Henry-Wood county line, 27 feet northeast to cross on telephone pole.....	41	14	25.6	83	52	55.9
T. 3 N., R. 9 E., northwest corner sec. 8, in field of Mrs. Rush, southwest corner of schoolhouse bears N. 15° 30' E., distant 80.8 feet; cross cut on abutment of bridge bears N. 66° 20' W., distant 16.8 feet; iron post stamped "Prim. Trav. Sta. No. 12, 1905".....	41	14	26.1	83	51	43.0
T. 3 N., R. 9 E., corner secs. 4, 5, 8, and 9, 15 feet south to center of bridge over ditch, 12 feet north to crossroads.....	41	14	26.4	83	50	33.0
T. 3 N., R. 9 E., corner secs. 3, 4, 9, and 10, T road west at stone to (church and schoolhouse), 50 feet south to center of bridge over ditch.....	41	14	26.2	83	49	24.4
T. 3 N., R. 9 E., corner secs. 2, 3, 10, and 11, crossroads at stone to.....	41	14	25.8	83	48	14.6
T. 3 N., R. 9 E., east corner to secs. 2 and 11, crossroads at schoolhouse No. 1, stone.....	41	14	24.9	83	47	07.2
T. 3 N., Rs. 9 and 10 E., corner secs. 1, 6, 7, and 12, crossroads, 21 feet south to center of bridge, 21 feet southeast to Mrs. F. A. Lovell's mail box.....	41	14	26.9	83	45	57.4
T. 3 N., R. 10 E., northeast corner sec. 7, at crossroads at schoolhouse No. 2, cross cut in southwest corner of large stone culvert bears N. 11° E., distant 17.6 feet; southwest corner of schoolhouse bears N. 48° E., distant 126 feet; iron post stamped "Prim. Trav. Sta. No. 13, 1905".....	41	14	26.1	83	44	46.5

EDON QUADRANGLE (WILLIAMS COUNTY).

Geographic positions along highways near Ohio-Indiana State line.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Ts. 6 and 7 N., R. 1 E., west corner secs. 6 and 31, T road east.....	41	30	45.6	84	48	14.6
T. 7 N., R. 1 E., stone at corner secs. 30 and 31.....	41	31	38.0	84	48	15.1
T. 7 N., R. 1 E., west corner secs. 19 and 30, T road east.....	41	32	29.9	84	48	15.7
Edon, crossing of Wabash R. R. and Ohio-Indiana State line 2 miles west of.....	41	32	53.9	84	48	16.0
T. 7 N., R. 1 E., secs. 7 and 18, crossroads at west corner.....	41	34	13.9	84	48	17.3
T. 7 N., R. 1 E., west corner secs. 6 and 7, T road east.....	41	35	06.2	84	48	18.0
T. 8 N., R. 1 E., secs. 30 and 31, west corner, T road south.....	41	36	46.6	84	48	19.2
Columbia, crossroads.....	41	37	58.0	84	47	18.6
Columbia, road west 1.5 miles north of.....	41	39	10.8	84	47	36.3
Store, T road east just south of, 0.33 mile north of schoolhouse, 33 feet southeast to mail box, 44 feet northeast to apple tree.....	41	40	15.6	84	47	44.2
Ohio-Indiana State line, T road east, 1.25 miles south of northwest corner of Ohio.....	41	40	41.2	84	48	20.4
T road east.....	41	41	34.1	84	48	20.2
Ohio-Indiana-Michigan, corner of.....	41	41	45.5	84	48	20.2
T. 9 S., R. 4 W., corner secs. 8, 9, 16, and 17, T road north.....	41	41	34.7	84	47	10.0
T. 9 S., R. 4 W., corner secs. 9, 10, 15, and 16, T road north.....	41	41	35.6	84	46	00.3

FRAZEYSBURG QUADRANGLE (COSHOCTON, LICKING, AND MUSKINGUM COUNTIES).

Magnetic declination, west border, 3° 08' west; north border, 0° 46' west.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Fallsburg, road west at hotel, 42 feet northwest to cross on telegraph pole, 58 feet southeast to stone step to store.....	40 12 16.6	82 14 18.0
Secs. 12 and 13, quarter corner between.....	40 12 47.2	82 13 58.9
Wakaton Creek, just east of Eli Frey's residence, east end of covered bridge over.....	40 13 15.1	82 13 16.8
Trampton, at schoolhouse, corner stone to secs. 1, 2, 9, and 10.....	40 13 37.8	82 12 11.9
Trampton, 1 mile east of, at Licking-Coshocton county line, T road south, forked post.....	40 13 40.6	82 11 01.7
Crossroads, guidepost at ("Bladensburg 8 mi.").....	40 13 47.0	82 09 54.8
French Melick's residence, road north at, cross on telegraph pole.....	40 14 13.5	82 09 21.8
West Carlisle, 1.3 miles west of, road south, 15 feet to cross on fence post, 33 feet west to cross on telegraph pole.....	40 14 10.6	82 08 26.3
West Carlisle, in southwest corner of lot of H. M. Robinson; northwest corner of Presbyterian Church bears S. 1° 30' E., distant 123 feet; nail in east face of locust tree bears N. 83° W., distant 46.2 feet; iron post stamped "Prim. Trav. Sta. No. 55, 1905".....	40 13 43.7	82 07 00.0
Cooperdale, 1.66 miles west of, forks of road, 36 feet southwest to cross on fence post, 35 feet southeast to cross on corner of rail fence.....	40 13 52.4	82 05 50.6

Geographic positions along Cleveland, Akron and Columbus Railway, Cooperdale to Tunnel Hill.

Station.	Latitude.	Longitude.
Cooperdale, 0.33 mile north of, road crossing.....	40 13 22.6	82 04 05.3
Tunnel Hill, 1.75 miles south of, east-west road crossing.....	40 14 00.2	82 03 48.4
Tunnel Hill, 0.75 mile south of, northwest-southeast road crossing.....	40 14 47.0	82 03 13.9
Tunnel Hill, road crossing.....	40 15 17.4	82 02 56.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
Tunnel Hill, 1.5 miles east of, T road north, 27 feet due south to cross on fence post.....	40 15 29.1	82 01 30.1
Tunnel Hill, 2 miles east of, near northwest corner of field of Wm. L. Wright; northeast corner of Wright's house bears S. 14° W., distant 87 feet; iron post stamped "Prim. Trav. Sta. No. 56, 1905".....	40 15 18.9	82 00 32.8

Geographic positions along Baltimore and Ohio Railroad, Pleasant Valley to milepost 85.

Station.	Latitude.	Longitude.
Pleasant Valley, 1.5 miles southeast of, opposite milepost 86, center of track.....	40 00 09.7	82 06 54.4
Milepost 85, 275 feet east of, private road crossing.....	40 00 02.6	82 05 48.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
Reform, 1.5 miles south of, T road east at H. L. Smith's residence, 36 feet southeast to cross on gatepost, 45 feet southwest to H. L. Smith's mail box.....	40 06 47.1	82 14 49.5
Hanover, 1 mile northeast of, five corners, 24 feet southeast to cross on corner fence post, 32 feet east to cross on picket at corner of fence....	40 05 34.5	82 14 53.7

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Geographic positions along Wheeling and Lake Erie and Cincinnati and Muskingum Valley railroads near Dresden.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wheeling and Lake Erie R. R. milepost 11, center of track opposite...	40 04 40.8	82 00 01.1
Dresden, 2 miles south of, milepost 4, just north of, east-west road crossing of Cincinnati and Muskingum Valley R. R.	40 05 41.5	82 01 02.0
Milepost 3, 500 feet north of, east-west road crossing.	40 06 33.5	82 00 42.8
Dresden, near northwest corner of public school grounds; northwest corner of schoolhouse bears N. 80° E., distant 137.3 feet; nail in root of maple tree bears S. 30° 30' E., distant 13 feet; iron post stamped "Prim. Trav. Sta. No. 54, 1905".....	40 07 17.8	82 00 49.8
Canal, road crossing under railroad bridge.....	40 07 57.6	82 01 02.4

Geographic positions along Cleveland, Akron and Columbus Railway, Trinway to Wakatomika.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Trinway station, just west of, crossing of Cleveland, Akron and Columbus and Pennsylvania R. Rs., main line, north track.....	40 08 36.3	82 00 54.4
Trinway, 2 miles north of, northwest-southeast road crossing, at covered bridge.....	40 10 16.3	82 01 48.8
Wakatomika, 0.75 mile south of, east-west road crossing.....	40 11 19.2	82 02 19.7
Wakatomika, 0.5 mile north of, road crossing.....	40 12 06.2	82 03 04.6
East-west road crossing.....	40 12 45.1	82 03 36.5

GRANVILLE QUADRANGLE (LICKING COUNTY).

Magnetic declination, east border, 0° 44' west; north border, 0° 36' west.

Geographic positions along highways, Croton to Homer.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Croton, 2.5 miles west and 0.5 mile south of, at crossroads at Wm. Farel's residence, in southeast corner of James Wilson's farm; nail in east face of cherry tree bears S. 89° W., distant 20 feet; iron post stamped "Prim. Trav. Sta. No. 40, 1905".....	40 13 57.1	82 44 18.0
Croton, 1.25 miles west of, T road east, 36 feet southeast to cross on fence post, 27 feet northeast to Green's mail box.....	40 14 21.5	82 42 49.5
Croton, Delanon street crossing of railroad.....	40 14 20.7	82 41 20.1
Croton, 1 mile east of, T road north, 13 feet due south to cross board at west of wire fence.....	40 14 27.9	82 39 52.4
Bennington Township House, 1.66 miles west of, crossroads 300 feet south of schoolhouse, 21 feet northeast to B. E. Nash's mail box, 36 feet southeast to cross on corner fence post.....	40 14 22.5	82 38 26.4
Lock, 2 miles south of, Bennington Township House, at northwest corner of; nail in west oak bears S. 60° 45' W., distant 19.8 feet; northwest corner foundation of house bears S. 80° 30' E., distant 3.5 feet; iron post stamped "Prim. Trav. Sta. No. 39, 1905".....	40 14 22.8	82 36 22.1
Bennington Township House, 1 mile east of, covered bridge over Otter Creek North, center of.....	40 14 40.5	82 35 14.3
Crossroads, 1,500 feet east of, Otter Creek East, center of iron bridge over.....	40 14 48.8	82 34 16.3
Homer, 1.66 miles west of, T road south, 42 feet southeast to cross on corner fence post, 40 feet southwest to hickory tree.....	40 15 25.5	82 33 17.2
Otter Creek East, center of covered bridge over.....	40 15 11.0	82 32 20.4
Homer, in northwest part of public school grounds; northwest corner of schoolhouse foundation bears S. 3° 45' W., distant 78 feet; iron pump bears S. 70° W., distant 11.3 feet; iron post stamped "Prim. Trav. Sta. No. 38, 1905".....	40 15 09.60	82 31 20.62

Geographic positions along Baltimore and Ohio Railroad, Summit to Union.

Station.	Latitude.	Longitude.
Summit station, 1 mile north of, in northwest corner of small lot owned by W. S. Griffith, lot situated just south of east-west section line, on east side of north-south road, iron post stamped "Prim. Trav. Sta. No. 34, 1905"	° ' "	° ' "
Milepost 24, private-road crossing, south track	40 00 44.6	82 45 03.4
Union station, 1.5 miles west of, east-west road crossing	40 00 08.3	82 33 26.6
Union station, 0.75 mile west of, crossroads, in southeast corner of Ira Showman's field; crosscut on stone abutment to bridge bears S. 9° 15' E., distant 47.6 feet; iron post stamped "Prim. Trav. Sta. No. 36, 1905"	40 01 15.6	82 31 29.2
Union station, 0.5 mile east of, north-south gravel-road crossing	40 01 22.8	82 30 22.5

Geographic positions along highways, Granville to Union schoolhouse.

Station.	Latitude.	Longitude.
Granville, 1 mile south of, T road to west at schoolhouse, 19 feet north-east to cross on corner of fence, 7 feet south to end of culvert	° ' "	° ' "
Granville station, north-south street crossing, Toledo and Ohio Central Rwy.	40 02 53.3	82 31 25.2
Granville station, 0.75 mile north of, T road west, 35 feet northwest to north end of culvert, 46 feet south to cross on telegraph pole	40 03 51.7	82 31 14.8
Schoolhouse No. 8, 1891, 0.5 mile north of, T road east, 30 feet southeast to corner of garden fence, 28 feet northeast to cross on telegraph pole	40 04 39.1	82 31 18.2
Brushy Creek, south end of iron bridge over	40 06 34.7	82 31 08.0
Fredonia, schoolhouse yard, in west part of, northwest corner of; foundation of schoolhouse bears S. 72° 30' E., distant 122.6 feet; southeast foundation to Willard's store bears N. 46° 30' W., distant 94.5 feet; iron post stamped "Prim. Trav. Sta. No. 37, 1905"	40 07 24.5	82 31 04.5
Highwater, crossroads, 63 feet south to northwest corner of store porch, 31 feet southwest to guidepost	40 09 08.6	82 31 12.5
Highwater, 1 mile north of, crossroads, 27 feet north to cross on corner of board fence, 60 feet north to J. F. Riley's mail box	40 10 34.4	82 31 10.7
Union schoolhouse, 0.5 mile south of, T road west, 16 feet due west to W. F. Wagoner's mail box	40 11 22.3	82 31 05.2
Union schoolhouse, 0.5 mile south of, T road west, 16 feet due west to W. F. Wagoner's mail box	40 12 42.3	82 31 10.8
Union schoolhouse, 0.5 mile north of, crossroads, post	40 13 37.4	82 31 13.6

LOGAN QUADRANGLE (PERRY COUNTY).

Geographic positions along Cincinnati and Muskingum Valley Railroad near Junction City.

Station.	Latitude.	Longitude.
Milepost 42, 0.33 mile east of, road crossing	° ' "	° ' "
Junction City, near Stalzenbach & Harris's store, on north line between Cincinnati and Muskingum Valley Railroad and property of Junction City; southwest corner of store bears N. 26° 50' W., distant 78.9 feet; north rail of track at road crossing bears S. 43° 45' W., distant 53 feet; iron post stamped "Prim. Trav. Sta. No. 66, 1905"	39 43 23.5	82 16 43.8
Milepost 13, road crossing	39 43 13.4	82 17 57.0
McElroys, 1 mile south of, road crossing at spur	39 43 24.6	82 20 00.6
McElroys station, road crossing	39 44 00.8	82 20 19.3
	39 44 57.3	82 19 53.2

M'CLURE QUADRANGLE (HENRY AND WOOD COUNTIES).

Geographic positions along highways near north border of quadrangle.

Station.	Latitude.	Longitude.
Whitehouse, 1.5 miles south of, crossroads and schoolhouse, 4 miles east of Neapolis, 44 feet northeast to school pump, 33 feet northwest to guidepost.....	° ' " 41 29 43.1	° ' " 83 48 26.6
Neapolis, 2.25 miles east of, crossroads, 32 feet southwest to Geo. Rapp's mail box, 23 feet northwest to northeast corner stone of culvert.....	41 29 42.6	83 49 36.0
Crossroads at schoolhouse, 28 feet northwest to cross on corner fence post, 39 feet southwest to S. Jewell's mail box.....	41 29 42.0	83 50 44.6
Neapolis, road crossing.....	41 29 32.9	83 52 23.9
T. 6 N., R. 8 E., sec. 12, southeast corner of, in southeast corner of field of Mary A. Long, iron post stamped "Prim. Trav. Sta. No. 30, 1905".....	41 29 14.5	83 52 58.4
T. 6 N., R. 8 E., corner secs. 11, 12, 13, and 14, stone at crossroads.....	41 29 13.1	83 54 08.6
T. 6 N., R. 8 E., corner secs. 10, 11, 14, and 15, crossroads, 29 feet northwest to H. Leneman's mail box, 36 feet southwest to board on small tree.....	41 29 13.1	83 55 18.1
T. 6 N., R. 8 E., corner secs. 9, 10, 15, and 16, stone at crossroads.....	41 29 12.9	83 56 27.8
T road north, T. 6 N., R. 8 E., corner secs. 8, 9, 16, and 17, 22 feet southeast to F. C. March's mail box, 24 feet south to cross on fence post.....	41 29 12.5	83 57 37.6
T. 6 N., R. 8 E., corner secs. 7, 8, 17, and 18, crossroads, 36 feet northwest to mail box, 31 feet southwest to cross on telephone pole.....	41 29 12.1	83 58 47.0

MONTPELIER QUADRANGLE (WILLIAMS COUNTY).

Geographic positions along highways near Ohio-Michigan State line.

Station.	Latitude.	Longitude.
T. 9 S., R. 2 W., corner secs. 10, 11, 14, and 15, T road north.....	° ' " 41 41 40.6	° ' " 84 30 51.2
T. 9 S., R. 2 W., corner secs. 9, 10, 15, and 16, T road east.....	41 41 40.3	84 32 00.5
Ohio-Michigan State line, center of north-south road.....	41 42 09.0	84 32 00.8
Pioneer, T road west, 1 mile east of, 30 feet northwest to cross cut on corner fence post, 42 feet southwest to cross cut on telephone pole ..	41 40 47.7	84 32 07.8
Pioneer, northeast corner of bridge at crossing of main streets.....	41 40 47.2	84 33 10.8
T. 9 S., R. 2 W., corner secs. 17, 18, 19, and 20, crossroads.....	41 40 47.6	84 34 20.2
T. 9 S., R. 2 W., west corner secs. 18 and 19, T road east.....	41 40 47.3	84 35 30.9
T. 9 S., R. 3 W., corner secs. 13, 14, 23, and 24, crossroads.....	41 40 46.9	84 36 40.9
T. 9 S., R. 3 W., corner secs. 14, 15, 22, and 23, at Bethel Church, crossroads.....	41 40 46.5	84 37 50.2
T. 9 S., R. 3 W., southeast corner sec. 10, 4 miles west and 1 mile north of Pioneer, in southeast corner of Osborne's farm, iron post stamped "Prim. Trav. Sta. No. 18, 1905".....	41 41 39.0	84 37 50.6
Ohio-Michigan State line, T. 9 S., R. 3 W., 349 feet south of quarter corner between secs. 10 and 11.....	41 42 01.5	84 37 50.5
T. 9 S., R. 3 W., corner secs. 9, 10, 15, and 16, T road north.....	41 41 38.5	84 39 00.6
T. 9 S., R. 3 W., corner secs. 8, 9, 16, and 17, crossroads.....	41 41 38.1	84 40 10.7
T. 9 S., R. 3 W., north corner secs. 17 and 18, T road south.....	41 41 37.7	84 41 20.6
Northwest Church, T road north.....	41 41 36.3	84 43 04.8
In southeast corner of field owned by F. M. Husghy, iron post stamped "Prim. Trav. Sta. No. 19, 1905".....	41 41 36.4	84 44 50.0
Ohio-Michigan State line, center of north-south road, 3 feet south of southwest gatepost.....	41 41 50.6	84 44 49.8

Geographic positions along highways near west border of qua drangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 9 S., R. 4 W., corner secs. 14, 15, 22, and 23, crossroads.....	41 40 43.6	84 44 49.8
T. 9 S., R. 4 W., corner secs. 22, 23, 26, and 27, T road west.....	41 39 51.2	84 44 49.8
T. 9 S., R. 4 W., corner secs. 26, 27, 34, and 35, T road west.....	41 38 58.8	84 44 48.9
Tps. 9 and 10 S., R. 4 W., corner secs. 2, 3, 34, and 35, center of north-south road crossing at corner.....	41 38 06.4	84 44 47.8
T. 10 S., R. 4 W., south corner secs. 2 and 3, T road north.....	41 37 14.4	84 44 46.9
T. 8 N., R. 1 E., south corner secs. 33 and 34, crossroads.....	41 36 06.8	84 44 58.1
T. 7 N., R. 1 E., southwest corner sec. 3, in southwest corner of John Fox's garden; southwest corner of schoolhouse bears N. 79° 40' W., distant 190.7 feet; southwest corner of section 3 bears S. 48° W., distant 30.7 feet; iron post stamped "Prim. Trav. Sta. No. 20, 1905".....	41 35 06.7	84 44 57.4
T. 7 N., R. 1 E., corner secs. 9, 10, 15, and 16, crossroads.....	41 34 14.2	84 44 57.6
T. 7 N., R. 1 E., corner secs. 15, 16, 21, and 22, crossroads.....	41 33 22.2	84 44 57.6
T. 7 N., R. 1 E., corner secs. 21, 22, 27, and 28, crossroads.....	41 32 30.2	84 44 57.4
T. 7 N., R. 1 E., corner secs. 27, 28, 33, and 34, crossroads.....	41 31 38.2	84 44 57.1
Tps. 6 and 7 N., R. 1 E., corner secs. 3, 4, 33, and 34, stone.....	41 30 46.2	84 44 56.7

NEWARK QUADRANGLE (LICKING COUNTY).

Magnetic declination, west border, 0° 36' west; north border, 2° 31' west; east border, 3° 08' west; south border, 1° 05' west.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Homer, 1.33 miles southeast of, large sugar maple in center of road....	40 14 39.2	82 29 22.5
Road southwest, 24 feet south to cross on black oak.....	40 13 55.7	82 28 00.0
Utica, in southeast part, east-west road crossing Baltimore and Ohio R. R.....	40 13 57.2	82 26 52.4
Licking-Knox county line, road west, 27 feet northwest to cross on gatepost, 27 feet southeast to cross on rail fence.....	40 14 35.8	82 25 04.2
Bell Church, 0.5 mile west of, T road north, 28 feet northwest to telephone pole, 22 feet southwest to cross on fence post.....	40 14 32.4	82 23 44.6
Martinsburg, 1.5 miles south of, at crossroads, in northeast corner of field of W. P. Harrison, iron post stamped "Prim. Trav. Sta. No. 41, 1905".....	40 14 53.7	82 21 36.2
Martinsburg, about 2 miles southeast of, crossroads, 10 feet southeast to gum tree, 21 feet northeast to mail box.....	40 14 50.8	82 20 18.1
County line, 0.5 mile north of, crossing of east-west and northwest-southeast roads, 38 feet north to large white oak, 38 feet northeast to cross on fence post.....	40 14 49.6	82 19 14.8
County line, 0.5 mile north of, at A. J. Blount's farm, T road west, 29 feet northeast to cross on fence post, 30 feet southeast to cross on telegraph pole.....	40 14 48.6	82 17 06.4
Henpeck Corners, crossroads, 28 feet southeast to guidepost, 27 feet northwest to Benbow Simpkins's mail box.....	40 14 02.2	82 16 52.7
Henpeck Corners, 1 mile southeast of, 2 miles northwest of Fallsburg, just north of schoolhouse, in southeast corner of W. H. Kidd's farm, at T road northeast, iron post stamped "Prim. Trav. Sta. No. 42, 1905".....	40 13 44.4	82 16 03.7
Fallsburg, 1 mile northwest of, T road east, scales, 200 feet north of, 16 feet east to Matt Frost's mail box.....	40 12 51.1	82 15 26.8
Corner secs. 14, 15, 16, and 17, cross on top of stone.....	40 11 56.0	82 15 46.1

Geographic positions along Toledo and Ohio Central Railway near Central City.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 28, 240 feet east of, east-west gravel-road crossing, north track.	40	01	43.1	82	29	25.1
Central City, 0.75 mile south of, 105 feet north of milepost 14, east-west gravel-road crossing.	40	01	30.2	82	28	26.9
Milepost 13, just north of, private-road crossing.	40	00	38.5	82	28	38.8

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Fulton schoolhouse, 0.25 mile east of, T road north, 22 feet south to cross on red gate.	40	01	21.5	82	26	41.7
Lloyds Corners, 1 mile west of, T road south, 21 feet east to east end of tile culvert, 19 feet southwest to west end of same.	40	00	54.1	82	25	24.5
Newark, about 3 miles south of, at Lloyds Corners, crossroads, 13 feet southeast to ring on telephone pole, 31 feet northeast to cross on picket fence.	40	00	49.7	82	24	14.0
Lutheran Church, 1 mile northwest of, at top of hill, T road west, point on intersection.	40	00	48.7	82	22	54.6
Newark, 4.5 miles southeast of, in Lutheran school grounds, southeast corner of schoolhouse foundation bears N. 25° 15' W., distant 11.9 feet; northwest corner of Lutheran Church foundation bears S. 37° 30' W., distant 67.6 feet; iron post stamped "Prim. Trav. Sta. No. 45, 1905"	40	00	16.6	82	22	04.8
Fry (John) farm, at southwest corner of, crossroads, 30 feet northeast to cross on post at south end of wire fence, 46 feet northwest to T. J. Moore's mail box.	40	00	00.8	82	21	01.3
Sigler (R. S.) residence, T road south, 10 feet northeast to mail box, 30 feet southwest to guidepost.	40	00	50.3	82	19	58.7
T. 1 N., R. 11 W., stone at corner secs. 1, 2, 9, and 10.	40	00	46.1	82	18	34.3
Boodle schoolhouse, 1.33 miles southeast of, road south, 13 feet north to cross on gatepost, 36 feet southwest to mail box.	40	00	04.8	82	16	57.9
Clay Lick, about 4 miles south of, in south part of grounds of Boodle schoolhouse, southwest corner of schoolhouse foundation bears N. 9° 15' E., distant 57 feet, nail in root of maple tree bears N. 84° 30' E., distant 60.1 feet; iron post stamped "Prim. Trav. Sta. No. 44, 1905"	40	00	58.7	82	17	23.4
Boodle schoolhouse, about 1.38 miles southeast of, road to south, 13 feet north to cross on gate-post, 36 feet southwest to mail box.	40	00	04.8	82	16	57.9
Scott (G. W.) residence, intersection of roads, mail box.	40	10	38.4	82	16	03.0
Sawmill, 900 feet north of, T road to west, on top of hill, 30 feet northwest to mail box.	40	10	01.2	82	15	29.1
Reform, 0.66 mile northwest of, crossroads, 25 feet northeast to F. Priest's mail box, 29 feet northwest to cross on corner fence post.	40	08	53.1	82	15	14.3
Reform crossroads, 21 feet southeast to R. S. Paine's mail box, 30 feet northeast to willow tree.	40	08	16.6	82	15	02.0
Reform, 0.75 mile south of, in southwest corner of field of John W. Gardner, opposite Methodist Church, iron post stamped "Prim. Trav. Sta. No. 43, 1905"	40	07	34.0	82	15	05.0
Hanover, in northwest part of, road crossing under Pennsylvania R. R. center of.	40	04	34.2	82	15	47.2
Hanover Electric R. R. station, road crossing, Newark and Zanesville Electric R. R.	40	03	53.4	82	16	03.6
Clay Lick, 0.5 mile north of, just south of electric railroad station, old Ohio Canal, center of bridge over.	40	03	54.0	82	17	27.7
Clay Lick, 1 mile south of, T road west.	40	02	52.7	82	17	29.2
Clay Lick, 2 miles south of, road to southwest at Jonathan Intow's residence, 12 feet southwest to J. R. Shepherd's mail box.	40	01	36.1	82	17	38.1

NEW COMERSTOWN QUADRANGLE (COSHOCTON AND GUERNSEY COUNTIES).

Magnetic declination, south border, 1° 57' west.

Geographic positions along Pennsylvania Railroad between West Lafayette and Isleta.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
West Lafayette, 1 mile south of, T road east, 24 feet east to guidepost, "Plainfield 5 miles," 38 feet southeast to cross on corner fence post.	40	15	29.8	81	44	27.6
West Lafayette, at northwest corner of public school grounds, northwest corner of schoolhouse bears S. 16° 15' E., distant 256.6 feet; iron post stamped "Prim. Trav. Sta. No. 58, 1905"	40	16	33.3	81	44	50.2
Milepost 77, 300 feet east of, road crossing, north track.	40	16	24.3	81	43	04.4
Milepost 78, 700 feet east of, north-south road crossing, south track.	40	16	18.5	81	41	51.8
Isleta station, road crossing, south track.	40	16	18.3	81	40	24.8

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Isleta, 1 mile southeast of, forks of road, 30 feet north to cross on board fence, 75 feet southeast to cross on telegraph pole.....	40 15 50.2	81 39 25.50
Top of hill, Y road at, 27 feet northeast to guidepost, " Coshocton 13 mi." 21 feet west to mound.....	40 14 53.8	81 37 59.50
Widder triangulation station, on land of Chas. Widder, 2.5 miles nearly south of New Comerstown, 50 feet west of north-south road, 0.5 mile west of Baptist Church, and 600 feet southwest of White schoolhouse. Station mark: A sandstone post 36 by 6 by 6 inches, set 63 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet (Ohio).....	40 14 09.67	81 36 54.11

NEW LEXINGTON QUADRANGLES (MORGAN AND PERRY COUNTIES).

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dovertown, cross streets, 48 feet northwest to southeast corner of post-office, 48 feet southwest to northeast corner of store at pump.....	39 44 03.1	82 02 16.7
T. 14 S., R. 14 W., north corner secs. 34 and 35.....	39 44 28.2	82 03 37.0
Dovertown station, road crossing Zanesville and Western Rwy.....	39 44 20.6	82 04 36.0
Stringtown crossroads, guidepost.....	39 44 39.5	82 05 18.1

Geographic positions along Cincinnati and Muskingum Valley Railroad between McLuney and New Lexington.

Station.	Latitude.	Longitude.
	° ' "	° ' "
McLuney, near station, on land of Charles Myers, southeast corner of station bears S. 71° W., distant 71.5 feet; northwest corner of store bears S. 81° 40' E., distant 10 feet; iron post stamped " Prim. Trav. Sta. No. 65, 1905".....	39 44 26.2	82 06 27.8
Lyondale station, road crossing.....	39 43 54.8	82 08 13.8
Milepost 35, 0.5 mile west of, north-south road crossing.....	39 43 29.1	82 09 47.6
Wilburn station, road crossing.....	39 43 26.7	82 10 38.1
New Lexington, 1 mile northeast of, north-south road crossing.....	39 43 16.0	82 11 45.6
New Lexington station, center of track opposite.....	39 43 08.7	82 13 00.0
Milepost 40, 900 feet west of, road crossing.....	39 43 20.9	82 14 35.7

OTTAWA QUADRANGLE (HENRY COUNTY).

Geographic positions along Baltimore and Ohio Southwestern Railroad between Holgate and Hamler.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Holgate, crossing of Baltimore and Ohio Southwestern R. R. and Clover Leaf Route.....	41 14 53.9	84 07 40.5
Holgate, 1 mile east of, in northwest corner of field at T road south, T. 3 N., R. 7 E., west quarter corner to sec. 6 is 30 feet west and 35 feet north of station; iron post stamped " Prim. Trav. Sta. No. 10, 1905".....	41 14 46.0	84 06 47.7
Holgate, 2 miles east of, road crossing north and south.....	41 14 30.0	84 05 34.6
Hamler, 2.5 miles west of, section line, road crossing north and south, T. 3 N., R. 7 E., corner secs. 4, 5, 8, and 9, stone at crossroads.....	41 14 17.4	84 04 28.8
Hamler, 1.25 miles west of, road crossing north and south.....	41 14 04.1	84 03 18.9
Hamler, crossing of Baltimore and Ohio Southwestern and Detroit, Toledo and Ironton R. Rs.....	41 13 46.7	84 01 47.4
Road crossing northeast and southwest (south track).....	41 13 31.1	84 00 25.4
T. 3 N., R. 8 E., sec. 7, northwest corner, iron post stamped " Prim. Trav. Sta. No. 11, 1905".....	41 14 21.9	84 59 50.9

82 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

PAULDING QUADRANGLE (PAULDING COUNTY).

Geographic positions along highways near north border of quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Section line, road crossing north and south.....	41	14	25.1	84	30	54.9
T. 3 N., R. 3 E., corner secs. 4, 5, 8, and 9, crossroads.....	41	14	15.6	84	32	02.7
T. 3 N., R. 3 E., corner secs. 5, 6, 7, and 8, crossroads.....	41	14	14.7	84	33	11.5
T. 3 N., Rs. 2 and 3 E., corner secs. 1, 6, 7, and 12, crossing Cincinnati Northern R. R. just east of.....	41	14	14.7	84	34	08.5
T road south.....	41	13	53.7	84	34	56.2
Cecil, crossroads 1 mile north of.....	41	13	51.2	84	36	05.9
T. 3 N., R. 2 E., center sec. 2, T road west.....	41	14	40.4	84	36	04.7

PHILO QUADRANGLE (MORGAN AND MUSKINGUM COUNTIES).

Magnetic declination, north border, 1° 52' west; west border, 0° 51' west; south border, 1° 04' west, 1° 22' west; east border, 1° 15' west, 1° 38' west.

Geographic positions along Baltimore and Ohio Railroad between Zanesville and Norwich.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Zanesville, 2 miles north of, Zanesville and Gilbert road just west of, between Baltimore and Ohio and Cincinnati and Muskingum Valley R. Rs., in southeast corner of field of Mrs. Margaret Clark, in stone post 10 by 12 by 33 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 62, 1905".....	39	58	42.2	81	58	55.0
Block station, just west of, overhead crossing.....	39	58	40.7	81	56	31.0
Milepost 65, center of track opposite.....	39	58	35.6	81	55	06.4
Sonora station, just northeast of, just inside of railroad right of way, northwest corner of J. A. Rush's residence bears S. 40° 45' E., distant 25.5 feet; northeast corner of station bears S. 39° W., distant 87.8 feet; iron post stamped "Prim. Trav. Sta. No. 61, 1905".....	39	59	02.3	81	54	12.4
Milepost 67, road crossing.....	39	59	25.7	81	53	27.4
Milepost 69, 0.75 mile west of, road crossing, warning post on north side of track.....	39	58	51.3	81	52	17.2
Bridgeville, 1 mile west of, road crossing under culvert.....	39	58	34.1	81	51	07.2
Bridgeville station, center of track opposite.....	39	58	54.4	81	50	05.6
Norwich station, 1.25 miles west of, national road crossing.....	39	58	39.5	81	48	48.3
Sundale station, center of track opposite.....	39	58	35.3	81	47	36.9
Sundale station, 0.75 mile east of, on north side of Baltimore and Ohio R. R. at north-south road crossing, in southwest corner of field owned by W. E. Dingley, center of railroad at road crossing bears S. 12° 30' W., distant 48 feet; iron post stamped "Prim. Trav. Sta. No. 60, 1905".....	39	58	54.0	81	46	47.1
Norwich, 0.5 mile east of, crossing of national road and north-south road, 33 feet northwest to cross on telephone pole, 54 feet south to corner yard fence.....	39	59	14.9	81	46	54.4
Wheeling and Lake Erie R. R. milepost 4, 400 feet south of, private-road crossing.....	39	59	35.3	81	58	52.1

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Pleasant Valley schoolhouse, 0.75 mile south of, T road north, 6 feet south to south end of culvert, 39 feet northwest to mail box on fence.....	39	47	35.5	81	45	29.2
Pleasant Valley, 0.5 mile north of, T road east, 13 feet northeast to elm snag, 27 feet west to cross on fence post.....	39	48	53.8	81	45	13.6
Snowball schoolhouse, 0.33 mile southeast of T road southwest, 15 feet north to cross on large corner fence post, 28 feet southeast to west end of box culvert.....	39	49	32.6	81	45	14.2
Highhill post-office, just north of, T road east, 16 feet southwest to cross on corner of stable, 33 feet northeast to "MF" cut on stone-wall.....	39	50	00.8	81	46	04.4
Freeland, 1.5 miles south of, opposite Lee Warner's mail box, arrow painted on rail fence.....	39	51	33.4	81	46	16.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Freeland, in west corner of George Thorla's field, south rail of narrow-gage railroad bears N. 31° 45' W., distant 38 feet; south corner of station bears N. 57° E., distant 152.3 feet; in stone post 12 by 12 by 36 inches, marked "U. S. G. S., "stamped "Prim. Trav. Sta. No. 69"	39 52 51.2	81 46 31.7
Center of bridge.	39 53 43.9	81 45 34.0
Rich Hill, Methodist Church, T road southeast, 10 feet northwest to cross on telegraph pole, 28 feet southeast to guidepost ("Rexs Mill 1.5 mi.")	39 54 33.9	81 45 12.1
Rexs Mill, 0.25 mile southeast of, T road west, 32 feet west to cross on fence post, 27 feet southwest to cross on gate post.	39 55 19.0	81 44 20.5
Rexs Mill, 1 mile northwest of, crossroads, 21 feet northwest to Lee Davis's mail box, 22 feet northeast to cross on telegraph pole.	39 56 14.0	81 45 14.0
Sundale, 1.25 miles east by 0.25 mile south of, T road south, 22 feet southeast to cross on corner fence post, 45 feet north to cross on board fence.	39 58 11.0	81 45 57.3

Geographic positions along Ohio and Little Kanawha Railroad between Brush Creek and Dillon.

Station.	Latitude.	Longitude.
Brush Creek bridge, about 1 mile northwest of, 0.25 mile southeast of coal-mine shaft, road crossing.	39 53 22.1	81 59 42.6
Brush Creek station, in northeast corner of A. M. Shylock's field, 24 feet north to south rail of Ohio and Little Kanawha R. R., 31 feet east to center of north-south road, iron post stamped "Prim. Trav. Sta. No. 63, 1905"	39 52 41.4	81 58 50.9
Brush Creek bridge, 0.75 mile south of, overhead road crossing.	39 52 02.8	81 59 00.9
Ohio and Little Kanawha R. R. milepost 3, 0.33 mile north of, north-south road crossing.	39 51 15.2	81 59 07.3
Stovetown, road crossing at station.	39 50 19.6	81 59 12.0
Milepost 1, road crossing.	39 49 28.6	81 59 06.8
Connelsville station, Dillon post-office, just east of, street crossing railroad.	39 48 48.9	81 59 46.0

Geographic positions along highways from Dillon post-office to a point 1.75 miles north of Rowland post-office.

Station.	Latitude.	Longitude.
Dillon post-office, 1 mile southeast of, T road west at large elm tree, 15 feet southwest to elm tree, 29 feet northeast to corner fence post.	39 48 16.4	81 59 15.9
Forks of road, 17 feet north to cross on telegraph pole, 22 feet east to mail box No. 46.	39 47 25.2	81 58 57.9
Bailey Church and schoolhouse, 0.25 mile north of, T road south, 24 feet east to small walnut tree, 35 feet southwest to cross on fence post.	39 45 21.5	81 59 13.8
Sharp Hill schoolhouse, 0.25 mile east of, T road south, 35 feet southwest to cross on corner fence post, 21 feet northeast to wild-cherry tree.	39 45 39.4	81 56 46.3
Duront, 0.75 mile west of, T road north, arrow painted on Lewis Fouta's yard fence.	39 44 57.2	81 55 37.4
Duront, W. H. Stokes's front yard, south corner of fence bears N. 10° 45' W., distant 29.7 feet; iron post stamped "Prim. Trav. Sta. No. 67, 1905"	39 45 02.9	81 54 48.5
At corner of apple orchard, T road north, 30 feet to cross on board fence, 28 feet east to cross on fence post.	39 45 03.2	81 53 33.4
Duront, 2 miles east of, T. 11 S., R. 12 W., corner secs. 3, 4, 9, and 10, stone.	39 44 53.7	81 52 19.3
Brick house, T road west, cross on corner fence post.	39 45 10.7	81 50 40.2
Sewall's (John) residence, T road east, 24 feet north to cross on fence post, 45 feet west to cross on corner of outbuilding.	39 45 30.3	81 49 29.2
Sewall's (John) residence, 1 mile east of, T road southwest, 28 feet south to cross on gate post, 36 feet west to corner of hedge fence.	39 45 12.0	81 48 31.8
Rowland post-office, 0.5 mile north of, at T road west, in northeast corner of Walton Blackledge's field; iron post stamped "Prim. Trav. Sta. No. 68, 1905"	39 45 04.2	81 46 21.5
Rowland, 1.75 miles north of, T road southeast, 19 feet south to mail box, 24 feet northeast to large dead tree.	39 45 59.2	81 45 55.2

84 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

STRYKER QUADRANGLE (FULTON AND WILLIAMS COUNTIES).

Geographic positions along highways on west border of quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 6 N., R. 3 E., north corner secs. 1 and 2, T road south.....	41	30	49.4	84	28	36.7
T. 7 N., R. 3 E., corner secs. 25, 26, 35, and 36, crossroads.....	41	31	41.7	84	28	39.5
T. 7 N., R. 3 E., corner secs. 23, 24, 25, and 26, 0.3 mile north of, T road south.....	41	33	00.1	84	28	39.2
T. 7 N., R. 3 E., corner secs. 14, 15, 22, and 23, T road east.....	41	33	26.7	84	29	48.1
T. 7 N., R. 3 E., corner secs. 10, 11, 14, and 15.....	41	34	18.9	84	29	47.9
T. 7 N., R. 3 E., corner secs. 2, 3, 10, and 11, crossroads.....	41	35	11.1	84	29	48.0
T. 8 N., R. 3 E., southwest corner sec. 35, in southwest corner of field of Joseph Eberly, northwest corner of his house bears S. 2° E., distant 91.4 feet; southwest corner of Warnick's house bears N. 74° W., distant 76.4 feet; iron post stamped "Prim. Trav. Sta. No. 16, 1905".....	41	36	02.4	84	29	49.4
T. 8 N., R. 3 E., north corner secs. 34 and 35.....	41	36	54.3	84	29	50.1
T. 10 S., R. 2 W., south corner secs. 1 and 2, crossroads.....	41	37	18.7	84	29	43.0
T. 9 S., R. 2 W., corner secs. 25, 26, 35, and 36, crossroads.....	41	39	03.4	84	29	42.7
T. 9 S., R. 2 W., corner secs. 23, 24, 25, and 26, crossroads.....	41	39	56.1	84	29	42.7
T. 9 S., R. 2 W., corner secs. 13, 14, 23, and 24, crossroads.....	41	40	48.6	84	29	42.4

Geographic positions along highways on north border of quadrangle near Ohio-Michigan State line.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 9 S., R. 2 W., in southeast corner sec. 11, in southeast corner of field of E. Thatcher, iron post stamped "Prim. Trav. Sta. No. 17, 1905".....	41	41	41.3	84	29	41.6
T. 9 S., R. 2 W., east corner secs. 12 and 13, T road west.....	41	41	39.9	84	28	32.0
T. 9 S., R. 1 W., corner secs. 7, 8, 17, and 18, crossroads.....	41	41	40.7	84	27	22.7
T. 9 S., R. 1 W., corner secs. 8, 9, 16, and 17, T road south.....	41	41	41.0	84	26	14.8
Ohio-Michigan State line, 0.33 mile west of Cincinnati Northern R. R., T road south.....	41	42	17.6	84	25	40.5
Ohio-Michigan State line, 0.75 mile east of Cincinnati Northern R. R., crossroads.....	41	42	19.2	84	24	31.8
T. 9 S., R. 1 W., corner secs. 10, 11, 14, and 15, Fulton-Williams county line.....	41	41	41.5	84	23	56.6
T. 9 S., R. 1 W., southeast corner sec. 11, in southeast corner of field of G. S. Wilnor, iron post stamped "Prim. Trav. Sta. No. 23, 1905".....	41	41	41.6	84	22	47.3
T. 9 S., R. 1 W., east corner of secs. 12 and 13, T road west.....	41	41	42.0	84	21	36.2
T. 9 S., R. 1 E., corner secs. 7, 8, 17, and 18, crossroad.....	41	41	41.9	84	19	40.6
T. 9 S., R. 1 E., corner secs. 8, 9, 16, and 17, crossroad.....	41	41	43.7	84	18	28.8
T. 9 S., R. 1 E., corner secs. 9, 10, 15, and 16, crossroad.....	41	41	45.3	84	17	19.7
T. 9 S., R. 1 E., corner secs. 10, 11, 14, and 15, crossroad.....	41	41	45.6	84	16	09.8
Ohio-Michigan State line, center of north-south road.....	41	42	31.7	84	16	11.0
Ritters, 1.5 miles southeast of, in northwest corner of Hewey Sutton's front yard; northwest corner of Sutton's house bears S. 79° E., distant 181.2 feet; east rail of electric railway at crossing bears N. 67° W., distant 69 feet; iron post stamped "Prim. Trav. Sta. No. 24, 1905".....	41	41	46.8	84	14	56.7

SUGARGROVE QUADRANGLE (FAIRFIELD COUNTY).

Geographic positions along Hocking Valley Railway between Lancaster and Hooker.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Pleasant triangulation station (2), on the summit of a bluff locally called Mount Pleasant, about 300 feet above and 1 mile north of Lancaster, Ohio, immediately east of fairgrounds, on land of F. J. Buschemeyer. Station mark: Center of iron windmill near west end of summit. Reference mark: A triangle cut in sandstone ledge, with arrows cut on edge of bluff pointing to station. Azimuth from station to center of windmill, 148° 23', distance, 228 feet.....	39	43	30.56	82	35	42.36
Lancaster, crossing of Fair avenue and Columbus street.....	39	43	26.4	82	36	15.10
Lancaster, 1.6 miles northwest of, pike crossing Hocking Valley Rwy., east track, township line follows railroad northwest.....	39	43	30.1	82	37	40.60
Water tank, spout between tracks.....	39	44	16.1	82	38	43.30
Hooker station, 350 feet northwest of, on north side of east-west road, near southeast corner of field of Mike Vase; southwest corner of foundation to house bears N. 43° 15' E., distant 29 feet; iron post stamped "Prim. Trav. Sta. No. 48, 1905".....	39	44	51.5	82	39	47.60

Geographic positions along highways.

Station.	Latitude.	Longitude.
Hooker, 1.75 miles west of, 22 feet northwest to R. V. Allen's mail box, 25 feet northeast to cross on fence post.....	° ' " 39 44 52.7	° ' " 82 41 51.7
Hooker, 3 miles west of, at crossroads, in east part of field owned by Jacob Bookmon, near apple tree on top of steep bank west of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 49, 1905".....	39 44 50.3	82 42 47.1

SWANTON QUADRANGLE (FULTON AND LUCAS COUNTIES).

Geographic positions along highways near north border of quadrangle.

Station.	Latitude.	Longitude.
Seward, 2 miles east by 0.5 mile north of, at crossing of township-line road with Lyons-Metamora road, in northwest corner of field of Adam Math, iron post stamped "Prim. Trav. Sta. No. 25, 1905".....	° ' " 41 42 33.7	° ' " 83 59 53.2
Whiteville, crossroads, 20 feet southwest to E. J. Smith's mail box, 36 feet north to road crossing of T. and W. electric road.....	41 42 40.3	83 58 34.9
Whiteville, T road north 1 mile east of, 27 feet north to road crossing of T. and W. electric road, 24 feet east to Peter Myer's mail box.....	41 42 45.5	83 57 25.9
Whiteville, T road north 2 miles east of, at stop 27, 39 feet north to road crossing of electric railroad.....	41 42 51.0	83 56 15.4
Ohio-Michigan State line, crossing north-south road.....	41 43 05.9	83 56 16.0
Metamora, center of bridge over creek in.....	41 42 41.2	83 54 38.0
In south part of schoolhouse yard at county line; north rail of electric road at switch block bears S. 49° 30' E., distant 126 feet; south-east corner of schoolhouse bears N. 0° 15' E., distant 78 feet; iron post stamped "Prim. Trav. Sta. No. 26, 1905".....	41 42 42.6	83 52 48.3
Berky, crossroads at stop 55, 1 mile west of, 33 feet west to mail box, 30 feet southwest to south end of culvert.....	41 43 01.5	83 51 31.9
Berky, crossroads, 33 feet southeast to crossing of T. and W. electric road.....	41 42 54.2	83 50 21.9
Berky, crossing north-south road and electric road 1 mile east of.....	41 42 48.5	83 49 11.9
Berky, T road north 2 miles east of.....	41 42 55.7	83 48 05.6
T. 9 S., R. 5 E., sec. 11, northeast part of, 0.25 mile west of electric-railroad junction, in northeast corner of field owned by John S. Clark, at T road south, iron post stamped "Prim. Trav. Sta. No. 27, 1905".....	41 42 56.3	83 47 11.7
Ohio-Michigan State line.....	41 43 19.8	83 48 06.6
T. 9 S., R. 5 E., corner secs. 11, 12, 13, and 14, 0.25 mile west of, mail box of Kate R. Van Norman and Paul Talor, crossroads.....	41 42 05.8	83 47 09.2

Geographic positions along highways near east border of quadrangle.

Station.	Latitude.	Longitude.
T. 9 S., R. 5 E., secs. 13, 14, 23, and 24, crossroads 0.25 mile west of, 19 feet northeast to John G. Taylor's mail box, 18 feet north to east end of small bridge.....	° ' " 41 41 12.4	° ' " 83 47 07.9
T. 9 S., R. 5 E., secs. 23, 24, 25, and 26, T road north 0.25 mile west of, 30 feet north to C. Lochrighler's mail box, 27 feet northeast to east end of stone culvert.....	41 40 22.7	83 47 05.4
T. 95 N., R. 5 E., corner secs. 22, 23, 26, and 27, T road north, 24 feet northeast to cross on telephone pole, 21 feet northwest to west end of stone culvert.....	41 40 22.5	83 47 42.9
T. 9 S., R. 5 E., corner secs. 21, 22, 27, and 28, 33 feet southwest to cross on telephone pole, 38 feet southeast to corner fence post, T road south.....	41 40 21.7	83 49 07.3
T. 9 S., R. 5 E., corner secs. 27, 28, 33, and 34, crossroads, 21 feet west to center of bridge, 36 feet northeast to southwest corner of pool hall.....	41 39 27.4	83 49 05.6
T. 9 S., R. 5 E., south corner secs. 33 and 34, stone at T road north.....	41 38 35.9	83 49 03.9
T. 10 S., R. 5 E., corner secs. 3, 4, 9, and 10, 32 feet northwest to cross on telephone pole, 31 feet southeast to J. K. Barnes's mail box.....	41 37 45.2	83 49 02.3
T road north at Oak Grove schoolhouse, 18 feet northeast to J. R. Bower's mail box, 36 feet northwest to arrow on post.....	41 37 00.9	83 49 00.6
Holland, 4 miles west of, 0.33 mile south of Lake Shore and Michigan Southern Rwy., at crossroads, iron post stamped "Prim. Trav. Sta. No. 23, 1905".....	41 36 01.0	83 47 34.8
T. 7 N., R. 5 E., secs. 11 and 12, quarter corner between, T road east, stone at intersection of road.....	41 34 55.0	83 47 10.5

Geographic positions along highways near east border of triangle—Continued.

Station.	Latitude.	Longitude.
T. 7 N., R. 5 E., east corner secs. 14 and 23, T road west, 21 feet north-west to northeast corner of stone culvert, 23 feet southwest to south-east corner of same culvert.	° ' " 41 33 36.8	° ' " 83 47 09.8
T. 7 N., R. 5 E., corner secs. 23, 24, 25, and 26, crossroads at schoolhouse, 25 feet northeast to mail box on post, 33 feet northwest to maple tree at corner of fence.	41 32 44.0	83 47 09.4
T. 7 N., R. 5 E., south corner secs. 35 and 36, stone to, T road north.	41 30 59.4	83 47 09.2
Waterville, 3.5 miles west of, on Waterville-Neapolis pike, T road north, in southeast corner of field of John Lichales, iron post stamped "Prim. Trav. Sta. No. 29, 1905"	41 29 43.8	83 46 58.6
Waterville, 2 miles west of, crossroads at schoolhouse, 44 feet southwest to guidepost, 48 feet southeast to iron pump.	41 29 44.1	83 46 00.9
Waterville station, east-west pike crossing of Clover Leaf Route about 800 feet southwest of.	41 29 55.9	83 43 35.5

THORNVILLE QUADRANGLE (FAIRFIELD, LICKING, AND PERRY COUNTIES).

Magnetic declination, north border, $1^{\circ} 05'$ west; south border, $0^{\circ} 37'$ west; west border, $0^{\circ} 15'$ west; east border, $1^{\circ} 22'$ west.

Geographic positions along Baltimore and Ohio Railroad between milepost 28 and Chalfont.

Station.	Latitude.	Longitude.
	° ' " 39 45 47.3	° ' " 82 18 55.7
Milepost 28, 2,000 feet north of, private-road crossing.	39 46 34.8	82 18 42.5
Wellom station, east-west road crossing.	39 47 27.2	82 18 20.6
Road crossing under trestle.	39 48 18.8	82 17 51.7
Somerset, 0.5 mile south of station, overhead crossing.	39 49 25.0	82 17 19.4
Brick plant, switch block to spur.	39 50 17.6	82 16 43.2
Milepost 22, 495 feet north of, east-west road crossing.	39 51 08.6	82 16 48.0
Milepost 21, 440 feet north of, road crossing.		
Chalfont station, east-west road crossing in southwest corner of field of N. S. Axline, center of road crossing bears S. $60^{\circ} 15' W.$, distant 33 feet; iron post stamped "Prim. Trav. Sta. No. 52, 1905"	39 52 08.7	82 17 11.0

Geographic positions along Zanesville and Western Railway near Glassrock.

Station.	Latitude.	Longitude.
	° ' " 39 52 36.7	° ' " 82 17 22.0
Glassrock station, north-south road crossing railroad.	39 52 34.7	82 16 06.8
Milepost 21, 0.5 mile east of, north-south road crossing.		
Glassrock station, 2 miles east of, railroad bridge over Jonathan Creek, north-south road crossing, 800 feet east of.	39 52 39.8	82 15 06.9

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' " 39 53 57.9	° ' " 82 15 16.8
On top of hill and T road east, G. Hartsough's mail box.		
Corner secs. 13 and 14 (?) on Licking-Perry county line, rail fence west along north edge of woods, 19 feet west to cross on fence post.	39 54 50.5	82 15 12.8
Brownsville, 1 mile south of, crossroads, cross on corner fence post.	39 55 44.8	82 15 43.2
Brownsville, Davy Hotel, just west of, T road north, 35 feet north-west to guidepost, 39 feet southeast to cross on telegraph pole.	39 56 49.6	82 15 28.1
Brownsville, 3 miles north of, at Clark's blacksmith shop, crossroads, guidepost.	39 59 21.2	82 15 48.8
Boodle schoolhouse, 1.33 miles southeast of, road south, 13 feet north to cross on gatepost, 36 feet southwest to mail box.	40 00 04.8	82 16 57.9

Geographic positions along Toledo and Ohio Central Railway near Hebron.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 13, just north of, private-road crossing.....	40 00 38.5	82 28 38.8
Trestle No. 1364 over northeast-southwest gravel road, center of.....	39 59 27.9	82 28 48.9
Hebron, crossing of Toledo and Ohio Central and C., N. and Z. electric road.....	39 57 41.2	82 29 34.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Baptist Corners, 1 mile east of, center of bridge at crossroads.....	39 46 31.1	82 29 20.4
West Rushville, crossroads, 46 feet southwest to northeast corner of Dilger Bros.' store, 63 feet southeast to John Dilger's store.....	39 45 48.9	82 26 51.8
Rushville, crossroads at Ruchville Hotel, center of intersection.....	39 45 52.6	82 25 54.5
Rushville, 1.1 miles east of, T road north, 27 feet northwest to cross on fence post, 27 feet southwest to cross on telegraph pole.....	39 46 01.2	82 24 41.3
Perry-Fairfield county line, T road south.....	39 46 06.4	82 24 06.9
Rushville, 2.5 miles east of, 2 miles north of Avlon, at crossroads, in southeast corner of John Love's farm; southwest corner of Thos. Griffin's residence bears N. 59° E., distant 45.6 feet; iron post stamped "Prim. Trav. Sta. No. 51, 1905".....	39 46 06.6	82 22 57.9
Ottoman, United Brethren Church, 0.25 mile south of, crossroads, 10 feet west to cross on corner fence post, 24 feet to cross on corner post in wire fence.....	39 46 09.9	82 21 47.4
Top of hill, T road east, 15 feet southeast to Henry Brehm's mail box.....	39 45 50.1	82 21 06.8
Shoal House, T road west, 12 feet east to cross on small locust tree, 32 feet northwest to southeast corner of coal shed.....	39 45 21.4	82 20 34.8

THURSTON QUADRANGLE (FAIRFIELD AND LICKING COUNTIES).

Magnetic declination, west border, 0° 31" west.

Geographic positions along Baltimore and Ohio Railroad, Summit to Outville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Summit, road crossing at station, north track.....	39 59 52.6	82 45 07.5
Summit station, 1 mile east of, north track at north-south road crossing.....	39 59 50.7	82 43 45.4
Summit, 2 miles east of station, north track at east-west road crossing.....	39 59 49.3	82 42 43.4
Columbia Center, north-south road crossing.....	39 59 48.0	82 41 49.6
Pataskala, street crossing east of station.....	39 59 46.2	82 40 31.1
Pataskala, 1.5 miles east of, at road crossing Pennsylvania R. R., in southeast corner of field of Edward Condit; north rail of north track at road crossing bears S. 20° 30' E., distant 60 feet; iron post stamped "Prim. Trav. Sta. No. 35, 1905".....	39 59 44.2	82 38 41.5
Pataskala, 2.5 miles east of, south track at road crossing.....	39 59 41.9	82 37 32.6
Outville, north-south road crossing.....	39 59 39.6	82 35 48.4
Outville, 1 mile east of, north track at north-south road crossing.....	39 59 44.0	82 34 40.4

Geographic positions along Toledo and Ohio Central Railway, Outville to Pleasantville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 8, center of track opposite.....	39 56 49.4	82 30 36.6
Licking-Fairfield county line, east-west road crossing.....	39 55 38.6	82 31 15.1
Millersport, 1 mile north of, water tank, center of track.....	39 54 42.6	82 31 43.7
Millersport, near bridge, in south part of lot owned by Pence & Swisher, 47 feet due west to east rail; cross on corner of bridge abutment bears S. 54° 45' W., distant 54.7 feet; iron post stamped "Prim. Trav. Sta. No. 46, 1905".....	39 53 57.7	82 32 12.9
Millersport, 2 miles south of, east-west gravel road crossing.....	39 52 10.2	82 32 32.8
Thurston, crossing of Zanesville and Western and Toledo and Ohio Central Rwy's.....	39 50 48.2	82 32 39.7
Thurston, 1.2 miles south of, center of track at east-west road crossing.....	39 49 28.3	82 31 45.9
Thurston, 1.2 miles south of, T. 16 S., R. 18 W., corner secs. 27, 28, 33, and 34, 610 feet west of east-west road crossing.....	39 49 28.3	82 31 53.8
Pleasantville, township line, road crossing.....	39 48 33.2	82 31 02.4

88 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along highways, Pleasantville to a point 5 miles west of Zinc schoolhouse.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pleasantville, 1.33 miles east of, crossroads at schoolhouse, 33 feet northeast to cross on telegraph pole, 38 feet northwest to cross on corner fence post.....	39 47 51.7	82 30 23.5
Schoolhouse, 1 mile south of, T road east, 24 feet northeast to granite boulder, 39 feet southeast to locust tree.....	39 46 55.8	82 30 28.8
Pleasantville, 2.5 miles south and 0.5 mile east of, in southeast corner of Baptist schoolhouse yard; pump bears west, distant 11 feet; southeast corner of schoolhouse bears N. 44° 20' W., distant 25.7 feet; iron post stamped "Prim. Trav. Sta. No. 47, 1905".....	39 46 22.1	82 30 22.5
Bridge over creek, 700 feet east of, T road south just east of J. G. Mertz's mail box.....	39 45 57.2	82 31 44.8
T. 15 S., R. 18 W., secs. 16, 17, 20, and 21, corner of stone and T road north.....	39 46 01.5	82 33 31.2
Lancaster, 3.5 miles north of, Friesner's nursery, crossroads, 30 feet northwest to cross on telegraph pole.....	39 46 04.0	82 34 37.8
Zinc schoolhouse, crossroads, 19 feet south to large elm tree.....	39 45 09.2	82 35 01.1
T road west at corner of sections (no numbers).....	39 45 34.2	82 42 43.6
Gravel pit, crossroads, 33 feet northeast to cross on board fence, 34 feet northwest to cross on corner fence post.....	39 46 24.3	82 42 15.4

Geographic positions along Hocking Valley Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Carroll station, 0.5 mile southeast of, north-south road crossing railroad.....	39 47 33.8	82 42 09.7
Carroll station, east-west road crossing.....	39 48 00.6	82 42 35.6
Little Walnut Creek, 0.25 mile south of, east-west road crossing.....	39 49 06.6	82 43 04.2
Sherman schoolhouse, 1 mile south of, north-south road crossing.....	39 49 45.2	82 43 30.5

Geographic positions along highways, Sherman to district No. 10 schoolhouse.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sherman schoolhouse, crossroads, 35 feet southwest to walnut tree, 23 feet southeast to cross on telegraph pole.....	39 50 27.3	82 43 27.2
Sherman schoolhouse, 1 mile north of, crossroads, 30 feet northeast to mail box, 26 feet southeast to cross on fence post.....	39 51 20.6	82 43 22.6
T. 15 S., R. 20 W., corner secs. 13, 14, 23, and 24.....	39 51 47.4	82 43 20.4
T. 15 S., R. 20 W., secs. 11, 12, 13, and 14, crossroads, 24 feet southwest to mail box on fence post, 24 feet northwest to cross on telegraph pole.....	39 52 39.4	82 43 16.1
T. 15 S., R. 20 W., northwest corner sec. 12, at T road south, in northwest corner of Wm. Hay's pasture; nail in root of small cherry tree bears S. 6° E., distant 13.4 feet; iron post stamped "Prim. Trav. Sta. 50, 1905".....	39 53 32.6	82 43 11.4
Violet Chapel, 0.25 mile north of, forks of road, 19 feet northwest to cross on gatepost, 21 feet southeast to cross on large fence post.....	39 54 36.8	82 43 42.4
Violet Chapel, 1.5 miles north of, stone at crossroads.....	39 55 46.7	82 43 35.9
Wagram, 1 mile south of, crossroads, 23 feet southeast to corner of rail fence, 24 feet northeast to boulder at end of hedge fence.....	39 56 40.6	82 43 51.3
Wagram, at post-office, north-south road crossing of C., N. and Z. electric railway.....	39 57 24.6	82 43 50.1
Wagram, 1.25 miles west of, T road north, 24 feet northeast to cross on board fence, 40 feet northwest to guidepost.....	39 57 23.4	82 45 11.1
Schoolhouse, district No. 10, T road south, Philip Krunnas's mail box.....	39 58 31.3	82 45 05.4

WAUSEON QUADRANGLE (FULTON COUNTY).

Geographic positions along highways on south border of quadrangle.

Station.	Latitude.	Longitude.
T. 6 N., R. 7 E., northeast corner, sec. 13, at crossroads, in northeast corner of orchard owned by Edna Cline, iron post stamped "Prim. Trav. Sta. No. 31, 1905"	° ' " 41 29 10.5	° ' " 84 00 30.7
T. 6 N., R. 7 E., north corner secs. 11 and 12, T road south, 31 feet southwest to cross on corner fence post, 30 feet northwest to E. M. Smith's mail box.	41 29 10.9	84 01 05.5
T. 6 N., R. 7 E., corner secs. 10, 11, 14, and 15, crossroads, 33 feet southwest to end of wire fence, 37 feet northwest to cross on gatepost.	41 29 11.5	84 02 15.2
T. 6 N., R. 7 E., corner secs. 2, 3, 10, and 11, crossroads, 22 feet southwest to south end of culvert, 41 feet southeast to cross on corner fence post.	41 30 03.9	84 02 14.9
T. 6 N., R. 7 E., corner secs. 3, 4, 9, and 10, crossroads, 39 feet southeast to cross on corner fence post, 45 feet southwest to G. S. Frederick's mail box.	41 30 01.2	84 03 05.8
T. 6 N., R. 7 E., corner secs. 4, 5, 8, and 9, crossroads, 34 feet southeast to cross on corner fence post, 48 feet southwest to cross on fence post.	41 30 01.1	84 04 34.8
T. 6 N., R. 7 E., corner secs. 5, 6, 7, and 8, crossroads at schoolhouse, 33 feet northeast to T. L. Ammand's mail box, 35 feet northwest to cross on telephone pole.	41 30 00.9	84 05 43.8
T. 6 N., R. 6 E., east corner secs. 1 and 12, 31 feet northwest to Val Snyder's mail box, 34 feet southwest to corner of rail fence.	41 30 02.0	84 06 52.5
T. 6 N., R. 6 E., southwest corner sec. 1, in southwest corner schoolhouse No. 3 yard, crossroads, southwest corner of schoolhouse bears N. 16° 10' E., distant 171.4 feet; northwest corner foundation of church bears S. 2° 30' E., distant 79.9 feet, iron post stamped "Prim. Trav. Sta. No. 32, 1905"	41 30 01.7	84 08 02.0
T. 6 N., R. 6 E., corner secs. 2, 3, 10, and 11, crossroads, 34 feet southeast to cross on corner fence post, 36 feet northeast to cross on yard fence post.	41 30 01.3	84 09 12.0
T. 6 N., R. 6 E., corner secs. 3, 4, 9, and 10, crossroads, 34 feet southeast to cross on telephone pole, 39 feet northeast to penalty notice.	41 30 01.2	84 10 21.7
T. 6 N., R. 6 E., corner secs. 4, 5, 8, and 9, crossroads, 12 feet southeast to cross on telephone pole, 29 feet southwest to Frank Lea's mail box.	41 30 00.0	84 11 30.1
T. 6 N., R. 6 E., corner secs. 5, 6, 7, and 8, at schoolhouse, crossroads, 25 feet southwest to David Reyze's mail box, 43 feet northeast to iron fence.	41 30 00.3	84 12 41.1
T. 6 N., R. 5 W., east corner secs. 1 and 12, 33 feet southwest to corner of garden fence, 32 feet northwest to cross on advertising board.	41 30 00.6	84 13 44.0
T. 6 N., R. 5 E., southeast corner sec. 2, in southeast corner of yard of district No. 14 schoolhouse, center of iron pump in yard bears N. 82° W., distant 42 feet; southeast corner of schoolhouse bears N. 45° W., distant 44.7 feet.	41 30 00.8	84 14 54.0

ZANESVILLE QUADRANGLE (LICKING AND MUSKINGUM COUNTIES).

Magnetic declination, west border, 1° 22' west; east border, 0° 51' west.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Gratiot, 2.5 miles north of, 2.5 miles east of Clark's blacksmith shop, T road south, 30 feet southeast to large chestnut tree, 17 feet northeast to cross on rail fence.	39 59 05.1	82 13 15.9
Licking-Muskingum county line, rail fence north and south, center of road, 25 feet south to west end of hedge fence.	39 59 12.2	82 11 48.5
G. W. Fisher's mail box at Newark, road to northwest.	39 59 16.6	82 11 05.7
J. Riggles's mail box, center of small bridge.	39 59 24.1	82 10 08.7
E. T. Smith's mail box, southeast corner of iron bridge.	39 59 53.0	82 09 20.8
Pleasant Valley station, 2 miles southwest of, just south of Mapdonia Church; in northeast corner of lot, in front of S. W. Wincia's residence, iron post stamped "Prim. Trav. Sta. No. 53, 1905"	39 59 47.1	82 08 24.2

Geographic positions along Baltimore and Ohio Railroad near Dillon.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 84, 900 feet west of, private-road crossing.....	39 59 38.0	82 05 07.9
Milepost 83, center of track opposite.....	39 58 57.7	82 04 09.9
Dillon station, road crossing.....	39 58 17.0	82 03 30.8

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dillon, 0.75 mile north of station, on east side of river, T road east, 25 feet southeast to cross on board fence, 27 feet northeast to cross on corner fence post.....	39 58 49.6	82 03 05.6
Harris's farm, crossing of Frostburg road and east-west road, 33 feet southwest to cross on telegraph pole, 27 feet northeast to cross on telegraph pole.....	39 58 46.5	82 01 01.8
Zanesville, 3 miles north of, J. N. Blair's farm, T road west, 33 feet northwest to cross on board fence, 16 feet east to cross on gatepost.....	39 58 45.0	82 00 14.7

Geographic positions along Wheeling and Lake Erie Railroad, near Zanesville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Zanesville, Monroe Street Bridge over railroad.....	39 57 05.5	82 00 06.0
Licking Creek, center of terminal railway bridge over.....	39 56 30.6	82 01 23.1
Owen (J. B.) Pottery Co.'s plant, just south of, road crossing under trestle.....	39 55 35.4	82 01 43.6
Jonathan Creek, road crossing just north of bridge over.....	39 54 15.9	82 00 14.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Muskingum-Morgan county line, center of road at, 30 feet due east to dead beech tree at corner of fence.....	39 46 05.9	82 00 15.6
Morgan County line, 0.33 mile south of, stone at crossroads, 25 feet south to cross on fence post, 54 feet northeast to corner of barn.....	39 45 50.7	82 00 20.6
Muskingum-Morgan county line. 0.5 mile south of, in southeast corner of foundation to brick house of N. H. Pletcher on the Dillon-Dover-town road, aluminum tablet stamped "Prim. Trav. Sta. No. 64, 1905".....	39 45 43.0	82 00 31.1
Dovertown, 1.5 miles northeast of, at Charles Bush's residence, T road east, 40 feet to C. A. Pletcher's mail box, 9 feet south to west end of box culvert.....	39 45 01.4	82 01 18.7

PENNSYLVANIA-NEW YORK.

TRIANGULATION STATIONS.

WARREN COUNTY, PA.; CHAUTAUQUA COUNTY, N. Y.

WARREN AND YOUNGVILLE QUADRANGLES.

During the summer of 1905 E. L. McNair, topographer, located eight new stations for the control of these two quadrangles, one of these stations being in Chautauqua County, N. Y., near the State line. This triangulation was based on Meas and Busti, two stations of the Geological Survey in Chautauqua County, N. Y., established by A. H. Thompson in 1902.

BUSTI, CHAUTAUQUA COUNTY, N. Y.

In the southeast corner of Busti Township, about 2 miles a little east of south from the village of Busti, on a commanding ridge on land owned by C. Meredith.

Station mark: A stone post 30 by 6 by 6 inches set 28 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 42° 00' 32.55". Longitude, 79° 16' 25.26'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Panama.....	108 08 36.83	287 58 46.96	4.3286072
Meas.....	194 05 59.78	14 07 45.77	4.1734905
Highland.....	201 20 39.98	21 25 02.32	4.4000139
Walrod.....	227 50 04.10	47 56 24.17	4.2451027
Peterson.....	254 30 43.27	74 38 04.93	4.1970889
Nelson.....	341 12 36.14	161 13 42.13	3.8485040

MEAS, CHAUTAUQUA COUNTY, N. Y.

Near the center of Ellicott Township, on a high ridge about 3 miles north of Jamestown and one-third mile south of the Jamestown-Ross Mills road, on land owned by P. A. Melonist.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground and having a bronze tablet cemented in its top.

[Latitude 42° 08' 21.22". Longitude 79° 13' 47.06'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nelson.....	3 42 36.51	183 41 56.66	4.3260087
Busti.....	14 07 45.77	194 05 59.78	4.1734905
Panama.....	71 53 22.33	251 41 45.66	4.4002458
Bates.....	90 18 08.34	270 06 18.84	4.3853254
Highland.....	211 41 41.49	31 44 22.96	4.0211111
Walrod.....	285 49 02.01	105 53 36.45	3.9898545
Peterson.....	311 39 50.39	131 45 26.57	4.1886157
Quaker Hill.....	341 46 17.09	161 51 00.88	4.4950339

PETERSON, CHAUTAUQUA COUNTY, N. Y.

In Carroll, about 3½ miles east of Frewsburg, on a bare hill on farm of Frank Peterson. View cut off to east by higher ridges.

Station mark: A sandstone post 36 by 6 by 6 inches set 32 inches in the ground, in center of top of which is a bronze triangulation tablet.

[Latitude 42° 02' 48.23". Longitude 79° 05' 25.58'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quaker.....	5 15 07.39	185 14 15.61	4.2902612
Nelson.....	49 58 03.48	229 51 48.101	4.2272878
Busti.....	74 38 04.93	254 30 43.27	4.1970889
Meas.....	131 45 26.57	311 39 50.39	4.1886157

92 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

BULL, WARREN COUNTY, PA.

In the southwest part of Sugar Grove Township, on a small knob of conglomerate rock on land owned by Warren Bull. An excellent view in every direction.

Station mark: A bronze triangulation tablet cemented in solid rock.

[Latitude $41^{\circ} 55' 34.76''$. Longitude $79^{\circ} 23' 36.59''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Nelson.....	258	07	32.15	78	13	19.67	4.0877421
Yankee Bush.....	291	38	56.82	111	46	40.20	4.2359605
Crippen.....	335	03	06.01	155	05	41.12	4.1042866

CLARENDON, WARREN COUNTY, PA.

On a brushy and timbered hill about 3 miles west of Clarendon and 1 mile north of J. E. Boyd's house on Tionesta Creek, about 40 rods east of road going over the hill.

Station mark: A marble post 36 by 6 by 6 inches set 30 inches in the ground, in top of which is cemented a bronze triangulation tablet.

[Latitude $41^{\circ} 47' 04.13''$. Longitude $79^{\circ} 09' 37.69''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Wilcox.....	90	33	56.69	270	30	24.03	3.8674586
Yankee Bush.....	161	38	51.48	341	37	21.45	3.9951024
Quaker Hill.....	202	32	50.55	22	34	47.05	4.0214009

CRIPPEN, WARREN COUNTY, PA.

In Brokenstraw Township, about 2 miles south of Youngsville, on a rocky timbered knob on land owned by A. L. Crippen. The view is good to north, but cut off to the southwest and south. Instrument elevated 34 feet on trunk of chestnut tree, around which is built a tower, which is fastened to the solid rock by four iron ring bolts.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference marks: Center of chestnut tree used for observing support and center of tower is distant 10 feet, azimuth $103^{\circ} 43'$.

[Latitude $41^{\circ} 49' 21.05''$. Longitude $79^{\circ} 19' 34.22''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Bull.....	155	05	41.12	335	03	06.01	4.1042866
Nelson.....	205	15	30.15	25	18	42.17	4.1910448
Yankee Bush.....	244	06	05.15	64	11	13.05	4.0730580
Wilcox.....	302	57	13.28	123	00	18.19	3.8827312

NELSON, WARREN COUNTY, PA.

In Farmington, about 1 mile south of Lander post-office, in a cleared field on land owned by John T. Nelson.

Station mark: A marble post 36 by 6 by 6 inches set 34 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 41° 56' 56.06". Longitude 79° 14' 46.60".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Crippen.....	25 18 42.17	205 15 30.15	4.1910448
Bull.....	78 13 19.67	258 07 32.15	4.0877421
Busti.....	161 13 42.13	341 12 36.14	3.8485040
Meas.....	183 41 56.66	3 42 36.51	4.3260087
Peterson.....	229 51 48.10	40 58 03.48	4.2272878
Quaker.....	307 29 07.07	127 34 30.08	4.1477939
Yankee Bush.....	335 41 09.25	155 43 05.42	3.9885983

QUAKER HILL, WARREN COUNTY, PA.

In Glade, about 4 miles northeast of Warren, on a prominent bare hill on land owned by W. D. Ward.

Station mark: A marble post 36 by 6 by 6 inches, set 34 inches in the ground, in top of which is cemented a bronze triangulation tablet.

[Latitude 41° 52' 18.57". Longitude 79° 06' 43.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clarendon.....	22 34 47.05	202 32 50.55	4.0214009
Yankee Bush.....	87 29 21.33	267 25 54.64	3.8542143
Nelson.....	127 34 30.08	307 29 07.07	4.1477939
Meas.....	161 51 00.88	341 46 17.09	4.4950339
Peterson.....	185 14 15.61	5 15 07.39	4.2902612

WILCOX, WARREN COUNTY, PA.

On a brushy and timbered hill about 7 miles southwest of Warren and 2 miles east of Allegheny River, on land owned by Earl Wilcox.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference marks: Four iron ringbolts fastening signal to rock and distant about 6 feet from center of station.

[Latitude 41° 47' 06.37". Longitude 79° 14' 56.83".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Crippen.....	123 00 18.19	302 57 13.28	3.8827312
Yankee Bush.....	204 30 14.43	24 32 17.23	4.0102466
Clarendon.....	270 30 24.03	90 33 56.69	3.8827312

YANKEE BUSH, WARREN COUNTY, PA.

In Conewango Township, about $3\frac{1}{2}$ miles northwest of Warren, on roadside close to cemetery fence.

Station mark: A marble post 36 by 6 by 6 inches, set 28 inches in the ground, in top of which is cemented a bronze triangulation tablet.

[Latitude $41^{\circ} 52' 08.30''$. Longitude $79^{\circ} 11' 52.69''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Wileox.....	24	32	17.23	204	30	14.43	4.0102466
Crippen.....	64	11	13.05	244	06	05.15	4.0730580
Bull.....	111	46	40.20	291	38	56.82	4.2359605
Nelson.....	155	43	05.42	335	41	09.25	3.9885983
Quaker Hill.....	267	25	54.64	87	29	21.33	3.8542143
Clarendon.....	341	37	21.45	161	38	51.48	3.9951024

PENNSYLVANIA.

PRIMARY TRAVERSE.

DAUPHIN, LEBANON, AND YORK COUNTIES.

MIDDLETOWN QUADRANGLE.

The following geographic positions were determined by C. B. Kendall, field assistant, in October, 1905. The line begins at Rutherford station on the Philadelphia and Reading Railway, in Dauphin County, and runs easterly along highways via Hummelstown, Hockersville, and Bachmanville to Colebrook, in the southwest corner of Lebanon County, thence southerly via Milton Grove and Florin to Columbia, thence southwesterly via Wrightsville and Hellam to York.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Rutherford station, 0.75 mile east of, center of north track under overhead road crossing.....	40	15	47.3	76	46	41.7
Rutherford station, 2.5 miles east of, 800 feet west of brick store, three corners, 35 feet west to telephone pole, 50 feet southeast to corner of yard fence.....	40	15	46.0	76	44	56.9
Hummelstown, 1.25 miles west of, T road to north, 40 feet northwest to corner of board fence, 40 feet southeast to telephone pole.....	40	15	42.1	76	43	45.6
Hummelstown, center of car track at center of intersection of Main and Hanover streets, 70 feet southeast to northwest corner of brick house, 70 feet northeast to southwest corner of stone house.....	40	15	55.3	76	42	28.9
Hummelstown, 1 mile east of, T road to south, 15 feet south to car track, 30 feet southeast to corner of fence.....	40	16	01.6	76	41	09.8
Hockersville, four corners, 30 feet southwest to northeast corner of stone blacksmith shop, 60 feet northwest to center of trolley track.....	40	16	23.1	76	39	22.2
Hockersville, four corners, 0.75 mile southeast of, 150 feet northwest of Fishbarn Church, 30 feet northeast to corner of cemetery fence, 40 feet southeast to locust tree.....	40	15	55.4	76	38	40.7
Vian, in east face of southeast corner of stone blacksmith shop, at forks of road, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1905".....	40	15	20.7	76	37	56.4
Vian, 0.25 mile southeast of, three corners at rock schoolhouse.....	40	15	08.4	76	37	43.9
Bachmanville, four corners, 1.25 miles southwest of, 30 feet southeast to corner of fence, 30 feet northwest to corner of fence and signboard.....	40	14	22.8	76	36	41.3
Bachmanville, four corners, 30 feet north to corner of fence and signboard, 40 feet east to corner of iron fence.....	40	14	34.8	76	35	44.0
Bachmanville, 0.6 mile southeast of, crossing of Dauphin-Lebanon county line.....	40	14	15.7	76	35	08.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Lawn, 1 mile north of, four corners at yellow schoolhouse, 30 feet northeast to corner of fence, 50 feet southeast to northwest corner of schoolhouse.	40 14 37.4	76 33 50.4
Colebrook station, 1.5 miles northwest of, forks of road, 40 feet northwest to signpost, 20 feet south to rail fence.	40 14 46.3	76 32 15.5
Colebrook station, 0.5 mile northwest of, forks of road at schoolhouse, 40 feet south to signpost, 50 feet southeast to stone gatepost.	40 14 46.6	76 31 06.6
Colebrook station, 750 feet north of, opposite "The Mansion," in west wall at northwest corner of stone tenant house of Monroe Shupp, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1905"	40 14 25.3	76 30 45.6
Colebrook station, 1.25 miles southeast of, T road west, 25 feet southwest to signpost.	40 13 19.7	76 30 18.8
Colebrook station, 1.5 miles southeast of, stone post on Lebanon-Lancaster county line.	40 13 00.2	76 30 19.6
County-line post, 1.12 miles southwest of, forks of road, 200 feet south of brick schoolhouse, 10 feet west to rail fence, 25 feet east to rail fence.	40 12 08.4	76 30 56.8
Brandt (Aaron) residence, forks of road 200 feet west of, 25 feet west to forked cherry tree, 20 feet south to rail fence.	40 11 10.1	76 31 08.3
Milton Grove Cemetery, 1 mile north of, four corners, 30 feet northeast to corner of yard fence and signboard, 40 feet southeast to red gate.	40 10 51.4	76 32 02.4
Milton Grove Cemetery, forks of road, 50 feet northwest to cemetery gate, 5 feet east to rail fence.	40 10 04.6	76 32 11.8
Milton Grove, four corners, 30 feet southwest to corner of stone wall, 40 feet west to corner of stone wall.	40 09 45.3	76 31 56.7
Milton Grove, 1 mile southeast of, four corners, 35 feet southeast to locust tree and signboard, 30 feet northwest to sassafras tree.	40 09 05.0	76 31 42.0
Milton Grove, 2 miles south of, 200 feet west of schoolhouse, T road south, 20 feet south to signpost, 50 feet east to guy-wire pole.	40 08 18.9	76 31 53.4
Florin, 0.75 mile northwest of, T road east, 25 feet southeast to corner of wire fence, 30 feet northeast to two locust trees.	40 07 25.1	76 31 34.3
Florin, intersection of streets at Florin Hotel, 20 feet northwest to southeast corner of watering trough, 40 feet northeast to locust tree.	40 06 54.8	76 31 27.6
Florin Hotel, in south wall at southeast corner of brick foundation to porch, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1905"	40 06 54.9	76 31 28.2
Florin, 1.75 miles southeast of, four corners at schoolhouse, 25 feet east to telephone pole, 30 feet northwest to rail fence.	40 05 29.7	76 31 13.0
Florin, 2.75 miles southeast of, roads west and north, 30 feet east to signpost, 20 feet north to stone wall.	40 04 46.4	76 30 44.9
Big Chiquesalunga Creek, center of covered bridge over, Rapho-East Hemphfield township line.	40 04 08.4	76 30 00.6
Kinderhook, four corners, 35 feet west to corner of shop, 40 feet southeast to corner of store.	40 03 11.0	76 29 56.6
Columbia, intersection of Seventh and Chestnut streets.	40 02 16.7	76 29 56.8
Columbia, Northern Central Rwy. bridge over Susquehanna River, in capstone at southeast corner of east-shore abutment, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1905"	40 01 54.5	76 30 35.6
Wrightsville, three corners at small triangular grass plot, street to north, 40 feet north to two old cannons, 10 feet south to center of trolley track.	40 01 29.9	76 32 03.2
Wrightsville, 0.75 mile southwest of, T road north at old blacksmith shop, 35 feet northwest to signboard, 15 feet south to trolley track.	40 01 17.8	76 32 57.4
Wrightsville, 1.75 miles southwest of, T road north, 10 feet south to trolley track, 30 feet northwest to corner of fence.	40 01 04.2	76 33 59.0
Hellam, Evangelical Lutheran Church, 1.5 miles northeast of, four corners, 15 feet south to trolley track, 25 feet northeast to street car waiting room.	40 00 45.6	76 34 58.1
Hellam, Evangelical Lutheran Church, 0.6 mile northeast of, four corners, 25 feet northeast to corner of yard fence and signboard, 15 feet south to trolley track.	40 00 29.8	76 35 48.4
Hellam, Evangelical Lutheran Church, in north wall of stone foundation and east of entrance to, aluminum tablet stamped "Prim. Trav. Sta. 5, 1905"	40 00 14.8	76 36 26.8
Stony Brook station, 0.8 mile northeast of, T road north, 25 feet northwest to corner of trolley station, 10 feet south to trolley track.	39 59 41.6	76 27 59.2
Stony Brook station, center of Pennsylvania R. R. and Pike road crossing.	39 59 13.2	76 38 40.3

Geographic positions along Pennsylvania Railroad, Stony Brook to York.

Station.	Latitude.	Longitude.
Heistand station, center of Pennsylvania R. R. track and under over-head road crossing.....	39 58 59.8	76 39 53.5
Heistand station, 0.8 mile southwest of, center of track at road crossing.....	39 58 48.2	76 40 57.4
York, east edge of, center of track at road crossing.....	39 58 32.1	76 42 25.6
York, Duke-street crossing, between north and south main tracks, 60 feet southeast to northwest corner of freight station, 65 feet southwest to northeast corner of passenger station.....	39 58 02.7	76 43 41.9
York, south meridian mark, in Pennsylvania Park. Station mark: A sandstone post 40 by 6 by 6 inches, having a bronze tablet cemented in its top, set 36 inches in ground, 430 feet east of center of Water street and 57 feet north of center of Fulton street.....	39 57 20.1	76 43 36.8

BERKS AND LANCASTER COUNTIES.

NEW HOLLAND QUADRANGLE.

The following geographic positions were determined in 1905 by primary traverse run by C. B. Kendall, field assistant. The line starts at Pequea, in Salisbury Township, Lancaster County, and runs westerly via highways nearly to Lancaster, thence northerly to Durlach, in Clay Township, thence easterly via Adamstown to Alleghenyville in Berks County.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Pequea, Unity Evangelical Church, road corners.....	40 02 01.9	76 00 33.7
Millwood schoolhouse, road corners, 40 feet northwest to oak in school yard, 12 feet southeast to telephone pole.....	40 01 04.9	76 01 05.9
Buyerstown, four corners, 80 feet southeast to corner stone to blacksmith shop, 25 feet northwest to signpost "Gap 2.25 mi.".....	40 00 41.4	76 02 48.4
Vintage post-office, four corners, 50 feet north to corner of porch, 50 feet southwest to corner of dwelling, 120 feet south to Pennsylvania R. R.....	40 00 02.5	76 04 48.6
Tollgate, 150 feet east of, four corners, 25 feet northeast to corner of yard fence, 40 feet southwest to corner of school-yard fence.....	40 00 17.3	76 06 19.9
Paradise, road corners at Odd Fellows' Hall, 70 feet southeast to corner of hall, 30 feet southwest to corner of front yard.....	40 00 32.1	76 07 31.0
Paradise post-office, 400 feet west of, at southeast corner of A. R. Hersey's store, in south face of stonewall, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1905".....	40 00 35.2	76 07 45.0
Sandersburg, four corners, 40 feet northeast to corner of yard fence, 25 feet south to maple at brick store.....	40 00 53.6	76 09 19.5
Sandersburg, 1 mile west of, four corners, 20 feet north to telephone pole, 10 feet south to trolley line.....	40 01 07.1	76 10 27.6
Pleasant View schoolhouse, 1 mile east of, four corners, 20 feet northeast to signpost, 45 feet west to locust tree.....	40 01 06.4	76 12 06.2
Pleasant View schoolhouse, 75 feet west of, on north side of east-west road, in face of large limestone boulder, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1905".....	40 00 46.6	76 13 21.1
Mill Creek, 0.5 mile southeast of, four corners, 20 feet southwest to corner of rail-and-wire fence, 40 feet northwest to corner of rail-and-wire fence.....	40 01 11.6	76 14 18.9
Fertility, 0.5 mile northwest of, three corners, 35 feet south to telephone pole, 50 feet northeast to white gate.....	40 01 58.9	76 14 44.8
Lancaster and Bird-in-Hand pike, road corners, 35 feet southeast to corner of fence, 35 feet southwest to corner of fence.....	40 02 24.2	76 14 12.2
Four corners, 35 feet northeast to corner of fence and 1 milepost, 12 feet northwest to corner of rail fence.....	40 02 58.1	76 13 39.6
Four corners, 25 feet north to corner of fence and sign, 35 feet northeast to corner of wire fence.....	40 03 23.3	76 12 55.3
Mechanicsburg, 2 miles southwest of, three corners, 125 feet north to corner of fence and sign, 15 feet east to corner of wire and rail fence.....	40 04 03.4	76 13 23.5
New Holland pike, four corners, center of trolley track and north-south road.....	40 04 54.0	76 14 04.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Bushon's mill, 0.5 mile south of, four corners, 25 feet southeast to maple, 15 feet southwest to signpost.	40 05 49.4	76 14 18.5
Oregon, forks of road at east end of, 12 feet north to telephone pole, 40 feet southwest to front-yard fence.	40 06 55.8	76 14 34.9
West Earl, four corners, 20 feet northwest to signpost.	40 07 51.6	76 13 03.1
West Earl Inn, southwest corner of, west fence, bronze tablet stamped "Prim. Trav. Sta. No. 10, 1905, Elev. 300 feet"	40 07 52.3	76 13 03.0
West Earl, 1.25 miles northwest of, road corners at yellow house, 30 feet southwest to corner of fence and milepost, 15 feet northwest to corner of yard fence.	40 08 46.0	76 13 51.6
Rothville, 0.25 mile northeast of, forks of road, 15 feet northwest to signpost, 15 feet south to corner of small white crib.	40 09 19.3	76 14 19.0
Millway station, 700 feet north of, in stone doorsill of front of Brubaker's mill, bronze tablet stamped "Prim. Trav. Sta. No. 11, 1905, Eleven 316 ft."	40 09 46.8	76 14 10.9
Millway station, 1.25 miles northeast of, four corners, 10 feet east to corner of rail fence, 90 feet west to signboard, 35 feet south to stump.	40 10 34.4	76 13 30.8
Durlach, 3 miles south of, four corners, 15 feet northeast to corner of front-yard fence, 15 feet west to corner of front-yard fence.	40 11 18.6	76 13 34.2
Durlach, 2.25 miles south of, forks of road.	40 11 58.4	76 13 10.0
Durlach, 0.75 mile south of, three corners, 20 feet west to signpost, 45 feet north to front-yard gate.	40 13 18.0	76 13 22.0
Durlach, four corners, 45 feet west to large willow, 70 feet northeast to southwest corner of brick store.	40 13 53.2	76 13 49.0
Durlach, 0.5 mile north of, road corners at, Mount Airy Hotel, 50 feet to bench mark.	40 14 20.2	76 13 43.2
Durlach, 0.5 mile north of, in south wall at southeast corner of Mount Airy Hotel, aluminum tablet stamped "Prim. Trav. Sta. No. 12, 1905"	40 14 20.4	76 13 43.8
Mount Airy Hotel, 0.75 mile east of, 15 feet northeast to corner fence painted "U. S. 536"	40 14 27.0	76 12 53.2
Schoeneck, 1 mile west of, four corners, 25 feet northeast to signpost, 30 feet southwest to post painted "460"	40 14 39.5	76 11 38.3
Schoeneck, five corners, 40 feet southeast to northwest corner of hotel, 20 feet northwest to corner of fence.	40 14 29.9	76 10 33.5
Schoeneck, 0.75 mile southeast of, three corners, 25 feet northwest to signpost, 12 feet east to tree on fence line.	40 14 17.9	76 09 44.4
Denver, 1 mile north of, 0.25 mile west of Philadelphia and Reading Rwy., four corners, 20 feet northeast to post painted "U. S. 461," 157 feet to bench mark.	40 14 37.9	76 07 54.0
Denver, 1 mile north of, in east wall at southeast corner of small stone residence of Mrs. Rachael Walter, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1905"	40 14 39.4	76 07 53.3
Adamstown, 2.5 miles west of, four corners, 25 feet north to signpost, 40 feet northeast to corner of fence.	40 14 41.4	76 06 16.3
Adamstown, 1.25 miles west of, three corners, 30 feet northwest to signboard.	40 14 35.7	76 05 01.5
Adamstown, 1.25 miles east of, center of Conestoga Traction Co.'s track, at forks of road, 20 feet north to telephone pole painted "U. S. 489"	40 14 28.9	76 03 39.7
Lancaster-Berks county line stone monument at crossing of Reading-Lancaster pike.	40 14 53.4	76 02 44.2
Alleghenyville, 1.75 miles northwest of, three corners, 100 feet northwest of schoolhouse, 10 feet northeast to corner of rail fence, 35 feet southeast to corner of rail fence.	40 14 49.0	76 00 48.1
Alleghenyville, 1 mile northwest of, four corners, at Eight Mile House, 60 feet southeast to windmill, 60 feet northeast to front entrance of hotel.	40 14 41.4	75 59 55.7
Alleghenyville, northwest corner of stone church.	40 14 03.9	75 59 20.6

TENNESSEE.

PRIMARY TRAVERSE.

CANNON AND RUTHERFORD COUNTIES.

WOODBURY QUADRANGLE.

The following geographic positions on the United States standard datum were determined by a line of primary traverse run by C. B. Kendall, field assistant, in June, 1906. Starting at Liberty triangulation station of the Coast and Geodetic Survey, the line follows the borders of the quadrangle and is tied to Short Mountain triangulation station of the same Survey.

Magnetic declination, north border, $2^{\circ} 29'$ east; east border, $2^{\circ} 2'$ east; south border, $2^{\circ} 52'$ east; west border, $2^{\circ} 35'$ east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Liberty triangulation station, pole erected by citizens of town of Liberty to be observed for position of their town. It is N. 70° W., true bearing, and 275 poles from center of town and 200 feet above it.	36 00 34.02	85 58 36.89
Liberty, 1.25 miles south of, three corners at schoolhouse, 40 feet northeast to sycamore on bank of creek, 25 feet southeast to telephone pole.	35 59 35.1	85 59 01.0
Three corners, 1,000 feet south of store, T road southeast up hollow, at sycamore tree.	35 58 29.0	85 59 05.9
Hancock's store, three corners, T road to west up Sycamore Creek, at forks of road, roads north and east.	35 57 12.3	85 59 40.9
Gassaway, center of Clear Fork Creek at forks of road.	35 56 25.1	85 59 45.3
Clear Fork and Wyandotte creeks, junction of, at forks of road up each.	35 55 17.5	85 59 21.9
Four corners, second-class northeast and southwest crossroads, southwest road follows up Clear Fork, 50 feet south to large rock at point of ridge.	35 54 41.8	85 58 24.2
Second-class road to west, 10 feet east to oak tree.	35 53 22.5	85 57 28.4
Second-class road, 20 feet east to oak, 20 feet north to old oak stump.	35 52 43.5	85 57 12.7
Short Mountain triangulation station, on highest group of Short Mountains, 2 miles northwest of Short Mountain post-office, which is kept at Comer's store; road passes Blair's and John Herringer's; signal is on land of Mr. Dougald. Station mark: A bottle filled with ashes, the center of the neck accurately under station; above bottle is a stone 8 inches square and 3 feet long, rising 3 inches above surface, with intersecting grooves north and south and east and west marking point.	35 52 11.5	85 58 23.2
Forks of road west and northwest, 40 feet north to large oak stump, 40 feet south to large sycamore stump.	35 52 33.4	85 56 52.3
Comer's store, forks of road 600 feet south of, roads southeast and south, 90 feet east to beech tree.	35 51 13.4	85 56 32.9
Wood's store, three corners, T road west, 35 feet east to store door, 40 feet southwest to large oak.	35 50 43.7	85 56 45.2
Forks to east, 40 feet west to door of log church.	35 49 59.2	85 56 48.0
Four corners, 10 feet southeast to oak tree and signboard "Manchester 26 miles," 40 feet northeast to two mail boxes.	35 49 03.3	85 56 56.0
Four corners, 15 feet east to oak, 30 feet southwest to two oaks.	35 48 11.2	85 57 18.0
Forks of road northeast, 30 feet southwest to oak, 40 feet south to oak.	35 47 13.5	85 57 45.1
Second-class road forks to northeast, oak tree.	35 46 19.9	85 58 01.0
Burns's store, three corners 0.25 mile west of, 20 feet southwest to large oak.	35 45 55.8	85 58 37.0
Davenport's store, 1,500 feet northwest of, 7 miles southeast to Woodbury, in east wall northeast corner of R. L. Spidell's brick spring house, on south edge of old stage road from Woodbury to Minnville, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1906".	35 46 38.3	85 59 11.9
Forks of road at sawmill.	35 46 25.5	85 59 42.8
Iconium Church, three corners $\frac{1}{2}$ mile east of, T road north near corner of clearing, 40 feet southwest to oak, 90 feet north to oak.	35 46 29.5	86 00 49.1
Public roads, oak tree in southwest corner.	35 46 05.1	86 01 56.5
Three corners, road to west at bend of main road to south, 15 feet southeast to corner of fence, 20 feet north to fence.	35 45 36.1	86 02 42.7
Four corners, intersection of Woodbury-Manchester and Short Mountain-Pettys Gap roads, 40 feet northeast to oak, 90 feet southwest to oak, 300 feet northeast to Quickstep schoolhouse.	35 45 04.1	86 03 19.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Four corners, 0.5 mile east of Old Pettys post-office, 80 feet northeast to oak tree, 40 feet north to oak.	35 44 45.3	86 03 35.0
Second-class road at small graveyard, 40 feet north to gate, 20 feet south to gate.	35 45 17.9	86 04 58.5
Bent, three corners, 1.75 miles southeast of, T road south to Jamison's brandy distillery, 20 feet northwest to oak tree, 100 feet south to bridge.	35 45 21.0	86 06 19.1
Forks of road, 100 feet northwest of barn and 300 feet southeast of Horse Spring Fork, roads northwest down and southeast up, 40 feet southeast to barnyard gate, 60 feet northeast to locust tree.	35 45 39.0	86 06 53.3
Burt Carsons Fork, center of, at ford 0.25 mile southwest of.	35 45 58.1	86 07 53.9
West side of Woodbury-Hollow Springs road, 80 feet west of center of Carsons Fork, at junction with public road leading southwest over ridge to Bradyville and 250 feet north of new store on Bradyville road, in limestone rock, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1906"	35 44 45.0	86 07 44.8
Second-class T road to northeast down hollow 5 feet southwest to stone fence, 30 feet north to bench of sycamore sprouts.	35 44 25.3	86 09 00.9
Readyville, junction of Murfreesboro-Hollow Springs pike and T road to east, 40 feet southeast to corner of store porch, 35 feet northeast to store porch.	35 44 22.6	86 09 56.7
Three corners, 1.12 miles west of Readyville, second-class T road to north, 25 feet northwest to gate, 10 feet south to rail fence.	35 44 46.5	86 10 49.3
Murfreesboro-Hollow Springs pike, 50 feet north of center of, in new corner of junction of pike with road north down Cripple Creek to Bradyville, 2,000 feet west of church, in limestone boulder, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1906"	35 44 50.4	86 11 27.7
Forks of road uphill to northeast, 60 feet north to locust tree.	35 45 54.6	86 11 31.2
Three corners, public T road to north, 10 feet south to B. M. Beeton's mail box, 30 feet northeast to peach tree.	35 46 51.7	86 12 23.1
Three corners, 0.75 mile south of pike, second-class T road northwest, 40 feet south to large oak, 30 feet northwest to cedar.	35 48 21.1	86 12 17.4
Readyville post-office, forks of road 1/4 mile north of.	35 49 44.9	86 10 44.8
Readyville, forks 1 mile north of, road north and northwest, 15 feet north to stone walk, 40 feet east to wire fence.	35 50 04.7	86 11 23.8
Readyville, four corners 2 miles north of, crossroads, 10 feet southwest to three cedars, 50 feet east to cedar.	35 50 48.3	86 11 11.1
Auburn pike, 60 feet northeast to large oak, 30 feet southwest to rail fence.	35 51 48.5	86 11 31.0
Murfreesboro-Auburn pike, in north edge of, at three corners, 500 feet east of Antioch Church, T road south to Readyville and 3.3 miles north of, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1906"	35 51 48.8	86 11 31.4
Four corners, second-class crossroads, 10 feet southwest to corner of fence, 40 feet northeast to hickory tree.	35 52 26.6	86 12 10.4
Forks of road, public roads south and southwest, 600 feet southwest of church, 30 feet west to cedar.	35 53 29.3	86 12 01.5
Milton, crossroads, 1.6 miles south of, center of rock ledge, 40 feet east to elm, 50 feet west to mail box.	35 54 50.4	86 11 36.0
Milton, Presbyterian Church, junction of Milton-Murfreesboro pike and Readyville road, 25 feet southwest to corner of wire fence, 35 feet southeast to corner of churchyard fence.	35 55 46.4	86 10 56.1
Three corners, T road west, 20 feet southwest to small bridge, 30 feet east to gate, 10 feet northwest to J. H. Paty's mail box.	35 56 42.0	86 10 42.7
Three corners, T road northwest, 10 feet north to corner of rock fence, 12 feet west to mail box No. 74.	35 58 01.6	86 10 28.0
Ewingsville schoolhouse, 3.1 miles north of Milton, on Milton-Statesville road, limestone rock, being northwest corner of Woodbury quadrangle, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1906"	35 58 28.7	86 10 24.5
Forks of roads northwest to northeast, up small stream, 50 feet north to poplar tree, 50 feet east to center of stream.	35 58 27.3	86 09 09.6
Forks of roads, east down Kennedy Creek and uphill to Auburn, 10 feet south to rock fence.	35 58 03.3	86 08 25.2
Three corners, T road to south, 25 feet southwest to corner of rail fence, 25 feet southeast to H. W. Preston's mail box.	35 58 13.3	86 05 50.2
Junction Kennedy Creek road and Murfreesboro pike and Herican road, 1.5 miles east of Auburn and about 300 feet north of Wilson-Cannon county line, 30 feet south of center of pike, in limestone ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1906"	35 57 55.9	86 04 32.4
Forks at west end of old bridge site, road northeast, limestone boulder, 40 feet southwest to gate at store fence, 80 feet north to corner of barn, 125 feet east to center Sanders Fork.	35 58 35.0	86 04 14.3
Prosperity, steeple of church.	35 58 47.0	86 03 27.1
Three corners at east end of old bridge site across Sanders Fork, T road to north, 35 feet southwest to tree, 25 feet north to stone fence.	35 59 19.1	86 02 21.5
T road southeast, 40 feet southeast to gate.	36 00 08.0	86 01 16.4
Liberty, forks of pike 2 miles northwest of, 50 feet northwest to corner of store, 40 feet south to corner of blacksmith shop.	36 00 41.1	86 00 00.7
Liberty, west edge of, 80 feet north of northwest corner of Salem Baptist Church, in limestone ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1906"	36 00 13.1	85 58 27.6

VIRGINIA.

TRIANGULATION STATIONS.

FLOYD AND PATRICK COUNTIES.

FLOYD AND STUART QUADRANGLES.

In the fall of 1905 W. H. Lovell, topographer, extended triangulation control over the Floyd quadrangle and the northern portion of the Stuart quadrangle. Seven new stations, based on Buffalo and Bull of the Coast and Geodetic Survey, were occupied.

BUFFALO, FLOYD COUNTY.

On a high narrow ridge cleared on all sides, about 15 miles by road southwest of Floyd. Best reached from J. A. Alderman's house by good path. A station of the Coast Survey.

Station mark: A bronze tablet in solid ledge.

[Latitude $36^{\circ} 47' 46.15''$, longitude $80^{\circ} 28' 39.05''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Stocker.....	231	42	41	51	48	39	4.27487
Haycock.....	248	20	16	68	27	47	4.30184
Bull.....	296	49	47	116	58	51	4.40298
Hylton.....	305	38	00	125	43	07	4.19545
Turner.....	321	10	54	141	14	57	4.20722

HAYCOCK, FLOYD COUNTY.

On a high partly cleared hill about 5 miles southeast of Floyd and 0.75 mile from Haycock post-office, on what is known as the Lee farm. Wagon can be driven to signal.

Station mark: A bronze tablet set in sandstone rock.

[Latitude $36^{\circ} 51' 45.4''$, longitude $80^{\circ} 16' 07.2''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Hylton.....	19	40	50	199	38	30	4.24422
Buffalo.....	68	27	47	248	20	16	4.30184
Stocker.....	138	09	26	318	08	23	3.75940
Bull.....	348	16	41	168	18	15	4.28360

STOCKER, FLOYD COUNTY.

On Stockers Knob, about 0.75 mile south of Floyd court-house, near Floyd-Stuart pike. Hill cleared except to west. Can drive to station.

Station mark: A drill hole in quartz rock.

[Latitude 36° 54' 04.2'', longitude 80° 18' 42.1'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hylton.....	5 40 50	185 40 00	4.32029
Buffalo.....	51 48 39	231 42 41	4.27487
Haycock.....	318 08 23	138 09 26	3.75940
Bull.....	341 27 12	161 30 19	4.38671

BULL, PATRICK COUNTY.

On the highest peak of a group of high wooded hills a few miles north of Stuart. Best reached by following the Stuart-Patrick Springs highway to a point 4 miles from Stuart and 1 mile east of Mr. Orr's house. A path leads up south spur to summit.

Station mark: A bronze tablet in rock set in ground.

[Latitude 36° 41' 34.97'', longitude 80° 13' 29.93'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Noel.....	24 11 46	204 10 22	3.93032
Carter.....	43 44 02	223 41 16	4.00004
Turner.....	84 55 08	264 50 08	4.09753
Hylton.....	103 12 04	283 08 08	4.00330
Buffalo.....	116 58 51	296 49 47	4.40298
Stocker.....	161 30 19	341 27 12	4.38671
Haycock.....	168 18 15	348 16 41	4.28360

CARTER, PATRICK COUNTY.

About 3 miles southwest of Stuart, on the summit of a ridge called Carters Mountain, on land of William Hayden. View intercepted by woods to west and northwest.

Station mark: A bronze tablet in sandstone rock.

[Latitude 36° 37' 40.4''. Longitude 80° 18' 18.2'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hylton.....	163 02 00	343 00 50	3.99821
Bull.....	223 41 16	43 44 02	4.00004
Stuart.....	242 01 00	62 02 00	3.52906
Noel.....	278 58 00	98 59 00	3.53924

HYLTON, PATRICK COUNTY.

On a high, bare ridge about 250 feet east of the highway leading from Stuart to Cruise and within 0.12 mile of Cruise post-office, on land owned by A. A. Hylton, who lives a few hundred feet south of the station.

102 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Station mark: A dead tree 60 feet high with a triangle of six nails driven in the side facing Buffalo.

[Latitude $36^{\circ} 42' 49.4''$. Longitude $80^{\circ} 20' 05.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Turner.....	37 51 23	217 49 50	3.63573
Buffalo.....	125 43 07	305 38 00	4.19545
Stocker.....	185 40 00	5 40 50	4.32029
Haycock.....	199 38 30	19 40 50	4.24422
Bull.....	283 08 08	103 12 04	4.00330
Noel.....	327 49 10	147 51 42	4.07515
Carter.....	343 00 50	163 02 00	3.99821

NOEL, PATRICK COUNTY.

Three miles south of Stuart, in an open field 100 feet west of public road, on land of Mrs. Noel.

Station mark: A bronze tablet in rock at pile of stones.

[Latitude $36^{\circ} 37' 22.9''$. Longitude $80^{\circ} 15' 50.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carter.....	98 58 00	278 58 00	3.53924
Hylton.....	147 51 42	327 49 10	4.07515
Bull.....	204 10 22	24 11 46	3.93032

STUART METHODIST EPISCOPAL CHURCH SPIRE, PATRICK COUNTY.

Station mark: Center of spire.

[Latitude $36^{\circ} 38' 31.9''$. Longitude $80^{\circ} 16' 08.0''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carter.....	62 02 00	242 01 00	3.52906
Noel.....	348 29 00	168 29 00	3.33639

TURNER, PATRICK COUNTY.

About 4 miles southwest of Cruise post-office, on land of Rufus Turner, within 200 yards of road and house.

Station mark: Dead stump of tree 9 feet high having triangle of nails driven in west side.

[Latitude $36^{\circ} 40' 58.7''$. Longitude $80^{\circ} 21' 52.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buffalo.....	141 14 57	321 10 54	4.20722
Hylton.....	217 49 50	37 51 23	3.63573
Bull.....	264 50 08	84 55 08	4.09753

ALLEGHANY, BATH, BEDFORD, BOTETOURT, CRAIG, AND ROCKBRIDGE
COUNTIES.

BUCHANAN AND FINCASTLE QUADRANGLES.

In the spring of 1906 Oscar Jones, topographer, located four new stations for the control of two 15-minute quadrangles. Positions are based on Bald Knob, Flat Top, and Potts, United States standard datum.

RICH PATCH, ALLEGHANY AND BOTETOURT COUNTIES.

(Not occupied.)

On a flat timbered summit of Rich Patch Mountain, 4 miles north of Oriskany, the nearest railroad station. May be reached by road from Oriskany to old Grace Furnace, thence by path which crosses mountain 2 miles southwest of station.

Station mark: A monument of stone 6 feet in diameter at the base and 5 feet high, piled around the base of an oak tree 12 inches in diameter in which is placed a signal.

[Latitude 37° 40' 38.09". Longitude 79° 58' 14.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugar Loaf.....	274 53 54.9	95 04 01.6	4.387810
Flat Top.....	306 00 46.9	120 14 58.9	4.627556
Caldwell.....	4 23 39.2	184 23 06.1	4.239700

POTTS, ALLEGHANY AND CRAIG COUNTIES.

A station of the Geological Survey first established in 1885, on the Craig-Alleghany county line, on a rounded knob on Potts Mountain east of the Fincastle-Sweet Springs road, 12 miles by road and trail north of Newcastle. The old stage from Newcastle to Sweet Springs crosses the mountain 0.25 mile west of the station.

Station mark: The birch signal tree, around which is a mound of stone.

Reference marks: Two holes drilled in solid rock: No. 1, station bears N. 22° E magnetic, distant 12.1 feet; No. 2, station bears S. 42° W. magnetic, distant 7.7 feet.

[Latitude 37° 36' 02.9". Longitude 80° 08' 45.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bald Knob.....	215 39 03.8	35 49 53.1	4.647675
Sugar Loaf.....	260 46 54.7	81 03 25.9	4.605446
Flat top.....	288 12 03.4	108 32 37.9	4.719626
Caldwell.....	301 55 13.3	122 01 04.7	4.222150

BALD KNOB, BATH COUNTY.

Coast Survey station on Warm Springs Mountain, about 3 miles (air line) south of Healing Springs, 1,000 feet north of highest summit and 20 feet lower. Millboro depot and Covington, nearest railroad stations.

Station mark: (C. and G. S.; could not be found.)

Reference marks: One stone post bearing S. 87° E. true, distant 7 feet; one hole bearing S. 87° W. true, distant 7.28 feet; one hole bearing N. 8° W. true, distant 10.58 feet.

[Latitude $37^{\circ} 55' 32.58''$. Longitude $79^{\circ} 51' 04.77''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Sugar Loaf.....	335	03	49.0	155	09	34.2	4.515084
Flat Top.....	335	40	48.5	155	50	39.8	4.760975
Potts.....	35	49	53.1	215	39	05.8	4.647675

CALDWELL, BOTETOURT COUNTY.

A point on the southwest end of Caldwell Mountain, about 7 miles west of Fincastle. Station may be reached from Fincastle by following the Newcastle road almost to the top of the mountain, turning to the left at an apple orchard on the summit. There is a road up the hollow to a point within 1 mile of the station. Good view.

Station mark: A bronze tablet cemented in solid rock.

Reference marks: Arrow cut in rock bearing N. $63\frac{1}{2}^{\circ}$ E. magnetic, distant 6.75 feet; arrow cut in rock bearing N. $59\frac{1}{2}^{\circ}$ W. magnetic, distant 2.68 feet.

[Latitude $37^{\circ} 31' 16.46''$. Longitude $79^{\circ} 59' 08.55''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Potts.....	122	01	04.7	301	55	13.3	4.222150
Rich Patch.....	184	23	06.1	4	23	39.2	4.239700
Sugar Loaf.....	239	18	30.9	59	29	09.6	4.474849
Flat Top.....	282	04	03.3	102	18	45.8	4.561680

SUGAR LOAF, BOTETOURT COUNTY.

On the east end of Sugar Loaf Mountain, 12 miles north of Buchanan. Buchanan-Daggers Springs road up Purgatory Creek crosses divide 0.75 mile east of station. The top is cleared, giving a good view in all directions.

Station mark: A bronze tablet set in cement 18 inches below the surface, over which is built a mound of stone 6 feet in diameter at the base and 5 feet high.

Reference marks: A 1-inch hole drilled in solid rock bearing N. 65° W. magnetic, distant 12 feet; a 1-inch hole drilled in solid rock bearing N. 70° E. magnetic, distant 14.60 feet.

[Latitude 37° 39' 29.27". Longitude 79° 41' 41.59".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Caldwell.....	59	29	09.6	239	18	30.9	4.474849
Potts.....	81	03	25.9	260	46	54.7	4.605446
Rich Patch.....	95	04	01.6	274	53	54.9	4.387810
Bald Knob.....	155	09	34.2	335	03	49.0	4.515084
Short Hill.....	254	24	25.2	74	28	18.3	3.987007
Flat Top.....	336	35	03.2	156	39	09.0	4.396856

FLAT TOP, BOTETOURT AND BEDFORD COUNTIES.

A station of the Coast Survey 10 miles northwest of Liberty, Bedford County. Rough wagon road within one-fourth mile of station.

Station mark: A bronze tablet cemented in stone boulder, replacing Coast Survey bench mark, which had been removed.

[Latitude 37° 27' 06.78". Longitude 79° 34' 58.40".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Caldwell.....	102	18	45.8	282	04	03.3	4.501680
Potts.....	108	32	37.9	288	12	03.4	4.719626
Rich Patch.....	126	14	58.9	306	00	46.9	4.627556
Bald Knob.....	155	50	39.8	335	40	48.5	4.760975
Sugar Loaf.....	156	39	09.0	336	35	03.2	4.396856
Short Hill.....	178	48	18.1	358	48	04.9	4.406521

SHORT HILL, ROCKBRIDGE COUNTY.

(Not occupied.)

On mountain known as Short Hill, about 5 miles northwest of Natural Bridge. A road crosses the ridge about 0.75 mile north of the station. There are two knolls near each other, the east one covered with timber, the west one bare. The station is on the west knoll. A good view can be had in all directions.

Station mark: A mound of stone 8 feet in diameter at the base and 6 feet high.

[Latitude 37° 40' 53.72". Longitude 79° 35' 20.10".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Flat Top.....	358	48	04.9	178	48	18.1	4.406521
Sugar Loaf.....	74	28	18.3	254	24	25.2	3.987007

WEST VIRGINIA.

TRIANGULATION STATIONS.

BRAXTON, CALHOUN, CLAY, KANAWHA, ROANE, AND WIRT COUNTIES.

ARNOLDSBURG, FLATWOOD, LITTLE OTTER, MINNORA, SPENCER, AND WALTON
QUADRANGLES.

Triangulation control was extended in 1904 by C. A. Clunet, field assistant, from stations Ruble, Staats, and Weed. Twenty-three new stations were located on the United States standard datum.

COON, BRAXTON COUNTY.

On a high peak at the head of Coon Creek, 2 miles northwest of Hoover post-office and 6 miles southwest of Sutton; timber is mostly cleared from top of knob. Land is owned by T. M. Dean, who lives at Hoover. A ridge road runs 300 yards south of signal.

Station mark: A sandstone post 36 by 8 by 8 inches, set 30 inches in the ground and having a stamped bronze triangulation tablet cemented in the top.

Reference mark: The chestnut oak signal tree, distant 17.5 feet, true azimuth 333° .

[Latitude $38^{\circ} 36' 53.36''$. Longitude $80^{\circ} 46' 49.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harrison.....	58 12 12.2	238 05 21.0	4.274113
Pilot.....	72 30 53.5	252 17 44.8	4.506895
Frame.....			4.133550
Mule.....	111 03 34.0	290 52 58.8	4.420508
Sugar.....	164 33 57.0	344 32 46.3	4.012311
High.....	240 48 59.0	60 56 47.0	4.316880
Green.....			4.140950

FRAME, BRAXTON COUNTY.

(Not occupied. Position unchecked.)

On a high, wooded peak 1 mile northeast of Servia post-office.

Station mark: A large chestnut tree having cleats nailed up trunk to top, which is cut out.

[Latitude $38^{\circ} 37' 40.3''$. Longitude $81^{\circ} 56' 10.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pilot.....			4.30581
Coon.....			4.13355

GIP, BRAXTON COUNTY.

(Not occupied. Position unchecked.)

On a high, partially wooded summit known locally as Rattlesnake Hill, 0.5 mile northeast of Gip post-office, on land of Mr. Miller, who lives at Gip.

Station mark: A stone post 24 by 8 by 8 inches, set 20 inches in the ground.

Reference marks: A large chestnut-oak tree (signal tree) 5 feet east of station.

[Latitude 38° 40' 15.9". Longitude 80° 58' 55.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Weedy.....			4.17697
Mule.....			3.88757

GREEN, BRAXTON AND NICHOLAS COUNTIES.

(Not occupied. Position unchecked.)

On a high, wooded knob 5 miles southeast of Littlebirch post-office and 3 miles north of Skyles post-office, at the head of Carpenter Fork to the north and Mill Creek to the west, on the Braxton-Nicholas county line and 0.5 mile west of Webster County line. Station is 150 yards east of county road and 300 yards north of forks of road at top of hill at George Wynn's house.

Signal: A flag and target on top of red-oak tree 20 feet south of fence line, distant from station 22 feet.

Station mark: A sandstone post 36 by 8 by 8 inches, set 28 inches in the ground and having a bronze triangulation tablet cemented in the top.

[Latitude 38° 31' 39.4". Longitude 79° 40' 01.7".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Coon.....			4.14095
High.....			4.33104

HIGH, BRAXTON COUNTY.

On a high knob, mostly cleared, 12 miles northeast of Sutton and 2 miles west of Caress post-office, in pasture on land of John Marple, who lives in hollow 0.5 mile northwest of station. Station is 3 feet north of east-west fence line, 100 yards north of forks of county road and same distance east of Methodist Church.

Station mark: A sandstone post 36 by 8 by 8 inches, set 30 inches in the ground and having a bronze triangulation tablet cemented in top.

[Latitude 38° 42' 20.73". Longitude 79° 34' 20.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Green.....	22 41 40	240 48 59	4.33104
Coon.....	60 56 47	269 26 10	4.31688
Sugar.....	89 35 10		4.31908

SUGAR, BRAXTON COUNTY.

At the head of Sugar Creek, on a high knob locally known as Sugar Knob, 4 miles northwest of Gassaway station, on the Coal and Coke Railway, on land of Mr. Dodery, east side of summit cleared and west side timbered.

Station mark: A stone post.

Reference marks: The tall, straight hickory tree on north-south fence line which divides the woods from cleared land, distant from station 14.6 feet, azimuth 175° 16'.

[Latitude 38° 42' 14.94". Longitude 79° 49' 43.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harrison.....	33 43 12.8	213 37 31.9	4.377235
Mule.....	88 47 22.3	268 37 57.3	4.339282
High.....	269 26 10.0	89 35 10.0	4.319080
Coon.....	344 32 46.3	164 33 57.0	4.012311

DESERT, CALHOUN COUNTY.

On a high, cleared peak in pasture 2 mile south of Beech post-office and 0.25 mile east of Roane County line, on land of Joseph Wagner, who lives on east slope of knob, locally known as Desert Peak.

Station mark: A sandstone post 36 by 7 by 7 inches, set 32 inches in the ground and having a bronze triangulation tablet cemented in top.

Signal: A tall chestnut-oak tree near top of hill.

[Latitude 38° 44' 32.91". Longitude 81° 09' 59.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Craig.....	128 34 26.1	308 28 56.2	4.210752
Rattlesnake.....	172 22 36.1	352 21 33.6	4.258036
Millstone.....	232 24 31.0	52 28 01.0	4.009880
Mule.....	297 44 21.2	117 48 14.5	4.007943

MILLSTONE, CALHOUN COUNTY.

On a high, cleared knob 3.5 miles northeast of Arnoldsburg and 0.5 mile southwest of Millstone post-office, on land of Mr. Altizer, of Arnoldsburg.

Station mark: A stone post 36 by 7 by 7 inches, set 30 inches in the ground and having a bronze triangulation tablet cemented in the top.

[Latitude 38° 47' 55.2". Longitude 81° 04' 24".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Desert.....	52 28 01	232 24 31	4.00988
Rattlesnake.....	138 09 47	318 05 14	4.19694
Kite.....			4.21711

MULE, CALHOUN COUNTY.

On a high, sharp peak, mostly cleared, 1.5 miles southeast of Minnora post-office, on land of Charles Knoth, who lives on south side of hill. Road almost to top. Locally known as Mule Knob.

Station mark: A stone post, 28 by 9 by 9 inches, set 26 inches in the ground and having a bronze tablet cemented in the top.

[Latitude 38° 41' 59.01". Longitude 81° 03' 46.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pilot.....	17 26 22.8	197 23 47.9	4.302253
Weedy.....	28 08 46.4	208 06 15.6	4.093060
Spencer.....	99 43 53.5	279 32 54.5	4.411902
Desert.....	117 48 14.5	297 44 21.2	4.007943
Craig.....	124 28 02.0	304 18 39.0	4.420269
Lukens.....	135 51 21.3	315 42 09.8	4.483672
Rattlesnake.....	153 21 33.5	333 16 37.3	4.404923
Sugar.....	268 37 57.3	88 47 22.3	4.339282
Coon.....	290 52 58.8	111 03 34.0	4.420508
Gip.....	294 18 06.0		3.887570
Harrison.....	335 53 09.5	155 56 52.5	4.326130

KITE, CALHOUN COUNTY.

On a high, cleared knob, 3 miles northeast of Grantsville and 0.25 mile southeast of Glenville road, on land belonging to Mrs. Maggie Spoon, who lives on south side of hill.

Station mark: A stone post, 36 by 8 by 8 inches, set 30 inches in the ground and having a bronze triangulation tablet cemented in the top.

[Latitude 38° 56' 46.7". Longitude 81° 03' 11.3".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Millstone.....			4.21711
Rattlesnake.....			4.11750

LUKENS, CALHOUN-WIRT COUNTY LINE.

About 5 miles northwest of Richardson, on a high, partly cleared knob, on land owned by Mr. Quick and about 0.5 mile from house of Mr. Lukens. There are a few chestnut trees on the north side of the knob and pines on the south. There is also an old peach orchard on top.

Station mark: A blue freestone post, 36 by 8 by 8 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $38^{\circ} 53' 46.84''$. Longitude $81^{\circ} 18' 27.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Craig	3 51 01.25	183 50 49.06	3.8436737
Poplar	18 05 57.27	198 04 02.62	4.1291083
Ball	55 26 09.26	235 22 13.84	4.0408885
Weed	97 40 15.91	277 32 54.51	4.2326080
Ruble	183 07 56.34	3 08 14.74	4.1101241
Rattlesnake	264 52 52.47	84 57 08.33	3.9937419
Mule	315 42 09.80	135 51 21.30	4.4836720

RATTLESNAKE, CALHOUN COUNTY.

On a high peak, mostly cleared of timber, at the head of Annamoriah Run, 0.5 mile west of Joker post-office, on land of Camden Somers, of Clarksburg, locally known as Rattlesnake Knob.

Station mark: A bronze tablet cemented in solid rock.

Reference marks: A tall lone pine tree 21.36 feet due west; arrow cut in solid rock 11.13 feet due south.

[Latitude $38^{\circ} 54' 15.16''$. Longitude $81^{\circ} 11' 39.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Spencer	37 22 26.53	217 16 22.43	4.3637765
Craig	52 45 14.47	232 40 46.59	4.1117250
Lukens	84 57 08.33	264 52 52.47	3.9937419
Ruble	142 49 37.84	322 45 40.06	4.1777789
Kite			4.1175000
Millstone	318 05 14.00	138 09 47.00	4.1969400
Mule	333 16 37.30	153 21 33.50	4.4049230
Desert	352 21 33.60	172 22 36.10	4.2580360

HARRISON, CLAY COUNTY.

On a high, wooded peak 1 mile northwest of Harrison post-office and 1 mile east of Sand Fork, on the Brackerhoff tract of land. A wood road runs almost to signal tree from the south from the Clay-Sutton road on top of the hill 0.5 mile east of Sand Fork.

Signal: A flag in a large chestnut oak having cleats nailed up to platform in top of tree.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference marks: Chestnut-oak signal tree, distant 13.8 feet, azimuth 277° 56'.

[Latitude 38° 31' 31.62". Longitude 80° 57' 49.48".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Pilot.....	90	52	03.7	270	45	46.5	4.166418
Mule.....	155	56	52.5	335	53	09.5	4.326130
Sugar.....	213	37	31.9	33	43	12.8	4.377235
Coon.....	238	05	21.0	58	12	12.2	4.274113

PILOT, CLAY COUNTY.

On a high knob which has been cleared of timber on top, 0.5 mile northwest of Valley Fork post-office, on land owned by Swann, Brown & Co. Road crosses gap 0.5 mile east of station.

Station mark: A stone post, 36 by 8 by 8 inches, set 30 inches in the ground and having a bronze triangulation tablet cemented in the top.

[Latitude 38° 31' 38.40". Longitude 81° 07' 55.02".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Campbell.....	99	29	50.6	279	20	14.7	4.355820
Nichols.....	127	34	30.5	307	28	30.7	4.245792
Spencer.....	140	21	51.7	320	13	28.9	4.484208
Weedy.....	181	07	06.1	1	07	10.3	3.914430
Mule.....	197	23	47.9	17	26	22.8	4.302255
Frame.....	237	29	12.0				4.305810
Coon.....	252	17	44.8	72	30	53.5	4.506893
Harrison.....	270	45	46.5	90	52	03.7	4.166418

GUNSTOCK, KANAWHA COUNTY.

On a high, wood-topped peak, 2 miles south of Kettle post-office and 1 mile south of the Roane County line, on land belonging to M. A. Tuipin, who lives on the northeast side of the hill.

Station mark: A stone post, 36 by 8 by 8 inches, set 30 inches in the ground and having a bronze triangulation tablet cemented in the top.

[Latitude 38° 32' 51.34". Longitude 81° 29' 58.31".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Countsville.....	198	16	58.0				4.235120
Spencer.....	210	30	57.8	30	36	21.2	4.391509
Nichols.....	244	47	27.6	64	55	13.1	4.300013
Campbell.....	261	21	08.9	81	25	17.7	3.989973

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BALL, ROANE COUNTY.

About 5 miles northwest of Spencer and 1.5 miles southwest of Kyger, on a cleared ridge, near its north end, on land of Mr. Ball and about 0.75 mile nearly east of his house.

Station mark: A blue freestone post, 36 by 8 by 8 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: A dead snag used for signal, distant 4.3 feet, true azimuth $31^{\circ} 49'$.

[Latitude $38^{\circ} 50' 24.53''$. Longitude $81^{\circ} 24' 42.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Staats.....	111 19 39.49	291 16 19.98	3.9154249
Weed.....	137 08 05.22	317 04 39.56	4.0645923
Lukens.....	235 22 13.84	55 26 09.26	4.0408885
Craig.....	274 47 04.47	94 50 47.55	3.9350141
Poplar.....	323 22 40.70	143 24 47.25	3.9122159

CAMPBELL, ROANE COUNTY.

On a high bare knob 2 miles east of Dodd post-office, in pasture on land owned by W. C. Campbell, who lives on the west side of the hill.

Signal: A lone tree with limbs cut off.

Station mark: A stone post, 36 by 8 by 8 inches, set 30 inches in the ground and having a bronze triangulation tablet cemented in the top.

Reference mark: The lone trimmed signal tree, distant 31.6 feet, true azimuth $142^{\circ} 00'$.

[Latitude $38^{\circ} 33' 38.81''$ Longitude $81^{\circ} 23' 19.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gunstock.....	81 25 17.7	261 21 08.9	3.989973
Spencer.....	188 16 19.5	8 17 33.7	4.300063
Nichols.....	230 07 11.1	50 10 47.7	4.039300
Pilot.....	279 20 14.7	99 29 50.6	4.355820

COUNTSVILLE, ROANE COUNTY.

(Not occupied. Position unchecked.)

On a high cleared knob, 0.25 mile east of Countsville post-office and 100 yards east of Walton road.

Station mark: A tall locust tree having a flag in top.

[Latitude $38^{\circ} 41' 40.4''$. Longitude $81^{\circ} 26' 15.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gunstock.....			4.23512
Spencer.....			3.93667

CRAIG, ROANE COUNTY.

About 5 miles northeast of Spencer, on a bald hill just north of fence around graveyard, on land of Scott Craig and 0.25 mile south-east of his residence. The hill is high and prominent, having three oak trees along a fence row on the north, and a peach orchard covers the east side of knob.

Station mark: A freestone post, dressed, 36 by 8 by 8 inches, set 30 inches in ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude 38° 50' 01.09". Longitude 81° 18' 46.48".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Spencer.....	19	25	39.82	199	24	03.39	4.0483462
Poplar.....	32	28	11.53	212	26	35.13	3.8398566
Ball.....	94	50	47.55	274	47	04.47	3.9350141
Weed.....	119	18	17.36	299	11	08.45	4.2760014
Lukens.....	183	50	49.06	3	51	01.25	3.8436737
Rattlesnake.....	232	40	46.50	52	45	14.47	4.1117250
Mule.....	304	18	39.00	124	28	02.00	4.4202690
Desert.....	308	28	56.20	128	34	20.10	4.2107520

NICHOLS, ROANE COUNTY.

On the high peaked top of a very large rock, 4 miles south of Looneyville, 2 miles northeast of Kester post-office, and 1 mile south of Vineyard Gap, on land owned by Lige Nichols, who lives 0.25 mile northwest of summit in hollow.

Signal: A lone snaggy tree.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference marks: The lone snaglike signal tree, distant 29.2 feet, due south.

[Latitude 38° 37' 26.30". Longitude 81° 17' 32.02".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Campbell.....	50	10	47.7	230	07	11.1	4.039300
Gunstock.....	64	55	13.1	244	47	27.6	4.300013
Spencer.....	156	34	45.3	336	32	22.5	4.142326
Pilot.....	307	28	30.7	127	34	30.5	4.245792

POPLAR, ROANE COUNTY.

About 1.5 miles southwest of Spencer, on a high bald knob on north side of which stands a lone poplar tree 20 inches in diameter with a broken top. Signal is lone poplar tree.

Station mark: A rough sandstone post, 30 by 14 by 5 inches, set 24 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet.

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Reference marks: Arrow head cut in solid rock nearly east and 38.25 feet from station mark; the lone poplar signal tree is distant 29.9 feet, true azimuth $190^{\circ} 47'$.

[Latitude $38^{\circ} 46' 51.84''$. Longitude $81^{\circ} 21' 20.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Spencer.....	0 02 00.03	180 01 59.96	3.6726746
Staats.....	127 19 37.73	307 14 11.76	4.1976405
Ball.....	143 24 47.25	323 22 40.70	3.9122159
Lukens.....	198 04 02.62	18 05 51.27	4.1291083
Craig.....	212 26 35.13	32 28 11.53	3.8398566

SPENCER, ROANE COUNTY.

On a high, cleared knob with a few scattering trees, 5 miles south of Spencer and 1 mile northeast of Speed post-office, on land belonging to Mr. Spencer, who lives on east side of hill.

Station mark: A stone post 36 by 8 by 8 inches, set 30 inches in the ground, in the top of which is cemented a bronze triangulation tablet.

[Latitude $38^{\circ} 44' 19.22''$. Longitude $81^{\circ} 21' 20.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Campbell.....	8 17 33.70	188 16 19.50	4.3000630
Gunstock.....	30 36 21.20	210 30 57.80	4.3915090
Countsville.....			3.9366700
Poplar.....	180 01 59.96	360 02 00.03	3.6726746
Craig.....	199 24 03.39	19 25 39.82	4.0483462
Rattlesnake.....	217 16 22.43	37 22 26.53	4.3637765
Mule.....	279 32 54.50	99 43 53.50	4.4119020
Weed.....	307 46 15.50	127 54 42.90	4.3954670
Pilot.....	320 13 28.90	140 21 51.70	4.4842080
Nichols.....	336 32 22.50	156 34 45.30	4.1423260

STAATS, ROANE COUNTY.

On the highest part of the bare, sharply rounded south knob of a double-headed mountain, the north knob of which is wooded, about 3 miles southeast of Liverpool and 1 mile northwest of Latimer, on land owned by W. T. Staats, whose house is in the valley.

Station mark: A sandstone post 36 by 9 by 9 inches, set 30 inches in the ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude $38^{\circ} 52' 01.49''$. Longitude $81^{\circ} 30' 00.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reynolds.....	59 58 09.35	239 50 50.09	4.2908180
Balis.....	137 16 22.34	317 12 31.56	4.1152546
Weed.....	177 35 16.45	357 35 10.40	3.7416364
Ruble.....	227 07 48.19	47 15 22.24	4.3750402
Ball.....	291 16 19.98	111 19 39.49	3.9154249
Poplar.....	307 14 11.76	127 19 37.73	4.1976405

WEEDY, ROANE COUNTY.

On a high, bare, cultivated knob 5 miles east of Newton and 2 miles southeast of Uler post-office, on land belonging to J. J. Smith, who lives at foot of hill on north side.

Signal: A lumber tripod.

Station mark: A stone post 36 by 8 by 8 inches, set 30 inches in the ground, and having a bronze triangulation tablet cemented in center of top.

[Latitude 38° 36' 04.66". Longitude 81° 07' 48.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pilot.....	1 07 10.3	181 07 06.1	3.9144300
Spencer.....	127 54 42.9	307 46 15.5	4.3954670
Mule.....	208 06 15.6	28 08 46.4	4.0930600
Gip.....	238 55 44.0		4.1769700

RUBLE, WIRT COUNTY.

On a very high, wooded knob at south end of ridge, 2.5 miles north of Burning Springs, at head of Two Run on east and Charleston Run on west, on land owned by C. L. Ruble, who lives on the northeast side of ridge. It is about 0.25 mile east of the Ruble log church. Locust trees cover east side of the summit.

Station mark: A sandstone post 36 by 9 by 9 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 00' 44.10". Longitude 81° 17' 57.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lukens.....	3 08 14.74	183 07 56.34	4.1101241
Staats.....	47 15 22.24	227 07 48.19	4.3750402
Weed.....	59 01 48.11	238 54 07.75	4.3132201
Balis.....	76 05 30.89	255 54 05.29	4.4319366
Windy.....	94 29 37.09	274 20 57.36	4.2992679
Jephany.....	111 45 25.77	291 41 08.73	4.0240129
Freed.....	148 42 28.80	328 38 06.99	4.2831913
Rattlesnake.....	322 45 40.06	142 49 37.84	4.1777789

WEED, WIRT, JACKSON, AND ROANE COUNTIES.

At highest point of a cultivated knob on boundary of Wirt, Jackson, and Roane counties, 3 miles northeast of Liverpool, on land of D. W. Dougherty, whose residence, a small log house, is situated 200 feet northeast of the station, at a slightly lower elevation. Station is about 7 feet east of fence and about 100 feet south of road. (No boundary post was found.)

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Station mark: A sandstone post 36 by 9 by 9 inches, set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 38° 55' 00.21". Longitude 81° 30' 09.86".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Balis.....	115	16	15.75	295	12	30.91	3.9789552
Windy.....	169	30	34.12	349	29	35.35	4.0915521
Jephany.....	208	12	33.91	28	16	02.67	4.2168738
Ruble.....	238	54	07.75	59	01	48.11	4.3132201
Lukens.....	277	32	54.51	97	40	15.91	4.2326080
Craig.....	299	11	08.45	119	18	17.36	4.2760014
Ball.....	317	04	39.56	137	08	05.22	4.0645923
Staats.....	357	35	10.40	177	35	16.45	3.7416364

WISCONSIN.

PRIMARY TRAVERSE.

DANE COUNTY.

CROSS PLAINS QUADRANGLE.

The following geographic positions were determined by primary traverse in 1905 by George T. Hawkins, topographer. The line starts from Coast and Geodetic Survey astronomic pier at Madison and follows highways west to the edge of the Cross Plains quadrangle; thence south, west, north, east, and south to the point where the line first touched the quadrangle. The line is connected with the Norwegian Church spire, a United States Coast and Geodetic Survey triangulation station near Mount Horeb. Positions are given on approximate United States standard datum.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Madison astronomic station.....	43	04	30.6	89	24	07.3
T. 7 N., R. 8 E., corner secs. 13, 14, 23, and 24, crossroads.....	43	04	31.3	89	30'	08.6
T. 7 N., R. 8 E., hub at corner secs. 23, 24, 25, and 26, crossroads.....	43	03	38.7	89	30	09.6
T. 7 N., R. 8 E., corner secs. 25, 26, 35, and 36, T road east.....	43	02	46.7	89	30	11.4
Township line, east-west road on same.....	43	01	54.0	89	30	42.3
Blizzard (J.) house, across road in front of, 6 feet north of telegraph pole, in sec. 2, on southeast side of road running northeast and southwest, iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	43	01	29.7	89	31	11.1
Verona, five corners, 2 miles north of.....	43	00	57.9	89	32	00.7
Verona, road north 2 miles north by 1.5 miles west of.....	43	00	47.0	89	33	46.9
Rs. 7 and 8 E., line between.....	43	00	35.3	89	36	07.8
Clantorf, T road north.....	43	00	35.1	89	37	18.6
Clantorf, 1,800 feet west of, on south side of road, 2 feet north of wire fence, iron post stamped "Prim. Trav. Sta. No. 8, 1905".....	43	00	29.8	89	37	42.0
Norwegian Church, three corners 0.75 mile southeast of.....	43	00	09.8	89	40	37.0
Norwegian Church spire.....	43	00	21.5	89	41	29.1
T. 6 N., Rs. 6 and 7 E., quarter corner between secs. 7 and 12.....	43	00	36.7	89	43	14.5
Mount Horeb, in northeast part of, 40 feet northeast of creamery and 5 feet southwest of corner of wire fence, iron post stamped "Prim. Trav. Sta. No. 9, 1905".....	43	00	45.5	89	43	48.7
Tps. 6 and 7 N., R. 6 E., quarter corner between secs. 1 and 36.....	43	01	55.2	89	43	51.3
Cheese factory, three corners.....	43	04	06.0	89	43	44.9
Creamery, T road west.....	43	05	24.1	89	44	12.6
Tps. 7 and 8 N., R. 6 E., corner secs. 2, 3, 34, and 35.....	43	07	08.3	89	45	33.5
Black Earth, in southwest part of, on west side of north-south road and 200 feet south of forks to northwest, iron bench-mark post stamped "Prim. Trav. Sta. No. 10, 1905".....	43	08	03.8	89	44	58.2

Geographic positions along Chicago, Milwaukee and St. Paul Railway between Black Earth and Roxbury.

Station.	Latitude.	Longitude.
Black Earth, road crossing at three corners about 1.5 miles northwest of.....	° ' " 43 09 13.9	° ' " 89 46 07.8
Mazomanie, Catholic Church spire.....	43 10 23.4	89 47 30.9
T. 8 N., R. 6 E., corner secs. 2, 3, 10, and 11, four corners.....	43 11 29.5	89 45 33.4
Tps. 8 and 9 N., R. 6 E., Chicago, Milwaukee and St. Paul Rwy., at township line crossing.....	43 12 22.1	89 45 08.7
On north side of east-west road, 410 feet east of railroad and 2 feet south of wire fence, iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	43 14 58.5	89 43 30.2
T. 9 N., Rs. 6 and 7 E., corner secs. 13, 18, 19, and 24.....	43 14 58.6	89 43 11.3
T. 9 N., R. 7 E., corner secs. 17, 18, 19, and 20, T road south.....	43 14 59.2	89 42 00.0
Roxbury, crossroads.....	43 14 58.8	89 40 30.5
T. 9 N., R. 7 E., sec. 23, three corners near by, T road west.....	43 14 32.2	89 38 05.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 9 N., R. 7 E., in sec. 24, on east side of road running northwest and southeast, 6 feet west of fence and 1,900 feet northwest of stone church painted white, iron post stamped "Prim. Trav. Sta. No. 12, 1905".....	° ' " 43 14 50.8	° ' " 89 36 21.5
T. 9 N., Rs. 7 and 8 E., quarter corner between secs. 19 and 24.....	43 14 32.6	89 36 02.0
T. 9 N., R. 8 E., quarter corner between secs. 19 and 20, T road north.....	43 14 33.4	89 34 51.6
T. 9 N., R. 8 E., corner secs. 20, 21, 28, and 29.....	43 14 08.1	89 33 39.4
T. 9 N., R. 8 E., corner secs. 21, 22, 27, and 28, crossroads.....	43 14 08.7	89 32 27.4
T. 8 N., R. 8 E., corner secs. 22, 23, 26, and 27, T road north.....	43 14 09.8	89 31 15.7
T. 9 N., R. 8 E., 0.25 mile east and 440 feet south of corner secs. 22, 23, 26, and 27, east side of north-south road, 2 feet west of wire fence, iron post stamped "Prim. Trav. Sta. No. 13, 1905".....	43 14 05.4	89 30 57.2
T. 9 N., R. 8 E., four corners in south part of sec. 26.....	43 13 27.3	89 30 22.3
Tps. 8 and 9 N., R. 8 E., crossing of township line between.....	43 12 25.0	89 30 22.7
Schoolhouse, T road south.....	43 12 11.1	89 30 04.9
Schoolhouse, crossroads.....	43 10 39.0	89 29 47.0
T. 8 N., R. 8 E., quarter corner between secs. 13 and 24.....	43 09 46.8	89 29 29.9
T. 8 N., R. 8 E., quarter corner between secs. 25 and 36.....	43 08 01.2	89 29 29.5
Tps. 7 and 8 N., R. 8 E., quarter corner between secs. 1 and 36, 770 feet north of, 3 feet from wire fence, on west side of north-south road, iron post stamped "Prim. Trav. Sta. No. 14, 1905".....	43 07 32.1	89 29 29.5
Pheasant Branch, three corners.....	43 06 15.2	89 29 33.2

ROCK AND WALWORTH COUNTIES.

DELAN, JANESVILLE, AND SHOPIERE QUADRANGLES.

Geographic positions in these quadrangles were obtained by primary traverse in 1905 by George T. Hawkins, topographer. The line starts from the position of the crossroads 2.75 miles northeast of Janesville, follows highways south, east, and north near the borders of the Shopiere quadrangle, and is connected with the city school at Janesville, the Congregational Church spire at Beloit, and the adjusted position of bench-mark post No. 8, 1904, 6.5 miles south of Whitewater.

It also extends from the southwest corner of the Delavan quadrangle east and north to the Yerkes Observatory.

118 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

JANESVILLE QUADRANGLE (ROCK COUNTY).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Janesville, four corners 2.75 miles northeast of.....	42	43	12.2	88	59	47.6
Janesville, dome of city school.....	42	40	55.1	89	00	57.1
T. 2 N., Rs. 12 and 13 E., quarter corner between secs. 7 and 12, T road west.....	42	38	58.4	89	00	41.9
T. 2 N., Rs. 12 and 13 E., quarter corner between secs. 13 and 18, crossroads.....	42	38	05.9	89	00	41.6
On east side of north-south road, 2 feet from wire fence, D. A. Beckus's house bears N. 30° W., distant 340 feet, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	42	37	03.5	89	00	41.1
T. 2 N., Rs. 12 and 13 E., corner secs. 25, 30, 31, and 36, crossroads.....	42	35	55.2	89	00	41.1
Tps. 1 and 2 N., Rs. 12 and 13 E., corner secs. 1, 6, 31, and 36, crossroads.....	42	35	03.2	89	00	39.9
T. 1 N., Rs. 12 and 13 E., corner secs. 1, 6, 7, and 12, crossroads.....	42	34	06.8	89	00	40.0
T. 1 N., Rs. 12 and 13 E., quarter corner between secs. 19 and 24, T road west.....	42	31	56.1	89	00	41.8
Beloit, Congregational Church spire.....	42	30	05.7	89	01	39.7

SHOPIERE QUADRANGLE (ROCK COUNTY).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Beloit, 2 miles east of, 870 feet east of Chicago, Milwaukee and St. Paul Rwy., on south side of east-west road, 2 feet north of wire fence, iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	42	30	24.4	88	59	52.4
T. 1 N., R. 13 E., corner secs. 27, 28, 33, and 34, T road south.....	42	30	36.1	88	57	22.5
T. 1 N., R. 13 E., quarter corner between secs. 26 and 35, T road south.....	42	30	33.7	88	55	25.9
T. 1 N., Rs. 13 and 14 E., corner secs. 25, 30, 31, and 36, crossroads.....	42	30	30.9	88	53	39.8
Salisbury (L. A.) house, 260 feet northeast of, on south side of east-west road, 2 feet from wire fence, iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	42	30	29.6	88	52	37.6
T. 1 N., R. 14 E., quarter corner on south side of sec. 32, State line.....	42	29	36.3	88	51	53.8
T. 1 N., R. 14 E., quarter corner between secs. 27 and 34, crossroads.....	42	30	24.9	88	49	31.9
T. 1 N., R. 14 E., corner secs. 25, 26, 35, and 36.....	42	30	23.6	88	47	45.8
T. 1 N., R. 14 E., quarter corner between secs. 29 and 32, 1,600 feet west of, north side of east-west road, 3 feet from plank fence, iron post stamped "Prim. Trav. Sta. No. 4, 1905".....	42	30	24.6	88	45	11.5
T. 1 N., R. 15 E., corner secs. 29 and 32, crossroads.....	42	30	25.2	88	44	50.2
T. 1 N., R. 15 E., corner secs. 28 and 33, crossroads.....	42	30	27.4	88	43	38.8

DELAVAN QUADRANGLE (WALWORTH COUNTY).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 1 N., R. 15 E., quarter corner between secs. 21 and 28, T road west.	42	31	19.8	88	43	38.7
T. 1 N., R. 15 E., quarter corner between secs. 9 and 16, crossroads.	42	33	04.2	88	43	38.6
Tps. 1 and 2 N., R. 15 E., quarter corner between secs. 4 and 33.	42	34	51.1	88	43	38.2
T. 2 N., R. 15 E., center of sec. 27, crossroads.	42	36	09.6	88	43	38.7
Darien, 1.25 miles northwest of, north side of road at head of north-south road, 2 feet from wire fence, iron post stamped "Prim. Trav. Sta. No. 6, 1905"	42	36	40.7	88	43	39.1
Turtle Creek, T road east 0.25 mile north of.	42	37	53.1	88	44	32.7
Turtle Creek, T road west 0.75 mile north of.	42	38	18.8	88	44	32.9
Township line, four corners 1 mile south of.	42	39	11.0	88	44	33.9
Tps. 2 and 3 N., R. 15 E., corner secs. 4, 5, 32, and 33, crossroads.	42	40	03.7	88	44	14.9
T. 3 N., R. 15 E., quarter corner between secs. 28 and 29, crossroads.	42	41	22.3	88	44	17.8
Richmond, 0.75 mile southeast of, T road east.	42	42	27.2	88	44	20.6
T. 3 N., R. 15 E., quarter corner between secs. 5 and 8, 70 feet southwest of schoolhouse, district No. 5, at southwest corner of school yard, 6.5 miles south of Whitewater, 35 feet northeast of crossroads, iron post stamped "Prim. Trav. Sta. No. 8, 1904"	42	44	24.7	88	44	58.1
T. 1 N., R. 15 E., corner secs. 26, 27, 34, and 35, crossroads.	42	30	30.1	88	41	54.6
T. 1 N., R. 15 E., at corner secs. 25, 26, 35, and 36, crossroads.	42	30	31.8	88	40	44.2
T. 1 N., Rs. 15 and 16 E., corner secs. 25, 30, 31, and 36, crossroads.	42	30	33.8	88	39	34.5
T. 1 N., R. 16 E., corner secs. 29, 30, 31, and 32, crossroads.	42	30	34.4	88	38	18.0
T. 1 N., R. 16 E., corner secs. 29, 30, 31, and 32, 330 feet east of, on north side of east-west road, iron post stamped "Prim. Trav. Sta. No. 5, 1905"	42	30	34.6	88	38	13.0
T. 1 N., R. 16 E., corner secs. 28, 29, 32, and 33, crossroads.	42	30	34.2	88	37	07.8
T. 1 N., R. 16 E., corner secs. 27, 28, 33, and 34, crossroads.	42	30	33.3	88	35	56.1
T. 1 N., R. 16 E., quarter corner between secs. 21 and 22, crossroads.	42	31	52.4	88	35	57.3
T. 1 N., R. 16 E., quarter corner between secs. 15 and 16, crossroads.	42	32	44.4	88	35	57.8
T. 1 N., R. 16 E., quarter corner between secs. 10 and 11, crossroads.	42	33	36.4	88	34	48.2
Yerkes Observatory dome.	42	34	13.6	88	33	23.5

DODGE, MILWAUKEE, OZAUKEE, AND WASHINGTON COUNTIES.

CLYMAN, HARTFORD, PORT WASHINGTON, WAUKESHA, AND WESTBEND QUADRANGLES.

The following geographic positions were determined by George T. Hawkins, topographer, in 1905. The line starts from bench mark No. 16, 1904, 3 miles north of Ashippun, follows highways north near the border of the Clyman quadrangle to the northwest corner of the Hartford quadrangle, thence east to Lake Michigan; starting from the northeast corner of the Westbend quadrangle, it runs southward to bench mark No. 22, 1904, at North Greenfield.

The line is tied to Woodland triangulation station of the United States Lake Survey, to Kewaskum triangulation station of the United States Geological Survey, and to primary traverse position at Belgium, 1901.

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HARTFORD QUADRANGLE (DODGE AND WASHINGTON COUNTIES).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Ashippun, 3 miles north of, iron post No. 16, 1904.....	43	16	07.5	88	31	54.9
Tps. 9 and 10 N., R. 17 E., corner secs. 5, 6, 31, and 32, T road east.....	43	16	59.1	88	31	05.8
T. 10 N., R. 17 E., corner secs. 29, 30, 31, and 32, T road east.....	43	17	51.8	88	31	06.0
Neosho, T road east.....	43	18	38.2	88	31	05.5
T. 10 N., R. 17 E., corner secs. 17, 18, 19, and 20, crossroads.....	43	19	35.3	88	31	04.5
T. 10 N., R. 17 E., quarter corner sec. 5, north side of, T road south.....	43	22	14.4	88	30	29.0
Woodland triangulation station, in SW. $\frac{1}{4}$ sec. 33, Herman Township, 1.12 miles east of Woodland railway station and 10 meters north of middle of road, on Herman-Rubicon township line. Height of sta- tion used was 47 feet. Station mark: A stone post 2.5 feet below surface. Reference marks: Three stone posts—one S. $1^{\circ} 38'$ E., dis- tant 17.07 meters; one S. $87^{\circ} 46' 26''$ W., distant 320.59 meters, and one S. $88^{\circ} 41' 24''$ E., distant 484.49 meters. Height of ground at station, 607.2 feet.....	43	22	14.8	88	29	49.7
T. 11 N., R. 17 E., south corner secs. 31 and 32, 240 feet north and 10 feet east of, on east side of north-south road, iron post stamped "Prim. Trav. Sta. No. 15, 1905".....	43	22	16.7	88	30	03.8
T. 11 N., R. 17 E., south corner secs 31 and 32, T road north.....	43	22	14.3	88	30	03.9
T. 11 N., R. 17 E., corner secs. 29, 30, 31, and 32, crossroads.....	43	23	06.4	88	30	00.6
T. 11 N., R. 17 E., corner secs. 19, 20, 29, and 30, crossroads.....	43	23	58.6	88	30	00.5
T. 11 N., R. 17 E., corner secs. 17, 18, 19, and 20, crossroads.....	43	24	50.7	88	30	00.5
T. 11 N., R. 17 E., corner secs. 7, 8, 17, and 18, crossroads.....	43	25	42.5	88	30	00.3
T. 11 N., R. 17 E., corner secs. 5, 6, 7, and 8, crossroads.....	43	26	34.7	88	29	59.7
Tps. 11 and 12 N., R. 17 E., corner secs. 5, 6, 31, and 32, T road west.....	43	27	25.1	88	29	59.4
T. 12 N., R. 17 E., corner secs. 29, 30, 31, and 32, crossroads.....	43	28	17.5	88	29	59.0
T. 12 N., R. 17 E., quarter corner between secs. 29 and 30, crossroads.....	43	28	43.7	88	29	59.1
T. 12 N., R. 17 E., 966 feet west of quarter corner between secs. 29 and 30, north side of east-west road, iron post stamped "Prim. Trav. Sta. No. 16, 1905".....	43	28	43.8	88	30	12.2
T. 12 N., R. 16 E., quarter corner between secs. 25 and 30, T roads.....	43	28	44.5	88	31	18.8
Mayville, T road east 1 mile south of.....	43	28	46.5	88	32	46.6
T. 12 N., R. 17 E., quarter corner between secs. 28 and 29.....	43	28	43.7	88	28	47.4
T. 12 N., R. 17 E., corner secs. 23, 24, 25, and 26, T road north.....	43	29	08.8	88	25	12.1
T. 12 N., Rs. 17 and 18 E., 16 feet north and 42 feet west of corner secs. 19, 30, 24, and 25, north side of east-west road, iron post stamped "Prim. Trav. Sta. No. 17, 1905," elevation 1,026.072 feet.....	43	29	09.5	88	24	02.1
T. 12 N., Rs. 17 and 18 E., corner secs. 19, 30, 25, and 24, T road west.....	43	29	09.3	88	24	01.6
Rock River, iron bridge over, center of.....	43	28	33.6	88	22	55.9
T. 12 N., R. 18 E., corner secs. 27, 28, 33, and 34, T road south.....	43	28	16.2	88	20	30.4
T. 12 N., R. 18 E., corner secs. 26, 27, 34, and 35, crossroads.....	43	28	14.6	88	19	18.4
T. 12 N., R. 18 E., corner secs. 25, 26, 35, and 36, T road south.....	43	28	14.4	88	18	06.2
T. 12 N., Rs. 18 and 19 E., corner secs. 25, 30, 31, and 36, crossroads.....	43	28	14.2	88	16	54.6
T. 12 N., Rs. 18 and 19 E., corner secs. 25, 19, 24, and 30, T road east.....	43	29	06.8	88	16	53.6
T. 12 N., Rs. 18 and 19 E., corner secs. 17, 18, 19, 24, and 13, T road east.....	43	29	59.3	88	16	53.2
T. 12 N., R. 19 E., corner secs. 17, 18, 19, and 20, 450 feet east of, on north side of east-west road, 3 feet south of wire fence, iron post stamped "Prim. Trav. Sta. No. 18, 1905".....	43	29	59.0	88	15	33.6

WESTBEND QUADRANGLE (OZAUKEE AND WASHINGTON COUNTIES).

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 12 N., R. 19 E., corner secs. 16, 17, 20, and 21, crossroads.....	43	29	57.9	88	14	28.6
T. 12 N., R. 19 E., corner secs. 15, 16, 21, and 22, crossroads.....	43	29	56.7	88	13	17.1
Three corners, 40 feet west of, 2 feet north of wire fence, iron post stamped "Prim. Trav. Sta. No. 19, 1905," adjusted elevation 968.749 feet.....	43	29	48.0	88	10	37.5
T. 12 N., Rs. 19 and 20 E., corner secs. 13, 18, 19, and 24, crossroads.....	43	29	55.3	88	09	38.5
T. 12 N., Rs. 19 and 20 E., corner secs. 17, 18, 49, and 20, crossroads.....	43	29	54.0	88	08	25.3
T. 12 N., R. 20 E., corner secs. 16, 17, 20, and 21, T road south.....	43	29	53.5	88	07	13.5
T. 12 N., R. 20 E., corner secs. 15, 16, 21, and 22, crossroads.....	43	29	53.1	88	06	01.4
T. 12 N., R. 20 E., corner secs. 13, 14, 23, and 24, crossroads.....	43	29	53.5	88	03	36.8
T. 12 N., R. 20 E., corner secs. 13, 14, 23, and 24, 55 feet south and 15 feet east of, on east side of north-south road, iron post stamped "Prim. Trav. Sta. No. 20, 1905," adjusted elevation 847.971 feet.....	43	29	52.9	88	03	36.6
T. 12 N., Rs. 20 and 21 E., corner secs. 18, 19, 24, and 13, T road north.....	43	29	53.6	88	02	24.9
T. 12 N., R. 21 E., corner secs. 16, 17, 20, and 21, crossroads.....	43	29	54.0	88	00	01.4

PORT WASHINGTON QUADRANGLE (OZAUKEE COUNTY.)

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 12, R. 21 E., corner secs. 15, 16, 21, and 22, T road west	43	29	55.0	87	58	49.5
T. 12 N., R. 21 E., corner secs. 13, 14, 23, and 24, crossroads	43	29	57.4	87	56	25.8
T. 12 N., Rs. 21 and 22 E., corner secs. 13, 18, 19, and 24, T road south ..	43	29	58.7	87	55	13.5
T. 12 N., R. 22 E., corner secs. 17, 18, 19, and 20, crossroads	43	29	58.3	87	54	00.8
T. 12 N., R. 22 E., corner secs. 16, 17, 20, and 21, crossroads	43	29	58.2	87	52	48.7
T. 12 N., R. 22 E., corner secs. 15, 16, 21, and 22, crossroads	43	29	58.1	87	51	37.1
Belgium station	43	29	55.2	87	51	17.0
T. 12 N., R. 22 E., corner secs. 13, 14, 23, and 24, crossroads	43	29	58.2	87	49	13.3
T. 12 N., Rs. 22 and 23 E., corner secs. 18, 19, 24, and 13, crossroads ..	43	29	57.6	87	48	02.2
T. 12 N., Rs. 22 and 23 E., corner secs. 18, 19, 24, and 13, 30 feet north and 15 feet east of, iron post stamped "Prim. Trav. Sta. No. 21, 1905"	43	29	57.9	87	48	02.0
Fredonia, crossroads 0.75 mile north of	43	29	01.9	87	59	24.5
T. 12 N., R. 21 E., quarter corner between secs. 28 and 33, T road north ..	43	28	09.6	87	59	24.1
T. 12 N., R. 21 E., south quarter corner between secs. 33 and 34, T road north	43	27	18.0	87	58	47.6
T. 11 N., R. 21 E., north corner secs. 3 and 4, T road south	43	27	18.0	87	58	48.7
T. 11 N., R. 21 E., corner secs. 3, 4, 9, and 10, crossroads	43	26	25.1	87	58	49.1
T. 11 N., R. 21 E., corner secs. 9, 10, 15, and 16, crossroads	43	25	32.7	87	58	49.5
T. 11 N., R. 21 E., corner secs. 15, 16, 21, and 22, crossroads	43	24	40.4	87	58	49.5
T. 11 N., R. 21 E., corner secs. 27, 28, 33, and 34, crossroads	43	22	55.7	87	58	47.8
T. 12 N., R. 21 E., south corner secs. 33 and 34, T road north	43	22	03.6	87	58	46.8
T. 11 N., R. 21 E., south corner secs. 33 and 34, 16 feet south of, on south side of east-west road, 3 feet north of stone fence, iron post stamped "Prim. Trav. Sta. No. 22, 1905"	43	22	03.4	87	58	46.8
T. 10 N., R. 21 E., corner secs. 2, 3, 10, and 11, crossroads	43	21	06.4	87	59	06.0
T. 10 N., R. 21 E., corner secs. 10, 11, 14, and 15, crossroads	43	20	14.6	87	59	05.0
T. 10 N., R. 21 E., corner secs. 14, 15, 22, and 23, crossroads	43	19	22.6	87	59	04.4
T. 10 N., R. 21 E., corner secs. 27, 28, 33, and 34, crossroads	43	17	36.5	88	00	14.2
T. 9 N., R. 21 E., north corner secs. 3 and 4, T road north	43	16	44.4	88	00	13.7
T. 10 N., R. 21 E., south corner secs. 33 and 34, T road north	43	16	44.4	88	00	13.2
T. 9 N., R. 21 E., corner secs. 3, 4, 9, and 10, crossroads	43	15	55.4	88	00	12.5

WAUKESHA QUADRANGLE (WASHINGTON AND WAUKESHA COUNTIES.)

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 9 N., R. 21 E., corner secs. 9, 10, 15, and 16, 2,000 feet south of, on east side of north-south road, iron post stamped "Prim. Trav. Sta. No. 23, 1905"	43	14	45.9	88	00	11.7
T. 9 N., R. 21 E., corner secs. 15, 16, 21, and 22, crossroads	43	14	10.4	88	00	11.7
T. 9 N., R. 21 E., corner secs. 21, 22, 27, and 28, crossroads	43	13	18.1	88	00	12.0
T. 9 N., R. 21 E., corner secs. 27, 28, 33, and 34, crossroads	43	12	25.9	88	00	12.3
Tps. 8 and 9 N., R. 21 E., corner secs. 3, 4, 33 and 34, crossroads	43	11	33.3	88	00	13.0
T. 8 N., R. 21 E., corner secs. 3, 4, 9, and 10, crossroads	43	10	40.6	88	00	14.7
T. 8 N., R. 21 E., corner secs. 9, 10, 15, and 16, crossroads	43	09	47.9	88	00	15.8
T. 8 N., R. 21 E., corner secs. 15, 16, 21, and 22, crossroads	43	08	55.6	88	00	18.2
T. 8 N., R. 21 E., corner secs. 21, 22, 27, and 28, crossroads	43	08	02.8	88	00	19.8
T. 8 N., R. 21 E., corner secs. 21, 22, 27, and 28, 1,700 feet south of, 1 foot east of wire fence, on north-south road, iron post stamped "Prim. Trav. Sta. No. 24, 1905"	43	07	45.7	88	00	20.6
T. 8 N., R. 21 E., south corner secs. 33 and 34, T road north	43	06	20.3	88	00	21.2
T. 7 N., R. 21 E., north corner secs. 3 and 4, T road south	43	06	20.3	88	00	23.8
T. 7 N., R. 21 E., corner secs. 3, 4, 9, and 10, crossroads	43	05	24.2	88	00	25.0
T. 7 N., R. 21 E., corner secs. 9, 10, 15, and 16, crossroads	43	04	31.7	88	00	25.5
T. 7 N., R. 21 E., corner secs. 15, 16, 21, and 22, crossroads	43	03	39.2	88	00	25.9
North Greenfield, iron post No. 22, 1904	43	00	36.7	88	00	47.6

WESTERN DIVISION OF TOPOGRAPHY.

E. M. DOUGLAS, *Geographer in charge.*

CALIFORNIA.

TRIANGULATION STATIONS.

COLUSA AND YOLO COUNTIES.

COPAY, COLUSA, DUNNIGAN, RUMSEY, AND WOODLAND QUADRANGLES.

In 1905 C. F. Urquhart, topographer, extended triangulation over five 15-minute quadrangles in the Sacramento Valley, in cooperation with the State of California. Positions are based on Yolo northwest base and southeast base, United States standard datum, of the Coast and Geodetic Survey.

ARBUCKLE, COLUSA COUNTY.

(Not occupied.)

Station mark: The spire on Baptist Church in Arbuckle, in the southwest part of town, near the schoolhouse.

[Latitude 39° 00' 54.526". Longitude 122° 03' 23.352".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Foothill.....	56	32	48.78	236	27	42.49	4.1478049
Stovall.....	116	31	54.06	296	21	24.88	4.4260583
Franklin.....	219	46	32.38	39	48	03.97	3.7520770
Gallup.....	348	04	13.70	168	05	41.30	4.2109251

ASH, COLUSA COUNTY.

On a hill in Mr. Ash's pasture, about 6 miles west and one-half mile north of Arbuckle. The road from Arbuckle to Rumsey passes one-half mile south of the station, at a point about one-fourth mile west of the schoolhouse on Sand Creek. At this point there is a wire gate leading into the Jones ranch, thence up old grade to the fence between the Jones and Ash ranches.

Signal: A lumber quadripod about 14 feet high.

Station mark: An iron bench-mark post set in ground under center of signal.

[Latitude 39° 01' 15.437". Longitude 122° 09' 45.363".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stovall.....	127 26 37.83	307 20 12.48	4.2671365
Webster.....	240 41 46.26	60 44 55.60	3.9184686
Arbuckle.....	273 58 49.67	94 02 53.26	3.9644111

BARN, COLUSA COUNTY.

(Not occupied.)

The cupola on large barn owned by Mr. Morris, about 6 miles north of Arbuckle.

Station mark: Center of cupola.

[Latitude 39° 06' 03.067". Longitude 122° 03' 17.193".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Foothill.....	34 31 25.57	214 26 15.11	4.3212151
Stovall.....	95 42 28.43	275 31 57.88	4.3825774
Franklin.....	326 09 55.18	146 11 26.06	3.7942240

COLLEGE CITY, COLUSA COUNTY.

(Not occupied.)

Station mark: The spire on church in College City, about 3 miles east of Arbuckle, a station on the Southern Pacific Railroad.

[Latitude 39° 00' 14.459". Longitude 122° 00' 23.592".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Foothill.....	67 56 45.06	247 49 45.74	4.2386071
Stovall.....	115 02 15.56	294 49 56.26	4.4928252
Franklin.....	172 46 14.18	352 45 55.64	3.7499138

COLUSA, COLUSA COUNTY.

(Not occupied.)

The station is the top of what seemed to be a large, high water tank in Colusa. Windows showed in the square-shaped building, and on top there was a round tank.

[Latitude 39° 12' 55.137". Longitude 122° 00' 12.870".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Franklin.....	3 05 25.41	183 05 00.07	4.2529963
Foothill.....	28 34 02.06	208 26 55.03	4.5329373
Stovall.....	70 06 15.28	249 53 47.53	4.4806461

FOOTHILL, COLUSA COUNTY.

On a small bald point about 12 miles southwest of Arbuckle. There is a good road from Arbuckle to Pat. Molalley's ranch, on Petroleum Creek, a distance of 7 miles; thence up the creek 4 miles to a cabin, and about one-fourth mile beyond the cabin up left-hand creek to place where a cabin has been burned. There is a small shack standing and an old well. At this place wagon will have to be left. Thence up creek on horseback or foot between one-fourth and one-half mile, thence up ridge to left.

Signal: A tree set in the ground.

Station mark: An iron bench-mark post set in the ground near the signal tree.

[Latitude $38^{\circ} 56' 43.005''$. Longitude $122^{\circ} 11' 30.267''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Stovall.....	148	13	35.26	328	08	16.29	4.3637283
Williams.....	188	11	45.10	8	13	13.94	4.3756454
Colusa.....	208	26	55.03	28	34	02.06	4.5329373
Barn.....	214	26	15.11	34	31	25.57	4.3212151
Webster.....	218	02	34.18	38	06	49.38	4.1992505
Franklin.....	231	40	21.81	51	47	02.84	4.2907543
Arbuckle.....	236	27	42.49	56	32	48.78	4.1478049
College City.....	247	49	45.74	67	56	45.06	4.2386071
Johns.....	266	09	54.15	86	18	17.22	4.2858171
Smokestack.....	274	27	46.75	94	39	29.83	4.4318735
Dunnigan.....	288	23	01.06	108	31	27.83	4.3115246
Gallup.....	298	18	28.22	118	25	01.57	4.2342202

FRANKLIN, COLUSA COUNTY.

The pole set in the cupola of Franklin schoolhouse, about 5 miles north and east of Arbuckle and about 3 miles north of College City, about one-eighth mile south of store where road turns east to go over long bridge leading into Morman Basin.

Station mark: An iron bench-mark post set in the ground 50 feet from signal on line to Stovall station. The post is very near the fence in front of the school, between fence and northernmost hitching post.

[Latitude $39^{\circ} 03' 15.331''$. Longitude $122^{\circ} 00' 53.017''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Gallup.....	0	44	55.09	180	44	48.19	4.3063418
Stevens.....	17	32	09.04	197	28	05.45	4.4921667
Arbuckle.....	39	48	03.97	219	46	32.38	3.7520770
Foothill.....	51	47	02.84	231	40	21.81	4.2907543
Webster.....	93	40	38.53	273	38	12.51	3.7469059
Stovall.....	105	25	51.87	285	13	50.73	4.4548808
Barn.....	146	11	26.06	326	09	55.18	3.7942240
Colusa.....	183	05	00.07	3	05	25.41	4.2529963
Smokestack.....	320	49	59.37	140	55	02.34	4.2640047
Mesa.....	341	58	46.76	162	03	29.20	4.5453601

JOHNS, COLUSA COUNTY.

(Not occupied.)

Station mark: The flag pole on Johns schoolhouse, about 5 miles north of Dunnigan.

[Latitude 38° 57' 24.129". Longitude 121° 58' 10.026".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gallup.....	24 00 48.72	203 58 59.45	4.0130554
Foothill.....	86 18 17.22	266 09 54.15	4.2858171
Franklin.....	160 06 27.64	340 04 45.06	4.0613867

SMOKESTACK, COLUSA COUNTY.

Station mark: The smokestack of pumping plant on reclamation district 108. There is a road to it down Sacramento River from Grimes post-office, but the best way is to go from Captain Hull's residence by boat. Mr. Friel, who lives 4½ miles north of Dunnigan, has a very good boat and will act as boatman. The point is also known as Howell Point. No post was put in at this station, as the only land above water was the levee.

[Latitude 38° 55' 33.303". Longitude 121° 52' 51.488".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesa.....	2 17 48.31	182 17 28.37	4.2823401
Curtis.....	36 47 19.03	216 43 44.96	4.1391498
Stevens.....	53 49 05.50	233 40 00.16	4.4148425
Dunnigan.....	60 03 14.41	239 59 58.43	3.9384923
Gallup.....	63 14 09.70	243 02 39.88	3.5399159
Foothill.....	94 39 29.83	274 27 46.75	4.4318735
Franklin.....	140 55 20.34	320 49 59.37	4.2640047
Blodgett.....	349 17 57.53	169 18 51.31	4.0466199

STOVALL, COLUSA COUNTY.

On the highest of three peaks, known locally as the Three Sisters, on ridge in pasture of the Stovall-Wilcoxon Company. It is about 3 miles west by northwest of the Stovall residence and about 1½ miles south of the Mountain House post-office. The hill is probably 1,500 or 2,000 feet high and scattering oak and pine trees are on it. The best way to climb it is from the Mountain House, where there are accommodations for men and animals. The mountain is 11 miles from Williams and 18 from Arbuckle. There are several high trees on the northeast side of the mountain which would interfere with observations in the direction of Maxwell.

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Signal: A small tree set in the ground on highest point.

Station mark: An iron bench-mark post.

[Latitude 39° 07' 19.704". Longitude 122° 19' 56.753".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Colusa.....	249	53	47.53	70	06	15.28	4.4806461
Williams.....	255	57	43.23	76	04	31.94	4.2047986
Barn.....	275	31	57.88	95	42	28.43	4.3825774
Franklin.....	285	13	50.73	105	25	51.87	4.4548808
Webster.....	288	03	26.68	108	13	01.73	4.3629346
College City.....	294	49	56.26	115	02	15.56	4.4928252
Arbuckle.....	296	21	24.88	116	31	54.06	4.4260583
Ash.....	307	20	12.48	127	26	37.83	4.2671365
Foothill.....	328	08	16.29	148	13	35.26	4.3637283

WEBSTER, COLUSA COUNTY.

Station mark: The cupola on schoolhouse, known as the Webster school, about 4 miles up the railroad from Arbuckle.

[Latitude 39° 03' 26.880". Longitude 122° 04' 44.758".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Foothill.....	38	06	49.38	218	02	34.18	4.1992505
Ash.....	60	44	55.60	240	41	46.26	3.9184686
Stovall.....	108	13	01.73	288	03	26.68	4.3629346
Franklin.....	273	38	12.51	93	40	38.53	3.7469059

WILLIAMS, COLUSA COUNTY.

(Not occupied.)

Station mark: The cupola on large school building in Williams, a station on the Southern Pacific Railroad.

[Latitude 39° 09' 25.252". Longitude 122° 09' 09.261".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Foothill.....	8	13	13.94	188	11	45.10	4.3756454
Stovall.....	76	04	31.94	255	57	43.23	4.2047986
Webster.....	330	04	31.08	150	07	17.91	4.1054577

BLACKS, YOLO COUNTY.

(Not occupied.)

Station mark: The spire on church at Blacks station, or Zamora, a station on the Southern Pacific Railroad.

[Latitude 38° 48' 06.340". Longitude 121° 52' 53.883".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Mesa.....	7	40	18.80	187	40	00.08	3.7330318
Curtis.....	108	31	33.63	288	28	00.44	3.9371752
Blodgett.....	216	37	09.86	36	38	04.82	3.5492765

BLODGETT, YOLO COUNTY.

A high windmill in Mr. Blodgett's yard, about $3\frac{1}{2}$ miles northeast of Zamora or Blacks station, on the Southern Pacific Railroad, and about one-fourth mile from the edge of water known as the Tule. There are several windmills in the vicinity, but this is the highest and has white cloth around the derrick just below the platform.

Signal: Center of derrick.

Station mark: Iron post extending into ground.

[Latitude $38^{\circ} 49' 38.530''$. Longitude $121^{\circ} 51' 25.789''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesa.....	19 04 51.16	199 03 37.55	3.9384519
Blacks.....	36 38 04.82	216 37 09.86	3.5492765
Curtis.....	89 29 43.21	269 25 15.04	4.0136002
Gallup.....	109 34 14.52	289 28 11.83	4.1700617
Mumma.....	153 03 53.68	333 01 28.58	4.0866882
Smokestack.....	169 18 51.31	349 17 57.53	4.0466199

BRICK HOUSE, YOLO COUNTY.

(Not occupied.)

Station mark: The chimney on a large brick house in Hungry Hollow, about 4 miles north and 1 mile east of Capay post-office.

[Latitude $38^{\circ} 45' 12.757''$. Longitude $122^{\circ} 01' 28.258''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stevens.....	113 53 14.48	293 49 33.76	3.9686716
Curtis.....	207 29 42.47	27 31 31.94	3.9604774
Mesa.....	269 59 30.93	90 04 34.51	4.0685796

CORBIN, YOLO COUNTY.

On a round prairie hill in the foothills, about $3\frac{1}{2}$ miles southwest of George Scott's residence and on land owned by him, about 1.5 miles west of the Corbin ranch. Mr. Scott's residence is about 3 miles south and 1 mile west of Madison post-office.

Signal: A lumber quadripod.

Station mark: An iron bench-mark post set 40 inches in the ground.

[Latitude $38^{\circ} 37' 08.411''$. Longitude $122^{\circ} 02' 33.280''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stevens.....	159 38 45.52	339 35 45.78	4.2998654
Esparta.....	196 27 37.03	16 28 39.23	3.9290019
Mesa.....	221 38 12.54	41 43 56.32	4.3007868
Yolo northwest base.....	247 23 55.40	67 30 50.55	4.2406557
Scott.....	288 09 52.42	108 16 15.00	4.1937828
Winters.....	337 37 42.76	157 39 48.83	4.1096763

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CURTIS, YOLO COUNTY.

On land of Al. Bummerly used as pasture, about 5 miles south of Dunnigan. A road leads from Dunnigan to the Curtis residence on the Bermmerly ranch, thence into the hills. Mr. Curtis or anyone at his ranch can give directions to station. It is probably the highest hill in the vicinity.

Signal: A lumber quadripod about 14 feet high with white and black cloth on it.

Station mark: An iron bench-mark post set in the ground under center of signal.

[Latitude 38° 49' 35.365". Longitude 121° 58' 33.517".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Brick house.....	27	31	31.94	207	29	42.47	3.9604774
Roth.....	48	55	33.57	228	53	01.05	3.8917122
Stevens.....	71	13	44.99	251	08	14.59	4.1283773
Gallup.....	144	15	51.00	324	14	16.62	3.7931496
Mumma.....	203	29	25.02	23	31	29.38	4.0782451
Smokestack.....	216	43	44.96	36	47	19.63	4.1391498
Blodgett.....	269	25	15.04	89	29	43.21	4.0136002
Blacks.....	288	28	00.44	108	31	33.63	3.9371752
Mesa.....	317	14	25.78	137	17	40.13	4.0427297

DAVISVILLE, YOLO COUNTY.

(Not occupied.)

Station mark: Center of a very high eucalyptus tree with the limbs cut off within 15 feet of top, in the town of Davis.

[Latitude 38° 32' 35.496". Longitude 121° 44' 23.477".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Yolo southeast base.....	72	30	06.54	252	27	52.57	3.7373120
Scott.....	107	03	22.57	286	58	25.53	4.0815727

DUNNIGAN, YOLO COUNTY.

(Not occupied.)

Station mark: The spire on church in Dunnigan, a station on the Southern Pacific Railroad.

[Latitude 38° 53' 12.688". Longitude 121° 58' 03.530".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Stevens.....	50	39	19.48	230	33	30.05	4.2402921
Gallup.....	69	07	14.38	249	05	21.11	3.6680244
Foothill.....	108	31	27.83	288	23	01.06	4.3115246
Smokestack.....	239	59	58.43	60	03	14.41	3.9384923
Mesa.....	335	25	59.53	155	28	55.21	4.2115660

ESPARTA, YOLO COUNTY.

(Not occupied.)

Station mark: The pole in cupola on the large school building in Esparta, on branch line of Southern Pacific Railroad from Elmira to Rumsey.

[Latitude 38° 41' 32.507". Longitude 122° 00' 53.717".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Corbin.....	16	28	39.23	196	27	37.03	3.9290019
Stevens.....	138	30	21.64	318	26	19.44	4.1491683
Mesa.....	238	01	00.86	58	05	42.62	4.1079913
Scott.....	316	18	45.36	136	24	06.08	4.2553407

FAIRVIEW, YOLO COUNTY.

(Not occupied.)

Station mark: The pole in cupola of Fairview School, on road between Dunnigan and Capay, about 6 or 7 miles from Dunnigan.

[Latitude 38° 49' 55.005". Longitude 122° 02' 32.789".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Stevens.....	54	36	30.34	234	33	29.87	3.9306902
Gallup.....	205	45	50.26	25	46	45.96	3.6923959

GALLUP, YOLO COUNTY.

On a round cultivated hill, highest in vicinity, about 3 miles west-southwest of Dunnigan, a small town on the Southern Pacific Railroad. It is on land of Mr. Gallup, of Sacramento, at present rented by Mr. Dubois. A buggy can be driven to summit, but to do so one would have to go through a cultivated field. A good road from Dunnigan to Mr. Dubois's residence must be traveled, but leave it and follow divide just as his residence comes into view.

Signal: A lumber quadripod.

Station mark: An iron post under center of signal.

[Latitude 38° 52' 18.830". Longitude 122° 01' 03.990".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Fairview.....	25	46	45.96	205	45	50.26	3.6923959
Stevens.....	44	08	21.96	224	04	25.74	4.1158360
Foothill.....	118	25	01.57	298	18	28.22	4.2342202
Franklin.....	180	44	48.19	0	44	55.09	4.3063418
Johns.....	203	58	59.45	24	00	48.72	4.0130554
Mumma.....	234	42	25.05	54	46	03.95	4.0123504
Smokestack.....	243	09	00.44	63	14	09.70	4.1237603
Dunnigan.....	249	05	21.11	69	07	14.38	3.6680244
Blodgett.....	289	28	11.83	109	34	14.52	4.1700617
Mesa.....	319	44	34.14	139	49	22.90	4.2359042
Curtis.....	324	14	16.62	144	15	51.00	3.9731496

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GREEN, YOLO COUNTY.

(Not occupied.)

Station mark: Center of a high windmill in grove of Mrs. Green's yard, $1\frac{1}{2}$ miles west and 9 miles south of Woodland.

[Latitude $38^{\circ} 34' 08.148''$. Longitude $121^{\circ} 48' 13.514''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Scott.....	96	27	55.24	276	25	21.54	3.7785356
Yolo southeast base	355	23	08.21	175	23	17.56	3.6546895

HINES, YOLO COUNTY.

(Not occupied.)

Station mark: Center of a very high eucalyptus tree near Mr. Hines's residence, one-half mile east of Plainfield.

[Latitude $38^{\circ} 35' 18.814''$. Longitude $121^{\circ} 47' 44.868''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Yolo southeast base.....	2	50	01.08	182	49	52.57	3.8252855
Scott.....	77	17	25.12	257	14	33.53	3.8342838
Yolo northwest base.....	151	43	45.18	331	41	24.89	4.0574943

MESA, YOLO COUNTY.

On a rolling prairie hill in Mrs. Bemmerly's pasture, 4 miles west and 2 miles north of Yolo, about $3\frac{1}{2}$ miles south of Blacks station and 1 mile west of Mr. Morgan's ranch.

Signal: Lumber quadripod with white and black cloth on it.

Station mark: An iron bench-mark post set 34 inches in the ground.

[Latitude $38^{\circ} 45' 12.531''$. Longitude $121^{\circ} 53' 23.281''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Corbin.....	41	43	56.32	221	38	12.54	4.3007868
Esparta.....	58	05	42.62	238	01	00.86	4.1079913
Monticello.....	69	15	06.95	249	03	52.16	4.4455587
Brickhouse.....	90	04	34.51	269	59	30.93	4.0685796
Stevens.....	100	38	09.00	280	29	24.59	4.3131381
Roth.....	102	37	34.00	282	31	47.35	4.1365453
Curtis.....	137	17	40.13	317	14	25.78	4.0427297
Gallup.....	139	49	22.90	319	44	34.14	4.2359042
Dunnigan.....	155	28	55.21	335	25	59.53	4.2115660
Franklin.....	162	03	29.20	341	58	46.76	4.5453601
Smokestack.....	182	17	28.37	2	17	48.31	4.2823401
Blacks.....	187	40	00.08	7	40	18.80	3.7330318
Blodgett.....	199	03	37.55	19	04	51.16	3.9384519
Yolo.....	287	41	39.39	107	44	47.06	3.8809679
Woodland.....	309	03	31.39	129	07	55.25	4.1183305
Yolo northwest base.....	341	25	49.98	161	27	01.74	3.9399342
Scott.....	355	34	48.55	175	35	28.08	4.2982274

MONTICELLO, YOLO COUNTY.

In extreme northeast corner of sec. 4, T. 9 N., R. 3 W. of Mount Diablo meridian, the highest summit of mountain range lying between Sacramento and Berryessa valleys, about 5 miles north of Monticello, in lower portion of Berryessa Valley. May be approached from this town, from which it is visible. Location known to people in neighborhood. The lower underground mark is a metallic cartridge placed ball downward in a $\frac{1}{2}$ -inch hole, $1\frac{1}{2}$ inches deep, drilled in bottom of a 6-inch round hole 1 foot deep excavated in sandstone rock, the top of cartridge being 2.5 feet below surface. Surface mark is a copper bolt five-eighths inch by 5 inches, with a silver pin in it, set in cement in a hole in this stone. Bolt projects one-fourth inch above stone. A rough stone theodolite pier was then built to a height of 3.84 feet and capped with a flat stone 32 inches square, 31.288 feet north and 3.687 feet east of station; the latitude pier is 31.413 feet north and 8.823 feet east of station, and the vertical-circle pier bears S. $38^{\circ} 17'$ E. (true) and is distant 19.786 meters from station.

[Latitude $38^{\circ} 39' 50.645''$. Longitude $122^{\circ} 11' 22.327'$]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Vaca.....	343	53	24.67	163	57	21.54	4.5220726
Mount Helena.....	91	04	27.64	270	47	50.79	4.5863347
Diablo.....	344	21	34.46	164	31	50.15	4.9547254
Tamapais.....	23	32	08.73	203	17	02.14	4.9517165
Stevens.....	203	03	32.18	23	06	03.33	4.1728090
Mesa.....	249	03	52.16	69	15	06.95	4.4455587
Yolo northwest base.....	266	35	03.73	86	47	29.67	4.4610020
Yolo southeast base.....	293	47	19.46	114	01	55.20	4.5700850

MUMMA, YOLO COUNTY.

About 5 miles northeast of Dunnigan, a station on the Southern Pacific Railroad, on the very flat ground about 100 feet south of the Yolo-Colusa county line and very near the overflow country known as The Tule. It is about one-fourth mile southeast from Thomas Mumma's residence, which is in Colusa County. The land on which it stands is not fenced, and a buggy can be driven to it.

Signal: A lumber quadripod about 16 feet high. To reach signal from Dunnigan, go north to county line, thence east to point.

Station mark: An iron bench-mark post set in the ground under center of signal.

[Latitude $38^{\circ} 55' 35.451''$. Longitude $121^{\circ} 55' 15.382''$]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Curtis.....	23	31	29.38	203	29	25.02	4.0782451
Gallup.....	54	46	03.95	234	42	25.05	4.0123504
Smokestack.....	269	02	39.88	89	04	10.29	3.5399159
Blodgett.....	333	01	28.58	153	03	52.68	4.0866882

ROTH, YOLO COUNTY.

(Not occupied.)

Station mark: The chimney on Mr. Roth's residence, 5 miles north of Capay, on the Capay-Dunnigan road.

[Latitude $38^{\circ} 46' 49.244''$. Longitude $122^{\circ} 02' 36.909''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° / "	° / "	Meters.
Stevens.....	96 36 04.55	276 32 06.77	3.8385753
Curtis.....	228 53 01.05	48 55 33.57	3.8917122
Mesa.....	282 31 47.35	102 37 34.00	4.1365453

SCOTT, YOLO COUNTY.

On a low prairie hill with a lone locust tree on it. The land is sometimes used for grain, but it is a pasture at present. It is three-fourths mile west of Isaac Quinn's residence, which is 3 miles west and 1 mile south of Plainfield. Land is owned by George Scott.

Signal: A lumber quadripod with a black cloth on it.

Station mark: An iron bench-mark post set 30 inches in the ground.

[Latitude $38^{\circ} 34' 30.006''$. Longitude $121^{\circ} 52' 20.020''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° / "	° / "	Meters.
Winters.....	54 50 18.74	234 46 02.62	4.0856900
Corbin.....	108 16 15.00	288 09 52.42	4.1937828
Stevens.....	137 21 53.96	317 12 31.02	4.5064425
Esparta.....	136 24 06.08	316 18 45.36	4.2553407
Mesa.....	175 35 28.08	355 34 48.55	4.2982274
Yolo northwest base.....	186 08 37.82	6 09 09.95	4.0653494
Woodland.....	216 55 13.58	36 58 57.43	4.1592491
Woodland high school.....	219 58 49.20	40 02 32.35	4.1287728
Hines.....	257 14 33.53	77 17 25.12	3.8342838
Green.....	276 25 21.54	96 27 55.24	3.7785356
Davisville.....	286 58 25.53	107 03 22.57	4.0815727
Yolo southeast base.....	309 13 59.56	129 16 42.54	3.9126286

STEVENS, YOLO COUNTY.

On high point in Mr. Stevens's pasture, the highest bald point on the ridge in the range of hills between the Capay Valley and Hunger Hollow. To reach station, follow the Capay-Dunnigan road to Mr. Roth's residence, 5 miles from the Capay post-office, thence west 1 mile to Mr. Scheller's ranch, from which there is a good road uphill to the signal. The road is very steep $3\frac{1}{2}$ or 4 miles from Mr. Scheller's to signal.

Signal: An oak tree set in ground.

Station mark: An iron bench-mark post set in ground by side of tree.

[Latitude 38° 47' 14.791". Longitude 122° 07' 20.733".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Monticello.....	23 06 03.33	203 03 32.18	4.1728090
Franklin.....	197 28 05.45	17 32 09.04	4.4921667
Gallup.....	224 04 25.74	44 08 21.96	4.1158360
Smokestack.....	233 40 00.16	53 49 05.50	4.4148425
Curtis.....	251 08 14.59	71 13 44.99	4.1283773
Mesa.....	280 29 24.59	100 38 09.00	4.3131381
Yolo northwest base.....	297 31 16.55	117 41 12.32	4.4141826
Yolo southeast base.....	315 33 36.12	135 45 42.12	4.6043066
Scott.....	317 12 31.02	137 21 53.96	4.5064425
Corbin.....	339 35 45.78	159 38 45.52	4.2998654

WINDMILL, YOLO COUNTY.

(Not occupied.)

Station mark: Center of windmill about 1½ miles south-southwest of Yolo northwest base, Coast and Geodetic Survey monument.

[Latitude 38° 39' 51.679". Longitude 121° 52' 07.336".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Scott.....	1 46 22.74	181 46 14.82	3.9960663
Winters.....	31 13 34.82	211 09 10.54	4.2967123

WINTERS, YOLO COUNTY.

On a prominent bald hill with large oak tree near the northwest end of it, about 1 mile southwest of Winters, on Southern Pacific Railroad from Elmira to Rumsey.

Signal: A quadripod with white and black cloth on it.

Station mark: An iron bench-mark post set 40 inches in the ground.

[Latitude 38° 30' 42.303". Longitude 121° 59' 11.054".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Corbin.....	157 39 48.83	337 37 42.76	4.1096763
Yolo northwest base.....	211 01 37.33	31 06 25.84	4.3362415
Scott.....	234 46 02.62	54 50 18.74	4.0856900

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WINTERS SCHOOL, YOLO COUNTY.

(Not occupied.)

Station mark: The pole in cupola on large school building at Winters, a town on the Elmira-Rumsey branch of the Southern Pacific Railroad.

[Latitude $38^{\circ} 31' 22.293''$. Longitude $121^{\circ} 58' 22.572''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Corbin.....	150 23 44.84	330 21 08.53	4.0891083
Scott.....	236 34 21.95	56 38 07.89	4.0218368

WOODLAND CITY HALL, YOLO COUNTY.

(Not occupied.)

Station mark: The steeple on the city hall in Woodland.

[Latitude $38^{\circ} 40' 43.970''$. Longitude $121^{\circ} 46' 21.428''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Scott.....	36 58 57.43	216 55 13.58	4.1592491
Yolo northwest base.....	90 13 32.13	270 10 20.19	3.8706276
Mesa.....	129 07 55.25	309 03 31.39	4.1183305

WOODLAND HIGH SCHOOL, YOLO COUNTY.

(Not occupied.)

Station mark: The pole in cupola on the Woodland high school, about 1 mile south of the center of the town.

[Latitude $38^{\circ} 40' 04.132''$. Longitude $121^{\circ} 46' 22.512''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Scott.....	40 02 32.35	219 58 49.20	4.1287728
Yolo northwest base.....	99 38 53.68	279 35 42.44	3.8752754
Mesa.....	133 07 30.01	313 03 06.85	4.1436614

YOLO, YOLO COUNTY.

(Not occupied.)

Station mark: The steeple on the white church in Yolo, a town on the Southern Pacific Railroad.

[Latitude $38^{\circ} 43' 57.487''$. Longitude $121^{\circ} 48' 23.410''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yolo northwest base.....	36 59 38.45	216 57 42.68	3.8714131
Mesa.....	107 44 47.06	287 41 39.39	3.8809679

YOLO NORTHWEST BASE, YOLO COUNTY.

In the SE. $\frac{1}{4}$ sec. 28, T. 10 N., R. 1 E., Mount Diablo meridian, $4\frac{1}{2}$ miles west of the railroad passing through Woodland, and immediately on the north side of county road running west toward Madison and Capay Valley.

Station mark: A needle hole in a German-silver plug in a copper bolt in top of a granite block 35 inches long by 20 inches square at the base and drest to 12 inches square at the top, having letters "U. S. C. & G. S." deeply cut on it. The top of the brick is $4\frac{1}{2}$ feet below the surface and a glass hemisphere is placed over the copper bolt. The surface mark is a fine needle hole in a copper bolt set in lead on top of a granite block 25 inches square by 26 inches deep, having the letters "U. S. C. S. S. E. Yolo base" cut on it. Top of block is even with surface of ground and block itself is in center of a solid brickwork pier, having a base of 70 inches square at a depth of 50 inches below surface, battering to 54 inches square at surface. This brickwork was carried to a height of $33\frac{1}{4}$ feet above surface and capped with a granite slab 40 inches square by 8 inches thick with a $1\frac{1}{4}$ -inch hole in the center. Charcoal and charcoal dust were mixt with the earth in filling around the subsurface part of the structure.

No reference marks.

[Latitude $38^{\circ} 40' 44.806''$. Longitude $121^{\circ} 51' 28.553''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Yolo southeast base	343	05	07.93	163	07	18.98	4.2427032
Diablo	3	09	32.63	183	07	28.85	4.9474512
Vaca	30	25	42.34	210	17	15.66	4.5909077
Scott	6	09	09.95	186	08	37.82	4.0653494
Winters	31	06	25.94	211	01	37.33	4.3362415
Corbin	67	30	50.55	247	23	55.40	4.2406557
Monticello	86	47	29.67	266	35	03.73	4.4610020
Stevens	117	41	12.32	297	31	16.55	4.4141826
Mesa	161	27	01.74	341	25	49.98	3.9399342
Yolo	216	57	42.68	36	59	38.45	3.8714131
Woodland city hall	270	10	20.19	90	13	32.13	3.8706276
Woodland high school	279	35	42.44	99	38	53.68	3.8752754

YOLO SOUTHEAST BASE, YOLO COUNTY.

In the NW. $\frac{1}{4}$ sec. 19, T. 8 N., R. 2 E., Mount Diablo meridian, $3\frac{1}{8}$ miles west and $1\frac{1}{8}$ miles south of Davisville and about 25 meters from the left bank of Putah Creek.

Station mark: Same as Yolo northwest base, viz, needle hole in german-silver plug in copper in granite block $4\frac{1}{2}$ feet below surface, with another needle hole in a copper bolt in lead in a granite block even with ground, in center of a brick pier extending to a height of $33\frac{1}{4}$ feet above ground, capped by a granite block.

Reference marks: Four marks were set, consisting of granite blocks .1 foot square and $1\frac{1}{4}$ feet high, with copper bolts and drill holes on

top, incased in brickwork 18 inches below surface. Two were in line to the Yolo northwest base at a distance of 18 feet $11\frac{1}{8}$ inches and 327 feet 10 inches from the center, and two were in line at right angles thereto eastward at a distance of 20 feet five-eighths of an inch and 328 feet $5\frac{5}{8}$ inches from the center.

[Latitude $38^{\circ} 41' 42.185''$. Longitude $121^{\circ} 47' 58.18''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Vaca.....	55	49	13.77	235	38	37.32	4.4775212
Diablo.....	7	56	54.56	187	52	41.08	4.8599088
Monticello.....	114	01	55.20	293	47	19.46	4.5700850
Scott.....	129	16	42.54	309	13	59.56	3.9126286
Stevens.....	135	45	42.12	315	33	36.12	4.6043065
Yolo northwest base.....	163	07	18.98	343	05	07.93	4.2427032
Green.....	175	23	17.56	355	23	08.21	3.6546895
Hines.....	182	49	52.57	2	50	01.08	3.8252855
Davisville.....	252	27	52.57	72	30	06.54	3.7373120

MARIPOSA AND TUOLUMNE COUNTIES.

YOSEMITE SPECIAL QUADRANGLE.

For the control of this special quadrangle Charles F. Urquhart, topographer, extended triangulation control from Pilot Peak and Devil Peak in 1905. Twelve stations, controlling an area of 100 square miles, were located on the United States standard datum.

CLOUDS REST, MARIPOSA COUNTY.

On the highest point of Clouds Rest, a well-known mountain at the northeast corner of the Yosemite State Park. There is a good trail from the Yosemite Valley to the summit of the mountain. Animals can be taken within 200 feet (elevation) of top.

Signal: A cairn 5 feet high, built of large, flat rocks.

Station mark: A copper bolt set in rock very near and west of cairn.

[Latitude $37^{\circ} 46' 05.58''$. Longitude $119^{\circ} 29' 18.90''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Starr King.....	19	04	06.99	199	03	04.76	3.8821831
Devil Peak.....	40	00	43.66	219	51	32.29	4.5381966
Sentinel Dome.....	59	21	29.37	239	17	59.94	3.9884838
Glacier Point.....	61	00	29.03	240	57	23.16	3.9293950
Eagle.....	77	39	36.31	257	34	59.80	4.0537206
Yosemite Point.....	82	00	09.13	261	56	19.84	3.9663925
Flat.....	107	11	17.36	287	05	27.92	4.1644432

DEVIL PEAK, MARIPOSA COUNTY.

At the southeast end of a short, sharp ridge, 9 miles southwest of Wawona Park, bare on top and covered with loose rock. Ascended by wagon road from Wawona. Nearest camping place is $1\frac{1}{4}$ miles northeast of summit.

Station mark: A cairn 4 feet in diameter at the base, $4\frac{1}{2}$ feet high, on site of old monument, 5.6 feet west of "U. S. G. S." chiseled on rock (Urquhart, 1905). Cairn could not be found, but rock with "U. S. G. S." was found, and point used was within 2 or 3 feet of old point.

[Latitude $37^{\circ} 31' 46.79''$. Longitude $119^{\circ} 44' 23.09''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Cottonwood.....	180	37	19.76	00	37	31.81	4.6445464
Hoffman.....	209	50	37.68	29	59	03.70	4.6092431
Conness.....	217	07	08.88	37	22	32.54	4.7855484
Clarks Peak.....	235	55	55.04	56	07	20.30	4.5212361
Red.....	244	35	09.78	64	47	16.70	4.5097490
Kaiser.....	297	47	02.53	118	07	16.04	4.7451616
Big Shuteye.....	305	41	47.10	125	53	10.71	4.5325137
Bullion Mount.....	96	31	08.21				4.4740000
Pilot.....	146	23	49.18	326	16	39.63	4.4928478
Flat.....	194	51	35.15	14	54	59.19	4.5030993
Clouds Rest.....	219	51	32.29	40	00	43.66	4.5381966

DEWEY, MARIPOSA COUNTY.

On the bluff overlooking the Yosemite Valley, on south side of the valley and west of Bridal Veil Creek. It can be reached by trail either from Glacier Point or Fort Monroe. Distance from Fort Monroe to station is about 4 miles. Trail is known as Pohono trail.

Signal: A small fir tree placed in a crack in the rock with rock piled around its base.

Station mark: A triangulation tablet cemented in rock at the foot of tree.

[Latitude $37^{\circ} 42' 16.03''$. Longitude $119^{\circ} 39' 06.31''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
El Capitan.....	201	24	41.54	21	25	14.24	3.5544804
Eagle.....	215	33	40.67	35	35	03.79	3.7572966
Sentinel Dome.....	250	37	44.55	70	40	14.60	3.8039652

EAGLE, MARIPOSA COUNTY.

On the summit of Eagle Peak, a well-known point on the north side of Yosemite Valley. There is a good trail known as the Yosemite Point and Eagle Peak trail from the valley to station.

Signal: An iron rod about 4 feet high set in rock. It is necessary to have a flag of some kind on rod.

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Station mark: A triangulation tablet cemented in rock at foot of rod.

[Latitude 37° 44' 46.90''. Longitude 119° 36' 50.46'']

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Dewey.....	35	35	03.79	215	33	40.67	3.7572966
El Capitan.....	56	55	46.25	236	54	55.83	3.3815997
Yosemite Point.....	239	01	46.76	59	02	33.99	3.3428995
Clouds Rest.....	257	34	59.80	77	39	36.31	4.0537206
Valley.....	275	40	32.04	95	41	26.92	3.3435984
Glacier Point.....	295	05	15.94	115	06	46.50	3.6021166
Sentinel Dome.....	313	28	34.14	133	29	41.12	3.5674215

EL CAPITAN, MARIPOSA COUNTY.

(Not occupied.)

On the highest point of El Capitan, nearest the bluff. The Eagle Peak trail continues on to this mountain.

Station mark: A cairn on highest point.

[Latitude 37° 44' 04.28''. Longitude 119° 38' 12.86'']

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Eagle.....	236	54	55.83	56	55	46.25	3.3815997
Sentinel Dome.....	284	37	43.60	104	39	40.99	3.6862312
Dewey.....	21	25	14.24	201	24	41.54	3.5544804

FLAT, MARIPOSA COUNTY.

On the summit of a flat-topped rocky peak at the source of West Fork of Yosemite Creek and about 5 miles from junction of Eagle Peak and Yosemite Point trails. There is no trail at this point, but animals can be taken to foot of peak. The south side is probably the easiest to climb. About 300 feet inaccessible for animals.

Signal: A cairn with dead tree inside of it.

Station mark: A triangulation tablet set in rock under the cairn.

[Latitude 37° 48' 25.17''. Longitude 119° 38' 49.20'']

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Devil Peak.....	14	54	59.19	194	51	35.15	4.5030993
Pilot.....	79	10	59.75	259	00	24.24	4.4124128
Clouds Rest.....	287	05	27.92	107	11	17.36	4.1644432
Starr King.....	315	03	17.42	135	08	04.35	4.2108574
Yosemite Point.....	319	24	08.84	139	26	08.84	3.8673813
Sentinel Dome.....	328	54	57.80	148	57	17.54	4.0343607

GLACIER POINT, MARIPOSA COUNTY.

At the east end of iron railing at Glacier Point, a well-known point on the south side of Yosemite Valley. There is a good trail known as the Glacier Point trail from the valley to the station.

Signal: A pole about 25 feet high set in rock.

Station mark: A triangulation tablet set in rock.

[Latitude $37^{\circ} 43' 51.85''$. Longitude $119^{\circ} 34' 22.50''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Eagle.....	115	06	46.50	295	05	15.94	3.6021166
Valley.....	136	00	48.03	316	00	12.34	3.3128519
Yosemite Point.....	148	30	53.24	328	30	09.89	3.5210068
Clouds Rest.....	240	57	23.16	61	00	29.03	3.9293950

PILOT PEAK, MARIPOSA AND TUOLUMNE COUNTIES.

On boundary of Mariposa and Tuolumne counties. Rose's ranch is 2.5 miles east.

Station mark: A new cairn with tree in it was built and the greater portion of brush cut. Triangulation tablet set in loose rock and a flat rock with a cross cut on it placed immediately over it. The tree in center of cairn is over center of cross.

[Latitude $37^{\circ} 45' 46.57''$. Longitude $119^{\circ} 56' 06.42''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Flat.....	259	00	24.24	79	10	59.75	4.4124128
Sentinel Dome.....	277	56	30.06	98	09	24.64	4.4953983
Devil Peak.....	326	16	39.63	146	23	49.18	4.4928478
Moccasin Peak.....	97	52	44.00	277	38	19.00	4.5424939
Big Canyon.....	144	46	11.00	324	39	25.00	4.4473833

SENTINEL DOME, MARIPOSA COUNTY.

On the summit of Sentinel Dome, a well-known peak on the south side of Yosemite Valley. The Glacier Point trail continues south and west along the bluff to Fort Monroe. This trail passes Sentinel Dome about 1 mile from Glacier Point Hotel.

Signal: The trunk of a tree with large spreading top.

Station mark: A triangulation tablet set in rock under center of signal tree. The tree stands above anything else on mountain.

[Latitude $37^{\circ} 43' 24.46''$. Longitude $119^{\circ} 35' 01.02''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Dewey.....	70	40	14.00	250	37	44.55	3.8039652
Pilot.....	98	09	24.64	277	56	30.06	4.4953983
El Capitan.....	104	39	40.99	284	37	43.60	3.6862312
Eagle.....	133	29	41.12	313	28	34.14	3.5674215
Flat.....	148	57	17.54	328	54	57.80	4.0343607
Yosemite Point.....	167	51	35.66	347	51	15.89	3.5750003
Clouds Rest.....	239	17	59.94	59	21	29.37	3.9884838
Starr King.....	290	47	27.31	110	49	54.39	3.7993631

STARR KING, MARIPOSA COUNTY.

(Not occupied.)

Station is on highest point of Mount Starr King, a well-known mountain on the southeast side of Yosemite Valley. Very difficult to climb.

Station mark: Cairn on the summit.

[Latitude $37^{\circ} 42' 11.86''$. Longitude $119^{\circ} 31' 00.58''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Sentinel Dome	110	49	54.39	290	47	27.31	3.7993631
Flat	135	08	04.35	315	03	17.42	4.2108574
Clouds Rest	199	03	04.76	19	04	06.99	3.8821831

VALLEY, MARIPOSA COUNTY.

In the Yosemite Valley, on the north side of junction of roads to Camp Yosemite and Mirror Lake and about 50 yards from bridge over Merced River, near the Sentinel Hotel. Signal is a 4 by 4 inch post set in ground, with signboard pointing to Mirror Lake on it. Another board at right angles to signboard and post.

Station mark: A concrete pier $2\frac{1}{2}$ feet high, 20 by 20 inches at base, 12 by 12 inches at top, in the top of which was placed an aluminum plug marked "△ U. S. G. S. B. M.," over which was placed an aluminum plate, one-half inch thick by $4\frac{1}{2}$ inches wide, 7 inches long, engraved as follows:

U. S. Geological Survey,
Charles D. Walcott, Director,
Latitude $37^{\circ} 44' 40''$
Longitude $119^{\circ} 35' 21''$
Elevation above sea, 3,960 feet,
1095.

[Latitude, $37^{\circ} 44' 39.81''$. Longitude, $119^{\circ} 35' 20.80''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Eagle	95	41	26.92	275	40	32.04	3.3435984
Yosemite Point	167	13	43.08	347	13	35.42	3.1417253
Glacier Point	316	00	12.34	136	00	48.03	3.3128519

YOSEMITE POINT, MARIPOSA COUNTY.

At the west end of iron railing on Yosemite Point, a well-known point overlooking Yosemite Valley. There is a good trail known as the Yosemite Point and Eagle Peak trail to station. The pole is not straight, so the part at top of railing was sighted.

Station mark: A triangulation tablet cemented in rock at foot of pole.

[Latitude, $37^{\circ} 45' 23.65''$. Longitude, $119^{\circ} 35' 33.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Eagle.....	59 02 33.99	239 01 46.76	3.3428995
Flat.....	139 26 08.84	319 24 08.84	3.8673813
Clouds Rest.....	261 56 19.84	82 00 09.13	3.9063925
Glacier Point.....	328 30 09.89	148 30 53.24	3.5210068
Valley.....	347 13 35.42	167 13 43.08	3.1417253
Sentinel Dome.....	347 51 15.89	167 51 35.66	3.5750003

CALIFORNIA-NEVADA.

TRIANGULATION STATIONS.

ESMERALDA AND NYE COUNTIES, NEV.; INYO COUNTY, CAL.

AMARGOSA REGION.

During the field season of 1905-6 triangulation control was extended over a large part of southern Nye County, Nev., and a small area adjacent to Death Valley, in Inyo County, Cal., by R. H. Chapman and B. D. Stewart, topographers. The work was more of a reconnaissance than a standard nature and was done in connection with topographic surveys, which were carried on rapidly. The foresights were made to the natural points selected, and signals were erected when the points were occupied for observations. The stations were marked and signals erected according to regulations of the Survey. The instruments used were the standard 8-inch theodolites reading to 2 seconds of arc.

The scheme was carried forward from the line Lone Mountain-Montezuma, the first a primary and the second a secondary or tertiary point of the United States Coast and Geodetic Survey. The value of this base is taken from finally adjusted figures in the scheme brought from points in California during 1905 by Mr. Urquhart. The initial position is that given for Lone Mountain by the Coast Survey, and is on the United States standard datum.

Figures were extended about $1\frac{1}{2}^{\circ}$ eastward from Lone Mountain and tied to the secondary Coast Survey point Kawich, which was occupied, and by long, unclosed sights to the primary point White Pine.

From these figures the scheme was carried southward to the Death Valley region and tied to triangulation points Grape and Nye, established by the Coast Survey in connection with the survey of the Nevada-California oblique boundary.

In all cases the preliminary positions, azimuths, and distances agreed so closely with those given by the Coast Survey that no figure adjustment was made, it being considered that the preliminary

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methods of field work and the small differences found did not warrant the labor of the operation.

In connection with the general scheme small areas were controlled by local triangulation at Goldfield and Bullfrog.

A list of points and positions at check points is appended.

BOUNDARY, INYO COUNTY, CAL.

On highest of group of summits in lower Grapevine Mountains, about 10 miles west of Rose's Well, on the Bullfrog-Las Vegas road 20 miles southwest of Bullfrog, 1 mile southeast of Chloride Cliff, and 5 miles from Keane Springs. Can be easily reached from any of above points with pack animals.

Station mark: A bronze triangulation tablet in solid rock under center of a cairn 7 feet high.

[Latitude $36^{\circ} 41' 36.45''$. Longitude, $116^{\circ} 51' 48.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tin.....	112 17 55	291 56 39	4.75626
Grape.....	139 54 35	319 44 18	4.59698
Bare.....	216 03 58	36 09 36	4.37584
Cane.....	261 16 06	81 40 46	4.79303
Furnace.....	325 55 36	146 04 36	4.60556

DEATH, INYO COUNTY, CAL.

Westernmost and highest of group of bare rounded summits south and east of Bullfrog-Ballarat wagon road. About 15 miles north of west of Furnace Creek ranch, 10 miles southwest of Salt Creek, and 10 miles northeast of Emigrant Spring, on wagon road just mentioned. The peak is locally known as Tucki or Sheep Mountain. It is easily ascended by taking trail east over ridge 0.25 mile north of Emigrant Spring to divide toward Death Valley, thence northwest about 4 miles.

Station mark: A bronze triangulation tablet cemented in block of stone 16 by 14 by 10 inches, under a small heap of stones and flag-staff 9 feet high.

[Latitude $36^{\circ} 30' 00.61''$. Longitude $117^{\circ} 07' 47.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tin.....	145 57 07	325 45 14	4.71493
Grape.....	178 03 37	358 02 54	4.71332
Bare.....	222 49 03	43 04 13	4.74454

FURNACE, INYO COUNTY, CAL.

(Not occupied.)

A high, rocky peak, southernmost in Amargosa Range, about 15 miles east of Furnace Creek ranch (Death Valley), 6 miles west-southwest of Lee's well, and 10 miles northwest of Franklin well, Amargosa Desert. Local name, Pyramid Peak. It was ascended on foot from the southeast.

Station mark: A bronze triangulation tablet set in slab of black limestone and surmounted by cylindrical cairn 7.5 feet high and 5 feet in diameter.

Reference marks: Cross cut in solid rock about 20 feet southwest, cross cut in solid rock about 30 feet north.

[Latitude $36^{\circ} 23' 32.15''$. Longitude $116^{\circ} 36' 42.09''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boundary.....	146 04 36	325 55 36	4.60556
Bare.....	170 51 48	350 48 24	4.72672
Timber.....	189 52 34	9 57 59	4.89419

GRAPE, INYO COUNTY, CAL.

Highest peak of Grapevine Range, 20 miles northwest of Bullfrog and 15 miles from Thorp's mill, which is on Bullfrog-Goldfield wagon road; nearest water is spring on Bullfrog-Grapevine ranch trail about 5 miles northwest. Station is one used by Coast Survey in establishing Nevada-California boundary line. Center left by the survey found and occupied. No additional marks made.

Station mark: Drill hole one-half by one-half inch in rock 14 by 12 by 10 inches, over which is monument 4 feet high and flagstaff.

[Latitude $36^{\circ} 57' 56.40''$ ($36^{\circ} 57' 55.21''$ a). Longitude $117^{\circ} 08' 57.73''$ ($117^{\circ} 08' 58.04''$ a).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tin.....	72 21 38	252 10 36	4.45705
Gold Mountain, N.....	156 33 46	336 28 08	4.54060
Tolicha.....	221 48 45	42 01 02	4.65454
Timber.....	257 18 09	77 42 03	4.70779
Jumbo.....	273 02 52	93 16 06	4.51472
Cane.....	283 18 38	103 53 41	4.95088
Bare.....	285 27 46	105 43 43	4.61240
Boundary.....	319 44 18	139 54 35	4.59698
Death.....	358 02 54	178 03 37	4.71332
Nye a.....	305 29 00	3.68880
Nye.....	305 28 30	3.68850

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TELESCOPE PEAK, INYO COUNTY, CAL.

(Not occupied.)

Highest peak of Panamint or Telescope Range.

[Latitude $36^{\circ} 11' 49.20''$. Longitude $117^{\circ} 04' 26.92''$.]

TIN, INYO COUNTY, CAL.

Highest and northernmost peak of Panamint Range; 15 miles southwest of Stainingers (Grapevine) ranch, 10 miles southwest of Mesquite Spring, and 6 miles north and a little west of Piñon Spring. Easily reached from south by trail to Gold Belt (old mining camp), which is 18 miles south of peak, thence north along trail to Rest and Burro springs, thence north along crest to point.

Signal: Tripod 6 feet high with flagstaff 10 feet higher.

Station mark: A bronze triangulation tablet cemented in solid rock.

Reference marks: None.

[Latitude $36^{\circ} 53' 13.13''$. Longitude $117^{\circ} 27' 20.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gold.....	198 12 03	18 18 33	4.63054
Grape.....	252 10 36	72 21 38	4.45705
Boundary.....	291 56 39	112 17 55	4.75626
Death.....	325 45 14	145 57 07	4.71493

ANDESITE, ESMERALDA COUNTY, NEV.

Highest knoll on top of lava flow about 3 miles south of Gold-field, 1 mile west of road to Lida.

Station mark: Bronze triangulation tablet in solid rock on highest point of hill.

Reference marks: Cross in solid rock 17 feet southwest, cross in solid rock 15.5 feet southeast.

Signal: A small local monument, the Great Star Lode claim location monument.

[Latitude $37^{\circ} 40' 18.30''$. Longitude $117^{\circ} 14' 16.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Montezuma.....	103 15 33	283 11 01	4.04896
Columbia.....	190 22 42	10 23 10	3.79819
Diamond.....	229 21 21	49 24 43	4.02791

COLUMBIA, ESMERALDA COUNTY, NEV.

High hill immediately northeast of Columbia, on large mass of rock at summit, locally known as Columbia Mountain.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 6.5 feet high.

Reference marks: No. 1, 17.6 feet south in solid rock; No. 2, 23.25 feet east-northeast, in solid rock.

[Latitude 37° 43' 38.76". Longitude 117° 13' 30.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Andesito.....	10 23 10	190 22 42	3.79819
Diamond.....	263 43 36	83 46 30	3.84505

GOLD MOUNTAIN, ESMERALDA COUNTY, NEV.

On highest summit of Gold Mountain a sharp, rocky peak 1.5 miles southeast of Oriental post-office (abandoned), now known as Old Town or Old Camp, and about 20 miles southeast of Lida post-office. Best reached from Old Camp, where there is good water and feed, and which is reached from Lida post-office by a good wagon road. (Wheeler point, 1871-72?)

Station mark: A bronze triangulation tablet in solid rock, stamped "8144 V A," under a rock monument 6 feet high.

[Latitude 37° 15' 09.50". Longitude 117° 18' 18.09".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tin.....	18 18 38	198 12 03	4.63054
Montezuma.....	174 12 45	354 10 41	4.69316
Stonewall.....	220 27 07	40 36 47	4.55844
Tolicha.....	267 34 42	87 52 41	4.64285
Grape.....	336 28 08	156 33 46	4.54060

LONE MOUNTAIN, ESMERALDA COUNTY, NEV.

A station of the Coast Survey on a prominent, well-known peak in a dry, desert country, 60 miles by road in a southerly direction from Cloverdale and 40 miles easterly from Columbus. The nearly extinct mining camps of Montezuma and Silver Peak lie 25 miles southwesterly and southeasterly, respectively, from the mountain. The geodetic point is marked by a cross on a one-half inch copper bolt leaded in a drill hole in a solid ledge of slate, around which is the usual stone and brick foundation pier for theodolite, surrounded by a stone wall 15.5 feet in diameter, with an opening to the northeast.

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The vertical-circle pier, 71.1 feet distant from geodetic point and surrounded by a stone ring wall 10.7 feet in diameter, with northeast opening, was left standing. Reference marks are four drill holes—one north, distant 9.15 feet; one north-northeast, distant 13.78 feet; one south-southeast, distant 21.59 feet, and one a little north of west, distant 8.2 feet from geodetic point.

In 1902 a large signal was placed over the above station.

[Latitude 38° 01' 28.759". Longitude 117° 29' 37.647".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Mount Grant.....	118	30	45.13	297	42	31.46	5.10932745
Toiyabe Dome.....	187	47	26.93	7	52	43.32	4.95700264
Cactus Peak.....	296	08	52.00	116	31	36.00	4.78170
Diamond.....	316	23	25.00	136	36	13.00	4.64768
Stonewall.....	325	21	47.00	145	38	27.00	4.84866
Montezuma.....	342	18	57.00	162	23	49.00	4.5845027

MONTEZUMA, ESMERALDA COUNTY, NEV.

On highest point of group of mountains about 8 miles west of Goldfield, locally known as Montezuma Peak. It is about 1.5 miles south of old Montezuma mill and springs and is a secondary point of the Coast Survey.

Station mark: A bronze triangulation tablet in block of stone 24 by 10 by 10 inches, partly buried, over which is a cairn 6 feet high, with small brush in top.

Reference marks: Cross cut in solid rock 25.6 feet west; cross cut in solid rock 17.4 feet east.

[Latitude 37° 41' 41.3". Longitude 117° 21' 41.2".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Lone Mountain.....	162	23	49	342	18	57	4.5845027
Cactus Peak.....	256	56	58	77	14	55	4.64124
Stonewall.....	307	06	58	127	18	45	4.55260
Gold Mountain.....	354	10	41	174	12	45	4.69316

TIMPAHUTE, LINCOLN COUNTY, NEV.

(Secondary point. Not occupied.)

Highest point on Timpahute Range.

[Latitude 37° 26' 58.26". Longitude 115° 43' 55.57".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Belted Peak.....	113	43	32	293	31	01	4.51921
Reveille.....	141	46	54	321	32	08	4.75751

BARE, NYE COUNTY, NEV.

On high, bare summit of very rocky ridge 2 miles southeast of Beatty post-office and 6 miles east of Bullfrog. Camp may be made at spring 1 mile south of Beatty post-office in wash at west foot of Bare Mountain. The climb may be made with instrument mule, but is rather difficult. Wheeler monument was removed, but no center found. Under monument was small tin cylindrical case 4 inches by 0.75 inch, within which was the following: "Explorations and Surveys West of 100th Meridian. Name of peak, Bare Mountain; triangulation station No. 7; approx. altitude, 5,800 feet. Party No. 2, executive officer, Lieut. R. Birnie; topographical ass't, Louis Nell; meteorological ass't, Stevens. En route from Panamint to C. Independence. Date: Sept. 16, 1875. Corps of Engineers, U. S. Army."

Station mark: A $\frac{1}{2}$ -inch drill hole in rock 12 by 12 by 4 inches under a rock monument 7 feet high.

[Latitude $36^{\circ} 51' 59.10''$. Longitude $116^{\circ} 42' 23.74''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Boundary.....	36	09	36	216	03	58	4.37584
Death.....	43	04	13	222	49	03	4.74454
Grape.....	105	43	43	285	27	46	4.61240
Yellow.....	122	53	29	302	48	32	4.16348
Jumbo.....	143	41	19	323	38	35	4.05819
Tolicha.....	168	22	17	348	18	32	4.65842
Timber.....	221	37	24	41	46	16	4.51761
Furnace.....	350	48	24	170	51	48	4.72672

BEATTY, NYE COUNTY, NEV.

On top of rocky summit of andesite-capped hill of dark color 1.5 miles northwest of Beatty and 1 mile east of Montgomery-Shoshone mine.

Station mark: A bronze triangulation tablet cemented in solid rock under a rock monument 5 feet high.

[Latitude $36^{\circ} 55' 06.28''$. Longitude $116^{\circ} 47' 16.78''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Busch.....	85	53	23	265	51	34	3.65317
Yellow.....	113	12	18	293	10	17	3.73-32
Jumbo.....	187	55	18	7	55	30	3.54085

BELTED PEAK, NYE COUNTY, NEV.

Highest point of bare, rocky mountain 2 miles south of northernmost point of Kawich-Groom road where it crosses Belted Range; about 15 miles a little north of east of Kawich post-office. Nearest water is Cliff Spring, 5 miles to the south, on west slope of range. Horses can go within 0.25 mile of top (from south).

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Station mark: A cross cut in solid rock.

Signal: A cairn 7.5 feet high over mark.

Reference marks: An arrow 27.4 feet east-northeast, cut in rock; a similar arrow 30.1 feet south-southeast, cut in rock, with $\frac{U}{G} \frac{S}{S}$ cut on left side of arrow.

[Latitude 37° 34' 07.83". Longitude 116° 04' 31.56".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Mesa.....	19	48	48	199	42	42	4.62570
Quartzite.....	74	33	23	254	24	20	4.35621
Kawich.....	142	12	51	321	58	44	4.74245
Reveille.....	170	34	16	350	32	20	4.50604

BUSCH, NYE COUNTY, NEV.

On high, rocky, gray point known as Busch Peak on Bonanza Mountain, 1 mile west of Rhyolite. Easily reached with animals by trail.

Station mark: A bronze triangulation tablet under a mineral location post to which black and white flags were attached.

[Latitude 36° 54' 55.78". Longitude 116° 50' 18.13".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Yellow.....	168	32	34	348	32	22	3.39957
Jumbo.....	232	49	12	52	51	13	3.79462
Beatty.....	265	51	34	85	53	23	3.65317

CACTUS PEAK, NYE COUNTY, NEV.

On highest point of north peak of Cactus Range, about 25 miles east of Goldfield and 35 miles southeast of Tonopah. It is northernmost peak of range and a local landmark over a large area. A monument 6 feet high was found, which was removed and a new one erected on its site.

Station mark: A bronze triangulation tablet in block of stone 3 by 2 by 1 foot, resting on surface, over which is a cairn 9 feet high and 5.5 feet in diameter at base.

[Latitude 37° 46' 58.44". Longitude 116° 52' 38.49".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Stonewall.....	24	35	09	204	29	12	4.53750
Montezuma.....	77	14	55	256	56	58	4.64124
Lone Mountain.....	116	31	36	296	08	52	4.78170
Kawich.....	241	24	45	61	40	05	4.61994
Quartzite.....	301	12	31	121	32	50	4.75821

CANE, NYE COUNTY, NEV.

Highest point on flat ridge running east and west, on north edge of mesa about 6 miles almost due west of Cane Spring, 22 miles northeast of Ash Meadows. Easily ascended with horses.

Station mark: A bronze triangulation tablet in solid rock 10 feet from edge of bluff under a cairn 8 feet high, 7 feet in diameter at base.

Reference marks: Cross cut in solid rock 38 feet southwest of center; cross cut in solid rock 44 feet southeast of center.

[Latitude 36° 46' 35.48". Longitude 116° 10' 33.05".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Boundary.....	81 40 46	261 16 06	4.79303
Grape.....	103 53 41	283 18 38	4.95088

CHALK MOUNTAIN, NYE COUNTY, NEV.

(Secondary point. Not occupied.)

Highest point of rocky ridge about 20 miles east of Kawich post-office and 10 miles east of Belted Range.

[Latitude 37° 31' 52.90". Longitude 115° 55' 12.62".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Belted Peak.....	106 55 22	286 49 42	4.15649
Reveille.....	152 09 23	332 01 30	4.60750

DIAMOND, NYE COUNTY, NEV.

On hill 3 miles northeast of Goldfield and 3.5 miles east-southeast of Diamondfield; about 0.75 mile to the east is another hill which is slightly higher.

Station mark: Bronze triangulation tablet in solid rock on highest point of hill.

Reference marks: Cross in solid rock 33.7 feet southeast of tablet; cross in solid rock 14.3 feet west-northwest of tablet.

Signal: Cairn 8 feet high on large rock.

[Latitude 37° 44' 03.46". Longitude 117° 08' 46.04".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Andesite.....	49 24 43	229 21 21	4.02791
Montezuma.....	77 04 10	256 56 16	4.28973
Lone Mountain.....	136 36 13	316 23 25	4.64768
Columbia.....	190 22 42	10 23 10	3.79819
Stonewall.....	340 02 35	160 06 29	4.44101

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FORTY (SHOSHONE MOUNTAIN), NYE COUNTY, NEV.

(Secondary point. Not occupied.)

Highest point on Shoshone Mountain about 15 miles northwest of Cane Springs, east of Fortymile Canyon.

[Latitude $36^{\circ} 57' 05.09''$. Longitude $116^{\circ} 18' 28.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boundary.....	160 10 13	239 50 13	4.75774
Cane.....	328 44 31	148 49 15	4.35001

JUMBO, NYE COUNTY, NEV.

On high summit 2 miles east of Indian Springs, near Rhyolite; the springs may be reached from Rhyolite by good wagon road and station is accessible with pack animals.

Station mark: Drill hole in solid rock under a rock monument 6 feet high.

[Latitude $36^{\circ} 56' 57.92''$. Longitude $116^{\circ} 46' 57.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beatty.....	7 55 30	187 55 18	3.54085
Busch.....	52 51 13	232 49 12	3.79462
Yellow.....	76 35 02	256 32 49	3.74956
Grape.....	93 16 06	273 02 52	4.51472
Bare.....	323 38 35	143 41 19	4.05819

KAWICH, NYE COUNTY, NEV.

On highest peak of Kawich Range, about 3 miles east of Long street's ranch, 6 miles northeast of Silverbow (camp), and 4 miles west of Eden (camp). Easily ascended by stock trails from any of above places. There are springs south and northeast of station 1 mile distant.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet high.

[Latitude $37^{\circ} 57' 42.67''$. ($37^{\circ} 57' 43.05''$ a) Longitude $116^{\circ} 27' 39.16''$ ($116^{\circ} 27' 39.62''$ a).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cactus Peak.....	61 40 05	241 24 45	4.6199400
Lone Mountain.....	94 43 06	274 04 30	4.9590000
Lone Mountain a.....	94 42 15	274 04 06	4.9589870
White Pine.....	244 27 00	65 02 35	4.9687800
White Pine a.....	244 26 29	65 02 02	4.9686134
Reveille.....	292 36 38	112 48 39	4.4922200
Belted Peak.....	321 58 44	142 12 51	4.7424500
Quartzite.....	346 12 58	166 18 02	4.7089600

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MAL, NYE COUNTY, NEV.

(Not occupied.)

The highest rocky conical mountain in the Cactus Range, about 10 miles southeast of Cactus Spring, from which it is plainly visible, and about 3 miles almost due west of Antelope Springs.

Station mark: A small cairn found on mountain.

[Latitude $37^{\circ} 37' 41.10''$. Longitude $116^{\circ} 45' 32.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stonewall.....	60 19 16	240 09 01	4.45572
Cactus Peak.....	148 45 31	328 41 11	4.30335

MESA (PAHUTE), NYE COUNTY, NEV.

On highest point of high ridge, southern boundary of plateau, about 12 miles a little south of west from Oak Spring, 10 miles west of Whiterock Spring, and 6 miles north-northeast of tank on Oak Spring, Indian Camp trail; at west end of ridge having scattering piñon and cedar trees on top, but bare on salient west of station. Horses can be ridden to station from tank to the southwest.

Signal: Piñon tree trimmed, with pole nailed in top carrying a white flag and bunch of green.

Station mark: Bronze triangulation tablet in solid rock.

Reference marks: Middle nail of 4-inch blazed piñon stump, 37.2 feet northeast; nail in blaze on piñon stump, 15 feet west.

[Latitude $37^{\circ} 12' 38.32''$. Longitude $106^{\circ} 14' 12.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quartzite.....	167 13 49	347 10 55	4.53821
Belted Peak.....	199 42 42	19 48 48	4.62570
Wheelbarrow Peak.....	207 49 41	27 55 28	4.47891

QUARTZITE, NYE COUNTY, NEV.

A high, bare, rocky mountain 3 miles southwest of Kawich (Gold-Reed), locally known as Quartzite Mountain; easily ascended on horses from Kawich or almost any direction. Nearest water, Cliff Spring, about 15 miles east across flat in Belted Range, or Indian Spring, 4 miles south of Cliff Spring.

152 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Station mark: Bronze triangulation tablet cemented in solid rock under a cairn 9 feet high with 8-foot base.

[Latitude $37^{\circ} 30' 50.78''$. Longitude $116^{\circ} 19' 23.355''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tolicha.....	57 49 00	237 31 16	4.70771
Stonewall.....	88 50 11	268 24 01	4.80171
Cactus Peak.....	121 32 50	301 12 31	4.75821
Kawich.....	166 18 02	346 12 58	4.70896
Reveille.....	203 40 27	23 47 21	4.61479
Belted Peak.....	254 24 20	74 33 23	4.35621
Wheelbarrow Peak.....	287 48 38	107 57 34	4.35669
Mesa.....	347 10 55	167 13 49	4.53821

REVEILLE, NYE COUNTY, NEV.

The southernmost, highest prominent peak of Reveille Range, about 12 miles south of New Reveille and about 12 miles a little north of east of Sumner Spring. Horses taken to summit from south.

Station mark: A bronze triangulation tablet in solid rock under a cairn 5 feet high with a brush top 3 feet high.

[Latitude $37^{\circ} 51' 13.90''$. Longitude $116^{\circ} 08' 06.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quartzite.....	23 47 21	203 40 27	4.61479
Kawich.....	112 48 39	292 36 38	4.49222
White Pine.....	226 54 43	47 18 54	4.88056
Belted Peak.....	350 32 20	170 34 16	4.50604
Wheelbarrow Peak.....	353 35 43	173 37 48	4.65290

SHEET LINE, NYE COUNTY, NEV.

(Not occupied.)

Highest peak, north end, of low hills about 20 miles southeast of Tonopah, 30 miles northeast of Goldfield, and about 16 miles due north of Cactus Peak. Hill is about 1 mile south of "short-cut" road from Tonopah to Silverbow and Longstreet's ranch; hills are known to some as Monitor Range.

Station mark: A cairn 5 feet high.

[Latitude $37^{\circ} 59' 00.3''$. Longitude $116^{\circ} 53' 35.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kawich.....	273 28 11	93 44 08	4.58052
Cactus Peak.....	356 24 17	176 24 49	4.34828

STONEWALL, NYE COUNTY, NEV.

On south peak of high, rocky mountain about 20 miles southeast of Goldfield. There is very little solid rock on station; only bare broken rock, grassy. It is easily ascended with saddle horses in two hours from Stonewall, a well-known watering place, 4 miles west of north of station, by going east from spring 0.5 mile up first canyon to head, thence up ridge to top and around high ridge to peak.

Station mark: A bronze triangulation tablet in block of stone 14 by 12 by 8 inches on surface, over which a cairn 6 feet high was built.

[Latitude $37^{\circ} 30' 01.30''$. Longitude $117^{\circ} 02' 22.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gold Mountain.....	40 36 47	220 27 07	4.55844
Montezuma.....	127 18 45	307 06 58	4.56260
Lone Mountain.....	145 38 27	325 21 47	4.84866
Diamond.....	160 06 29	340 02 35	4.44101
Cactus Peak.....	204 29 12	24 35 09	4.53750
Quartzite.....	208 24 01	88 50 11	4.80171
Tolicha.....	321 39 17	141 47 39	4.51599

TIMBER, NYE COUNTY, NEV.

On summit of westernmost and barest of two timber peaks, known as Timber Mountain, about 17 or 18 miles south of east of Howell ranch. Side camp can be made within 5 miles of summit with buck-board by following up wash in which runs Oak Spring trail and keeping a general southeasterly course along trail and onto long low ridge.

Station mark: A bronze triangulation tablet stamped "V A 7426" in solid rock, over which is a cairn 6 feet high with flag pole 10 feet high.

[Latitude $37^{\circ} 05' 16.77''$. Longitude $116^{\circ} 27' 38.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Furnace.....	9 57 59	189 52 34	4.89419
Bare.....	41 46 16	221 37 24	4.51761
Grape.....	77 42 03	257 18 09	4.79779
Tolicha.....	122 55 03	302 42 23	4.56742

TOLICHA, NYE COUNTY, NEV.

On southern summit of high bare point of reddish color 20 miles north of east of Thorp's mill and about 23 miles east of south of Gold Crater. More easily reached from Farmer stage station on Goldfield-Bullfrog road by coming up first large wash which drains to south. Good water and feed at Monte Cristo Springs, 1.5 miles west of north of station. (Is point of Lieut. G. M. Wheeler, 1871-72.)

154 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Station mark: A bronze triangulation tablet in solid rock, over which is a rock monument 6 feet high. Tablet is stamped "7031 V A."

[Latitude $37^{\circ} 16' 05.93''$. Longitude $116^{\circ} 48' 36.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grape.....	42 01 02	221 48 45	4.65454
Gold Mountain.....	87 52 41	267 34 42	4.64285
Stonewall.....	141 47 39	321 39 17	4.51599
Quartzite.....	237 31 16	57 49 00	4.70771
Timber.....	302 42 23	122 55 03	4.56742
Bare.....	348 18 32	168 22 17	4.65842

WHEELBARROW PEAK, NYE COUNTY, NEV.

Highest peak in belted range, about 15 miles south of east of Kawich post-office and about 2 miles north of point where trail from Indian Spring to Whiterock Spring (via Johnnies Water) crosses ridge.

Signal: Tripod, about 8 feet high, brush top.

Station mark: A bronze triangulation tablet in large boulder.

[Latitude $37^{\circ} 27' 04.18''$. Longitude $116^{\circ} 04' 42.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesa.....	27 55 23	207 49 41	4.47891
Quartzite.....	107 57 34	287 48 38	4.35669
Reveille.....	173 37 48	353 35 43	4.65290

WHITE PINE, NYE COUNTY, NEV.

A Coast Survey station on highest and boldest point of White Pine Mountains, called on Lieutenant Wheeler's map the Grant Range, but local name is Troy Peak. Station is near edge of precipice; the rock bluff, a few feet distant, falls almost vertically 700 or 800 feet. Geodetic point is a $\frac{5}{8}$ -inch by 4-inch copper bolt set in solid rock in center of stone foundation pier for the theodolite. A bottle, containing the approximate height and geographic position of station, was embedded in plaster of Paris in central pit of the pier above the bolt. Reference marks are three drill holes—one about northeast, distant 10.3 feet; one about south-southeast, distant 7.65 feet, and one about northwest, distant 9 feet from geodetic point. The vertical circle station is 27.62 feet distant from geodetic station in a northeasterly direction. The usual circular stone ring walls surrounding the central and the vertical circle stations, the stone cabins used for living purposes, and the bolts and drills to which the guy ropes of observing tents were fastened were left in position.

[Latitude 38° 19' 10.90'' ^a (38° 19' 10.728''), ^b Longitude 115° 30' 03.17''; ^a (115° 30' 04.791''^b).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Wheeler Peak ^b	234	03	10.65	54	47	42.11	5.10432259
Pioche ^b	285	46	48.23	106	40	33.05	5.12178013
Kawich ^b	65	02	02	244	26	29	4.96861340
Kawich ^a	65	02	35	244	27	00	4.96878000
Reveille ^a	47	18	54	226	54	43	4.88056000

^a From Lone Mountain, Montezuma.^b United States standard datum, Coast and Geodetic Survey.

YELLOW, NYE COUNTY, NEV.

On highest part of yellowish summit, 3 miles west of north of Rhyolite and 0.25 mile east of highest rocky summit of the Bullfrog Hills north of Rhyolite.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 5 feet high.

[Latitude 36° 56' 15.54''. Longitude 116° 50' 38.20'']

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Jumbo.....	256	32	49	76	35	02	3.74956
Beatty.....	293	10	17	113	12	18	3.73432
Bare.....	302	48	32	122	53	29	4.16348
Busch.....	348	32	22	168	32	34	3.39957

TERTIARY POINTS LOCATED BY INTERSECTIONS (NEVADA).

	Latitude.			Longitude.		
	°	'	''	°	'	''
AT BULLFROG.						
Rocky Cap, Nye County.....	36	53	48.88	116	46	35.16
Ladd, Nye County.....	36	53	45.79	116	49	14.17
AT GOLDFIELD.						
Portland (frame), Esmeralda County.....	37	42	16.60	117	13	11.00
St. Ives (frame), Esmeralda County.....	37	42	53.08	117	12	51.39
Combination (frame), Esmeralda County.....	37	42	48.32	117	13	27.28
Black Butte (highest point), Esmeralda County.....	37	45	04.67	117	10	34.67

FRESNO, INYO, MONO, TULARE, AND TUOLUMNE COUNTIES, CAL.; ESMERALDA AND NYE COUNTIES, NEV.

HIGH SIERRA REGION, CALIFORNIA; GOLDFIELD REGION, NEVADA.

During the field seasons of 1904-5 Charles F. Urquhart, topographer, extended triangulation over an area of 7,000 square miles for the control of seven 30-minute quadrangles.

Positions are based on Conness and White Mountain south, stations of the Coast and Geodetic Survey, on the United States standard datum.

GODDARD, FRESNO COUNTY, CAL.

Ascended peak by ridge running from the southwest up from camp on south fork of San Joaquin at pasture $1\frac{1}{2}$ miles above the camp of the Mount Goddard Copper Mining Company. Can take animals within 1,500 feet of summit. The south end of the mountain was occupied, although the north end is slightly higher. The south end seems to be recognized as the summit and is much easier of access.

Station mark: A bronze triangulation tablet set in loose shale rock, over which is erected a cairn 4 feet in diameter at base and 4 feet high.

[Latitude $37^{\circ} 06' 12.31''$. Longitude $118^{\circ} 43' 09.20''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Three Sisters	98	03	25.99	277	51	05.29	4.4856065
Kaiser	117	18	18.97	297	01	25.41	4.6671675
Silver	140	47	11.35	326	30	13.95	4.6873632
Morgan	178	01	57.03	358	01	28.67	4.5257589
White Mountain, south	214	45	39.07	35	02	33.26	4.8564939
Split Mountain	288	56	12.20	109	06	57.48	4.4468610
Whitney	326	37	02.71	146	52	26.30	4.8426164
Brewer	334	24	33.96	154	33	01.05	4.6859822
Baldy	16	54	10.44	196	48	19.23	4.6987440
Spanish (preliminary)	35	23	57.36	215	17	45.76	4.4213575
Hilgard	161	39	49.34	341	35	36.51	4.4786204
Silliman	357	42	48.51	177	43	37.67	4.7076974

HILGARD, FRESNO COUNTY, CAL.

Ascended from camp on Bear Creek, five and one-half hours' travel. Could camp an hour closer by going to summit of ridge between Bear and Mono creeks. Best approached along ridge between Bear and Mono creeks, finally dropping down into northeast fork of Bear Creek and climbing peak from east. On summit of this peak are three small high points of rock. The north or center one is point occupied.

Station mark: A large flat rock, in which is cemented a bronze triangulation tablet, surmounted by a cairn 3 feet in diameter at base and 3 feet high.

* [Latitude $37^{\circ} 21' 39.44''$. Longitude $118^{\circ} 49' 34.10''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Three Sisters	40	31	27.33	220	22	57.41	4.5051089
Silver	125	09	54.14	305	02	48.66	4.3232322
Goddard	341	36	11.21	161	40	04.09	4.4787793
Kaiser	77	03	50.04	256	50	47.29	4.5135451
Big Shuteye	88	51	40.06	268	29	47.16	4.7264787

KAISER, FRESNO COUNTY, CAL.

On a bald peak at the head of Kaiser and Pittman creeks, easily ascended from the south side. There are numerous lakes and small meadows in the neighborhood.

Station mark: A bronze triangulation tablet set in loose earth, there being no solid rock, above which was erected a cairn 5 feet in diameter at base and 5 feet high.

[Latitude 37° 17' 40.52". Longitude 119° 11' 05.66".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Lyell.....	171	16	36.00	351	13	27.41	4.6988733
Silver.....	216	42	52.26	36	48	51.25	4.3856890
Goddard.....	297	01	25.41	117	18	18.97	4.6671675
Three Sisters.....	326	51	14.47	146	55	46.14	4.3069355
Big Shuteye.....	106	00	18.72	285	51	29.47	4.3493243
Red.....	153	40	16.75	333	32	06.49	4.6487072
Lyell.....	171	16	30.07	351	13	21.55	4.6982751
Silver.....	216	42	50.78	36	48	49.00	4.3855104
Hilgard.....	256	50	47.29	77	03	50.04	4.5135451

HUMPHREYS, FRESNO AND INYO COUNTIES, CAL.

(Not occupied.)

On the highest point of Mount Humphrey, a very prominent mountain on the main crest of the Sierras, between the North Palisade and Hilgard, and at the source of Mill Creek, a tributary of Owens River. There is a trail up Mill Creek to foot of mountain.

Station mark: Highest point, a very sharp peak.

[Latitude 37° 16' 15.12". Longitude 118° 40' 20.38".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Goddard.....	12	38	27.03	192	36	55.00	4.2797563
Three Sisters.....	67	29	24.74	247	15	20.53	4.5716837
Morgan.....	160	28	16.60	340	26	05.80	4.2004826
Split Mountain.....	321	08	50.51	141	17	55.11	4.5506914

RED SLATE, FRESNO AND MONO COUNTIES, CAL.

(Not occupied.)

This point is a high, round-topped mountain on the main crest of the Sierras. Highest point between Mono Pass and Mammoth Pass.

Station mark: Highest point.

[Latitude 37° 30' 28.37". Longitude 118° 52' 07.16".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Silver.....	72	41	27.42	252	35	54.39	4.1487274
Lyell.....	126	03	00.98	305	48	17.83	4.6420540
Baldy.....	205	30	18.28	25	36	12.72	4.5171594
Morgan.....	313	12	06.38	133	17	05.06	4.2193242

SPLIT MOUNTAIN, FRESNO AND INYO COUNTIES, CAL.

On highest point of Split Mountain, which is on crest of the Sierras at the source of Tinnemaha Creek, flowing into Owens River, and Cartridge Creek, flowing into middle fork of Kings River. There is a higher point about 8 miles northwest (Mount Jordan). The point can be easily reached from the west side by going up Cartridge Creek to the summit of the ridge, thence south to peak. It can also be reached from the head of Tinnemaha Creek. It would be very difficult to climb it from the south.

Station mark: A cairn 6 feet high on highest point.

[Latitude 37° 01' 16.40". Longitude 118° 25' 18.51'']

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Brewer.....	9	11	54.05	189	09	38.34	4.5455577
Goddard.....	109	06	57.48	288	56	12.20	4.4468610
Morgan.....	147	13	59.01	327	02	43.14	4.7057157
White Mountain, south.....	192	12	05.44	12	18	09.46	4.8428852
Black Mountain.....	212	37	23.61	32	44	32.20	4.5110832
Waucoba.....	269	42	52.99	89	57	51.70	4.5669785
Kaynot.....	310	08	55.38	130	25	29.22	4.7307221
Whitney.....	346	36	56.01	166	41	37.36	4.7028133

SILVER, FRESNO COUNTY, CAL.

On the highest peak between Fish and Mono creeks, at head of Silver Creek. Summit is flat, running north-northeast and south-southwest. Highest point is at southwest end. Can camp at meadows below Margaret Lakes. Thence it is three and one-half hours' travel to station. Can take mules within 700 feet of summit on east. There is grass and water for one night within 1,200 feet of summit.

Station mark: A bronze triangulation tablet set in solid rock, on which was erected a cairn of rocks 5 feet in diameter at base and 5 feet high.

[Latitude 37° 28' 12.09". Longitude 119° 01' 14.36'']

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Big Shuteye.....	69	48	41.16	249	33	51.80	4.5842369
Red.....	120	54	43.33	300	40	31.80	4.6010921
Lyell.....	143	38	27.25	323	29	17.71	4.5704983
Hillgard.....	305	02	47.29	125	09	52.52	4.3230108
Three Sisters.....	5	29	49.98	185	28	23.83	4.5637232
Kaiser.....	36	48	51.25	216	42	52.26	4.3856891
Lyell.....	143	38	30.57	323	29	20.79	4.5706560
Morgan.....	285	33	44.39	105	44	15.58	4.4233811
Goddard.....	326	36	13.95	146	47	11.35	4.6873632

BIG PINE, INYO COUNTY, CAL.

(Not occupied.)

Station mark: The cupola on school in Big Pine.

[Latitude 37° 09' 57.91". Longitude 118° 17' 35.59".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Split Mountain.....	35 34 20.99	215 29 40.59	4.2956901
Round.....	110 29 24.80	290 24 21.19	4.1213363
Black Mountain.....	208 14 55.26	28 17 23.37	4.1054372

BISHOP, INYO COUNTY, CAL.

Station mark: The cupola on Methodist Academy in Bishop.

[Latitude 37° 21' 48.29". Longitude 118° 23' 53.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Morgan.....	95 05 26.58	278 53 16.21	4.4765596
Sheep.....	221 11 34.11	41 18 09.84	4.3849933
Black Mountain.....	304 42 42.28	124 49 00.79	4.2722012

BLACK MOUNTAIN, INYO COUNTY, CAL.

On the highest point of Black Mountain, a comparatively low mountain on the east side of Owens Valley between Black Canyon on the north and the toll road on the south, about 15 miles southeast of Bishop and 12 miles northeast of Big Pine. Animals can be taken to summit from south, though it is rather steep. There is a trail up Black Canyon to an abandoned mine three-fourths of a mile from station. Collin's residence is near mouth of Black Canyon.

Station mark: A rock cairn 6 feet in diameter at base and 8 or 9 feet high, with tree in center; triangulation tablet under center of tree.

[Latitude 37° 16' 02.12". Longitude 118° 13' 28.72".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Split Mountain.....	32 44 32.20	212 37 23.61	4.5110832
Round.....	70 19 33.80	250 12 01.66	4.2915272
Morgan.....	108 59 56.83	288 41 28.57	4.6769728
Heckla.....	140 17 52.94	320 06 20.01	4.6526073
White Mountain South.....	176 13 52.81	356 12 46.23	4.6111148
Sheep.....	181 17 14.31	1 17 30.38	4.4612513
Piper.....	239 00 19.49	59 11 08.24	4.4869603
Blue Dick.....	244 30 31.69	64 53 38.05	4.7932844
White Top.....	268 00 08.56	88 19 14.31	4.6687104
Gold Mountain.....	270 52 06.99	91 25 31.52	4.9117079
Waucoba.....	324 33 01.22	144 40 53.89	4.5232682

160 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

CRATER, INYO COUNTY, CAL.

On a small red hill with crater in center, between Tinnemaha and Taboose creeks and west of the road between Independence and Big Pine. Animals can be ridden to summit.

Station mark: A cairn about 5 feet high

[Latitude 37° 01' 45.14". Longitude 118° 17' 15.83".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Split Mountain.....	85 47 37.70	265 42 47.05	4.0778684
Round.....	147 05 42.24	327 00 28.39	4.3730474
Black Mountain.....	191 57 31.68	11 59 48.83	4.4314626
Independence.....	342 27 37.89	162 30 49.50	4.4189681

DARWIN, INYO COUNTY, CAL.

(Not occupied.)

[Latitude 37° 10' 01.88". Longitude 118° 40' 17.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Three Sisters.....	85 24 33.45	265 10 28.40	4.5396108
Silver.....	137 27 48.71	317 15 06.64	4.6598175
Morgan.....	168 30 33.81	348 28 21.32	4.4313845

DOUBLE, INYO COUNTY, CAL.

(Not occupied.)

This is a very prominent peak, and the highest point was located.

[Latitude 37° 33' 39.21". Longitude 118° 54' 23.76".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Silver.....	45 01 54.44	224 57 44.39	4.1541539
Baldy.....	216 18 56.03	36 26 14.12	4.4706843
Morgan.....	318 07 30.59	138 13 52.56	4.3641389

INDEPENDENCE, INYO COUNTY, CAL.

Station mark: The cupola on court-house in Independence.

[Latitude 36° 48' 13.33". Longitude 118° 11' 56.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Williamson.....	31 20 30.42	211 16 30.48	4.2823466
Crater.....	162 30 49.50	342 27 37.89	4.4189681
Keynot.....	296 34 50.74	116 43 22.33	4.3752495

KEYNOT, INYO COUNTY, CAL.

On highest point of mountain on east side of Owens Valley, about 16 or 18 miles northeast of Lone Pine post-office, by road and trail. The trail from Lone Pine to Keynot mine crosses ridge about 2 miles south of point. Animals can be taken to signal.

Station mark: A rock cairn 8 feet high with tree in center.

[Latitude 36° 42' 28.02". Longitude 117° 57' 41.90".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Olancha.....	15	55	49.03	195	50	15.38	4.7078290
Whitney.....	04	13	37.07	244	01	48.67	4.5154617
Williamson.....	79	42	21.24	259	29	50.89	4.5011643
Split Mountain.....	130	25	29.22	310	08	55.38	4.7307221
Waucoba.....	173	22	19.33	353	20	40.94	4.5455821

MORGAN, INYO COUNTY, CAL.

On highest part of high mountain, on east side and near source of Rock Creek. A rock cairn was found on this mountain, probably of Wheeler Survey in 1878. There is a trail from J. L. C. Sherwin's ranch in Round Valley to source of Rock Creek. Another trail goes from same place to Rickey's ranch in Long Valley, and trail up Mono Creek crosses range and intersects above-mentioned trails. This is the only mountain in the vicinity visible from Conness. Cairn was in good condition and was not disturbed.

Station mark: Triangulation tablet cemented in large flat rock, distant 10.2 feet, azimuth 72° 33', from cairn of Wheeler Survey.

[Latitude 37° 24' 20.14". Longitude 118° 43' 56.04".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Three Sisters.....	44	53	05.52	224	41	10.61	4.6157891
Silver.....	105	44	15.58	285	33	44.39	4.4233811
Lyll.....	128	05	41.28	307	45	58.78	4.7805563
Conness.....	140	24	24.56	320	02	49.62	4.9091556
Baldy.....	182	59	48.38	3	00	41.92	4.6136960
White Mountain, north.....	214	29	18.27	34	43	04.27	4.7666392
Heckla.....	220	03	25.98	40	10	06.14	4.3991161
White Mountain, south.....	238	48	03.66	59	05	29.89	4.6923306
Black Mountain.....	288	41	28.57	108	59	56.83	4.6769728
Waucoba.....	303	15	12.72	123	41	31.37	4.8873537
Round.....	309	27	08.48	129	38	03.12	4.5377405
Split Mountain.....	327	02	43.14	147	13	59.01	4.7057157
Sheep.....	253	15	49.17	73	34	36.83	4.6769802
Goddard.....	358	01	28.67	178	01	57.03	4.5257589

OLANCHA, INYO AND TULARE COUNTIES, CAL.

Highest peak on range southwest of Owens Lake. Can be easily ascended from the Monache Meadows on South Fork of Kern River. Animals can be ridden almost to timber line; thence very good walking to summit. Point was used by Wheeler Survey, as a small rock cairn was found on highest point.

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Signal: Rock cairn 7 feet in diameter at base and 10 feet high was erected at same point.

Station mark: A triangulation tablet cemented in rock at center of cairn.

[Latitude $36^{\circ} 15' 55.67''$. Longitude $118^{\circ} 07' 03.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mahogany.....	24 12 42.16	204 07 53.77	4.4750064
Big Meadows.....	27 10 05.78	207 02 29.90	4.6282480
Kern.....	107 33 43.41	287 27 41.77	4.2038386
Florence.....	112 03 14.31	291 47 51.25	4.6220191
Kaweah Mountain.....	131 57 46.73	311 44 57.01	4.6375102
Whitney.....	155 54 30.34	335 48 18.76	4.5811231
Keynot.....	195 50 15.38	15 55 49.03	4.7078290
Sunday.....	38 16 38.85	218 00 10.70	4.8332895

PALISADE, FRESNO AND INYO COUNTIES, CAL.

(Not occupied.)

North Palisade, or Mount Jordan, divides the waters of Big Pine Creek and Palisade Creek, the former flowing into Owens River, the latter into Middle Fork of Kings River. Highest point north of Split Mountain and probably higher than latter. Very difficult to climb. Best reached up Palisade Creek.

Station mark: Highest point on mountain.

[Latitude $37^{\circ} 05' 40.45''$. Longitude $118^{\circ} 30' 49.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goddard.....	93 08 26.77	273 01 00.70	4.2621665
Morgan.....	150 45 15.18	330 37 19.20	4.5975385
Round.....	209 58 09.31	30 01 06.71	4.1613348
Split Mountain.....	314 49 29.21	134 52 48.78	4.0622379

PINCHOT, FRESNO AND INYO COUNTIES, CAL.

A round-topt red mountain about 8 miles down (south) the main crest of the Sierras from Split Mountain, and probably the highest point between the Kearsarge Pass and Split Mountain. It is also called Red Mountain.

Station mark: The highest point of mountain.

[Latitude $36^{\circ} 56' 51.75''$. Longitude $118^{\circ} 24' 17.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Split Mountain.....	169 28 42.71	349 28 05.83	3.9189686
Waucoba.....	256 44 35.37	76 58 56.45	4.5604916
Keynot.....	303 49 32.80	124 05 29.04	4.6781902
Whitney.....	346 03 52.24	166 07 56.65	4.6248864

PIPER, INYO COUNTY, CAL.

On highest point of range of low mountains between Fish Valley and Deep Spring Valley, on the east side and about 1 mile distant from road between Big Pine and Oasis and about 7 miles from latter. Animals can be taken within a short distance of summit.

Station mark: A triangulation tablet cemented in rock under center of cairn 9 feet high.

[Latitude 37° 24' 33.39". Longitude 117° 55' 39.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Waucoba.....	9 22 19.54	189 19 26.05	4.6388914
Black Mountain.....	59 11 08.24	239 00 19.49	4.4869603
Sheep.....	117 15 12.24	297 04 37.65	4.4595886
White Mountain South.....	130 53 56.41	310 41 58.24	4.5826240
Boundary post 74.....	205 33 23.55	25 35 17.27	4.0275048
Boundary post 75.....	228 20 26.76	48 23 35.98	4.0101962
Blue Dick.....	250 00 44.76	70 13 03.73	4.5015097
Magruder.....	269 36 21.55	89 50 15.96	4.5276844
White Top.....	305 06 30.66	125 14 49.43	4.3937678

ROUND, INYO COUNTY, CAL.

On a round, bald point about 10 miles west-northwest of Big Pine and on east side of Coyote Valley. A trail goes from Big Pine up Baker Creek to Coyote Valley. Animals can be ridden to summit.

Station mark: A cairn about 7 feet high, 122 feet south of highest point of mountain. Cairn is probably a corner on forest, reserve line and was not disturbed.

[Latitude 37° 12' 27.77". Longitude 118° 25' 55.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Morgan.....	129 38 03.12	309 27 08.48	4.5377405
Black Mountain.....	250 12 01.66	70 19 33.80	4.2915272
Waucoba.....	298 28 08.81	118 43 32.04	4.6336966
Split Mountain.....	357 26 31.89	177 26 54.46	4.3163237

SHEEP, INYO COUNTY, CAL.

On the highest point of southeasternmost of two high red peaks at the source of Piute Creek. Can be reached by same trail that goes to White Mountain South station, except that one travels south after reaching summit of ridge.

Station mark: A triangulation tablet set in loose rock under center of a cairn 7 feet high.

[Latitude 37° 31' 40.09". Longitude 118° 13' 02.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black Mountain.....	1 17 30.38	181 17 14.31	4.4612513
Bishop.....	41 18 09.84	221 11 34.11	4.3849933
Morgan.....	73 34 36.83	253 15 49.17	4.6769802
White Mountain South.....	164 16 27.53	344 15 04.62	4.0898619
Piper.....	297 04 37.65	117 15 12.24	4.4565886

TOM, INYO COUNTY, CAL.

(Not occupied.)

On the highest point of Mount Tom, a well-known mountain on the west side of Round Valley; not difficult to climb.

Station mark: A small cairn.

[Latitude 37° 20' 19.70". Longitude 118° 39' 23.01".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Three Sisters.....	58	41	50.70	238	27	11.11	4.6230791
Morgan.....	137	50	13.72	317	47	28.00	4.0001589
White Mountain South.....	227	07	33.67	47	22	15.39	4.6842969

WAUCOBA, INYO COUNTY, CAL.

On highest point in range of mountains about 20 miles northeast of Independence. There is a wagon road from Citrus up Mazurka Canyon to its head, thence by trail about 2 miles east to a spring, which is only water in vicinity. The mountain can be seen northeast from ridge where trail crosses just before going down to spring, but signal is not in view. Station is 3 miles from spring and can be reached on horseback. There is little grass, but by letting animals range north and east they can get along fairly well.

Station mark: A cairn 12 feet high. All trees were cut or burned from summit of the mountain.

[Latitude 37° 01' 19.76". Longitude 118° 00' 25.90".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Whitney.....	27	21	35.89	207	11	23.12	4.7430219
Williamson.....	33	46	05.70	213	35	10.92	4.6884122
Split Mountain.....	89	57	51.70	269	42	52.99	4.5669785
Round.....	118	43	32.04	298	28	08.81	4.6336966
Morgan.....	123	41	31.37	303	15	12.77	4.8873537
Black Mountain.....	144	40	53.89	324	33	01.22	4.5232682
White Mountain South.....	162	09	37.92	342	00	36.84	4.8538027
Piper.....	189	19	26.05	9	22	19.54	4.6388914
Montezuma.....	217	16	02.41	37	39	33.03	4.9733803
White Top.....	223	33	00.76	43	44	10.54	4.5983045
Gold Mountain.....	247	30	26.42	67	55	52.73	4.8288720
Keynot.....	353	20	40.94	173	22	19.33	4.5455821

THREE SISTERS, FRESNO COUNTY, CAL.

On the south end of summit of the Three Sisters. Can be reached by trail between Shaver and Blaney Meadow (or Hot Springs). Leave trail at large meadow between Red Mountain and Potato Hill, traveling southeast. At foot of mountain on northeast side is a small meadow with running water. Animals can be taken nearly to summit from south to southeast.

Station mark: A bronze triangulation tablet set in loose rock with a cairn built over it 3 feet in diameter at base and 3 feet high.

[Latitude $37^{\circ} 08' 29.64''$. Longitude $119^{\circ} 03' 36.50''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Kaiser.....	146	55	46.14	326	51	14.47	4.3069355
Silver.....	185	28	23.83	5	29	49.98	4.5637231
Morgan.....	224	41	10.61	44	53	05.52	4.6157891
Goddard.....	277	51	05.29	98	03	25.99	4.4856065
Big Shuteye.....	125	27	35.30	305	14	15.24	4.6014723
Silliman.....	329	28	41.38	149	41	47.00	4.8062703
Spanish (preliminary).....	329	37	29.39	149	43	36.33	4.4747072
Baldy.....	342	58	38.44	163	05	03.75	4.7358215

WHITE TOP, INYO COUNTY, CAL.

On summit of white-topped mountain about 6 miles up ridge (southeast) from Last Chance Mountain. The nearest water is at Willow, which is $7\frac{1}{2}$ miles from Pigeon Springs, a well-known point on the Oasis-Lida road. There is no forage in the country; a wagon can be taken to Willow Spring, and animals can be ridden from that place to summit by going up ridge and keeping on the divide.

Station mark: A triangulation tablet set in loose rock under center of cairn 6 feet high.

[Latitude $37^{\circ} 16' 50.65''$. Longitude $117^{\circ} 41' 56.80''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Waucoba.....	43	44	10.54	223	33	00.76	4.5983045
Black Mountain.....	88	19	14.31	268	00	08.56	4.6687104
Piper.....	125	14	49.43	305	06	30.66	4.3937678
White Mountain South.....	128	45	45.34	308	25	28.17	4.7986824
Blue Dick.....	200	59	12.38	21	03	10.06	4.4287747
Magruder.....	223	02	13.54	43	07	46.12	4.2956894
Gold Mountain.....	274	59	44.33	95	14	03.60	4.5453611

WHITNEY, TULARE AND INYO COUNTIES, CAL.

Station is on the highest point of Mount Whitney. Peak is at source of Crabtree Creek as given by old Sierra Club map (but Whitney Creek on most recent edition) and Lone Pine Creek. Whitney Creek flows into Kern River. There is a good trail from Lone Pine post-office to summit of peak and another trail from Kern River up old Whitney or Volcano Creek to its source, thence over ridge to Rock Creek, thence over ridge to Whitney Creek, thence up creek to foot of mountain. Elevation, 14,499 feet above mean sea level.

Station mark: A triangulation tablet cemented in rock under center of a cairn 8 feet high.

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[Latitude 36° 44' 44.14". Longitude 118° 17' 28.84".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Big Meadows	2	55	30.58	182	54	03.07	4.8615178
Florence	50	32	40.95	230	23	26.66	4.4782336
Kaweah Mountain	70	49	52.86	250	43	13.01	4.2475638
Brewer	129	52	34.57	309	45	39.25	4.3522874
Goddard	146	52	26.30	326	37	02.71	4.8426164
Split Mountain	166	41	37.36	346	36	56.01	4.7028113
Williamson	168	40	29.09	348	39	47.84	3.9418286
Waucoba	207	11	23.12	27	21	35.89	4.7430219
Keynot	244	01	48.67	54	13	37.07	4.5154617
Olancho	335	48	18.76	155	54	30.34	4.5811231
Kern	359	17	41.07	179	17	49.85	4.4767457

WILLIAMSON, TULARE AND INYO COUNTIES, CAL.

(Not occupied.)

On the highest point of Mount Williamson, a well-known mountain about 5 miles a little west of north from Mount Whitney. The mountain can be climbed from either side, but animals can not be taken to summit.

Station mark: The higher of two cairns.

[Latitude 36° 3' 22.3". Longitude 118° 18' 37.99".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Split Mountain	166	16	00.70	346	12	00.57	4.6201792
Waucoba	213	35	10.92	33	46	05.70	4.6884122
Keynot	259	29	50.89	79	42	21.24	4.5011643
Whitney	348	39	47.84	168	40	29.09	3.9418286

BALDY, MONO COUNTY, CAL.

On the northwestern of two high points on mountain locally known as Baldy, almost 10 miles a little south of west of Benton post-office and store, on east side of Long Valley. It can be reached by road and trail either from Benton or Long Valley. This is the highest point in the range between the Sierras and White Mountains and probably about 10,000 feet above sea. Animals can be taken to summit.

Station mark: A cairn 6 feet in diameter at base and 8 feet high, with tree in center and triangulation tablet cemented in rock under center of tree.

[Latitude 37° 46' 31".00 Longitude 118° 42' 28.27".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Morgan	3	00	41.92	182	59	48.38	4.6136960
Lyell	85	37	47.22	265	17	08.03	4.6970120
Conness	111	45	56.12	291	23	22.03	4.7632685
Horse	158	41	58.00	338	38	15.64	4.3861824
White Mountain North	257	02	05.63	77	15	01.28	4.5017243
White Mountain South	291	14	13.31	111	30	50.25	4.6322517
Heckla	327	23	11.08	147	28	59.28	4.4139048

CASTLE PEAK, MONO COUNTY, CAL.

(Not occupied.)

A high mountain north of Conness.

Station mark: A small cairn.

[Latitude 38° 03' 53.91". Longitude 119° 16' 25.04".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Horse.....	282 56 07.78	103 13 19.27	4.6225526
Baldy.....	302 42 08.89	123 03 00.60	4.7725734
Conness.....	20 52 19.21	200 50 35.01	4.0641384

HORSE, MONO COUNTY, CAL.

On the highest point of a sagebrush ridge about 5 miles east of Mono Lake and about 10 miles north-northwest of Dexter Meadows, on road between Benton and Crater Lake post-office. There is no feed nor water closer than Dexter Meadows. A small spring about 3 miles south, but not sufficient water for camp. Animals can be ridden anywhere in this country.

Station mark: A triangulation tablet cemented in rock under center of cairn 9 feet high.

[Latitude 37° 58' 46.14". Longitude 118° 48' 30.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lyll.....	56 57 56.53	236 40 54.76	4.6868437
Conness.....	88 26 54.14	268 07 59.79	4.6534201
White Mountain North.....	291 17 08.39	111 33 48.34	4.6305132
Baldy.....	338 38 15.64	158 41 58.00	4.3861824

HECKLA, MONO COUNTY, CAL.

On a high rocky hill (not mountain), about 20 miles northwest of Bishop. There are a great many mines or prospects in the hill, several of which are owned by J. L. C. Sherwin. Road from Bishop to Long Valley passes about 2 miles south of point where first timber is reached; thence there are several wood roads to foot of hill. Animals can be taken within 200 feet of point on northwest side, but thence up it is very rough. No available water or food near. Owens River is not more than 6 miles south, but it is difficult to get down to water.

Station mark: A triangulation tablet cemented under rock under center of tree, with small cairn around it on highest rock on hill.

[Latitude 37° 34' 42".00 Longitude 118° 32' 58.58".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Morgan.....	40 10 06.14	220 03 25.98	4.3991161
Baldy.....	147 28 59.28	327 23 11.08	4.4139048
White Mountain South.....	256 26 26.69	76 37 13.77	4.4272420
Black Mountain.....	320 06 02.01	140 17 52.94	4.6526073

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LYELL, MONO COUNTY, CAL.

At end of Tuolumne Meadows, 14 miles southeast of Soda Springs. The south side a nearly perpendicular wall, the north a series of meadows until glacier is reached; the east and west sides rather steep. The highest point is a short sharp ridge, about 200 yards long, running northwest and southeast, the northwest end being the lower. Ascended from head of Lyell Fork and northeast side of peak.

Station mark: Small stone monument; "U.S.G.S." chiseled on rock east of it.

[Latitude $37^{\circ} 44' 23.13''$. Longitude $119^{\circ} 16' 15.30''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Conness.....	170	11	34.84	350	09	45.17	4.4089271
Horse.....	236	40	54.76	56	57	56.53	4.6868437
Baldy.....	205	17	06.03	85	37	47.22	4.6970120
White Mountain South.....	277	07	12.03	97	44	27.83	4.9559946
Morgan.....	307	45	58.78	128	05	41.28	4.7805563
Silver.....	323	29	20.79	143	38	30.57	4.5706562
Kaiser.....	351	13	27.41	171	16	36.00	4.6988733
Big Shuteye.....	17	46	48.27	197	41	04.96	4.6571504
Red.....	52	03	35.82	231	58	32.37	4.1882294
Clarks Peak.....	71	03	13.41	250	57	27.71	4.1654618
Hoffman.....	119	37	00.01	299	28	12.89	4.3836744
Dana.....	193	59	22.02	14	01	13.38	4.2637680

MONO, MONO COUNTY, CAL.

(Not occupied.)

Station mark: The highest point of Crater Mountain, near Crater post-office.

[Latitude $37^{\circ} 52' 42.26''$. Longitude $119^{\circ} 00' 23.41''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Conness.....	109	46	14.98	289	34	40.11	4.4673450
Horse.....	237	08	41.29	57	15	59.54	4.3162528
Baldy.....	293	26	00.44	113	36	59.80	4.4575319

MONUMENT, MONO COUNTY, CAL.

(Not occupied.)

[Latitude $37^{\circ} 48' 09.48''$. Longitude $118^{\circ} 20' 41.20''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Baldy.....	84	41	17.11	264	27	56.20	4.5068484
White Mountain North.....	165	48	16.54	345	47	50.95	3.6186534
White Mountain South.....	337	00	13.44	157	03	31.05	4.3069021

WHITE MOUNTAIN NORTH, MONO COUNTY, CAL.

A point located by the Coast and Geodetic Survey and also occupied by the Wheeler Survey. No signal was found in 1905, except a small pile of rocks, probably left by members of the Wheeler Survey.

Station mark: A large cairn erected over small rock pile of Wheeler Survey.

[Latitude 37° 50' 20.15". Longitude 118° 21' 22.95".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Morgan.....	34	43	04.27	214	29	18.27	4.7666392
Baldy.....	77	15	01.28	257	02	05.63	4.5017243
Conness.....	99	50	21.87	279	14	49.46	4.9344715
Horse.....	111	33	48.34	291	17	08.39	4.6305132
White Mountain South.....	338	29	12.76	158	32	56.00	4.3871739
Mount Grant.....	155	02	03.90	334	45	56.70	4.9527523
Carson Sink.....	183	05	17.80	3	09	51.60	5.2876628
Toiyabe Dome.....	218	11	31.10	38	48	52.90	5.1492056
Lone Mountain.....	254	31	38.60	75	03	27.40	4.8953334
White Pine.....	257	05	50.50	78	51	30.30	5.4084214

WHITE MOUNTAIN SOUTH, MONO COUNTY, CAL.

A point located by the Coast and Geodetic Survey on the highest summit of the White Mountain Range. It is best reached from Bishop by following the wagon road to Kellogg's ranch, a distance of 10 or 12 miles, thence along trail up Piute Creek to a cabin at end of old wagon road, thence up a creek 0.25 mile, thence along trail up the ridge nearly to summit of peak.

Station mark: A cairn 13 feet in diameter at base and 13 feet high.

[Latitude 37° 38' 04.07". Longitude 118° 15' 18.20".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Split Mountain.....	12	18	09.46	192	12	05.44	4.8428852
Morgan.....	59	05	29.89	238	48	03.66	4.6923306
Heckla.....	76	37	13.77	256	26	26.69	4.4272420
Lyell.....	97	44	27.83	277	07	12.03	4.9559946
Baldy.....	111	30	50.25	291	14	13.31	4.6322517
Conness.....	111	49	04.10	291	00	53.00	5.0037076
White Mountain North.....	158	32	56.00	338	29	12.76	4.3871739
Montezuma.....	264	52	07.86	85	24	53.55	4.8983360
Blue Dick.....	283	23	45.73	103	48	04.67	4.7811244
Gold Mountain.....	296	27	53.08	117	02	32.64	4.9738652
White Top.....	308	25	28.17	128	45	45.34	4.5826240
Piper.....	310	41	58.24	130	53	56.41	4.5826240
Waucoba.....	342	00	36.84	162	09	37.92	4.8538027
Black Mountain.....	356	12	46.23	176	13	52.81	4.6111148
Carson Sink.....	180	29	43.90	0	28	29.60	4.8157908
Toiyabe Dome.....	210	26	05.50	30	59	30.70	5.1895998
Lone Mountain.....	236	53	48.40	57	21	49.20	4.9019728
White Pine.....	251	42	23.40	73	24	04.40	5.4041605

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BIG MEADOWS, TULARE COUNTY, CAL.

The highest point on range between Kern River and South Fork of Kern River, about 25 miles northeast of Kernville along the Mount Whitney trail.

Station mark: A bronze triangulation tablet cemented in a large boulder, over which is erected a cairn 6 feet high.

[Latitude $35^{\circ} 55' 28.61''$. Longitude $118^{\circ} 19' 56.81''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Florence.....	159	55	59.35	339	48	16.67	4.7553965
Whitney.....	182	54	03.07	2	55	30.58	4.8615178
Kern.....	185	26	27.52	5	28	03.46	4.6317012
Olancha.....	207	02	29.90	27	10	05.78	4.6282480
Mahogany.....	213	58	12.72	34	01	00.04	4.1060172
Pahute.....	5	46	09.34	185	44	06.62	4.7224576
Breckinridge.....	23	25	23.77	203	16	37.60	4.7575669
Sunday.....	55	21	15.81	235	12	24.95	4.4420184
Moses.....	141	33	04.62	321	20	46.63	4.7013414

BREWER, TULARE COUNTY, CAL.

Highest point of Mount Brewer, a prominent mountain at source of Brewer Creek; rather difficult to climb. Sharp peak at summit is used for signal.

Station mark: A cairn.

[Latitude $36^{\circ} 42' 31.67''$. Longitude $118^{\circ} 29' 04.70''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Goddard.....	154	33	01.05	334	24	33.96	4.6859822
Split Mountain.....	189	09	38.34	9	11	54.05	4.5455577
Whitney.....	309	45	39.25	129	52	34.57	4.3522874
Kaweah Mountain.....	358	16	31.93	178	16	46.53	4.3062797

FLORENCE, TULARE COUNTY, CAL.

Mount Florence is the highest point east of Farewell Gap, about 6 miles southeast of Mineral King, at headwaters of Middle Fork of Kaweah and Little Kern rivers.

Station mark: A bronze triangulation tablet cemented in solid rock, surmounted by a cairn 6 feet high.

[Latitude $36^{\circ} 24' 23.05''$. Longitude $118^{\circ} 33' 00.85''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Kaweah Mountain.....	205	57	00.40	25	59	35.31	4.1708006
Whitney.....	230	23	26.66	50	32	40.95	4.4782336
Olancha.....	291	47	51.25	112	03	14.31	4.6220191
Kern.....	294	33	40.96	114	43	02.25	4.4144867
Mahogany.....	328	00	03.75	148	10	35.24	4.7033678
Big Meadows.....	339	48	10.67	159	55	59.35	4.7553965
Sunday.....	2	32	31.46	182	31	19.39	4.8406527
Moses.....	39	35	55.38	219	31	17.76	4.2635024
Baldy.....	134	54	42.41	314	42	51.70	4.6217913
Silliman.....	153	37	10.01	333	31	56.75	4.4687506

KAWEAH MOUNTAIN, TULARE COUNTY, CAL.

On easternmost and only flat-topped mountain of the Kaweah group. At the source of Chagoopa Creek, a tributary of Kern River. Best reached by Chagoopa Creek.

Station mark: A small cairn, on highest point of mountain.

[Latitude 36° 31' 35.24". Longitude 118° 28' 40.21".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Florence.....	25 59 35.31	205 57 00.40	4.1708006
Brewer.....	178 16 46.53	358 16 31.93	4.3062797
Whitney.....	250 43 13.01	70 49 52.86	4.2475638
Olancha.....	311 44 57.01	131 57 46.73	4.6375102
Kern.....	324 38 58.74	144 45 46.09	4.4711073

KERN, TULARE COUNTY, CAL.

On high, rocky mountain on divide between Kern River and South Fork of Kern River. The range is sometimes called Too-wa Range; it is about 4 miles south of the Mount Whitney trail at point where tunnel was cut from Whitney Creek to South Fork of Kern River. The trail down South Fork of Kern River to Monache Meadows passes within about $\frac{3}{4}$ miles of station and signal can be seen from meadow after leaving Whitney Creek. Animals can be taken within 500 feet of summit.

Station mark: A triangulation tablet set in solid rock under center of cairn, on highest point of mountain.

[Latitude 36° 18' 31.77". Longitude 118° 17' 14.05".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Big Meadows.....	5 28 03.46	185 26 27.52	4.6317012
Florence.....	114 43 02.25	294 33 40.96	4.4144867
Kaweah Mountain.....	144 45 46.09	324 38 58.74	4.4711073
Whitney.....	179 17 49.85	359 17 41.07	4.4767457
Olancha.....	287 27 41.77	107 33 43.41	4.2038386
Mahogany.....	354 33 04.26	174 34 16.30	4.5077615

MAHOGANY, TULARE COUNTY, CAL.

On a spur of Big Meadows Mountain and on divide of the waters of Fish Creek and South Fork of Kern River. The Kernville-Mount Whitney trail passes about 1 mile west of station on ridge. Can be reached by trail from the Monache Meadows. The summit has scattering clusters of mahogany trees on it. Animals can be taken to the signal. Description of trail is difficult, as there are many cattle trails in all directions. Fish Creek meadow is nearest good one.

172 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Station mark: A triangulation tablet under center of a rock cairn 6 feet in diameter at base and 5.8 feet high, with a tree in center.

[Latitude 36° 01' 11.99". Longitude 118° 15' 11.97".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Big Meadows.....	34	01	00.04	213	58	12.72	4.1060172
Florence.....	148	10	35.24	328	00	03.75	4.7033678
Kern.....	174	34	16.30	354	33	04.26	4.5077615
Olancha.....	204	07	53.77	24	12	42.16	4.4750004

TRAIL, TULARE COUNTY, CAL.

(Not occupied.)

Summit of mountain at end of high Sierras. The trail that goes up South Fork of Kern River thru Mulkey Meadows, thence across main ridge and down Cottonwood Creek to Lone Pine, passes south of and within a mile of point at summit of ridge. Can camp on either side of ridge.

Station mark: Highest point of mountain.

[Latitude 36° 25' 39.77". Longitude 118° 11' 22.97".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Kern.....	33	35	24.09	213	31	55.91	4.1905225
Florence.....	85	55	26.10	265	42	35.60	4.5108296
Whitney.....	151	32	41.44	331	29	03.80	4.2808189

CONNESSE, TUOLUMNE COUNTY, CAL.

A primary station of the Coast and Geodetic Survey, 10 miles north of Soda Springs. In shape an irregular parallelogram of granite, from northwest portion of which rises the top of peak, with precipitous side of 1,000 feet or more. It can be ascended from Soda Springs in four hours by a trail made by the Coast and Geodetic Survey. Grass and water can be found within 1 mile of summit.

Station mark: Concrete pier, with $\frac{5}{8}$ -inch copper bolt in center.

[Latitude 37° 58' 02.59". Longitude 119° 19' 14.23".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Red.....	12	36	41.02	192	33	26.59	4.55157670
Clarks Peak.....	17	29	05.74	197	25	09.01	4.49796440
Devil Peak.....	37	22	32.54	217	07	08.88	4.78554830
Hoffman.....	51	21	09.23	231	14	10.79	4.32883400
Cottonwood Peak.....	83	06	44.80	262	51	29.07	4.56390410
Dana.....	310	11	57.93	130	15	39.67	4.06213700
Round Top.....	142	39	27.37	322	14	10.26	4.98913744
Mount Grant.....	214	32	19.16	34	52	00.68	4.91090995
Castle Peak.....	200	50	35.01	20	52	19.21	4.06413840
Horse.....	268	07	59.79	88	26	54.14	4.65342010
White Mountain South.....	291	09	53.00	111	49	04.10	5.00370760
Baldy.....	291	23	22.03	111	45	56.12	4.76326850
Morgan.....	320	02	49.62	140	24	24.56	4.90915560
Lyell.....	350	09	45.17	170	11	34.84	4.40892710

CALIFORNIA-NEVADA BOUNDARY POST TRIANGULATION STATION NO. 75.

Position computed was that of the old triangulation station near No. 75.

[Latitude 37° 28' 14.01". Longitude 117° 50' 27.80'".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Piper.....	48	23	35.98	228	20	26.76	4.0101962
White Mountain South.....	116	33	54.60	296	18	46.22	4.6112609
Boundary post 74.....	132	35	01.54	312	33	45.93	3.6175456

CALIFORNIA-NEVADA BOUNDARY POST TRIANGULATION STATION NO. 74.

Position computed was that of the old triangulation station near No. 74.

[Latitude 37° 29' 44.97". Longitude 117° 52' 32.05'".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Piper.....	25	35	17.27	205	33	23.55	4.0273048
White Mountain South.....	114	46	02.30	294	32	09.41	4.5669083
Boundary post 75.....	312	33	45.93	132	35	01.54	3.6175456

BLUE DICK, ESMERALDA COUNTY, NEV.

On a high, bald ridge in the Palmetto Range, about 8 miles northwest of Lida and about the same distance north-northeast of Pigeon Spring. Road from Lida to Silver Peak passes about 4 miles east of station. A trail leaves road about 1 mile below summit on road and can be followed to station by going west, then north up ridge. There is no feed nor water near point.

Station mark: A triangulation tablet set in rock under center of cairn 9 feet high.

[Latitude 37° 30' 23.33". Longitude 117° 35' 25.43'".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
White Top.....	21	03	10.06	200	59	12.38	4.4287747
Waucoba.....	34	38	53.52	214	23	45.02	4.8145008
Black Mountain.....	64	53	38.05	244	30	31.69	4.7932844
Piper.....	70	13	03.73	250	00	44.76	4.5013097
White Mountain South.....	103	48	04.67	283	23	45.73	4.7811245
Lone Mountain.....	188	23	34.07	8	27	07.15	4.7644849
Montezuma.....	223	58	17.82	44	06	40.71	4.4636354
Stonewall.....	270	37	41.07	90	57	48.39	4.6876502
Gold Mountain.....	318	01	03.70	138	11	27.59	4.5782060
Magruder.....	340	02	35.49	160	04	10.89	4.0531807

GOLD MOUNTAIN, ESMERALDA COUNTY, NEV.

On the highest summit of Gold Mountain, a sharp, rocky peak 1.5 miles southeast of Oriental post-office (abandoned), now known as Old Town or Old Camp, and about 20 miles southeast of Lida post-office. Best reached from Old Camp, where there is good water and

feed and which is reached from Lida post-office by a good wagon road. (Wheeler point, 1871-72?)

Station mark: A bronze triangulation tablet in solid rock, stamped "8144 V A," under a rock monument 6 feet high.

[Latitude $37^{\circ} 15' 09.13''$ ($37^{\circ} 15' 09.50''$ *a*). Longitude $117^{\circ} 18' 17.76''$ ($117^{\circ} 18' 18.09''$ *a*).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Tin <i>a</i>	18	18	33.00	198	12	03.00	4.6305400
Montezuma <i>a</i>	174	12	45.00	354	10	41.00	4.6931600
Stonewall <i>a</i>	220	27	07.00	40	36	47.00	4.5584400
Tolicha <i>a</i>	267	34	42.00	87	52	41.00	4.6428500
Grape <i>a</i>	336	28	08.00	156	33	46.00	4.5406000
Waucoba.....	67	55	52.73	247	30	26.42	4.8288720
Black Mountain.....	91	25	31.52	270	52	06.99	4.9117079
White Top.....	95	14	03.60	274	59	44.33	4.5453611
White Mountain South.....	117	02	32.64	296	27	53.08	4.9738652
Magruder.....	129	23	32.11	309	14	44.03	4.4426453
Blue Dick.....	138	11	27.59	318	01	03.70	4.5782060
Montezuma.....	174	12	05.58	354	10	01.79	4.6932257
Stonewall.....	220	26	10.48	40	35	50.46	4.5585011

a B. D. Stewart, 1905.

LONE MOUNTAIN, ESMERALDA COUNTY, NEV.

For description of this station, see page 145.

[Latitude $38^{\circ} 01' 28.759''$ ($38^{\circ} 01' 28.83''$ *a*). Longitude $117^{\circ} 29' 37.647''$ ($117^{\circ} 29' 37.51''$ *a*).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Montezuma <i>a</i>	342	19	03.38	162	23	55.68	4.5845027
Blue Dick <i>a</i>	8	27	07.15	188	23	34.07	4.7644840
Mount Grant.....	118	30	43.13	297	42	31.46	5.1093270
Tolaybe Dome.....	187	47	26.93	7	52	43.32	4.9570026
Cactus Peak.....	296	08	52.00	116	31	36.00	4.7817000
Diamond.....	316	23	25.00	136	36	13.00	4.6476800
Stonewall.....	325	21	47.00	145	38	27.00	4.8486600
Montezuma.....	342	18	57.00	162	23	49.00	4.5845027

a Urquhart, 1905.

MAGRUDER, ESMERALDA COUNTY, NEV.

(Not occupied.)

On the highest point of Magruder Mountain, a well-known mountain 3 or 4 miles southwest of Lida.

Station mark: A triangulation tablet in center of cairn 6 feet high.

[Latitude $37^{\circ} 24' 38.69''$. Longitude $117^{\circ} 32' 48.56''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
White Top.....	43	07	46.12	223	02	13.54	4.2956894
Waucoba.....	43	35	46.78	223	19	03.89	4.7738605
Piper.....	89	50	15.96	269	36	21.55	4.5276844
Blue Dick.....	160	04	10.80	340	02	35.40	4.0531807
Montezuma.....	207	23	43.88	27	30	30.62	4.5506138
Gold Mountain.....	309	14	44.03	129	23	32.11	4.4426453

MONTEZUMA, ESMERALDA COUNTY, NEV.

For description of this station, see page 146.

[Latitude $37^{\circ} 41' 41.44''$ ($37^{\circ} 41' 41.3''$ a). Longitude $117^{\circ} 21' 41.24''$ ($117^{\circ} 21' 41.24''$ a).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Magruder.....	27	30	30.62	207	23	43.88	4.5506138
Waucoba.....	37	39	33.03	217	16	02.41	4.9733803
Blue Dick.....	44	06	40.71	223	58	17.82	4.4636354
White Mountain South.....	85	24	53.55	264	52	07.86	4.8983360
Lone Mountain.....	162	23	55.68	342	19	03.38	4.5845027
Stonewall.....	307	06	21.81	127	18	08.86	4.5525871
Gold Mountain.....	354	10	01.79	174	12	05.58	4.6932257
Lone Mountain a.....	162	23	49.00	342	18	57.00	4.5845027
Cactus Peak a.....	256	56	58.00	77	14	55.00	4.6412400
Stonewall a.....	307	06	58.00	127	18	45.00	4.5526000
Gold Mountain a.....	354	10	41.00	174	12	45.00	4.6931600

a R. H. Chapman, 1905.

STONEWALL, NYE COUNTY, NEV.

For description of this station, see page 153.

[Latitude $37^{\circ} 30' 01.38''$ ($37^{\circ} 30' 01.30''$ a). Longitude $117^{\circ} 02' 22.35''$ ($117^{\circ} 02' 22.43''$ a).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	
Gold Mountain.....	40	35	50.46	220	26	10.48	4.5585611
Blue Dick.....	90	57	48.39	270	37	41.07	4.6876502
Montezuma.....	127	18	08.86	307	06	21.81	4.5525871
Gold Mountain a.....	40	36	47.00	220	27	07.00	4.5584400
Montezuma a.....	127	18	45.00	307	06	58.00	4.5526000
Lone Mountain a.....	145	38	27.00	325	21	47.00	4.8486600
Diamond a.....	160	06	29.00	340	02	35.00	4.4410100
Cactus Peak a.....	204	29	12.00	24	35	09.00	4.5375000
Quartzite.....	268	24	01.00	88	50	11.00	4.8017100
Tolicha a.....	321	39	17.00	141	47	39.00	4.5159900

a R. H. Chapman, 1905.

CALIFORNIA.

PRIMARY TRAVERSE.

COLUSA, SACRAMENTO, AND YOLO COUNTIES.

SPECIAL SHEETS NOS. 19, 20, 21, AND 22.

Two lines of primary traverse were run by C. H. Birdseye, topographic aid, in 1905, as follows:

From Yolo northwest base (Coast and Geodetic Survey) east and north via county roads and Southern Pacific Railroad to Knights Landing, thence north and west along west bank of Sacramento River to Smokestack triangulation station.

From Knights Landing south and east along west bank of Sacramento River to Sacramento, tying to dome of State capitol.

Positions are given on the United States standard datum.

176 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along highways from Yolo northwest base to Woodland.

Station.	Latitude.			Longitude.		
Yolo northwest base (Coast Survey), in extreme southeast corner of SE. $\frac{1}{4}$ sec. 28, T. 10 N., R. 1 E., Mount Diablo meridian, $4\frac{1}{4}$ miles west of railroad passing thru Woodland and on north side of county road going west toward Madison and Capay Valley. Station mark: A needle hole in a German-silver plug inserted in a copper bolt in top of a granite block 35 inches long by 20 inches square at base and drest to 12 inches at top, with the letters "U. S. C. & G. S." cut on it, all 4.5 feet below surface, above which is a granite block 25 inches square by 26 inches deep, with the letters "U. S. C. & G. S. N. W. Yolo base" cut on it; in top of this block is a needle hole in lead in a copper bolt; top of block even with surface; a brick pier is built around this block to a height of 33 $\frac{1}{2}$ feet above ground.....	38	40	44.81	121	51	28.55
Woodland, 2.5 miles west of, center of crossroads.....	38	40	41.40	121	49	13.30
Woodland, 1.5 miles west of Browns Corners, center of crossroads....	38	40	40.80	121	48	06.70
Woodland, 0.5 mile west of, intersection of Cemetery avenue and Main street.....	38	40	40.40	121	46	59.90
Woodland, 0.5 mile west of and 1 mile north of, center of crossroads....	38	41	32.60	121	46	59.50
Woodland, 1 mile north of Southern Pacific station, 50 feet southwest of intersection of crossroads, 2 by 4 inch stake.....	38	41	32.10	121	45	52.60
Woodland, railroad crossing, 1.5 miles north of Southern Pacific station, on west side of road, junction of west rails.....	38	42	06.10	121	45	52.40

Geographic positions along Southern Pacific Railroad.

Station.	Latitude.			Longitude.		
Woodland, 2 miles north of, road crossing, junction of west rails.....	38	42	35.3	121	45	40.9
Pearl flag station, middle of road crossing, east rail.....	38	43	02.5	121	45	29.9
Cache Creek railroad bridge, 200 feet north of west rail at middle of crossroad.....	38	43	26.9	121	45	17.9
Lochanour flag station, point is center of track and road crossing 1,500 feet north of warehouse.....	38	44	33.0	121	44	44.8
Curtis flag station (500 feet north of milepost 91), at road crossing on township line, center of track.....	38	44	57.7	121	44	32.4
Milepost 92, 20 feet south of, center of track opposite iron post, elevation 30 feet.....	38	45	38.6	121	44	11.9
Knights Landing, 1.5 miles south of, private road crossing, center of track at south end of north guard rails.....	38	46	42.0	121	43	40.2
Milepost 94, center of track opposite.....	38	47	16.0	121	43	22.7
Knights Landing, road crossing 0.5 mile south of Southern Pacific station, center of road and track.....	38	47	46.3	121	43	07.4
Knights Landing (Grafton post-office), in west wall, south abutment of railroad bridge over Sacramento River, tablet.....	38	48	09.4	121	42	56.0

Geographic positions along west bank of Sacramento River from Knights Landing to Howells Point.

Station.	Latitude.			Longitude.		
Knights Landing, 1 mile northwest of, opposite temporary bench mark marked "35," center of levee road.....	38	48	42.3	121	43	25.4
Knights Landing, 1.12 miles northwest of, west edge of road at white gate.....	38	49	04.3	121	43	27.9
Knights Landing, 1.8 miles northwest of, opposite temporary bench mark marked "35," middle of levee road.....	38	49	25.1	121	43	25.2
Knights Landing, 2.8 miles northwest of, opposite temporary bench mark 35, north end of large warehouse, center of levee road.....	38	50	19.6	121	43	49.2
Darby Camp (Fair ranch), 3.4 miles east of, opposite temporary bench mark marked "16," elevation 36 feet, center of levee road.....	38	51	09.0	121	43	27.2
Darby Camp, 2.3 miles east of, opposite temporary bench mark marked "15," elevation 36 feet, center of levee road.....	38	51	40.5	121	44	16.7
Darby Camp, 1.3 miles east of, opposite old house, on north side of levee, standard bench-mark post stamped "39 B 1904".....	38	52	15.4	121	44	58.1
Fair ranch house at Darby Camp, at east gate to farmyard, temporary bench mark, elevation 34 feet.....	38	51	46.6	121	45	47.2
Fair ranch, 1.5 miles west of, temporary bench mark No. 11, elevation 37 feet, on gatepost on levee, south of Rough and Ready landing, center of levee opposite bench mark.....	38	51	07.5	121	47	11.1
Smokestack triangulation station (smokestack of Reclamation pumping plant district No. 8).....	38	55	33.2	121	52	51.5

Geographic positions along west bank of Sacramento River from Knights Landing to Sacramento.

Station.	Latitude.	Longitude.
Knights Landing, 0.5 mile south of Southern Pacific station, road crossing, center of road and track.....	38 47 46.3	121 43 07.4
Knights Landing, 1.5 miles southeast of, road turns south, 25 feet southwest of temporary bench mark, elevation 29 feet.....	38 47 45.7	121 41 58.7
Knights Landing, 2.6 miles southeast of, opposite north gatepost to Mr. Lippincott's house, center of road.....	38 46 39.4	121 41 23.2
Knights Landing, 3 miles southeast of, 75 feet south of timber, in west edge of levee.....	38 46 10.4	121 41 33.4
Knights Landing, 3 miles southeast of, on line with fence opposite standard iron post, center of levee.....	38 45 49.5	121 41 13.3
Grays Bend, 0.5 mile north of, 400 feet north of township road, in west edge of levee.....	38 44 59.7	121 40 38.0
Grays Bend, opposite creamery door, center of levee.....	38 44 34.9	121 40 23.9
Grays Bend, 0.25 mile northeast of, road turns east, leaving river, 35 feet northwest of temporary bench mark marked "29 D".....	38 44 47.0	121 40 03.9
Grays Bend, 0.75 mile northeast of, 30 feet north of gate and 1,000 feet southwest of P. Goettsch's dairy ranch, on top of levee, standard bench-mark post.....	38 44 55.5	121 39 38.7
Grays Bend, 0.75 mile east of, temporary bench mark marked "24 D" on power-line pole.....	38 44 57.4	121 39 12.0
Grays Bend, 3 miles east of, center of old windmill on edge of tule, temporary bench mark marked "20 D".....	38 45 30.2	121 37 20.1
Grays Bend, 3.75 miles east of, 300 feet north of fence line and on edge of timber, 1 mile west of Sacramento River, old cottonwood tree.....	38 45 25.8	121 36 35.8
Doyle's ranch, 0.75 mile west of, 20 feet south of road on top of back levee.....	38 45 31.4	121 36 21.2
Doyle's ranch, 0.5 mile south of, junction of river and back levees, center of levee at road at wire gate.....	38 44 59.1	121 35 46.9
Doyle's ranch, 1.25 miles south of, at large gate by large oak tree, west edge of levee.....	38 44 26.2	121 36 07.7
Doyle's ranch, 2 miles south of, temporary bench mark, elevation 33 feet, west edge of levee, opposite bench mark.....	38 43 51.1	121 36 18.1
Hushey's bee ranch, 200 feet east of old yellow house, west edge of levee, temporary bench mark marked "32 D".....	38 43 20.3	121 36 21.1
Elkhorn weir, station is standard tablet set in north wall of wier, marked "30 B".....	38 42 34.5	121 36 58.9
Elkhorn, 2 miles north of, 100 feet east of old barn, in root of large oak tree, temporary bench mark marked "25 D".....	38 41 55.5	121 37 51.6
Elkhorn saloon, 55 feet southeast of southeast corner of, stake in top of levee.....	38 40 37.3	121 37 49.3
Elkhorn, 1 mile south of, 1,200 feet north of Mr. Perkins's house (open across river), opposite white flag marked "Sta. 224 A," center of levee.....	38 39 58.9	121 37 03.6
Elkhorn, 2 miles south of, opposite south window of M. F. Silva's house (open across river), center of levee.....	38 39 19.9	121 36 21.2
Elkhorn, 3 miles south of, in front of Mr. Matalock's house, center of levee over water pipe.....	38 38 34.4	121 35 33.1
Elkhorn, 3.5 miles southeast of, junction of river and back levees on west edge of Fair ranch, on south side of road and west side of old canal, nail with flag.....	38 38 37.2	121 34 59.2
Fair ranch, 1 mile southeast of, east edge of road, southeast of fence corner, flag marked "Sta. 242".....	38 38 02.5	121 33 49.4
Fair ranch, 2 miles southeast of, in front of Mr. Cassleman's house, opposite temporary bench mark, elevation 29 feet, center of road.....	38 37 25.7	121 33 45.3
Lehman's hop yard, by water tank on east side of levee road, iron post stamped "32 B".....	38 36 35.5	121 33 35.1
Washington, 2 miles northwest of, on east side of fence where road leaves river, temporary bench mark, a nail in base of telephone pole, elevation 31 feet (capitol dome visible from point).....	38 35 49.1	121 32 46.7
Washington, 2 miles west of west end of switch, nail in west tie leading to switch block, center of track (capitol dome visible from point).....	38 35 14.5	121 32 41.7
Washington (Broderick post-office), street crossing on west edge of, 15 feet north of old railroad track in center of north-south street (Fifth street).....	38 35 16.6	121 30 44.3
Sacramento, bridge over Sacramento River, center of railroad track under cross arm in center of drawbridge.....	38 35 09.1	121 30 19.8
Sacramento, capitol dome, U. S. standard.....	38 34 37.4	121 29 34.3

MONTANA.
TRIANGULATION STATIONS.

FERGUS COUNTY.

MOCCASIN MOUNTAIN, MAIDEN, AND KENDALL QUADRANGLES.

During the season of 1905 H. L. Baldwin, jr., controlled an area of 800 square miles, based on the positions of Judith and Big Snowy, as published on page 305, Bulletin No. 122. Azimuth observations were made at stations Skaggs and Fence Corner, the weighted mean of which was adopted in computing the positions of 10 occupied and 12 unoccupied stations. Positions are given on the Bozeman astronomic datum of the Wheeler Survey of 1873.

BIG SNOWY, FERGUS COUNTY.

On highest summit of Big Snowy Mountains, south and east of Half Moon Pass, elevation 8,600 feet. A monument was found with 5-foot base and 7 feet high. It was enlarged to oval shape, 9 feet in large rdiameter and 5 feet in smaller diameter, so as to be seen from points to northward.

Station mark: Rock monument.

Reference mark: A bronze tablet cemented in decomposed limestone rock, true azimuth $155^{\circ} 35'$, distant 12.1 feet.

[Latitude $46^{\circ} 45' 12.30''$. Longitude $109^{\circ} 18' 48.80''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	<i>Meters.</i>
Crazy.....	42	37	36.00	221	55	45.00	5.0415500
Neihart.....	104	13	56.00	283	17	23.00	5.0661220
Judith.....	187	42	20.00	7	46	24.00	4.7178170
South Moccasin.....	<i>a</i> 160	27	40.19	340	17	56.98	4.7008583
Judith.....	<i>a</i> 187	38	46.00	7	42	47.44	4.7178170
Fox Pass.....	<i>a</i> 198	38	56.87	18	49	47.22	4.7669659

a Observed azimuth, 1905.

DOGMELLE, FERGUS COUNTY.

About 2 miles east of the Claggett road, on a prairie mesa lying between Dog and Armelle creeks, 2 miles southeast of a large ranch house supposed to belong to Fergus.

Station mark: An iron bench-mark post set 3 feet in the ground.

Reference mark: An "Ayer's Sarsaparilla" bottle buried 6 inches below surface of ground on line to North Moccasin and covered with a small pile of rocks, true azimuth from station $75^{\circ} 07'$, distant, 5.1 feet.

[Latitude 47° 20' 47.58". Longitude 109° 17' 53.03"]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pyramid.....	0 03 42.13	180 03 41.10	4.3492569
South Moccasin.....	43 59 49.54	223 49 22.57	4.4127832
North Moccasin.....	75 06 39.67	254 59 12.46	4.1209595
Fergus.....	273 03 50.89	93 10 26.41	4.0533075
Fox Pass.....	301 01 10.49	121 11 22.97	4.3106950
Judith.....	337 51 12.56	157 54 34.18	4.1851827

FENCE CORNER, FERGUS COUNTY.

On the high table-land one-half mile west of Cottonwood Creek; 36 feet north and 44 feet west of the junction of a road from the north with the east-west road; junction is probably the southwest corner of sec. 6, T. 15 N., R. 17 E.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 47° 05' 09.38". Longitude 109° 36' 57.95"]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South Moccasin.....	210 41 57.79	30 45 31.47	4.0800695
Pyramid.....	254 31 19.88	74 45 17.96	4.3980464
Tufted Pine.....	280 47 33.72	101 03 20.45	4.4439395

FERGUS, FERGUS COUNTY.

On a high bluff 1.5 miles northeast of Andrew Fergus's ranch.

Station mark: An iron bench-mark post set 3 feet in ground.

Reference mark: Beer bottle buried with top 8 inches below surface, true azimuth from station 83° 30', distant 6.4 feet.

[Latitude 47° 20' 27.66". Longitude 109° 08' 55.23"]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Judith.....	22 12 36.41	202 09 22.92	4.1661345
North Moccasin.....	83 29 38.15	263 15 35.56	4.3841602
Dogmelle.....	93 10 26.41	273 03 50.89	4.0533675
Fox Pass.....	327 59 35.28	148 03 12.53	4.0692567

FOX PASS, FERGUS COUNTY.

About 2 miles northeast of summit of Fox Pass on highest mountain and 1 mile southeast of Cone Butte.

Station mark: The signal consisting of several small trees supported by wires on highest part of hill.

Reference mark: A bronze triangulation tablet cemented in a lime rock set in the ground, true azimuth from station $80^{\circ} 15'$, distant 4.5 feet.

[Latitude $47^{\circ} 15' 05.48''$. Longitude $109^{\circ} 03' 59.59''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Big Snowy.....	18	49	47.22	198	38	56.87	4.7669659
Tufted Pine.....	31	26	36.92	211	18	14.62	4.4429533
Pyramid.....	56	13	50.18	236	03	37.84	4.3253830
Judith.....	72	55	15.24	252	48	24.85	4.0900705
North Moccasin.....	103	26	20.83	283	08	41.638	4.4931041
Dogmelle.....	121	11	22.97	301	01	10.49	4.3106950
Fergus.....	148	03	12.53	327	59	35.276	4.0692667
Skaggs.....	357	01	47.15	177	02	19.88	4.2592824

JUDITH, FERGUS COUNTY.

On highest peak of Judith Mountains, about 3 miles north of Maiden, Mont.

Station mark: A monument of rocks 6 feet in diameter at base and 8 feet high, with tree in center erected on site of original station, the monument of sticks and rocks having disappeared.

Reference marks: A tablet cemented in a small sloping rock, true azimuth from station $147^{\circ} 10'$, distant 7.5 feet; 4-inch pine tree blazed on side toward station, marked with triangle, true azimuth from station $181^{\circ} 20'$, distant 34 feet; 5-inch pine tree, blazed on side toward station, marked with triangle, true azimuth from station $288^{\circ} 14'$, distant 44.5 feet.

[Latitude $47^{\circ} 13' 08.09''$. Longitude $109^{\circ} 13' 18.60''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Big Snowy.....	7	42	47.44	187	38	46.00	4.7178170
Pyramid.....	35	26	49.81	215	23	27.66	4.0005064
South Moccasin.....	79	30	17.78	259	16	30.29	4.3829514
North Moccasin.....	120	15	26.24	300	04	38.02	4.3315202
Dogmelle.....	157	54	34.18	337	51	12.56	4.1851827
Fergus.....	202	09	22.92	22	12	36.41	4.1661345
Fox Pass.....	252	48	24.85	72	55	15.25	4.0900705
Skaggs.....	318	43	15.13	138	50	37.71	4.2855408

NORTH MOCCASIN, FERGUS COUNTY.

On the north peak of the North Moccasin group of mountains.

Station mark: A bronze tablet loosely cemented in the very loose limestone rock on summit.

Signal: A fir tree erected over tablet and supported by three guy-wires.

Reference marks: Small pine tree, true azimuth from station $189^{\circ} 36'$, distance to base of tree 9.4 feet; small pine tree, true azimuth from station $124^{\circ} 41'$, distance to base of tree 18.3 feet.

[Latitude 47° 18' 57.20". Longitude 109° 28' 00.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
South Moccasin.....	18 44 55.29	198 41 55.07	4.2062696
Dognelle.....	254 59 12.46	75 06 39.67	4.1209595
Fergus.....	263 15 35.56	83 29 38.15	4.3841602
Fox Pass.....	283 08 41.64	103 26 20.83	4.4931041
Judith.....	300 04 38.02	120 15 26.24	4.3315202
Pyramid.....	325 57 37.96	146 05 03.40	4.3586992

PYRAMID, FERGUS COUNTY.

Station is on bare peak of that name 4 miles southwest of Maiden and is easily ascended from any direction.

Station mark: A 2-inch gas pipe 1 foot long projecting 1 inch above top of ground and cemented into the compact but fissured rock on summit and about 4 feet north thereof.

[Latitude 47° 08' 43.89". Longitude 109° 17' 54.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fence Corner.....	74 45 17.96	254 31 19.88	4.3980464
South Moccasin.....	101 46 11.52	281 35 46.59	4.2631779
North Moccasin.....	146 05 03.40	325 57 37.96	4.3586992
Dognelle.....	180 03 41.10	0 03 42.13	4.3492569
Judith.....	215 23 27.66	35 26 49.81	4.0005064
Fox Pass.....	236 03 37.84	56 13 50.18	4.3253830
Tufted Pine.....	345 08 37.70	165 10 27.13	4.0899692

SKAGGS, FERGUS COUNTY.

On edge of bluff 1.5 miles south of Skagg's ranch and about 8 miles east of Gilt Edge post-office. Is probably in sec. 3, T. 15 N., R. 21 E., near southwest corner.

Station mark: An iron bench-mark-post set 3 feet in ground.

Reference marks: An upright beer bottle, cork 8 inches below surface of ground; distant 6.20 feet, true azimuth from station 2° 23'.

[Latitude 47° 05' 18". Longitude 109° 03' 14.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tufted Pine.....	70 18 43.30	250 09 49.00	4.2139046
Judith.....	138 50 37.71	313 43 15.13	4.2855408
Fox Pass.....	177 02 19.88	357 01 47.15	4.2592824

SOUTH MOCCASIN, FERGUS COUNTY.

On the middle peak of the south group of Moccasin Mountains, between Warm Spring and Big Spring creeks.

Station mark: A bronze tablet cemented in a large rock set on top of hill, over which is placed a pine tree 12 feet high, 10 feet spread of limbs, held in position by wires.

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Reference trees: Pine 4 inches in diameter true azimuth from station 195° , 21.3 feet distant. Pine 4 inches diameter, $266^{\circ} 30'$ from station, 32.6 feet distant.

[Latitude $47^{\circ} 10' 44.08''$. Longitude $109^{\circ} 32' 06.41''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Fence Corner.....	30	45	31.47	210	41	57.79	4.0800695
North Moccasin.....	198	41	55.07	18	44	55.29	4.2062696
Dogmelle.....	223	49	22.57	43	59	49.54	4.4127832
Judith.....	259	16	30.29	79	30	17.78	4.3829514
Pyramid.....	281	35	46.59	101	46	11.52	4.2631779
Tufted Pine.....	306	21	22.68	126	33	36.52	4.4192578
Big Snowy.....	340	17	56.98	160	27	40.19	4.7008583

TUFTED PINE, FERGUS COUNTY.

On highest rounded hill about 9 miles east of Lewistown and 3 miles southwest of Flat Mountain. Reached from Lewistown via road up Boyds Creek for 5 miles, then take right-hand branch; 2 miles farther road branches again; take right-hand road to coal mine, thence to top of hill.

Station mark: The base of the trunk of a pine tree 14 inches in diameter with a tufted top 30 feet above-ground.

Reference mark: Bronze triangulation tablet set in limestone rock at highest point of hill, true azimuth from station $227^{\circ} 23'$, distant 14.6 feet.

[Latitude $47^{\circ} 02' 18.82''$. Longitude $109^{\circ} 15' 24.78''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Fence Corner.....	101	03	20.45	280	47	33.72	4.4439395
South Moccasin.....	126	33	36.52	306	21	22.67	4.4192578
Pyramid.....	165	10	27.13	345	08	37.70	4.0899692
Fox Pass.....	211	18	14.62	31	26	36.92	4.4429533
Skaggs.....	250	09	49.00	70	18	43.30	4.2139046

The following positions are located by three or more intersections:

NORTH MOCCASIN MOUNTAINS, MIDDLE PEAK.

[Latitude $47^{\circ} 17' 44.64''$. Longitude $109^{\circ} 25' 04.28''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	''	°	'	''	Meters.
Pyramid.....	319	45	24	139	53	36	4.33956
North Moccasin.....	210	41	14	30	42	01	3.41509

EASTERN OF TWO TREES.

[Latitude $47^{\circ} 17' 32.4''$. Longitude $109^{\circ} 36' 15.5''$.]

Middle North Moccasin.....	267	33	55	87	39	12	3.95757
South Moccasin.....	337	24	29	157	27	32	4.13524

NIPPLE-SHAPED HILL, HIGHEST TREE.

[Latitude 46° 57' 30". Longitude 108° 42' 53".]

To station—	Azimuth.	Back azimuth.	Log distance.
	° ' "	° ' "	Meters.
Pyramid.....	4. 69020
Judith.....	4. 68303

LEWISTOWN HIGH SCHOOL (CENTER OF BUILDING).

[Latitude 47° 03' 45.55". Longitude 109° 25' 34.23".]

Pyramid.....	.....	.....	4. 12641
South Moccasin.....	.....	.....	4. 18590

SOUTH MOCCASIN MOUNTAINS (NORTHWEST PEAK).

(Rock monument 5 feet high.)

[Latitude 47° 11' 32.28". Longitude 109° 32' 16.40".]

Judith.....	.....	.....	4. 38252
South Moccasin.....	.....	.....	3. 17699

JUDITH MOUNTAINS (MIDDLE WEST PEAK).

[Latitude 47° 09' 10.82". Longitude 109° 21' 14.62".]

Judith.....	.....	.....	4. 09395
Dogmelle.....	.....	.....	4. 34106

PORPHYRY PEAK.

[Latitude 47° 12' 54.95". Longitude 109° 15' 55.70".]

Pyramid.....	.....	.....	3. 91086
South Moccasin.....	.....	.....	4. 31866

WINDMILL.

[Latitude 47° 04' 21". Longitude 109° 31' 49.34".]

South Moccasin.....	.....	.....	4. 07320
Fence Corner.....	.....	.....	3. 82476

BLACK BUTTE, NORTH POINT OF DOUBLE TOP.

[Latitude 47° 14' 14.90". Longitude 108° 58' 14.27".]

Judith.....	.....	.....	4. 28185
Dogmelle.....	.....	.....	4. 44056

CONE BUTTE.

[Latitude 47° 15' 35.95". Longitude 109° 04' 17.09".]

Judith.....	4. 08887
Fergus.....	4. 03092

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LINDSY'S RANCH HOUSE.

[Latitude $47^{\circ} 13' 50.80''$. Longitude $109^{\circ} 26' 24.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pyramid.....	4.15628
Judith.....	4.21990

SMALL TREE ON SUMMIT OF HILL WEST OF BARNES KING MINE.

[Latitude $47^{\circ} 17' 28.82''$. Longitude $109^{\circ} 28' 29.91''$.]

Pyramid.....	.....	.....	4.32258
Dogmelle.....	.....	.....	4.16781

DEERLODGE, GRANITE, POWELL, AND RAVALLI COUNTIES.

PHILIPSBURG AND SAPPHIRE QUADRANGLES.

During the season of 1905 H. L. Baldwin, jr., topographer, extended triangulation eastward from stations Quigg and Willow to stations Haggin and Powell. Fourteen primary stations were occupied and numerous secondary points were located by intersections.

Positions are based on the adopted mean value of Hamilton and Helena astronomic stations and bases.

BENCH-MARK POST 5124, DEERLODGE COUNTY.

(Not occupied.)

[Latitude $47^{\circ} 07' 40.5''$. Longitude $112^{\circ} 53' 43.6''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
West Mound.....	3.97360

HOWE, DEERLODGE COUNTY.

(Not occupied.)

On Continental Divide; elevation 10,475 feet.

[Latitude $46^{\circ} 02' 58.9''$. Longitude $113^{\circ} 12' 53.7''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Haggin.....	4.01056
Red Lion.....	4.42528

SHORT PEAK, DEERLODGE COUNTY.

(Not occupied.)

East peak of ridge south of Haggin; elevation 10,240 feet.

[Latitude 46° 03' 39.8". Longitude 113° 06' 19.3".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Haggin.....			3.50216
Warren.....			4.45502

WASHOE SMELTER SMOKE STACK, DEERLODGE COUNTY.

(Not occupied.)

Station mark: Center of stack; elevation of top 6,101 feet.

[Latitude 46° 06' 44.1". Longitude 112° 54' 45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Haggin.....			4.15681
Powell.....			4.43271

WARM SPRINGS, INSANE ASYLUM, DEERLODGE COUNTY,

(Not occupied.)

[Latitude 46° 10' 47.4". Longitude 112° 47' 28.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Powell.....		322 50 00	4.37901
Haggin.....		246 33 15	4.40769

WEST MOUND, DEERLODGE COUNTY.

(Not occupied.)

The higher of two large bare mounds, 5 miles north of Anaconda; elevation 7,209 feet.

[Latitude 46° 12' 19.66". Longitude 112° 56' 57.49".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Powell.....	172 08 38	352 07 22	4.21473
Haggin.....	40 58 53	220 52 35	4.23491

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BARE HILL, GRANITE COUNTY.

(Not occupied.)

[Latitude 46° 02' 59.4". Longitude 113° 44' 44.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kent	3.60839
Emerine.....	4.25047

BLACK PINE, GRANITE COUNTY.

On a bare summit, on timbered ridge running north and south, 2 miles east of Willow Creek, 9 miles northeast of junction of Willow and Rock creeks, about 4 miles west of the deserted town of Combination. Best reached from Rock Creek by following up Willow Creek Valley and taking ridge leading to first timbered point south of station, thence north along ridge.

Station mark: A rock monument 6 feet in diameter at base and 8 feet high.

Reference marks: An aluminum tablet buried 4 inches below surface of ground (at point occupied by instrument) and covered with a small pile of loose rock; true azimuth from station 266° 56', distant 4.7 feet; a 6-inch pine, blazed and marked with a triangle, true azimuth 198° 13', distant 77.1 feet; a 6-inch pine, blazed and marked with a triangle, true azimuth from station 216° 26', distant 62.9 feet.

[Latitude 46° 26' 21.21". Longitude 113° 26' 46.46".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warren.....	1 04 37.98	181 04 06.36	4.7002295
Emerine.....	27 25 19.45	207 17 13.86	4.4950967
Palisade.....	64 54 23.13	244 35 56.98	4.5576824
Quigg.....	103 25 49.94	283 14 01.08	4.3313048
Harvey.....	191 18 31.86	11 20 46.50	4.3038307
Chicago.....	233 20 21.44	53 34 12.42	4.4826352
Princeton.....	266 45 18.32	86 59 10.66	4.3900569
Red Lion.....	311 02 44.56	131 13 32.24	4.4048210

CHICAGO, GRANITE COUNTY.

On the highest prairie hill, 2 miles south of the town of New Chicago, but about 200 yards north of the highest point and very close to the east-west section line.

Station mark: Iron bench-mark post.

Signal: Black and white cloth, temporary in nature.

[Latitude 46° 36' 07.14". Longitude 113° 07' 41.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black Pine.....	53 34 12.42	233 20 21.44	4.4826352
Harvey.....	94 42 09.93	274 30 32.57	4.3115010
Princeton.....	359 45 32.84	179 45 35.23	4.2240669

CONGDON PEAK, GRANITE AND RAVALLI COUNTIES.

First rocky peak 2 miles south of Fox Peak. A wagon road leads from Rock Creek up Ross Fork Valley to mine about 8 miles distant. Best route is thence westward by trail 1 mile to Medicine Lake, thence southwest on trail 5 miles to Fox Peak, which is easily ascended from northeast end of spur; descend then to northwest about 400 feet in elevation to avoid slide rock on southwest face and thence along ridge southwest to peak.

Station mark: A rock monument 3 feet in diameter at base and 4 feet high.

[Latitude $46^{\circ} 05' 15.91''$. Longitude $113^{\circ} 46' 09.63''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warren.....	294 34 57	114 48 23	4.42313
Kent.....	36 45 38	210 44 36	3.48725

DOME-SHAPED MOUNTAIN, GRANITE COUNTY.

(Not occupied.)

Highest part.

[Latitude $46^{\circ} 18' 28''$. Longitude $113^{\circ} 46' 46.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quigg.....		13 39 41	4.30368
Black Pine.....		60 27 05	4.47006

EMERINE, GRANITE COUNTY.

On south knoll of the mountain of that name about 6 miles west of the junction of East Fork and Middle Fork of Rock Creek. Top of mountain is rocky and bare and difficult of ascent, the route from the south being perhaps the best.

Station mark: A rock cairn 8 feet in diameter at base and 9 feet high.

Reference mark: An aluminum tablet set in a sloping rock face, on the east side thereof, serves as a reference mark. True azimuth from station, $250^{\circ} 20'$, distant 4.22 feet.

[Latitude $46^{\circ} 11' 21.79''$. Longitude $113^{\circ} 37' 57.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kent.....	42 04 07 28	221 57 11.19	4.2675236
Palisade.....	124 03 35.67	303 53 16.85	4.3450147
Quigg.....	168 42 21 25	348 38 39.66	4.5233032
Black Pine.....	207 17 13 86	27 25 19.45	4.4950667
Prairie.....	250 26 56.29	70 34 27.80	4.1529706
Haggin.....	284 52 32.27	105 15 48.33	4.6338509
Warren.....	328 50 55.22	148 58 27.43	4.4169071

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FISH PEAK, GRANITE COUNTY.

(Not occupied.)

On Continental Divide; elevation 10,240 feet.

[Latitude 46° 00' 25.5". Longitude 113° 20' 03.8".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warren.....			3. 99276
Emerine.....			4. 48722

FOURTH PROMINENT PEAK SOUTHWEST OF MOUNT WARREN, GRANITE COUNTY.

(Not occupied.)

Station mark: A rock monument.

[Latitude 45° 56' 25.75". Longitude 113° 30' 53.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warren.....			3. 83749
Kent.....			4. 40899

FOX PEAK, GRANITE AND RAVALLI COUNTIES.

A wagon road leads up Ross Fork Valley from Rock Creek to mine about 8 miles distant. Best route is thence westward by trail 1 mile to Medicine Lake, thence southwest on trail 5 miles to Fox Peak, which is easily ascended from northeast end of spur.

Station mark: Rock monument.

[Latitude 46° 06' 12.53". Longitude 113° 45' 53.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warren.....	298 17 00	118 30 13	4. 43060
Kent.....	27 32 44	207 31 31	3. 67633

HAGGIN, GRANITE COUNTY.

On Haggin Peak, 8 miles southwest of Anaconda; easiest ascent is from end of wood road leading south from the 9-mile house on Warm Spring Creek, thence up ridge between Barker and Haggin lakes. Horses can be ridden to an elevation of 9,800 feet; thence on foot to summit of mountain along ridge to east. Ascent can also be made from Anaconda by taking road leading to the waterworks reservoir or Hearst Lake, but animals can be taken only a few hundred feet higher; ascent on ridge west of lake must then be made on foot, a 2,000-foot climb. Elevation 10,598 feet.

Station mark: A rock cairn 6 feet in diameter at base and 7 feet high.

Reference marks: An aluminum tablet set in large granite rock, true azimuth from station $211^{\circ} 13'$, distant 9 feet 9 inches.

[Latitude $46^{\circ} 05' 19.38''$. Longitude $113^{\circ} 05' 41.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warren.....	68 28 07.86	248 12 26.01	4.4810782
Emerine.....	105 15 48.33	284 52 32.27	4.6338509
Prairie.....	119 40 02.64	299 24 17.23	4.5095144
Red Lion.....	160 25 20.01	340 20 53.16	4.3733384
Princeton.....	176 28 41.03	356 27 17.05	4.6061458
Powell.....	197 03 43.66	17 08 46.54	4.4852933

HARVEY, GRANITE COUNTY.

On the bare summit at west end of Harvey Ridge, near headwaters of Cow Creek; north side of hill is timbered but south and east slopes are mostly bare. Is about 12 miles west of New Chicago.

Station mark: An aluminum tablet set in red-sandstone rock.

Reference marks: An 8-inch white pine trimmed and blazed with a triangle cut in blazed part and a large spike in center thereof, true azimuth from station $310^{\circ} 13'$, distant 87 feet.

[Latitude $46^{\circ} 37' 00.42''$. Longitude $113^{\circ} 23' 40.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black Pine.....	11 20 46.50	191 18 31.86	4.3038307
Chicago.....	274 30 32.57	94 42 09.93	4.3115010
Princeton.....	311 46 47.15	131 58 26.04	4.4402704
Red Lion.....	337 22 15.76	157 30 49.91	4.5962158

MOORE, GRANITE COUNTY.

(Not occupied.)

On Continental Divide, near southwest end of Methodist Mountains.

[Latitude $45^{\circ} 57' 51.62''$. Longitude $113^{\circ} 23' 36.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Emerine.....			4.49301
Kent.....			4.51760

190 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

NEW CHICAGO, GRANITE COUNTY.

(Not occupied.)

Station mark: Center of church spire.

[Latitude 46° 37' 42.8". Longitude 113° 08' 17.3".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Black Pine.....	228 12 30	4.50033
Chicago.....	165 26 40	3.48436

PEAK 2 MILES EAST OF QUIGG, GRANITE COUNTY.

(Not occupied.)

[Latitude 46° 28' 52.1". Longitude 113° 40' 45.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Palisade.....	4.39601
Emerine.....	4.51356

PEAK EAST OF HAGGIN AND 6 MILES SOUTHWEST OF ANACONDA, GRANITE COUNTY.

(Not occupied.)

Take road up Sheep Gulch from Anaconda and at summit thereof a wood road leads south across ravine to ridge, on which the peak is situated; follow ridge to summit.

Station mark: A rock monument 3 feet in diameter at base and 4 feet high.

[Latitude 46° 04' 53.9". Longitude 113° 03' 55.4".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Powell.....	192 34 37	12 38 23	4.48779
Haggin.....	109 01 00	289 00 00	3.38332

POINT LOOKOUT, GRANITE COUNTY.

(Not occupied.)

Shaft house of Kent and Congdon mine.

[Latitude 46° 07' 35.4". Longitude 113° 39' 45.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fox.....	3.91842
Emerine.....	3.86709

PRAIRIE, GRANITE COUNTY.

About 3 miles northeast of the junction of East Fork of Rock Creek with Ross Fork and West Fork of Rock Creek, on a high, nearly bare prairie hill.

Station mark: A pine tree standing among others 120 feet northeast of highest part of hill, with the lower branches trimmed. It is blazed 10 feet above ground on the southwest side and has a triangle on blaze.

Reference mark: An aluminum tablet set in rock about 2 inches below surface and covered with small rock pile; true azimuth from station, $243^{\circ} 11'$, distant 70 feet.

[Latitude $46^{\circ} 13' 55.461''$. Longitude $113^{\circ} 27' 32.504''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Kent.....	54	29	06.79	234	14	39.52	4.5018240
Emerine.....	70	34	27.80	250	26	56.29	4.1529706
Quigg.....	144	38	06.66	324	26	52.39	4.5358043
Red Lion.....	252	29	55.33	72	41	15.15	4.3246712
Haggin.....	299	24	17.23	119	40	02.64	4.5095145
Warren.....	359	53	52.98	179	53	54.60	4.4331270

PRINCETON, GRANITE COUNTY.

Situated on Mount Princeton, west of the head of Princeton Creek and 4 miles north of Princeton post-office. It is easily reached by taking old road northward from Princeton post-office for 1.5 miles along west side of creek, thence up the bare hill to station.

Station mark: A bronze triangulation tablet cemented in a projecting rock at summit of hill, surrounded by a rock monument 4 feet in diameter at base and 5 feet high.

Reference mark: Tall bare trunk of a dead pine 2 feet in diameter; true azimuth from station $170^{\circ} 18'$, distant 111 feet 2 inches.

[Latitude $46^{\circ} 27' 04.62''$. Longitude $113^{\circ} 07' 38.01''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Red Lion.....	16	44	24.32	196	41	20.78	4.2752007
Black Pine.....	86	59	10.66	266	45	18.32	4.3900569
Harvey.....	131	58	26.04	311	46	47.15	4.4402764
Chicago.....	179	45	35.23	359	45	32.84	4.2240669
Powell.....	314	01	46.23	134	08	24.19	4.2022534
Haggin.....	356	27	17.05	176	28	41.03	4.6061458

PROMINENT BARE HILL, GRANITE COUNTY.

(Not occupied.)

[Latitude $46^{\circ} 16' 17.66''$. Longitude $113^{\circ} 33' 57.2''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Emerine.....							4.02074
Quigg.....							4.42035

QUIGG, GRANITE COUNTY.

A high rocky peak about 20 miles south of Quigley and about 3 miles east of the westernmost point of Rock Creek, from which point it is easily accessible along the ridge leading eastward and 1 mile north of a log cabin built in 1905, this cabin being 0.5 mile north of trail leading up ridge westward to Burnt Fork and Steubenville. The peak is about 4,100 feet above river, sparsely timbered on sides, with summit bare. About 2 miles to the east is a conical peak, bare on top and of about equal height.

Station mark: An aluminum tablet set in solid rock over which was erected a cairn 6 feet in diameter at base and 8 feet high.

Reference marks: Copper nail in notch on west side of pine tree blazed on north, east, and west sides (S); true azimuth from station $352^{\circ} 48'$, distant 53.4 feet. Copper nail in top of pine stub blazed on four sides; true azimuth from station $128^{\circ} 01'$, distant 27.2 feet. The third reference point left by Chapman in 1898 has disappeared.

[Latitude $46^{\circ} 29' 01.36''$. Longitude $113^{\circ} 43' 04.32''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Kent.....	7	08	23.70	187	05	07.94	4.6705581
Pailsade.....	30	04	40.58	209	58	02.07	4.3711049
Willow.....	41	12	36.54	221	03	41.08	4.3803840
Black Pine.....	283	14	01.08	103	25	49.94	4.3313048
Red Lion.....	298	13	48.42	118	36	24.30	4.6580054
Prairie.....	324	26	52.39	144	38	06.66	4.5358044
Warren.....	339	56	16.26	160	07	30.80	4.7679305
Emerine.....	348	38	39.66	168	42	21.25	4.5233032
St. Mary.....	94	50	59.47	274	28	07.87	4.6069916
Miller.....	157	16	02.01	337	08	42.48	4.5212790
McLeod.....	167	13	20.58	347	04	26.19	4.8445761
Kamas.....	192	29	26.79	12	32	51.52	4.5532809

RED LION, GRANITE COUNTY.

On bare, rocky point 1.5 miles northwest of Red Lion mine and 2 miles east of the abandoned town of Ramsey. Elevation by Y level 8,773 feet. Reached by trail from Red Lion thru saddle 0.75 mile south of peak, also by same trail from Ramsey.

Station mark: A rock monument 5 feet in diameter and 6 feet high.

Reference marks: An aluminum tablet set in solid rock, true azimuth from station $20^{\circ} 49'$, distant 4.1 feet.

[Latitude $46^{\circ} 17' 20.08''$. Longitude $113^{\circ} 11' 51.58''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Warren.....	31	10	23.72	210	59	06.91	4.5914006
Prairie.....	72	41	15.15	252	29	55.33	4.3246712
Quigg.....	118	36	24.30	298	13	48.42	4.6580054
Black Pine.....	131	13	32.24	311	02	44.56	4.4048210
Harvey.....	157	30	49.91	337	22	15.76	4.5962158
Princeton.....	196	41	20.78	16	44	24.32	4.2752007
Powell.....	247	30	16.10	67	39	46.92	4.2616440
Haggin.....	340	20	53.16	160	25	20.01	4.3733384

SUGAR LOAF, GRANITE COUNTY.

(Not occupied.)

[Latitude 46° 33' 15.5". Longitude 113° 16' 42.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Princeton.....			4. 21226
Black Pine.....			4. 25907

SUMMIT OF HIGH, SPARSELY TIMBERED HILL, GRANITE COUNTY.

(Not occupied.)

[Latitude 46° 15' 56.3". Longitude 113° 52' 33.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Willow.....			3. 85481
Palisade.....			3. 59243

THIRD PROMINENT PEAK SOUTHWEST OF MOUNT WARREN, GRANITE COUNTY.

(Not occupied.)

[Latitude 45° 57' 00.2". Longitude 113° 29' 55.7".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warren.....			3. 72167
Kent.....			4. 41771

WARREN, GRANITE COUNTY.

On Warren Peak, at southwest end of Methodist Mountains. Can be reached from Rock Creek and Moose Lake as follows: At 1 mile above Moose Lake leave wagon road and follow a trail leading east from old arrastre, going due east 3.5 miles. At a tree marked "C L" trail branches, the south fork going to Carp Lake, 1.5 miles distant, where camp may be established and mountain ascended by ridge west of lake—a dangerous climb, even without instrument.

Station mark: A rock cairn 8 feet in diameter at base and 8 feet high.

Reference mark: An aluminum tablet set in a rock, true azimuth from station 291° 36', distant 9.85 feet.

[Latitude 45° 59' 17.43". Longitude 113° 27' 30.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kent.....	108 29 43.33	288 15 16.22	4. 4362698
Emerine.....	148 58 27.42	328 50 55.22	4. 4169071
Quigg.....	160 67 30.80	339 56 16.26	4. 7679305
Prairie.....	179 53 54.60	359 53 52.98	4. 4331270
Black Pine.....	181 04 06.36	1 04 37.98	4. 7002295
Red Lion.....	210 59 06.91	31 10 23.72	4. 5914006
Haggin.....	248 12 26.01	68 28 07.86	4. 4810782

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WILMA POST-OFFICE, GRANITE COUNTY.

(Not occupied.)

South end of Park's ranch house.

[Latitude $46^{\circ} 11' 31.01''$. Longitude $113^{\circ} 28' 07.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warren.....			4.35534
Emerine.....			4.10232

PIKES PEAK, POWELL COUNTY.

(Not occupied.)

Elevation, 9,359 feet.

[Latitude $46^{\circ} 25' 44.9''$. Longitude $113^{\circ} 00' 38.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Black Pine.....			4.52495
Red Lion.....			4.32661

POWELL, POWELL COUNTY.

Best route to station is probably up Dempsey Creek, following the northwest prong thereof, and on to the flat south of station. It can also be reached from the north and east up Tincup Joe Creek, but is very difficult of access from the west.

Station mark: A rock cairn 8 feet high, with 6-foot base.

Reference marks: An aluminum tablet set in granite rock; true azimuth from station $201^{\circ} 16'$, distant 12.14 feet.

[Latitude $46^{\circ} 21' 05.67''$. Longitude $112^{\circ} 58' 42.29''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Haggin.....	17 08 46.54	197 03 43.66	4.4852933
Red Lion.....	67 39 46.92	247 30 16.10	4.2616440
Princeton.....	134 08 24.19	314 01 46.23	4.2022534

DEER MOUNTAIN, RAVALLI COUNTY.

(Not occupied.)

[Latitude $46^{\circ} 01' 40.1''$. Longitude $114^{\circ} 03' 13.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Warren.....		95 40 13	4.66574
Congdon.....		73 15 11	4.36157

KENT, RAVALLI COUNTY.

On a bare, rocky summit, the third from the north, near headwaters of west prong of Ross Fork of Rock Creek and 8 miles southwest of Kent and Congdon mine. A wagon road leads from Rock Creek up Ross Fork Valley to the mine. Best route is thence westward by trail 1 mile to Medicine Lake, thence southwest on trail 5 miles to Fox Peak, which is easily ascended from northeast end of spur; descend from peak to northwest about 400 feet in elevation to avoid slide rock on southwest face, and thence along ridge southwest to foot of station, passing east of the rocky peak lying between Congdon and Kent peaks. Good camping place 1 mile northeast of station.

Station mark: A rock monument 7 feet in diameter at base and 7 feet high, on highest point of rocky summit.

Reference mark: An aluminum tablet 2 feet northwest of edge of monument, set in a large rock upon which the cairn rests; true azimuth from station $146^{\circ} 24'$, distant 3 feet 6 inches.

[Latitude $46^{\circ} 03' 56.23''$. Longitude $113^{\circ} 47' 35.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Palisade.....	167 06 11.90	347 02 50.20	4.4281934
Quigg.....	187 05 07.94	7 08 23.70	4.6705581
Emerine.....	221 55 11.19	42 04 07.28	4.2675236
Prairie.....	234 14 39.52	54 29 06.79	4.5018240
Warren.....	288 15 16.22	108 29 43.33	4.4362698

PALISADE, RAVALLI COUNTY.

On the double rocky top of a dividing ridge between Willow Creek and Burnt Fork, about 14 miles due east from Corvallis. Station is reached by going from Corvallis up Willow Creek to end of road, thence by trail to a point about 2 miles above old sawmill, where trail forks; take left-hand fork, which may lead to summit. Elevation about 8,500 feet.

Station mark: A rock cairn 5 feet in diameter at base and 7 feet high on highest part.

Reference mark: An aluminum tablet set in rock; true azimuth from station $116^{\circ} 51'$, distant 5 feet $10\frac{1}{2}$ inches.

[Latitude $46^{\circ} 18' 02.34''$. Longitude $113^{\circ} 52' 14.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willow.....	119 16 39.85	299 14 23.17	3.6661373
Quigg.....	209 58 02.06	30 04 40.58	4.3711049
Black Pine.....	244 35 56.98	64 54 23.13	4.5576824
Emerine.....	303 53 16.85	124 03 35.67	4.3450147
Kent.....	347 02 50.20	167 06 11.90	4.4281934

67, RAVALLI COUNTY.

(Not occupied.)

Lower of two timbered points.

[Latitude 46° 24' 43.2". Longitude 113° 49' 28.3'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Palisade.....	4. 10986
Willow.....	4. 10200

68, RAVALLI COUNTY.

(Not occupied.)

Higher of two timbered points.

[Latitude 46° 25' 59.8". Longitude 113° 50' 04.7'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Palisade.....	4. 12014
Willow.....	4. 10122

WILLOW, RAVALLI COUNTY.

A station in the base expansion, 15 miles northeast of Hamilton, on a bald summit of the range on the eastern side of the Bitterroot Valley and about 4,000 feet above it. Can be reached by following up Willow Creek from Corvallis to a half-finished log cabin, thence up a leading spur to station, the latter part of the way being through lodge-pole pines and difficult to travel. This station can be used in the extension of triangulation in any direction except eastward.

Station mark: A copper bolt in rock ledge. Signal is a pine tree placed over bolt and braced in position.

[Latitude 46° 19' 15.72". Longitude 113° 55' 23.70'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Quigg.....	221 03 41.08	41 12 36.54	4. 3803840
Palisade.....	299 14 23.17	119 16 39.85	3. 6661373
Daly.....	37 52 02.00	217 47 48.75	4. 0875630
El Capitan.....	46 38 13.00	226 17 46.10	4. 7018600
South base.....	52 06 38.56	231 56 56.56	4. 3401538
Ward (2).....	59 11 33.24	238 55 53.90	4. 5116330
Ward (1).....	59 20 44.57	239 05 10.47	4. 5084996
Astronomic pier.....	65 41 35.41	245 31 37.08	4. 2891104
North base.....	74 49 03.84	254 38 55.30	4. 2712508
St. Mary.....	131 06 13.50	310 52 19.34	4. 5129510

NEW MEXICO.

TRIANGULATION STATIONS.

BERNALILLO, SOCORRO, AND VALENCIA COUNTIES.

During December, 1904, and January and February, 1905, triangulation was extended over three 30-minute quadrangles and one 15-minute quadrangle in the valley of the Rio Grande by R. H. Chapman, topographer.

A base 5.943 miles in length was measured near San Antonio on a tangent of the Santa Fe Railway and an azimuth observed at North base station, with a check azimuth at Socorro Peak. A position for North base station was assumed and computations made through closed figures to the vicinity of Albuquerque, where a tie was made to Black Rock, a point established by A. P. Davis in 1887, and to the cross on the Roman Catholic Church at Albuquerque, which is one of the points given by R. S. Woodward in his astronomic determination of 1885.

The difference in position at Black Rock was applied as a constant correction to the points in the scheme. The positions given are therefore based on those brought eastward from the base and astronomic determination at Fort Wingate, N. Mex., and are very close to the United States standard. Fifteen stations were occupied, while signals were erected on 15 stations, one of which, Magdalena Peak, was not occupied. There were 21 points intersected in the towns along the river or adjacent to the railroad lines.

ALBUQUERQUE, UNIVERSITY FLAGPOLE, BERNALILLO COUNTY.

At University of New Mexico, on east extension of Railroad avenue, on bench overlooking the city.

Station mark: Center of north flagstaff.

[Latitude $35^{\circ} 04' 53.82''$. Longitude $106^{\circ} 37' 28.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lunas.....	27 10 04.12	207 04 04.51	4.5435053
Isleta.....	27 47 37.00	207 43 55.00	4.3061900
Vulcan.....	116 32 50.76	296 27 47.22	4.1741868

VULCAN, BERNALILLO COUNTY.^a

The northernmost of three rocky buttes on the Mesa Prieta, about 6 miles northwest of Albuquerque. Highest point in vicinity. Easily reached from south end of bridge at Albuquerque by wagon road to

^a Same as Black Rock station, A. P. Davis, 1887.

quarries 3 miles nearly south of triangulation station, thence by wagon northward on Mesa Prieta to east foot of butte (100 feet below top), thence by pack mule to summit.

Station mark: An aluminum bench-mark tablet in flat basalt rock, weighing several tons, about 20 feet southwest of highest rock on butte.

Signal: A tripod about 16 feet high; above it a flagstaff.

Reference marks: Cross cut on solid rock 10.4 feet south; cross cut on solid rock 9 feet north.

[Latitude 35° 08' 30.10". Longitude 106° 46' 16.00'.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Lunas.....	3	51	15.25	183	50	17.86	4.5782076
Lucero.....	41	49	21.94	221	33	29.08	4.8028363
University of New Mexico.....	296	27	47.22	116	32	50.76	4.1741868
Albuquerque (Roman Catholic Church).....	299	35	59.84	119	40	03.85	4.0919815
Isleta.....	350	50	36.00	170	52	18.00	4.1678800
Tome.....	351	47	34.38	171	49	53.30	4.6355953

CAMPANA, SOCORRO COUNTY.

A rocky, bare hill about 5 miles a little east of south of Carthage (Hilton Mines), about 10 miles southeast of San Antonio, on highest point of Sierra Campana. Wagon can be taken to point less than 0.25 mile northeast of station.

Station mark: A bronze triangulation tablet in solid rock, over which a tripod 7 feet high was erected.

Reference marks: A 60-penny spike in crevice of rock south; two 60-penny spikes driven in crevice of rock northwest.

[Latitude 33° 50' 54.49". Longitude 106° 42' 44.06'.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
South base.....	69	04	55.35	248	58	54.27	4.2520639
Chupadera.....	89	40	03.56	269	32	08.25	4.3412284
North base.....	101	27	03.61	281	21	43.46	4.1781188
Socorro.....	137	02	17.95	316	53	54.81	4.5300582
Canas.....	174	58	28.65	354	57	39.27	4.4127788

CANAS, SOCORRO COUNTY.

On north end of yellow ridge, about 10 miles due east of Rio Grande at Socorro, about 10 miles southeast of Publitos (Escondida crossing of river). It is about 1 mile from Chupadera (west) road, about 6 miles southeast of Ojo de la Parida, 5 miles southeast of Ojo Meado, and just south of road to cedar woods.

Station mark: A bronze triangulation tablet set in solid rock, over which is a tripod 12 feet high. Black and white band on signal.

[Latitude 34° 04' 50.87". Longitude 106° 44' 12.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chapadera.....	37 12 34.41	217 05 27.03	4.5121759
Socorro.....	87 19 20.50	267 11 45.36	3.3191492
Polvadera.....	115 16 57.63	295 08 14.89	4.4213690
Ladrones.....	140 51 00.84	320 39 15.56	4.7046962
Turututu.....	187 27 01.33	7 28 46.52	4.5660206
Campana.....	354 57 39.27	174 58 28.65	4.4127788

CHUPADERA, SOCORRO COUNTY.

A bare rocky mountain about 6 miles southwest of San Antonio and about 6 miles northwest of Elmendorf siding; easily ascended with horses.

Station mark: A bronze triangulation tablet in solid rock, over which is a tripod 6 feet high with black center pole.

[Latitude 33° 50' 49.54". Longitude 106° 56' 57.42".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Socorro.....	177 12 41.76	357 12 15.32	4.3971451
Canas.....	217 05 27.03	37 12 34.41	4.5121759
North base.....	246 21 16.94	66 23 52.20	3.8931043
Campana.....	269 32 08.25	89 40 03.56	4.3412284
South base.....	319 51 01.33	139 52 55.20	3.9118757

ISLETA, SOCORRO COUNTY.

(Secondary.)

On highest point and at south end of black malpais hill, about 2 miles west of Isleta, locally known as Isleta Hill; easily ascended.

Station mark: Triangle cut in top of malpais boulder.

Reference marks: Crosscut in solid rock 15 feet north; crosscut in solid rock 9 feet southeast.

[Latitude 34° 55' 12.7". Longitude 106° 43' 40.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lunas.....	26 15 22	206 12 55	4.16788
Vulcan.....	170 52 18	350 50 36	4.39604
University of New Mexico.....	207 43 55	27 47 37	4.30619
Tome.....	353 06 24	173 07 14	4.26313

NORTH BASE, SOCORRO COUNTY.

About 2 miles south of San Antonio station, on Atchison, Topeka and Santa Fe Railway. It is about 500 feet south of road crossing and 135 feet south of north end of and below first curve south of railway station. Signal and center 30 feet west of west rail.

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Station mark: A bench-mark post set 3.5 feet in ground in one-half cubic yard of cement and sand.

Reference marks: Three standard iron posts set as follows: One 15 feet west of center, perpendicular to line measured; one 15 feet east of center, perpendicular to line measured; one 15 feet north of center on extension of line measured.

[Latitude $33^{\circ} 52' 31.23''$. Longitude $106^{\circ} 52' 18.76''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
South base.....	11	29	16.93	191	28	35.70	3.9807180
Chupadera.....	66	23	52.20	246	21	16.94	3.8931043
Campana.....	281	21	43.40	101	27	03.61	4.1781188

POLVADERA, SOCORRO COUNTY.

A sharp rocky peak 4 miles southwest of Polvadera; locally called Polvadera Mountain and by some Limitar Mountain. Can be seen from valley (Rio Grande) from San Antonio nearly to Albuquerque, and is easily ascended from all sides.

Station mark: A bronze triangulation tablet in solid rock, over which is a cairn 8 feet high.

Reference marks: A cross cut on rock 16 feet south of center; a cross cut on rock 20.7 feet northwest of center.

[Latitude $34^{\circ} 10' 55.62''$. Longitude $106^{\circ} 59' 44.10''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Magdalena.....	39	55	32.00	219	49	05.00	4.4410800
Sanders.....	111	25	16.31	291	15	04.31	4.4755601
Ladrones.....	163	40	41.19	343	37	40.18	4.4650208
Turututu.....	228	27	46.17	48	38	16.44	4.5816668
Canas.....	295	08	14.89	115	16	57.63	4.4213690
Socorro.....	345	57	31.31	165	58	38.26	4.1007899
Socorro (observed).....				165	58	43.6	

SANDERS, SOCORRO COUNTY.

About 12 miles a little west of north of Magdalena, 4 miles west of west fence of Sander's pasture, on highest point of ridge north and south. Point has scattering cedar and piñon and shows sharp scarp toward east. Can be ascended by horse from any direction, but more easily from south or west.

Station mark: A bronze triangulation tablet in solid rock, over which is a cairn about 10 feet high.

Reference marks: Nail in blazed side of piñon stump 8.9 feet west of center. Blaze marked "B T Δ ." Nail at bottom of blaze.

[Latitude 34° 16' 48.61". Longitude 107° 17' 52.02".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Ladrones.....	228	47	47.00	48	54	59.73	4.4153166
Polvadera.....	291	15	04.31	111	25	16.31	4.4755601
Socorro.....	306	41	04.84	126	52	23.05	4.5866041
Magdalena.....	342	21	11.00	162	25	04.00	4.5269200

SOCORRO PEAK, SOCORRO COUNTY.

On the lower eastern peak of a double-topt mountain, about 3 miles west of Socorro. The point is bare except for scattering cedar scrub, and is easily reached from Socorro by wagon road to Coon's mines, thence by trail to ridge just south of summit.

Station mark: A bronze triangulation tablet in solid rock, over which is a tripod 12 feet high, with white flag over it and white bands below peak.

Reference marks: A cross cut in top of boulder 18.3 feet west of center; a cross cut in top of boulder 17 feet northeast of center.

[Latitude 34° 04' 18.51". Longitude 106° 57' 44.77".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Sanders.....	126	52	23.05	306	41	04.84	4.5866041
Polvadera.....	165	58	38.26	345	57	31.31	4.1007899
Polvadera (observed).....	165	58	43.60				
Canas.....	267	11	45.36	87	19	20.50	4.3191492
Campana.....	316	53	54.81	137	02	17.95	4.5300582
Chupadera.....	357	12	15.32	177	12	41.76	4.3971451

SOUTH BASE, SOCORRO COUNTY.

About 7.5 miles south of San Antonio and about 8.5 miles north of San Marcial, on Atchison, Topeka and Santa Fe Railway. It is 190 feet north of south end of tangent.

Signal: 30 feet west of west rail.

Station mark: Standard bench-mark post set 3.5 feet in ground, in one-half cubic yard of cement and cinders.

Reference marks: Standard bench-mark posts as follows: One 15.02 feet west of center; perpendicular to line of measurement; one perpendicular to line of measurement; one 15.12 feet south of center, in extension of measurement.

[Latitude 33° 47' 26.97". Longitude 106° 53' 32.82".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Chupadera.....	139	52	55.205	319	51	01.326	3.9118757
North base.....	191	28	35.697	11	29	16.928	3.9807180
Campana.....	248	58	54.266	69	04	55.346	4.2520639

202 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

TURUTUTU, SOCORRO COUNTY.

On a black malpais hill, about 10 miles northeast of La Joya and one-half mile west from La Joya-Manzano road. Local name, Cerro Turututu.

Station mark: A bronze triangulation tablet set in solid rock, over which is a tripod 12 feet high. Tripod carries a 6-foot flagstaff.

Reference marks: Cross cut in rock 5.5 feet northeast; cross cut in rock 11.1 feet south.

[Latitude 34° 24' 35.55". Longitude 106° 41' 05.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Canas.....	7 28 46.52	187 27 01.33	4.5660206
Polvadera.....	48 38 16.44	228 27 46.17	4.5816668
Ladrones.....	94 21 49.03	274 08 15.20	4.5666170
Lucero.....	123 59 58.97	303 41 18.76	4.7825605
Lunas.....	166 28 52.07	346 24 58.90	4.6498118
Tome.....	177 25 26.51	357 24 47.94	4.5849130

LUCERO, VALENCIA COUNTY.

A small rocky summit at east end of Lucero mesa, about 28 miles west of Los Lunas; easily ascended with saddle animals from north. Timber and a small amount of grass on mesa.

Station mark: A bronze triangulation tablet in solid rock, over which is a tripod about 12 feet high carrying a 4-foot bushy top.

Reference marks: Cross cut in rock 10.6 feet south of station; cross cut in rock 8.9 feet north of station; spike in blazed gum stump 21.4 feet southwest of station.

[Latitude 34° 42' 51.08". Longitude 107° 14' 00.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Vulcan.....	221 33 29.08	41 49 21.94	4.8028363
Lunas.....	256 14 33.78	76 29 25.49	4.6120870
Tome.....	264 22 03.41	84 40 09.82	4.6878101
Turututu.....	303 41 18.66	123 59 58.92	4.7825605
Ladrones.....	336 13 46.07	156 18 49.68	4.5300700

LUNAS, VALENCIA COUNTY.

A high, rocky, sandy hill, 5 miles a little south of west of Los Lunas. Very prominent and locally known; horses can be ridden to top. Every station of scheme developed northward of San Antonio base is visible with exception of two base stations. Local name Sierra Los Lunas.

Station mark: A bronze triangulation tablet in solid rock, over which is erected a tripod 14 feet high, carrying a 6-foot flagstaff.

Reference marks: Cross cut in rock 8.9 feet north; cross cut in rock 6.75 feet west.

[Latitude $34^{\circ} 48' 04.20''$. Longitude $106^{\circ} 47' 56.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ladrones.....	32 53 11.65	212 43 27.00	4.6847658
Lucero.....	76 29 25.45	256 14 33.78	4.6120870
Vulcan.....	183 50 17.86	3 51 15.25	4.5782076
Albuquerque.....	202 44 57.25	22 49 57.57	4.5359000
Isleta.....	206 12 55.00	26 15 22.00	4.1678800
University of New Mexico.....	207 04 04.51	27 10 04.12	4.5435053
Tome.....	299 47 31.46	119 50 46.92	4.0018224
Turututu.....	346 24 58.90	166 28 52.07	4.6498118

TOME, VALENCIA COUNTY.

On a black malpais hill, about 5 miles south of Lunas and 3 miles northeast of Tome. Horses can be ridden to top.

Station mark: A bronze triangulation tablet cemented in solid rock, over which is a tripod 14 feet high, carrying a 6-foot flagstaff.

Reference marks: Cross cut in rock 15.3 feet north of station; cross cut in rock 7.25 feet south of station.

[Latitude $34^{\circ} 45' 22.15''$. Longitude $106^{\circ} 42' 13.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ladrones.....	44 31 16.94	224 18 18.09	4.6985359
Lucero.....	84 40 09.82	264 22 03.41	4.6878101
Lunas.....	119 50 46.92	299 47 31.46	4.0018224
Vulcan.....	171 49 53.30	351 47 34.38	4.6355953
Isleta.....	173 07 14.00	353 06 24.00	4.2631295
Turututu.....	357 24 47.94	177 25 26.51	4.5849130

SECONDARY TRIANGULATION STATIONS.

ALBUQUERQUE, BERNALILLO COUNTY.

	Latitude.	Longitude.	To station—	Log. distance.
	° ' "	° ' "		Meters.
Catholic Church cross.....	35 05 11.80	106 39 11.79	Lunas.....	4.5359000
Catholic Church (astronomic).....	35 05 09.70	106 39 23.04	Vulcan.....	4.0919815
Old town court-house tower.....	35 05 40.15	106 40 06.40	Lunas.....	4.5397500
			Vulcan.....	4.0304000
Sawmill, dust burner.....	35 06 13.70	106 39 38.89	Lunas.....	4.5546900
			Vulcan.....	4.0373500

ISLETA, BERNALILLO COUNTY.

	Latitude.	Longitude.	To station—	Log. distance.
	° ' "	° ' "		Meters.
Church, east spire.....	34 54 32.97	106 41 33.74	Tome.....	4.23054
			Lunas.....	4.18818

BELEN, VALENCIA COUNTY.

	Latitude.	Longitude.	To station—	Log. distance.
	° ' "	° ' "		Meters.
Flour-mill tower.....	34 39 37.56	106 46 32.17	Tome.....	4.09668
			Lunas.....	4.19748

204 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

LA JOYA, VALENCIA COUNTY.

	Latitude.	Longitude.	To station—	Log. distance.
	° ' "	° ' "		Meters.
Railroad Station chimney.....	34 22 05.11	106 51 26.06	Polvadera.....	4.38462
			Ladrones.....	4.34601

LOS LUNAS, VALENCIA COUNTY.

Railroad windmill.....	34 48 16.25	106 44 08.43	Tome.....	3.78602
			Lunas.....	3.76340

RIO PUERCO BRIDGE, VALENCIA COUNTY.

Middle pier.....	34 23 39.44	106 50 44.43	Polvadera.....	4.43590
			Ladrones.....	4.35085

SAN ACACIA MESA, VALENCIA AND SOCORRO COUNTIES.

Top of mesa, corner at principal meridian and base line north-west.	34 15 36.28	106 53 12.92	Canas.....	4.38435
			Polvadera.....	4.12156

ALAMILLO, SOCORRO COUNTY.

Railroad windmill.....	34 14 28.05	106 54 21.70	Canas.....	4.37402
			Polvadera.....	4.02257

LEMITAR, SOCORRO COUNTY.

Church spire.....	34 09 38.29	106 54 25.48	Canas.....	4.25610
			Socorro.....	4.04525

LUIS LOPEZ, SOCORRO COUNTY.

Church spire.....	33 59 29.78	106 53 10.88	Campana.....	4.35434
			Canas.....	4.23018

MAGDALENA, SOCORRO COUNTY.

Schoolhouse.....	34 06 48.80	107 14 29.00	Ladrones.....	4.58447
			Sanders.....	4.28324
Railroad water tank.....	34 07 04.05	107 14 40.93	Polvadera.....	4.38124
			Sanders.....	4.27103

POLVADERA, SOCORRO COUNTY.

Church spire.....	34 12 26.69	106 55 15.32	Canas.....	4.34317
			Socorro.....	4.19094

SAN ANTONIO, SOCORRO COUNTY.

Windmill, railroad tank.....	33 54 26.34	106 52 00.97	Campana.....	4.19675
			Canas.....	4.35585
Old town church spire.....	33 55 00.53	106 51 51.77	Campana.....	4.20376
			Canas.....	4.33595

SOCORRO, SOCORRO COUNTY.

	Latitude.	Longitude.	To station—	Log. distance.
	° ' "	° ' "		Meters.
Court-house tower.....	34 03 20.86	106 53 33.80	Canas.....	4.16612
Old church, south spire.....	34 03 37.81	106 53 34.97	Polvadera.....	4.22848
School of Mines.....	34 03 59.25	106 54 12.96	Canas.....	4.16433
			Chupadera.....	4.38444
			Canas.....	4.18977
			Polvadera.....	4.18700

WATER CANYON (BRANCH RAILROAD), SOCORRO COUNTY.

Railroad tank.....	34 05 20.01	107 04 46.58	Polvadera.....	4.11136
			Sanders.....	4.46591

OKLAHOMA.

TRIANGULATION STATIONS.

LINCOLN, LOGAN, OKLAHOMA, AND PAYNE COUNTIES.

AGRA, CHANDLER, EDMOND, GUTHRIE, MALLON, MERRICK, QUAY, RIPLEY, AND
SAC-FOX QUADRANGLES.

During the season of 1905 H. H. Hodgeson, topographer, extended triangulation from Wingard and Edmond, stations in the ninety-eighth meridian arc of the Coast and Geodetic Survey, eastward to the Indian Territory line.

Twenty-four stations were occupied and 18 points were located by intersections. Positions are given on the United States standard datum.

COX, NUMBER 9 COUNTY.

This station is 2,400 feet south and 500 feet east of the closing corner on the old Oklahoma-Indian Territory boundary line. Said closing corner is on line between secs. 1 and 12, T. 14 N., R. 6 E.

Station mark: A 20-inch post-oak tree having branches and top cut off. Theodolite elevated 30 feet.

[Latitude 35° 42' 11.36". Longitude 796° 37' 06.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harger.....	23 54 09.99	203 51 30.74	4.2301625
Buck.....	99 38 46.20	279 32 55.86	4.1846860
Mesecher.....	147 07 57.77	327 04 58.54	4.1519573

AGRA, LINCOLN COUNTY.

On the highest timbered hill in the SW. $\frac{1}{4}$ sec. 33, T. 17 N., R. 4 E., on land of F. B. Griswold, about 1 mile northwest of Agra.

206 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Station mark: A 10-inch black-jack tree, top and branches cut off.
Theodolite elevated 20 feet.

[Latitude $35^{\circ} 54' 14.65''$. Longitude $96^{\circ} 53' 14.00''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Tryon.....	61	50	02.76	241	47	22.02	3.8922774
Paradise.....							4.5089629
Perkins.....	134	33	53.81	314	30	17.42	4.1126523
Mound.....	202	41	48.15	22	45	39.42	4.4064795
Cushing.....	232	54	08.27	52	57	44.69	4.0638806
Air.....	282	34	10.32	102	37	40.76	3.9648875
Buck.....	334	55	53.42	154	59	28.37	4.3382330

AGRA OIL TOWER, LINCOLN COUNTY.

(Not occupied.)

Station mark: Center of tower.

[Latitude $35^{\circ} 53' 47''$. Longitude $96^{\circ} 52' 06.7''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Air.....							3.86960
Cushing.....							4.03693
Agra.....							3.27641

AIR, LINCOLN COUNTY.

On wagon-road right of way about 800 feet north of corner to secs. 4, 5, 8, and 9, T. 16 N., R. 5 E., on highest ground between secs. 4 and 5.

Station mark: An iron bench-mark post set 3 feet in ground and about 3 feet from east fence.

[Latitude $35^{\circ} 53' 09.37''$. Longitude $96^{\circ} 47' 15.09''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Agra.....	102	37	40.76	282	34	10.32	3.9648875
Cushing.....	181	34	20.01	1	34	25.79	3.9541412
Indian.....	242	12	41.95	62	17	59.40	4.1855361
Buck.....	359	18	58.26	179	19	03.18	4.2487230
Mesecher.....	317	48	53.85	137	51	50.63	4.0525232

AVERY, LINCOLN COUNTY.

(Not occupied.)

German Church spire, 1 mile east of Avery.

[Latitude $35^{\circ} 53' 01.7''$. Longitude $96^{\circ} 44' 02.2''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Indian.....							4.05806
Cushing.....							4.01324
Air.....							3.68505

BUCK, LINCOLN COUNTY.

About 1,200 feet east and 600 feet north of corner to secs. 4, 5, 32, and 33, Tps. 14 and 15 N., R. 5 E., on highest cultivated ground in quarter section belonging to H. M. Johnson.

Station mark: None.

Reference mark: A bronze triangulation tablet cemented in a stone set flush with ground at angle of fence. Theodolite elevated 10 feet. True azimuth to mark $240^{\circ} 05' 22''$, distant 267 feet.

[Latitude $35^{\circ} 43' 34.12''$. Longitude $96^{\circ} 47' 06.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stuart.....	27 32 50.36	207 29 08.57	4.3338131
Agra.....	154 59 28.37	334 55 53.42	4.3382330
Air.....	179 19 03.18	359 18 58.26	4.2487230
Mesecher.....	218 11 09.19	38 14 00.71	4.0761618
Cox.....	279 32 55.86	99 38 46.20	4.1846860
Harger.....	335 31 31.07	155 34 41.53	4.2981235
Girdle.....			3.8577614

CHANDLER STANDPIPE, LINCOLN COUNTY.

(Not occupied.)

Station mark: Center of standpipe.

[Latitude $35^{\circ} 42' 22''$. Longitude $96^{\circ} 52' 47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buck.....			3.94632
Girdle.....			3.92795
Harger.....			4.36352

GIRDLE, LINCOLN COUNTY.

About 1,000 feet southeast of corner to secs. 19, 20, 29, and 30, T. 14 N., R. 5 E., on land belonging to H. C. Glover.

Station mark: A 16-inch (girdled) post-oak tree having top and branches cut off. Theodolite elevated 20 feet.

[Latitude $35^{\circ} 39' 45.98''$. Longitude $96^{\circ} 48' 09.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stuart.....	34 45 08.32	214 41 54.36	4.1678708
Harger.....	318 22 47.73	138 26 34.70	4.1696384
Buck.....			3.8577614

208 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

HARGER, LINCOLN COUNTY.

About 0.25 mile southeast of corner to secs. 29, 30, 31, and 32, and 600 feet south of line between secs. 29 and 32, T. 13 N., R. 6 E., on land of John Harger.

Station mark: A 20-inch post-oak tree having top and branches cut off. Theodolite elevated 27.5 feet.

[Latitude 35° 33' 47.31". Longitude 96° 41' 39.85".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stuart.....	86 46 38.39	266 39 38.00	4.2609290
Girdle.....	138 26 34.70	318 22 47.73	4.1696384
Buck.....	155 34 41.53	335 31 31.07	4.2981235
Cox.....	203 51 30.74	23 54 09.99	4.2301625

MESECHER, LINCOLN COUNTY.

About 1,500 feet west and 250 feet south of corner to secs. 5, 6, 31, and 32, T. 15 and 16 N., R. 6 E., on highest ground in quarter section owned by N. B. Mesecher.

Station mark: A 12-inch black-jack tree, the top and branches of which are cut off. Theodolite elevated 27 feet.

Reference mark: A 10-inch black-jack tree blazed and marked "B T Δ ." True azimuth to mark 193° 23' 52", distance 226.2 feet.

[Latitude 35° 48' 37.94". Longitude 96° 42' 13.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Air.....	137 51 50.63	317 48 53.85	4.0525232
Buck.....	38 14 00.71	218 11 09.19	4.0761618
Cox.....	327 04 58.54	147 07 57.77	4.1519373

PHEE, LINCOLN COUNTY.

On highest ground in the NW. $\frac{1}{4}$ sec. 23, T. 17 N., R. 2 E., on hay land owned by Daniel McPhee. North line of Lincoln County is about 800 feet north of station.

Station mark: A bronze triangulation tablet cemented in stone set flush with ground.

[Latitude 35° 56' 22.73". Longitude 97° 03' 40.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reece.....	74 27 42.29	254 23 54.12	4.0051680
Tryon.....			4.0670672
Perkins.....	231 25 57.32	51 28 28.50	3.9166136

SAC-FOX AGENCY WATER TANK, LINCOLN COUNTY.

(Not occupied.)

Station mark. Center of tank.

[Latitude 35° 40' 21.4". Longitude 96° 39' 26.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cox.....			3.68838
Buck.....			4.11448
Harger.....			4.10046

STUART, LINCOLN COUNTY.

In the SE. $\frac{1}{4}$ sec. 32, T. 13 N., R. 4 E., on land of C. A. Stuart, about 25 feet southeast of house, which is on highest land in said quarter. Observation for azimuth was made at this station November 7, 1905.

Station mark: A bronze triangulation tablet cemented in stone set flush with ground.

[Latitude 35° 33' 13.45". Longitude 96° 53' 42.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Buck.....	207 29 08.57	27 32 59.36	4.3338131
Girdle.....	214 41 54.36	34 45 08.32	4.1678708
Harger.....	266 39 38.00	86 46 38.39	4.2609290

TRYON, LINCOLN COUNTY.

Station mark: The center of steeple on Christian Church in Tryon. Theodolite elevated 35 feet.

[Latitude 35° 52' 15.05". Longitude 96° 57' 48.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Reece.....	104 53 00.28	284 45 45.93	4.2837655
Phoe.....			4.0670672
Perkins.....	169 30 45.10	349 29 49.70	4.1137369
Agra.....	241 47 22.02	61 50 02.76	3.8922774

FLINN, LOGAN COUNTY.

In the NW. $\frac{1}{4}$ sec. 24, T. 15 N., R. 2 W. (Indian meridian), on property of T. O. Flinn, about 800 feet northeast of his house and on highest ground. This farm is known as the old Holbrook place.

Station mark: An iron bench-mark post, the cap of which extends 4 inches above ground.

210 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Reference mark: A 10-inch blazed post-oak tree marked "B T Δ ."
True azimuth from station, $351^{\circ} 36' 13''$, distant 100 feet.

[Latitude $35^{\circ} 46' 00.01''$. Longitude $97^{\circ} 22' 02.33''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Edmond.....	36 41 12.41	216 37 45.79	4.1732601
Wingard.....	151 12 06.18	331 07 49.73	4.3575072
Wallace.....	194 59 05.93	15 00 12.69	4.0441422
Short.....	196 28 53.21	16 30 21.73	4.1261567

GUTHRIE STANDPIPE, LOGAN COUNTY.

(Not occupied.)

This standpipe was also located by the Coast Survey in 1902.
Station mark: Center of standpipe.

[Latitude $35^{\circ} 52' 38.15''$. Longitude $97^{\circ} 24' 40.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wingard.....	137 36 32	317 33 48	4.01730
Flinn.....			4.11035
Wallace.....			3.84522

LANGSTON, LOGAN COUNTY.

(Not occupied.)

Station mark: Center of main college building.

[Latitude $35^{\circ} 56' 40.7''$. Longitude $97^{\circ} 15' 34.6''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Short.....			3.95992
Reece.....			3.94399
Wallace.....			4.05506

REECE, LOGAN COUNTY.

In the SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 26, T. 17 N., R. 1 E., on cultivated land belonging to H. R. Reece and on highest ground northeast of Reece's house.

Station mark: None.

Reference marks: A bronze triangulation tablet set in sandstone rock at southeast corner of H. R. Reece's house. True azimuth to mark, $41^{\circ} 52' 30''$, distance 328 feet.

[Latitude 35° 54' 54.60". Longitude 97° 10' 09.09".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Short.....	75	30	20.20	255	24	50.66	4.1631730
Paradise.....	161	54	12.39	341	52	39.55	4.1052271
Perkins.....	244	04	10.20	64	10	29.72	4.2554371
Phee.....	254	23	54.12	74	27	42.29	4.0051680
Tryon.....	284	45	45.93	104	53	00.28	4.2837655
Strong.....							3.7728468
Cordis.....							4.1612354

SHORT, LOGAN COUNTY.

In the NE. $\frac{1}{4}$ sec. 5, T. 16 N., R. 1 W., on cultivated land of J. J. Mulhall, about 800 feet southeast of quarter corner on north side of said section and about 300 feet east and 50 feet north of angle of public road.

Station mark: A bronze triangulation tablet set in a sandstone rock and buried 1.5 feet in ground.

Reference marks: Iron bench-mark post set 3 feet in ground in fence corner 146.5 feet north of station.

[Latitude 35° 52' 55.99". Longitude 97° 19' 31.10".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Flinn.....	16	30	21.73	196	28	53.21	4.1261567
Wallace.....							3.3660029
Wingard.....	115	49	39.44	295	43	53.93	4.2148449
Cordis.....	196	36	03.16	16	37	43.31	4.1747474
Paradise.....	212	40	14.60	32	44	11.76	4.2726807
Perkins.....	249	05	20.03	70	17	09.22	4.5146389
Reece.....	255	24	50.66	75	30	20.20	4.1631730
Strong.....	257	53	07.90	77	56	25.67	3.9371098

STRONG, LOGAN COUNTY.

About 800 feet west of corner to secs. 5, 6, 31, and 32, Tps. 16 and 17 N., R. 1 E. It is in wagon-road right of way about 2.5 feet north of south fence, on highest ground along line between secs. 6 and 31.

Station mark: A bronze triangulation tablet cemented in stone set flush with ground.

Reference mark: A spike in a 10-inch black-jack tree. True azimuth, 270° 50' 40", distant 48.3 feet.

[Latitude 35° 53' 54.78". Longitude 7° 13' 53.74".]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Short.....	77	56	25.67	257	53	07.90	3.9371698
Paradise.....	186	48	44.56	6	49	23.66	4.1478444
Reece.....							3.7728468

WALLACE, LOGAN COUNTY.

About 1,600 feet south of corner to secs. 7, 8, 17, and 18, T. 16 N., R. 1 W.; it is in the right of way and about 7 feet west of north-south fence on east side of right of way. The farm of J. N. Wallace is the quarter section to the west of this station.

Station mark: An iron bench-mark post set $3\frac{1}{2}$ feet in the ground. Theodolite elevated 30 feet.

[Latitude $35^{\circ} 51' 46.96''$. Longitude $97^{\circ} 20' 08.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Flinn.....	15 00 12.69	194 59 05.93	4.0441422
Wingard.....	123 50 02.73	303 44 39.08	4.2214602
Short.....			3.3660029

WINGARD, LOGAN COUNTY.

A Coast Survey station, established in 1902; belongs to the ninety-eighth meridian net. In the SW. $\frac{1}{4}$ sec. 14, T. 17 N., R. 3 W., on land of J. B. Wingard, about 5 miles north and 3.75 miles west of Guthrie. Station located on highest part of ground, which is gently sloping.

Station mark: A 12-inch terra-cotta pipe set in cement and filled with cement, with a 60-penny wire nail to mark center; instrument elevated 40 feet.

Reference marks: Is in southwest quarter, very near center of section, 0.94 meter south of east-west fence and 0.50 meter west of north-south fence, true azimuth $194^{\circ} 22' 03''$, distant 329.096 meters; to corner stone of quarter corner between secs. 14 and 23, true azimuth $2^{\circ} 04' 56''$, distant 490.9 meters.

[Latitude $35^{\circ} 56' 47.428''$. Longitude $97^{\circ} 29' 20.129''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cordis.....	249 13 28.56	69 20 54.83	4.3084791
Short.....	295 43 53.93	115 49 39.44	4.2148749
Wallace.....	303 44 39.08	123 50 02.73	4.2214602
Flinn.....	331 07 49.73	151 12 06.18	4.3575072
Edmond.....	356 13 07.79	176 13 56.83	4.5048513

EDMOND, OKLAHOMA COUNTY.

A Coast Survey station, established in 1902; belongs to the ninety-eighth meridian net; near the center of sec. 25, T. 14 N., R. 3 W., on land of Pete Wilderson, at northeast outskirts of village of Edmond. The station is at east edge of cultivated field about 100 meters north-northeast of highest ground and 119.60 meters south of east-west fence running to section corner.

Station mark: A 12-inch terra-cotta pipe set and filled with cement, with a 60-penny nail projecting one-fourth inch from top. Theodolite elevated 30 feet.

Reference marks: In north-south fence, true azimuth $263^{\circ} 11' 39''$, distant 79.402 meters; to center of dome of Normal College, true azimuth $70^{\circ} 54' 33.9''$, distant 650 meters; to cross on spire of Catholic Church, true azimuth $63^{\circ} 29' 31.6''$.

[Latitude $35^{\circ} 39' 32.111''$. Longitude $97^{\circ} 27' 56.292''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wingard.....	176 13 56.83	356 13 07.79	4.5048513
Flinn.....	216 37 45.79	36 41 12.41	4.1732601

CORDIS, PAYNE COUNTY.

On land of E. D. Cordis, about 6.5 miles northwest of Coyle, in the NW. $\frac{1}{4}$ sec. 36, T. 18 N., R. 1 W.; is 60 feet northwest of highest ground.

Station mark: A bronze triangulation tablet cemented in a sand-stone rock set $1\frac{1}{2}$ feet in ground.

Reference mark: An iron bench-mark post set 3 feet in ground, true azimuth to mark $169^{\circ} 29' 33''$, distant 53.3 feet. Theodolite elevated 20 feet.

[Latitude $36^{\circ} 00' 40.91''$. Longitude $97^{\circ} 16' 40.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Short.....	16 37 43.31	196 36 03.16	4.1747474
Wingard.....	69 20 54.83	249 13 28.56	4.3084791
Paradise.....	256 09 58.82	76 12 16.03	3.7793720
Reece.....			4.1612354

CUSHING, PAYNE COUNTY.

About 1 mile southwest of Cushing and 1,000 feet south of corner to secs. 4, 5, 8, and 9, T. 17 N., R. 5 E.; the station is on wagon-road right of way about 3 feet from west fence.

Station mark: A bronze triangulation tablet cemented in stone set flush with the ground.

[Latitude $35^{\circ} 58' 01.21''$. Longitude $96^{\circ} 47' 05.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Air.....	1 34 25.79	181 34 20.01	3.9541412
Agra.....	52 57 44.69	232 54 08.27	4.0638806
Perkins.....	96 34 07.57	276 26 54.38	4.2693782
Mound.....	182 07 52.34	2 08 06.82	4.2186733
Quay.....	195 40 32.05	15 43 03.20	4.3755682
Indian.....	277 54 06.35	97 59 18.32	4.1284832

214 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

CUSHING OIL TOWER, PAYNE COUNTY.

(Not occupied.)

Station mark: Center of tower.

[Latitude 35° 58' 47.3". Longitude 96° 46' 52.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Air.....			4. 01829
Indian.....			4. 12673
Cushing.....			3. 16353

CUSHING, CHRISTIAN CHURCH SPIRE, PAYNE COUNTY.

(Not occupied.)

Station mark: Center of spire.

[Latitude 35° 58' 52.2". Longitude 96° 46' 11.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Air.....			4. 02888
Indian.....			4. 09472
Cushing.....			3. 31735

INDIAN, PAYNE COUNTY.

On a bare knoll about 800 feet west and 200 feet north of center of sec. 14, T. 17 N., R. 6 E., about 600 feet northwest of the house of J. M. Branstetter, on land belonging to an Indian.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 35° 57' 00.92". Longitude 96° 38' 13.95".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Air.....	62 17 59.40	242 12 41.95	4. 1855361
Cushing.....	97 59 18.32	277 54 06.35	4. 1284832

MOUND, PAYNE COUNTY.

Near the center of northernmost of two bare mounds known as Twin Mounds, in the SW. $\frac{1}{4}$ sec. 16, T. 19 N., R. 5 E.

Station mark: A bronze triangulation tablet cemented in stone set flush with ground.

[Latitude 36° 06' 57.65". Longitude 96° 46' 40.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cushing.....	2 08 06.82	182 07 52.34	4. 2186733
Agra.....	22 45 39.42	202 41 48.15	4. 4064795
Perkins.....	52 57 34.49	232 50 06.05	4. 3786537
Quay.....	222 30 48.31	42 33 05.21	3. 9336897

PARADISE, PAYNE COUNTY.

In the southeast corner of the NE. $\frac{1}{4}$ sec. 20, T. 18 N., R. 1 E. (Indian meridian), about 800 feet north of south line and 600 feet west of east line of quarter section, and on highest point.

Station mark: A bronze triangulation tablet cemented in stone set flush with ground.

Reference mark: Spike in 8-inch blazed black-jack tree which bears northwest, distant 89.5 feet.

[Latitude $36^{\circ} 01' 27.53''$. Longitude $97^{\circ} 12' 47.16''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Strong.....	6 49 23.66	186 48 44.56	4.1477843
Short.....	32 44 11.76	212 40 14.60	4.2726807
Cordis.....	76 12 16.03	256 09 58.82	3.7793720
Perkins.....	281 50 56.00	101 58 48.95	4.3137085
Agra.....			4.5089629

PERKINS, PAYNE COUNTY.

This station is the top of chimney of Union schoolhouse in district No. 55, 4 miles northeast of Perkins, in the southeast corner of the SW. $\frac{1}{4}$ sec. 33, T. 18 N., R. 3 E.

Station mark: Center of chimney. Theodolite elevated 30 feet.

[Latitude $35^{\circ} 59' 09.59''$. Longitude $96^{\circ} 59' 22.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Phee.....	51 28 28.59	231 25 57.32	3.9166136
Reece.....	64 10 29.72	244 04 10.20	4.255-371
Short.....	70 17 09.22	249 05 20.03	4.5106389
Paradise.....	101 58 48.95	281 50 56.00	4.3137085
Mound.....	232 50 06.05	52 57 34.49	4.3786537
Cushing.....	276 26 54.38	96 34 07.57	4.2693782
Agra.....	314 30 17.42	134 33 53.81	4.1126523
Tryon.....	349 29 49.70	169 30 45.10	4.1137369

PERKINS, TALLEST CHURCH SPIRE, PAYNE COUNTY.

(Not occupied.)

Station mark: Center of spire.

[Latitude $35^{\circ} 58' 33.1''$. Longitude $97^{\circ} 02' 04.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Phee.....			3 67032
Perkins.....			3 62399
Reece.....			4.14268

QUAY, PAWNEE COUNTY.

On bare point of ridge about 0.75 mile north of Quay, in the NE. $\frac{1}{4}$ sec. 36, T. 20 N., R. 5 E., about 200 feet west of north-south public road.

Station mark: A bronze triangulation tablet cemented in large limestone rock set flush with ground.

[Latitude $36^{\circ} 10' 22.87''$. Longitude $96^{\circ} 42' 48.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cushing.....	15 43 03.20	195 40 32.05	4.3755682
Mound.....	42 33 05.21	222 30 48.31	3.9336897

PRIMARY TRAVERSE.

LOGAN COUNTY.

GUTHRIE QUADRANGLE.

The following are results of a primary-traverse line between Wingard triangulation station (a station of the Coast Survey, 1903) and the Guthrie standpipe (an intersected point of the Coast Survey, 1903), run by H. H. Hodgeson, topographer, in 1905. Positions are based on the United States standard datum.

Geographic positions in Guthrie quadrangle.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Wingard triangulation station, T. 17 N., R. 3 W., in SW. $\frac{1}{4}$ sec. 14, on property of J. B. Wingard, about 5 miles north and 3.75 miles west of Guthrie.....	35	56	47.428	97	29	20.10
T. 17 N., R. 3 W., corner secs. 13, 14, 23, and 24.....	35	56	31.60	97	28	44.50
T. 17 N., Rs. 2 and 3 W., corner secs. 13, 18, 19, and 24.....	35	56	31.40	97	27	40.90
T. 17 N., Rs. 2 and 3 W., corner secs. 19, 24, 25, and 30.....	35	55	39.30	97	27	40.90
T. 17 N., R. 2 W., on line between secs. 19 and 30, south of road, 2 feet west of Mort Carey's mail box, iron post stamped "Prim. Trav. Sta. No. 17".....	35	55	38.90	97	27	00.00
T. 17 N., R. 2 W., corner secs. 19, 20, 29, and 30.....	35	55	39.20	97	26	35.10
T. 17 N., R. 2 W., corner secs. 20, 21, 28, and 29.....	35	55	38.80	97	25	31.10
Center of track between two spurs of Santa Fe bridge over Cimmaron River.....	35	54	58.50	97	25	43.20
Guthrie astronomic pier, located in "Government acre," 51.4 feet south of building line on Oklahoma avenue and 116.5 feet east of building line on Second street; geographic position of pier by astronomic observations by S. S. Gannett, 1892.....	35	52	42.22	97	25	33.04
By this traverse (United States standard).....	35	52	39.74	97	25	36.62
Guthrie standpipe.....	35	52	38.10	97	24	40.20

TEXAS-LOUISIANA.

PRIMARY TRAVERSE.

BOWIE, CASS, FANNIN, GREGG, HARRISON, LAMAR, MARION, RED RIVER, TITUS, AND UPSHUR COUNTIES, TEX.; CADDO PARISH, LA.

CLARKSVILLE, GILMER, JEFFERSON, MOUNT PLEASANT, MOUNT VERNON, PARIS, SHAW-NEETOWN, AND TEXARKANA.

An area of about 5,000 square miles in the northeastern part of Texas was controlled during the winter and spring of 1904-5 by Sledge Tatum, topographer, who ran a primary-traverse line 597 miles in length. The line started from a point at Texarkana previously located by primary traverse and was run approximately along parallels and meridians bordering 30-minute quadrangles, and was tied to triangulation station Goodland, Choctaw Nation, Indian Territory. Positions are given on the United States standard datum.

CLARKSVILLE QUADRANGLE (RED RIVER AND LAUREL COUNTIES, TEX.).

Geographic positions along Texas and Pacific Railway between Clarksville and Paris.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Clarksville, street crossing at west end of station..... ²	33	37	00.9	95	03	08.4
Milepost 63.....	33	37	54.3	95	04	58.3
Milepost 64, 50 feet north of center of track, iron post stamped "Prim. Trav. Sta. No. 11".....	33	38	23.8	95	05	50.8
Water tank.....	33	38	58.9	95	06	55.4
Milepost 67.....	33	39	28.3	95	08	36.9
Bagwell, 50 feet from center of track, street crossing at west end of station, south of track, east edge of road, iron post stamped "Prim. Trav. Sta. No. 27".....	33	39	45.6	95	09	40.9
Road crossing.....	33	39	49.4	95	11	04.6
Milepost 70.....	33	39	48.1	95	11	42.1
Road crossing, 50 feet north of center of track, east edge of road, iron post stamped "Prim. Trav. Sta. No. —".....	33	39	46.6	95	12	40.4
Schoolhouse, road crossing at.....	33	39	48.4	95	14	09.6
Milepost 73.....	33	39	50.0	95	14	47.2
Detroit station, at road crossing, east end of, iron post stamped "Prim. Trav. Sta. No. 50".....	33	39	44.0	95	15	57.2
Milepost 75.....	33	39	38.9	95	16	53.0
Milepost 76, 50 feet south of track, iron post stamped "Prim. Trav. Sta. No. 57".....	33	39	36.1	95	17	55.2
Milepost 77.....	33	39	34.6	95	18	57.1
Road crossing, 50 feet north of center of track, west of road, iron post stamped "Prim. Trav. Sta. No. 65".....	33	39	31.4	95	20	43.1
Road crossing.....	33	39	33.0	95	21	43.2
Road crossing.....	33	39	37.0	95	22	32.5
Blossom station, iron post 300 feet east of, stamped "Prim. Trav. Sta. No. 72".....	33	39	39.0	95	23	00.6
Milepost 82, road crossing.....	33	39	36.8	95	24	10.0
Milepost 83.....	33	39	34.7	95	25	12.2
Road crossing.....	33	39	33.0	95	26	03.4
Milepost 85.....	33	39	30.6	95	27	14.8
Reno flag station, road crossing, 50 feet from center of track, north edge of right of way, east edge of road, iron post stamped "Prim. Trav. Sta. No. 90".....	33	39	30.1	95	27	45.5
Road crossing.....	33	39	26.5	95	28	38.7
Road crossing.....	33	39	10.9	95	29	27.5
Road crossing.....	33	38	56.6	95	30	12.4
Water tank, road crossing.....	33	38	49.2	95	30	58.2
Milepost 90.....	33	38	56.9	95	32	17.7
Paris, Texas and Pacific Rwy. station.....	33	39	01.7	95	33	24.4
Paris, crossing of Texas and Pacific Rwy. and St. Louis and San Francisco R. R.....	33	38	55.8	95	34	07.3

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Clarksville station, street crossing at west end of.....	33	37	00.9	95	03	08.4
Station 15, iron post stamped "Prim. Trav. Sta. No. 15".....	33	34	34.7	95	02	48.5
Stanley post-office.....	33	33	22.0	95	02	54.9
Mail box 26.....	33	32	38.5	95	03	09.5
Iron post at east side of road stamped "Prim. Trav. Sta. No. 29".....	33	32	07.2	95	03	14.3
Albert Bullock's mail box.....	33	31	27.2	95	03	12.2

GILMER QUADRANGLE (CAMP, CASS, MARION, HARRISON, GREGG, AND UPSHUR
COUNTIES, TEX.).

*Geographic positions along Missouri, Kansas and Texas Railway between Dangerfield
and Lasater.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Hughes, also called Hughes Spring, Cass County, Coast and Geodetic Survey bench mark, the west face of a brick building owned by T. B. Keaster, in new part of building, in double column where the old and new parts join, 11 paces from the northwest corner of the building, in the twenty-first tier of brick above the concrete sidewalk, copper bolt.....	32	59	51.4	94	37	52.46
Dangerfield, tablet in court-house.....	33	01	53.3	94	43	19.40
Road crossing.....	32	59	43.5	94	36	42.40
Road crossing.....	32	59	37.4	94	36	24.10
Milepost 812.....	32	57	55.3	94	35	16.20
South edge of right of way, east edge of road, in angle of fence, iron post stamped "Prim. Trav. Sta. No. 210".....	32	57	13.2	94	34	31.70
Road crossing at Pattengill flag station.....	32	56	17.7	94	34	12.70
Milepost 218.....	32	55	39.5	94	34	00.10
Milepost.....	32	54	52.4	94	33	35.50
Road crossing.....	32	54	14.8	94	33	31.70
Avinger, southeast edge of station, iron post stamped "Prim. Trav. Sta.".....	32	54	01.9	94	33	25.30
Avinger, Cass County, Coast and Geodetic Survey bench mark, 26 paces north of old track, 19 paces west of old station, 2 telegraph poles east of milepost 817, 12 paces north of public road paralleling railroad, limestone post.....	32	53	30.2	94	32	46.40
Marion-Cass county-line post.....	32	52	46.2	94	32	16.70
At private road crossing, north edge of right of way, east edge of road, iron post stamped "Prim. Trav. Sta. No. 244".....	32	52	09.9	94	31	43.50
Milepost 821.....	32	51	15.4	94	31	45.90
Orrs flag station, road crossing.....	32	50	32.9	94	31	29.50
Road crossing.....	32	50	16.7	94	30	33.60
Lasater, Marion County, Coast and Geodetic Survey bench mark, 9 paces north of old abandoned grade, 35 paces north of new track, 10 feet east of second telegraph pole (old line), west of platform used as station, 44 paces west of railroad-crossing sign at road crossing, limestone post.....	32	50	05.0	94	30	12.30

Geographic positions along Texas and Pacific Railway, milepost 75 to Big Sandy.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 76, 1,950 feet west of, road crossing.....	32	30	33.6	94	30	19.8
Milepost 77, road crossing 2,000 feet west of.....	32	30	27.9	94	31	29.1
Hallsville, 1,000 feet east of station, street crossing, east of road, 24 feet south of railroad, iron post stamped "Prim. Trav. Sta. No. 137".....	32	30	14.9	94	34	13.6
Lansing flag station, 36 feet north of track at west edge of road, iron post stamped "Prim. Trav. Sta. No. 149".....	32	30	27.0	94	37	33.4
Road crossing 1,000 feet west of milepost 85.....	32	30	14.1	94	39	17.0
Milepost 87, 750 feet west of, private-road crossing.....	32	30	07.5	94	41	12.2
Longview Junction, 30 feet west of station, street crossing.....	32	29	38.4	94	43	45.7
Cattle guard west of section house, west side of guard, 21 feet west of track, iron post stamped "Prim. Trav. Sta.".....	32	29	45.2	94	44	42.8
Willow Springs flag station, road crossing.....	32	30	11.5	94	47	43.2
Road crossing at sawmill, Castleberg's spur.....	32	30	11.6	94	49	05.3
Camps flag station, road crossing, 40 feet north of track at west side of road, iron post stamped "Prim. Trav. Sta. No. 201".....	32	30	15.3	94	51	19.9

Geographic positions along Texas and Pacific Railway, milepost 75 to Big Sandy—Cont'd.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Milepost 99.....	32	30	41.4	94	53	17.2
Road crossing at sawmill and spur.....	32	31	12.8	94	54	38.8
Gladewater, street crossing, 60 feet east of station.....	32	32	04.8	94	56	41.4
Milepost 103, 140 feet west of, 26 feet south of track, iron post stamped "Prim. Trav. Sta. No. 221".....	32	32	14.8	94	56	58.7
Wilkin flag station, cattle guard 100 feet west of road crossing at 40 feet north of track, iron post stamped "Prim. Trav. Sta. No. 233".....	32	33	29.2	95	00	43.2
Milepost 110, 500 feet east of, road crossing.....	32	34	20.8	95	03	33.2
Big Sandy, crossing of Texas and Pacific Rwy. and Cotton Belt Route.....	32	34	53.3	95	06	32.4

Geographic positions along St. Louis Southwestern Railway, Big Sandy to Pittsburg.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing, 32 feet east of track, in angle of fence at north side of wagon road, iron post stamped "Prim. Trav. Sta. 255".....	32	35	03.0	95	06	15.1
Pinnacle flag station, road crossing at siding.....	32	37	32.9	95	03	48.8
Milepost 519.....	32	38	32.2	95	02	23.7
Road crossing, 32 feet east of track, south edge of road, iron post stamped "Prim. Trav. Sta. No. 295".....	32	38	49.3	95	02	06.3
Pritchett flag station, 530 feet northeast of mail crane, road crossing.....	32	39	45.4	95	01	02.9
Runaway flag station, road crossing.....	32	40	55.2	94	59	09.9
Road crossing.....	32	42	27.7	94	57	22.8
Gilmer, 1 mile south of, milepost 511, road crossing, 36 feet west of track, south edge of road, iron post stamped "Prim. Trav. Sta. No. 341".....	32	43	05.3	94	56	47.5
Gilmer, street crossing at north end of station.....	32	43	49.7	94	56	53.0
Road crossing at switch stand.....	32	47	04.8	94	57	21.0
Delrose flag station, road crossing north of, 30 feet west of track, at edge of road, iron post stamped "Prim. Trav. Sta.".....	32	47	22.5	94	57	28.0
Bettie, 100 feet north of station, road crossing.....	32	48	29.4	94	57	36.2
Smith flag station, 600 feet south of, 38 feet west of track, at cattle guard, iron post stamped "Prim. Trav. Sta.".....	32	50	36.3	94	58	13.7
Road crossing.....	32	51	47.5	94	58	10.0
Road crossing at church.....	32	53	22.9	94	58	01.9
Road crossing, 40 feet west of track and north of road, iron post stamped "Prim. Trav. Sta.".....	32	55	26.2	94	58	15.9
Road crossing north of water tank.....	32	57	27.3	94	57	55.7
Pittsburg, crossing of Missouri, Kansas and Texas and St. Louis Southwestern Rwys.....	32	59	47.7	94	58	08.8

JEFFERSON QUADRANGLE (CASS, JEFFERSON, AND MARION COUNTIES, TEX.).

Geographic positions along Missouri, Kansas and Texas Railway between Avinger and Jefferson.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing at milepost.....	32	49	15.1	94	29	01.3
Iron post at north edge of right of way and east edge of road, stamped "Prim. Trav. Sta. No. 282".....	32	49	00.7	94	27	33.0
Milepost 828.....	32	48	41.2	94	26	12.4
Kelleyville, Marion County, Tex., Coast and Geodetic Survey bench mark, 30 feet west of and across track from switch stand at west end of siding, between third and fourth telegraph poles east of milepost 830, 14 paces north of track, in an angle formed by right-of-way fence and fence crossing railroad, limestone post.....	32	47	19.9	94	25	01.5
At road crossing, south edge of right of way, east edge of road, iron post stamped "Prim. Trav. Sta. No. 317".....	32	47	09.6	94	23	03.0
Milepost 833.....	32	46	45.3	94	22	23.8
Road crossing at milepost 834.....	32	46	07.4	94	21	47.6
Crossing of Texas Pacific Rwy.....	32	45	53.4	94	21	19.9
Jefferson, Marion County, Coast and Geodetic Survey bench mark, 7 feet north of telegraph pole just opposite the Missouri, Kansas and Texas Rwy. station, almost in line with east end of building and 16 paces north of track, limestone post.....	32	45	31.8	94	20	38.4

Geographic positions along Texas and Pacific Railway between Marshall and Bivins.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Marshall, railroad junction and street crossing under tracks.....	32	33	05.2	94	22	07.6
Milepost 65.....	32	34	25.8	94	22	00.2
Road crossing.....	32	38	07.8	94	21	24.6
Road crossing.....	32	39	07.5	94	20	51.2
Woodlawn, street crossing 60 feet south of station.....	32	40	02.1	94	20	35.8
Private-road crossing at section house.....	32	40	29.6	94	20	29.2
Milepost 55, 1,800 feet north of, road crossing.....	32	43	00.0	94	21	02.4
Road crossing.....	32	43	58.4	94	21	27.2
Milepost 53.....	32	44	22.0	94	21	31.3
Road crossing.....	32	46	08.6	94	20	34.5
Private-road crossing, at west edge of right of way, north edge of road, iron post stamped "Prim. Trav. Sta. No. 346".....	32	47	35.1	94	19	50.7
Milepost 47.....	32	48	39.2	94	18	56.3
Road crossing, west edge of right of way, south edge of road, iron post stamped "Prim. Trav. Sta. No. 362".....	32	50	20.4	94	17	54.8
Milepost 43.....	32	51	42.6	94	17	03.2
Road crossing.....	32	52	19.6	94	17	03.0
Lodi, street crossing near, east edge of right of way, south edge of road, in angle of fence, iron post stamped "Prim. Trav. Sta. No. 379".....	32	52	34.1	94	16	54.1
Milepost 41.....	32	53	19.7	94	16	35.1
Milepost 40.....	32	54	09.1	94	16	22.6
Road crossing, west edge of right of way, south edge of road, iron post stamped "Prim. Trav. Sta. No. 398".....	32	55	01.6	94	16	00.4
Kildare station.....	32	56	27.9	94	15	01.6
Station No. 411 and also station No. 527 of Malta-Kildare line.....	32	56	45.1	94	14	53.6
Kildare station, 0.5 mile north of.....	32	56	45.1	94	14	46.2
Road crossing, 600 feet north of milepost 36, iron post stamped "Prim. Trav. Sta. No. 4".....	32	57	17.9	94	14	21.3
Milepost 35.....	32	57	57.5	94	13	52.8
Milepost 34.....	32	58	40.8	94	13	17.9
Water tank.....	32	59	42.3	94	12	35.4

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Tom Dodge's mail box.....	32	58	15.4	94	18	33.5
Road to right.....	32	58	00.2	94	17	53.8
Crossroads.....	32	57	05.1	94	15	39.0
Kildare public school, northeast corner of building lot.....	32	56	40.2	94	14	57.2

Geographic positions along Texas and Pacific Railway, Louisiana-Texas State line via Marshall to milepost 75.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Missouri, Kansas and Texas Rwy. crossing, 40 feet south of track, 1,000 feet east of crossing, iron post stamped "Prim. Trav. Sta. No. 77".....	32	28	34.9	94	03	00.5
Waskom station, 200 feet east of, street crossing.....	32	28	48.1	94	03	35.4
Milepost 344, road crossing.....	32	29	03.3	94	05	04.3
Jonesville, 400 feet east of station, street crossing.....	32	29	52.7	94	06	39.2
Road crossing 1.5 miles west of Jonesville, 30 feet south of track, west edge of road, iron post stamped "Prim. Trav. Sta. No. 55".....	32	30	03.1	94	08	07.9
Road crossing.....	32	30	06.5	94	09	08.9
Road crossing.....	32	30	47.2	94	11	15.7
Road crossing.....	32	31	20.2	94	12	57.1
Scottsville flag station, road crossing.....	32	32	16.8	94	14	19.7
Road crossing, iron post stamped "Prim. Trav. Sta. No. 27".....	32	32	31.3	94	15	27.7
Road crossing.....	32	32	45.2	94	16	49.3
Milepost 359, 300 feet east of, road crossing.....	32	33	15.3	94	18	56.0
Road crossing, at first telegraph pole east of milepost 68. Reference mark; An iron post 40 feet south of track at east side of road, stamped "Prim. Trav. Sta. 89".....	32	32	52.5	94	23	23.5
Abner flag station, road crossing, 40 feet north of track on west side of road, iron post stamped "Prim. Trav. Sta. No. 193".....	32	30	38.2	94	26	08.2
Road crossing at milepost 73.....	32	30	28.2	94	27	11.4
Road crossing 0.25 mile west of milepost 75.....	32	30	57.1	94	29	23.1

MOUNT PLEASANT QUADRANGLE (BOWIE, CASS, MORRIS, AND TITUS COUNTIES, TEX.).

Geographic positions along highways, Malla to Simms.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road to right	33	28	10.2	94	31	49.3
Crossroads	33	27	33.6	94	31	41.2
Crossroads (dim.)	33	27	00.2	94	31	38.0
Simms post-office, crossroads, 6 miles from	33	26	01.4	94	31	38.0
Bridge	33	25	13.3	94	31	35.1
Anderson Creek, bridge over	33	24	08.6	94	31	34.1
Sam Linsey's house	33	23	19.5	94	31	24.8
John Harris's house, iron post 600 feet west of, stamped "Sta. No. 94"	33	22	47.6	94	31	18.8
Road to right	33	21	18.1	94	31	13.3
Simms post-office, road to left, 400 feet east of	33	20	59.1	94	30	29.8
Bridge	33	19	28.1	94	30	01.1

Geographic positions along cotton-belt route near Bassett.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing	33	19	00.6	94	29	42.4
Milepost 449	33	18	34.4	94	32	08.1
Bassett station	33	18	42.9	94	33	46.5
Road south	33	18	31.1	94	34	13.2

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Signboard, "Bassett 4 miles"	33	16	13.0	94	31	51.0
Sulphur River, north bank of county line	33	16	06.7	94	31	47.4
Fence, corner of	33	15	31.4	94	31	17.6
Milepost, "21 miles to Linden"	33	15	22.8	94	30	55.6
Bryans Mill post-office, 0.25 mile northwest of, iron post stamped "Prim. Trav. Sta. 248"	33	14	15.2	94	30	05.4
ALONG WEST EDGE OF QUADRANGLE.						
Greenhill post-office	33	15	32.4	94	59	50.8
Payne's store, iron post stamped "Sta. No. 178"	33	14	58.8	94	59	49.5
W. W. Smith's house, 500 feet south of, east edge of road, iron post stamped "Sta. No. 193"	33	13	17.2	94	59	20.7
Mount Pleasant, 2 miles north of, 700 feet north of creek bridge, east edge of road, iron post stamped "Prim. Trav. Sta. No. 215"	33	11	14.8	94	58	21.7
Mount Pleasant court-house, tablet	33	09	23.0	94	58	10.1

Geographic positions along St. Louis Southwestern Railway between Mount Pleasant and Pittsburg.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
St. Louis Southwestern Rwy., street crossing	33	09	11.0	94	58	08.3
Road crossing	33	08	20.2	94	58	24.5
On west edge of right of way and north side of road, road crossing, iron post stamped "Prim. Trav. Sta. No. 12"	33	07	20.3	94	58	26.6
Road crossing	33	06	14.3	94	58	15.1
West edge of right of way, 50 feet west of track at gate, iron post stamped "Prim. Trav. Sta. No. 24"	33	05	00.3	94	58	07.8
Cypress flag station, road crossing at section house 300 feet north of	33	03	37.9	94	58	08.7
North side of road, east edge of right of way, iron post stamped "Prim. Trav. Sta. No. 37"	33	02	24.5	94	58	19.7
Road crossing	33	01	21.2	94	58	15.5
Milepost 490	33	00	45.7	94	58	08.6
On west edge of right of way, iron post stamped "Prim. Trav. Sta. No. 50"	33	00	01.9	94	58	07.7
Pittsburg, crossing of Missouri, Kansas and Texas and St. Louis Southwestern Rwys.	32	59	47.7	94	58	08.8

222 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along Missouri, Kansas and Texas Railway between Pittsburg and Hughes.

Station.	Latitude.	Longitude.
Pittsburg, Camp County, 0.25 mile west of station, on concrete arch culvert of Missouri, Kansas and Texas Rwy., 60 feet north of water tank, 1 telegraph pole east of milepost 786, top of coping to north side, copper bolt.	32 59 46.5	94 58 26.5
Milepost 789, private road crossing 100 feet north of, north of track on edge of right of way, iron post stamped "Prim. Trav. Sta."	33 00 42.4	94 55 34.6
Flag station, road crossing	33 00 53.8	94 54 11.5
Camp-Titus county line, 50 feet south of track, iron post stamped "Prim. Trav. Sta. No. 75"	33 01 05.0	94 52 35.2
Milepost 793	33 01 28.0	94 51 36.8
150 feet east of road crossing on south edge of right of way, iron post stamped "Prim. Trav. Sta. No. 93"	33 01 43.4	94 50 03.5
Carson-Titus county line, Coast and Geodetic Survey bench mark, 15 paces south of track, in an angle of fence on west side of road crossing, 7 telegraph poles west of station, 5 feet from south and east fences, limestone post 36 by 6 by 6 inches.	33 02 10.8	94 49 06.7
Milepost 798	33 01 49.5	94 46 57.7
South edge of right of way, east edge of road, iron post stamped "Prim. Trav. Sta. No. 118"	33 01 32.9	94 45 52.4
Road crossing	33 01 22.3	94 45 17.5
Road crossing	33 01 31.1	94 43 44.0
Dangerfield, tablet in court-house	33 01 53.3	94 43 19.4
Road crossing	33 01 55.8	94 42 06.0
Milepost 805	33 00 58.4	94 40 54.3
Road crossing	33 00 50.4	94 40 42.3
Veals flag station, crossroads at, north edge of right of way, iron post stamped "Prim. Trav. Sta. No. 171"	33 00 42.7	94 40 08.7
County-line post	33 00 19.3	94 39 14.5
Hughes, also called Hughes Spring, Cass County, Coast and Geodetic Survey bench mark, in west face of a brick building owned by T. B. Keaster, in new part of building, in the double column where the old and new parts join, 11 paces from northwest corner of building and in twenty-first tier of brick above the concrete sidewalk, copper bolt.	32 59 51.4	94 37 52.5

MOUNT VERNON QUADRANGLE (RED RIVER AND TITUS COUNTIES, TEX.).

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Cuthand Creek bridge, south end of, road to right	33 29 57.60	95 03 12.8
East edge of road, iron post stamped "Prim. Trav. Sta. No. 59"	33 28 41.20	95 03 19.4
Cuthand post-office	33 28 02.90	95 03 21.3
Cuthand, 2,100 feet south of, road to right	33 27 43.50	95 03 23.5
Crossroads, iron post stamped "Prim. Trav. Sta. No. 69"	33 27 17.05	95 03 20.6
Dim road to left	33 25 37.20	95 03 38.4
East edge of road, iron post stamped "Prim. Trav. Sta. No. 86"	33 24 36.50	95 03 53.3
County line, northeast end of Sulphur bridge	33 23 24.30	95 03 46.5
Opposite new house, iron post stamped "Prim. Trav. Sta. No. 109"	33 21 37.90	95 03 49.9
Mount Pleasant, milepost 13 from, 300 feet north of, iron post stamped "Prim. Trav. Sta. No. —"	33 19 47.50	95 02 09.4
White Oak Creek, north bank	33 18 37.50	95 01 24.2
South of White Oak Creek, on summit of ridge, west edge of road, iron post stamped "Prim. Trav. Sta. No. 154"	33 17 34.60	95 00 45.8

PARIS QUADRANGLE (FANNIN AND LAMAR COUNTIES, TEX.).

Geographic positions along St. Louis and San Francisco Railroad between Paris, Tex., and Goodland, Ind. T.

Station.	Latitude.	Longitude.
TEXAS.		
	° ' "	° ' "
Paris, crossing of Texas and Pacific Rwy. and St. Louis and San Francisco R. Rs.	33 38 55.8	95 34 07.3
Paris station, Frisco street crossing at north end of	33 39 39.6	95 34 03.3
Road crossing	33 40 12.3	95 34 03.8
Road crossing, iron post stamped "Prim. Trav. Sta. No. 18," south of road, 50 feet east of center of track	33 41 39.7	95 33 22.7
Road crossing	33 43 09.1	95 33 12.0

Geographic positions along St. Louis and San Francisco Railroad between Paris, Tex., and Goodland, Ind. T.—Continued.

Station.	Latitude.	Longitude.
TEXAS—continued.		
Hinckley flag station, road crossing, at angle of fence at east edge of right of way, north edge of road, iron post stamped "Prim. Trav. Sta. No. 28," 50 feet east of center of road.....	° ' " 33 44 18.6	° ' " 95 32 55.2
Road crossing, east edge of right of way and south edge of road, iron post stamped "Prim. Trav. Sta. No. 40," 50 feet east of center of track.....	33 47 22.1	95 31 50.5
Lenoir flag station, road crossing, 30 feet west of track, north side of road, iron post stamped "Prim. Trav. Sta. No. 45".....	33 48 43.7	95 31 24.0
Store, road crossing at.....	33 50 08.5	95 30 55.2
Arthur station, road crossing south of.....	33 52 07.7	95 30 16.8
INDIAN TERRITORY.		
Bridge, north end of, on abutment, 15 feet east of center of track, tablet.....	33 52 39.0	95 30 02.8
Milepost 567, road crossing at.....	33 53 44.1	95 29 36.8
Milepost 565.....	33 55 25.1	95 30 12.6
Grant station, road crossing 400 feet south of.....	33 56 25.3	95 30 34.7
Hugo, crossing Choctaw R. R.....	34 00 30.4	95 30 54.1
Goodland flag station, road crossing at.....	34 02 53.7	95 31 42.6
Road crossing (line turns west on wagon road).....	34 03 18.1	95 32 03.6
Goodland triangulation station, on a high flat prairie ridge owned by Tom Self, 4 miles west of Goodland. From quarter corner between sec. 1 and 2, T. 6 S., R. 16 E., station bears S. 79° 25' W., distant 11.63 chains. Station mark: Shell rocks piled around foot of tall signal pole.....	34 03 43.0	95 35 36.3

SHAWNEETOWN QUADRANGLE (BOWIE AND RED RIVER COUNTIES, TEX.).

Geographic positions along Texas and Pacific Railway between Malta and Clarksville.

Station.	Latitude.	Longitude.
	° ' " ° ' "	° ' " ° ' "
Road crossing, on north line of right of way, iron post stamped "Prim. Trav. Sta. No. 103".....	33 29 15.3	94 31 19.0
Milepost 30.....	33 29 40.7	94 32 47.4
Road crossing, 60 feet north of track, iron post stamped "Prim. Trav. Sta. No. 113".....	33 30 05.3	94 34 08.9
Road crossing.....	33 30 18.3	94 36 33.4
De Kalb station, street crossing 70 feet west of.....	33 30 29.3	94 36 59.6
De Kalb station, 1,980 feet west of, on north side of track, iron post stamped "Prim. Trav. Sta. 123".....	33 30 38.3	94 37 19.4
Road crossing.....	33 30 57.5	94 38 08.1
Milepost 38.....	33 31 49.0	94 40 35.1
Oak Grove, 840 feet east of, north side of right of way, iron post stamped "Prim. Trav. Sta. No. 143".....	33 32 02.9	94 41 05.2
Milepost 40.....	33 32 37.8	94 42 25.6
North side of track, west side of road, at road crossing, iron post stamped "Prim. Trav. Sta. No. 149".....	33 32 43.7	94 42 37.4
Milepost 42.....	33 33 17.2	94 44 19.2
Sixty feet north of track, on west side of road crossing, iron post stamped "Sta. 160".....	33 33 10.1	94 45 20.1
Avery station, street crossing 50 feet west of.....	33 32 58.1	94 46 50.2
Milepost 46.....	33 32 59.5	94 48 24.9
Road crossing, north side of track and east of road, iron post stamped "Prim. Trav. Sta. No. 174".....	33 33 20.4	94 49 07.8
Road crossing.....	33 33 59.5	94 50 43.7
North of track, west of road crossing, iron post stamped "Prim. Trav. Sta. 186".....	33 34 18.9	94 52 16.9
Road crossing.....	33 34 28.0	94 53 22.3
Anona station, 800 feet east of, 60 feet north of track, iron post stamped "Prim. Trav. Sta. No. 195".....	33 34 47.6	94 54 30.9
Private-road crossing, north of track and west of road, iron post stamped "Prim. Trav. Sta. No. 203".....	33 35 31.3	94 57 00.3
Milepost 256.....	33 35 52.5	94 58 09.1
Road crossing under bridge 288.....	33 36 09.3	94 59 02.2
Road crossing.....	33 36 18.5	94 59 43.5
Road crossing, north of track and east side of road, iron post stamped "Prim. Trav. Sta. 219".....	33 36 41.1	95 01 29.7
Clarksville, east edge of, north of track, at road crossing, iron post stamped "Prim. Trav. Sta. No. 225".....	33 36 56.7	94 02 46.1
Clarksville, west end of station, street crossing.....	33 37 00.9	94 03 08.4

224 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

TEXARKANA QUADRANGLE (BOWIE AND CASS COUNTIES, TEX.; CADDO PARISH, LA.).

Geographic positions along Texas and Pacific Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Texarkana, crossing of Texas and Pacific and Kansas City Southern Rlys.	33 25 02.36	94 03 07.8
Milepost 2.	33 25 26.92	94 04 31.1
Road crossing (grade)	33 25 51.3	94 05 52.8
Junction station (operator's window)	33 26 20.5	94 07 30.1
Road crossing (grade)	33 26 30.3	94 08 14.6
Iron bench-mark post stamped "Prim. Trav. Sta. 23"	33 26 44.9	94 09 26.0
Road crossing	33 26 54.0	94 10 04.0
Leary post-office, road crossing west of	33 27 32.8	94 12 25.7
Milepost 12	33 27 46.6	94 14 30.7
Milepost 14	33 27 58.2	94 16 36.2
Hooks station, 50 feet west of, iron post stamped "Prim. Trav. Sta. 52"	33 27 56.4	94 17 23.4
Milepost 16	33 27 51.9	94 18 40.3
Milepost 18	33 27 45.3	94 20 45.8
Road crossing	33 27 41.5	94 21 57.0
Milepost 21	33 27 35.2	94 23 51.8
New Boston station, street crossing at east end of	33 27 32.6	94 24 41.2
New Boston station, iron post at road crossing, 0.5 mile west of, stamped "Prim. Trav. Sta. 83"	33 27 33.5	94 25 24.5
Milepost 25	33 28 14.7	94 27 53.5
Road crossing	33 28 37.3	94 29 10.7
Malta, Norman's store, iron post 300 feet east of, stamped "Prim. Trav. Sta. 103"	33 29 15.3	94 31 19.0

Geographic positions along Texas and Pacific Railway between Bivins and Texarkana.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bivins, road crossing 125 feet south of, iron post stamped "Prim. Trav. Sta. No. 25"	33 01 12.8	94 11 55.4
Milepost 29	33 02 31.3	94 11 02.3
Road crossing under track	33 04 00.5	94 10 50.7
Milepost 26	33 05 03.8	94 10 34.7
Atlanta, Main street crossing	33 06 50.6	94 09 55.8
Milepost 23	33 07 31.6	94 09 33.6
Tank, road crossing 1,000 feet north of	33 08 43.3	94 09 11.2
Queen City station, street crossing north of	33 09 02.6	94 09 01.9
Road crossing	33 09 47.4	94 08 59.5
Tenark flag station, road crossing	33 10 56.6	94 09 06.8
Road crossing	33 12 50.4	94 08 10.8
Section house No. 40, tool house	33 13 25.6	94 08 09.9
Springdale flag station	33 14 00.1	94 08 03.9
Alamo post-office, road crossing, iron post stamped "Prim. Trav. Sta. No. 107"	33 15 56.1	94 06 48.3
Milepost 11	33 16 36.0	94 05 21.0
Sulphur Bridge, water tank at north end of	33 18 00.7	94 03 39.8
Railroad station	33 18 28.3	94 03 24.3
Road crossing	33 19 22.3	94 03 23.5
Road crossing	33 20 07.4	94 03 28.4
Road crossing	33 20 22.5	94 03 30.2
Milepost 4, road crossing 60 feet north of	33 22 01.1	94 03 41.2
Road crossing	33 22 46.8	94 03 46.2
Crossing of Kansas City Southern and Texas and Pacific Rlys.	33 23 23.3	94 03 43.0
Texarkana, crossing of Kansas City Southern and Texas and Pacific Rlys.	33 25 02.4	94 03 07.8

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Linden, milepost 18 miles from.....	33	13	23.2	94	29	41.4
Crossroads.....	33	12	48.5	94	29	11.3
Maple and Douglasville roads, intersection of.....	33	11	41.8	94	29	04.1
Road to left.....	33	11	40.9	94	28	33.0
Cusseta post-office, 60 feet south of.....	33	09	42.7	94	27	27.1
Linden, at crossroads 9 miles north of, iron post stamped "Prim. Trav. Sta. No. 341".....	33	07	08.8	94	25	18.6
Crossroads.....	33	06	15.9	94	25	27.5
Linden, milepost 6 miles from.....	33	05	01.1	94	24	38.6
W. N. Anderson's house.....	33	04	45.1	94	24	27.3
Crossroads.....	33	03	09.8	94	23	49.5
Road to right.....	33	02	45.5	94	23	49.3
Linden, milepost 2 miles from.....	33	01	49.3	94	23	18.1
Linden court-house, bench-mark post at northeast corner of yard, stamped "Prim. Trav. Sta. No. 429".....	33	00	39.8	94	21	52.8
Road to right.....	33	00	19.0	94	21	34.3

Geographic positions along Kansas City Southern Railway between Rodessa and Bloomburg.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Rodessa station, 740 feet south of, road crossing at section house, 30 feet west of track, on north side of road, iron post stamped "Prim. Trav. Sta. No. 286".....	32	58	10.4	93	59	37.4
Station 293, sawmill, flag station, road crossing.....	33	00	04.9	94	00	42.0
Station 298, State line Arkansas and Louisiana, road crossing. Reference mark: Iron post at corner of fence west of track.....	33	01	09.7	94	01	18.6
Milepost 514.....	33	02	40.6	94	02	09.9
Ravana flag station, 60 feet south of crossing, 35 feet west of track, iron post stamped "309".....	33	03	58.7	94	02	29.0
Section house No. 73.....	33	05	07.8	94	02	27.7
Arkansas-Texas State line, 50 feet east of track, iron post stamped "Prim. Trav. Sta. No. 320".....	33	06	30.4	94	02	35.1

Geographic positions along Kansas City Southern Railway between Bloomburg and Atlanta.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Bloomburg station, 300 feet north of, 35 feet south of track, west side of road, iron post stamped "Prim. Trav. Sta.".....	33	08	16.3	94	03	38.2
Road crossing 2.5 miles southwest of Bloomburg.....	33	08	05.0	94	04	51.1
Road crossing.....	33	08	11.1	94	06	34.1
Road crossing, 19 feet north of track, at west edge of road, iron post stamped "Prim. Trav. Sta. No. 349".....	33	08	13.4	94	07	32.8

UTAH-NEVADA.

TRIANGULATION STATIONS.

BEAVER, IRON, AND PIUTE COUNTIES, UTAH; LINCOLN COUNTY, NEV.

IRON SPRINGS SPECIAL QUADRANGLE.

In the fall of 1905 Fred McLaughlin, assistant topographer, occupied seven new triangulation stations, based on Pioche and Tushar stations of the Coast and Geodetic Survey.

BLUE, BEAVER COUNTY, UTAH.

On the highest and most prominent peak of the Blue Mountains, about 12 miles north of Lund railroad station.

Station mark: A triangulation tablet cemented in solid rock.

[Latitude $38^{\circ} 30' 42.19''$. Longitude $113^{\circ} 26' 04.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tushar.....	276 13 22.0	96 51 31.9	4.9534284
Hot.....	326 42 56.5	146 48 10.0	4.3487240
Peck.....			4.6893173
Springs.....			4.6399762
Iron.....			4.7707540
Frisco Peak.....			4.5946790

FRISCO PEAK, BEAVER COUNTY, UTAH.

On Quartzite Hill, a prominent timbered peak about 4 miles north of Frisco railroad station.

Station mark: A tablet cemented in solid rock.

[Latitude $38^{\circ} 47' 33.66''$. Longitude $113^{\circ} 09' 33.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hot.....	13 19 29.1	193 14 26.0	4.7095103
Tushar.....	302 13 56.8	122 41 55.6	4.8874153
Granite.....			4.6432765
Blue.....			4.5946789

GRANITE, BEAVER COUNTY, UTAH.

On the highest part of sharp granite range 10 miles east of Milford railroad station. Can be approached only from the west. About 600 feet north of this point is a sharp, isolated, and inaccessible rock, located by the United States Coast and Geodetic Survey, called Milford Needle.

Station mark: A triangulation tablet cemented in solid rock.

[Latitude $38^{\circ} 30' 55.48''$. Longitude $112^{\circ} 47' 54.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tushar.....	287 23 29.8	107 37 55.4	4.5486284
Hot.....	66 22 44.6	246 04 14.8	4.6750857
Frisco Peak.....			4.6432765

HOT, IRON COUNTY, UTAH.

On the southernmost and most prominent point of the Hot Springs Mountains, about 15 miles northeast of Lund railroad station.

Station mark: A triangulation tablet set in stone and covered by a cairn 4 feet high.

[Latitude $38^{\circ} 20' 36.71''$. Longitude $113^{\circ} 17' 39.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Springs.....	4 37 15.70	184 36 02.2	4.5563142
Iron.....	356 03 36.25	176 05 03.0	4.6987596
Blue.....	146 48 10.00	320 42 56.5	4.3487240
Frisco Peak.....	193 14 26.00	373 19 29.1	4.7095103
Granite.....	246 04 14.80	66 22 44.6	4.6750857
Tushar.....	263 28 56.80	84 01 49.3	4.8896770
Pioche.....	59 22 13.80	238 54 10.0	4.889691
Peak.....			4.5313362

IRON, IRON COUNTY, UTAH.

On Iron Mountain, a prominent peak about 16 miles west-southwest of Cedar City post-office, on the highest part of a large iron rock. Fifteen feet west (true) of the geodetic point a rock cairn 4 feet high was built over a triangulation tablet set in solid rock.

[Latitude $37^{\circ} 53' 39.63''$. Longitude $113^{\circ} 15' 19.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peak.....	205 12 50.0	25 16 24.1	4.2992595
Springs.....	155 38 22.1	335 35 42.5	4.1858920
Hot.....	176 05 03.0	356 03 36.2	4.6987596
Pioche.....	98 32 56.9	278 03 35.1	4.8494989
Blue.....			4.7707542

PEAK, IRON COUNTY, UTAH.

On the sharpest of the Three Peaks, about 11 miles west of Cedar City post-office and 2 miles north of Iron Springs.

Station mark: A tablet cemented in solid rock, over which a cairn was erected.

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[Latitude 38° 03' 23.98". Longitude 113° 09' 31.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Iron.....	25 16 24.1	205 12 50.0	4.2992595
Hot.....	159 34 07.2	339 29 05.1	4.5313362
Blue.....			4.6893173
Springs.....			4.1862740

SPRINGS, IRON COUNTY, UTAH.

On the easternmost and highest of three peaks about 20 miles south-southwest of Lund railroad station.

Station mark: A tablet cemented in a rock, over which a cairn 4 feet high was erected.

[Latitude 38° 01' 12.87". Longitude 113° 19' 38.72".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hot.....	184 36 02.2	4 37 15.7	4.5563142
Iron.....	335 35 42.5	155 38 22.1	4.1858920
Blue.....			4.6399761
Peak.....			4.1862739

TUSHAR, PIUTE COUNTY, UTAH.

A Coast Survey station of 1882, on summit of northernmost of the highest of three peaks in Tushar Range, the backbone of which forms the boundary between Beaver and Piute counties; the peak is locally known as Mount Belknap. Can be reached most easily from Marysville, a village on upper Sevier River, 10 miles distant in an air line.

Station mark: A $\frac{5}{8}$ -inch copper bolt leaded in solid rock, around and over which was built a stone foundation pier for theodolite, with a stone slab with a drilled hole in its top. Top of copper bolt is 11 $\frac{1}{4}$ inches below hole in slab. The vertical-circle station is almost due north 34.12 feet from station mark. Circular stone walls around these stations were left standing. The wall around station mark, 11 feet interior diameter, 2.5 feet thick, and 4.5 feet high, is concentric with station bolt and makes an excellent reference mark in the absence of usual drill holes, which were not made owing to the loose condition of the shale rocks about the station.

[Latitude 38° 25' 10.31". Longitude 112° 24' 42.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hot.....	84 01 49.3	263 28 56.8	4.8896770
Granite.....	107 37 55.4	287 23 29.8	4.5486284
Frisco Peak.....	122 41 55.6	302 13 56.8	4.8874153
Blue.....	96 51 31.9	276 13 22.0	4.9534284
Pioche.....	71 59 46.3	250 58 56.1	5.1802173

PIOCHE, LINCOLN COUNTY, NEV.

A station of the Coast Survey, located on the highest rock knoll of a peak in the mountains east of Eagle Valley. Peak is about 1,000 feet west of boundary line between Nevada and Utah and bears N. $80^{\circ} 25' E.$, distant 22.5 miles (about 33 miles by road) from the courthouse in Pioche. The geodetic point is marked by a $\frac{1}{2}$ -inch copper bolt leaded in solid rock in the center of a stone foundation pier for theodolite as a subsurface mark. The pier is covered by a stone slab with a $\frac{3}{4}$ -inch drill hole in its center as a surface mark. The copper bolt is $8\frac{3}{4}$ inches below top of drill hole. The vertical-circle station bears N. $26^{\circ} 20' E.$, distant 69.23 feet from geodetic point, and both points were surrounded with circular stone walls which were left standing.

Reference marks: Five drill holes, one N. $34^{\circ} 28' E.$, distant 8.27 feet; one S. $88^{\circ} 22' E.$, distant 7.91 feet; one S. $15^{\circ} 14' E.$, distant 8.92 feet; one N. $88^{\circ} W.$, distant 7.71 feet, and one N. $28^{\circ} 57' W.$, distant 6.56 feet from geodetic point.

[Latitude $37^{\circ} 59' 10.90''$. Longitude $114^{\circ} 03' 04.82''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Wheeler Peak.....	168	26	35.00	348	16	48.08	5.05423265
Tushar.....	250	58	56.09	71	59	46.26	5.18021727
Hot.....	238	54	10.00	59	22	13.80	4.88806910
Iron.....	278	03	35.10	98	32	56.90	4.84949890

WYOMING.

TRIANGULATION STATIONS.

BIGHORN, FREMONT, AND NATRONA COUNTIES.

ALCOVA, BROKEN HORN, LOST CABIN, NOWOOD, NOWATER, AND WATROUS QUADRANGLES.

During the season of 1905 T. M. Bannon, topographer, extended triangulation from the stations Broken Horn, Shepherd, and Reef, in the vicinity of Casper, Wyo., established by Sledge Tatum, topographer, from the Coast and Geodetic Survey stations Morrison and Table Mound in Colorado, northwestward to stations Deranch and Mahogany, established by Mr. Robertson from the Ranchester base and Sheridan position. The differences of the positions and bases are noted in the description for Mahogany.

Positions are given on the United States Standard datum.

DERANCH, BIGHORN COUNTY.

On the most prominent peak of Lyesite Mountain at the head of Lake Creek, a tributary of Kirby Creek. Road goes up one fork of Bridger Creek almost to station. Deranch post-office is about 7 miles

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south of station. Peak is timbered on the Lake Creek side and smooth and grassy on the Bridger Creek side. Water in both creeks.

Signal: A rock cairn 8 feet high, built around small pine.

Station mark: A bronze triangulation tablet set in stone which was placed in ground under center of signal.

[Latitude $43^{\circ} 34' 03.42''$ ($43^{\circ} 34' 05.67''^a$). Longitude $107^{\circ} 44' 05.57''$ ($107^{\circ} 44' 03.23''^a$).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Copper.....	42	11	07.23	222	04	57.40	<i>Meters.</i> 4.2549762
Cottonwood Pass.....	311	39	39.47	131	46	49.18	4.2737525
Canyon ^a	72	06	05.85	251	47	08.90	4.5911836
Kirby ^a	112	55	33.71	292	44	11.96	4.3811117
Honeycomba.....	199	25	15.59	19	29	28.37	4.3956133
Mahogany ^a	254	14	08.07	74	29	11.35	4.4843181

^a From Ranchester base.

MAHOGANY, BIGHORN COUNTY.

On highest point of Mahogany Butte, a prominent spur from the main mountain, forming a perpendicular bluff on the side of No Wood Creek, about 5 miles down the creek from No Wood post-office. Road from No Wood to Redbank and Big Trails passes directly under station. Take this road from No Wood post-office to a point where it crosses a creek on a bridge, then take trail to right.

Station mark: A bronze triangulation tablet cemented in solid rock, over which a cairn 8 feet high is centered.

[Latitude $43^{\circ} 38' 29.83''$ ($43^{\circ} 38' 32.10''^a$). Longitude $107^{\circ} 22' 16.20''$ ($107^{\circ} 22' 13.57''^a$).]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	
Deranch.....	74	29	03.28	254	14	00.31	<i>Meters.</i> 4.4842345
Deranch ^a	74	29	11.345	254	14	08.074	4.4843181
Cottonwood Pass.....	36	39	15.13	216	31	23.01	4.4117437
Honeycomba.....	125	58	26.19	305	47	36.38	4.4145173

^a From Ranchester base.

COPPER, FREMONT COUNTY.

On a high grassy hill of the Bridger Mountains between the forks of Little or Dry Bridge Creek and West Bridge Creek on the north and the drainage of Dry Creek on the south, 5 miles west of Deranch and 2 miles west of Deranch Pass. Station is on rim of Wind River Basin and visible for a great distance. Easily reached from north. A big lone pine near station distinguishes the hill.

Station mark: A bronze triangulation tablet cemented into a large stone buried flush with ground and centered under a small rock monument and tripod signal.

Reference marks: Top of two nails driven into a blazed place 6 feet above ground in a big pine tree 42.05 feet southeast of station.

[Latitude 43° 26' 51.19". Longitude 107° 53' 02.773".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badwater.....	111 38 45.88	291 16 53.32	4.6650032
Round Hill.....	144 12 08.09	324 00 20.15	4.5985699

HERDER, FREMONT COUNTY.

(Not occupied.)

A sheep herder's monument on a hill south of the stage road about one-half way between Round Hill and the Buck Camp.

[Latitude 43° 05' 22.67". Longitude 107° 35' 00.50".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Round Hill.....	171 33 14.8	351 32 40.6	3.8867036
Poison.....	225 28 23.0	45 30 49.6	3.8325969

POISON, FREMONT COUNTY.

On a small hill known as Round Hill, on the south side of Poison Creek, about 500 feet southwest of Round Hill stage station, at the junction of the Casper-Lander road and the Casper-Thermopolis stage road and telephone line. The station is near the Fremont-Natrona county line.

Station mark: A bronze tablet cemented into a large boulder buried several inches under ground, over which a mound of dirt was thrown.

Reference mark: A small hole picked into a rock buried 14.7 feet west.

[Latitude 43° 07' 57.16". Longitude 107° 31' 25.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Round Hill.....	115 31 39.6	295 28 38.6	3.8211898
Badwater.....	217 26 31.9	37 33 32.7	4.3576638

ROUND HILL, FREMONT COUNTY.

On a sand hill on the divide between Poison and Alkali creeks, about 3 miles northwest of Round Hill stage station at forks of Lander-Casper road and Casper-Lost Cabin-Thermopolis stage road. Station is in view for a long distance from both roads. Good grass and bad water in Poison Creek bottom.

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Station mark: A bronze tablet cemented into a large boulder buried under a quadripod signal and a rough rock monument.

Reference mark: A chiseled cross on a limestone ledge 45 feet east.

[Latitude $43^{\circ} 09' 29.59''$. Longitude $107^{\circ} 35' 50.58''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Badwater.....	232	24	53.63	52	34	55.74	4.3980835
Jack Pot.....	247	25	44.92	67	42	36.96	4.5573268
Reservoir.....	295	22	36.78	115	30	36.43	4.4560997

BADWATER, NATRONA COUNTY.

On grassy ridge on divide between Dry or South Fork of Badwater Creek and the drainage of Alkali Creek, 3 miles northeast of Cedar Pass (also known as Davis or Bostleman Pass), 3 miles east of Bostleman's ranch at forks of North and Dry Forks of Badwater Creek, 20 miles northwest of Walton, and 20 miles northeast of Lost Cabin. The road up Dry Fork of Badwater Creek passes one-half mile north of station. Good road from Walton to Bostleman via Cedar Pass; from Lost Cabin take old Bates road east to intersection with Cedar Pass road. Station is not on highest point, but 1,000 feet west and 50 feet lower. A large rock monument was also built on highest point.

Station mark: A bronze tablet cemented into a solid rock, over which a big cedar tree and rock monument were centered.

Reference mark: A chiseled cross on a large rock 32 feet west.

[Latitude $43^{\circ} 17' 42.94''$. Longitude $107^{\circ} 21' 11.44''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Jack Pot.....	276	05	58.26	96	12	48.78	4.1327726
Reservoir.....	347	50	49.07	167	53	48.22	4.4494994

CLARK, NATRONA COUNTY.

On the high north end of a grassy-topped ridge, fringed on slopes with trees and locally known as Pine Mountains, 5 miles south of Clark's and 7 miles southwest of Johnson's ranches, on Casper-Lander stage road. A road from Clark's ranch to top of mountain passes 200 feet east of signal. Fine grass all over the top of mountain, and water in spring at head of gulch 500 feet west of signal.

Station mark: A bronze tablet cemented in solid rock, over which are centered a small monument and a tripod signal.

Reference mark: A small hole picked into a flat rock buried 41 feet east of signal near a small pile of stone.

[Latitude 42° 58' 28.44". Longitude 106° 52' 25.09'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Easy.....	207 56 26.76	28 01 39.72	4.3444672
Reef.....	292 54 04.06	113 04 45.68	4.3655294

COTTONWOOD PASS, NATRONA COUNTY.

On highest point of limestone hill on the east side of Cottonwood Pass, about 1 mile southeast of telephone line in pass, 15 miles north of Lost Cabin and same distance south of Nowood post-office. The stage from Lost Cabin to Nowood and Bonanza comes up Cottonwood Creek from Lost Cabin and passes 1 mile west of signal. There is a good spring and grass in Cottonwood Creek at fork of a road to west 1 mile south of saddle. The road to the west intersects the main road from Nowood to Deranch. Hanson's ranch, on the stage road down Nowood Creek, is 7 miles north.

Station mark: A bronze tablet cemented under a quadripod signal into the solid limestone ledge.

Reference mark: An arrow pointing to a triangle chiseled into the limestone rock 29 feet southwest of station.

[Latitude 43° 27' 18.39". Longitude 107° 33' 41.45'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Round Hill.....	5 03 17.02	185 01 48.45	4.5199818
Copper.....	88 16 09.47	268 02 50.78	4.4170584

EASY, NATRONA COUNTY.

On the rim between Powder River and North Fork of Casper Creek, about 10 miles from both Clark's and Johnson's road ranches, on the Casper-Lander stage road. A wash leads from both of the ranches to the rim, which it follows around to Ballard's shearing pens, on the Casper-Kaycee wagon road.

Station mark: A bronze tablet cemented into a large boulder buried under a small pile of rock, over which is centered a quadripod signal.

Reference mark: A chiseled square on a sandstone ledge, which is on the edge of the rim 30 feet west.

[Latitude 43° 09' 00.98". Longitude 106° 44' 46.73'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Broken Horn.....	163 19 11.51	343 16 08.63	4.3212603
Shepherd.....	249 20 21.30	69 23 55.64	3.8787358
Reef.....	338 59 27.90	159 04 57.86	4.4858270

ENOCH, NATRONA COUNTY.

On a badland hill on divide between Keg Springs Creek and Jack Pot Fork of Powder River, about 5 miles northwest of Keg Springs station, 7 miles east of Walton, and 5 miles north of the reservoir at the head of Keg Springs Creek. The signal is in view of the Casper-Lander road for a long distance. The road from the springs stage station to Jack Pot ranch crosses the divide about 3 miles west of signal.

Station mark: A bronze tablet cemented into solid rock under a small rock monument and a quadripod signal.

Reference mark: A chiseled square on the brown rock-ledge extending east of station.

[Latitude $43^{\circ} 06' 05.95''$. Longitude $107^{\circ} 09' 47.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Easy.....	260 48 49.5	81 05 55.7	4.5360627
Clark.....	300 47 01.1	120 58 52.8	4.4394288

JACK POT, NATRONA COUNTY.

On a high hill on divide between Buffalo Creek to north and E. K. Creek and Poison Creek drainage to southeast, 1 mile southeast of E. K. Pass and the forks of the road to the Buffalo shearing pens, on the high south end of the Bighorn Mountains, from main stage road from Walton to Houck and Kaycee; about 7 miles north of Jack Pot ranch, which is at crossing of the Lost Cabin-Casper road (known as Bates road) and the stage road from Walton to Houck and Kaycee; about 15 miles northeast of Walton.

Station mark: A bronze tablet cemented into a sand rock, over which a tree and large sandstone monument were centered.

Reference mark: A nail driven into the sandstone ledge 36 feet west.

[Latitude $43^{\circ} 16' 55.76''$. Longitude $107^{\circ} 11' 12.73''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reservoir.....	16 18 23.00	196 14 32.55	4.4338522
Clark.....	323 10 23.50	143 23 14.39	4.6297172

RESERVOIR, NATRONA COUNTY.

Near the center of the north edge of a mesa on the divide between Powder River and Poison Creek at the south head of Keg Springs Creek, 4 miles southwest of Keg Springs stage station, 6 miles south of Walton, and 3 miles south of reservoir at the head of Keg Springs Creek. The station is in sight from Casper-Lander stage road for a

long distance. Water at Keg Springs, Reservoir, and Walton. Proposed extension of Chicago and Northwestern Railway from Casper west will pass in a saddle just north of signal.

Station mark: A bronze tablet cemented into a large boulder buried under a rock, over which a quadripod signal was erected.

Reference mark: The top of a flat iron pin driven in the ground 35 feet southeast of signal.

[Latitude $43^{\circ} 02' 51.07''$. Longitude $107^{\circ} 16' 49.59''$.]

To station—	Azimuth.			Back azimuth.			Log. distance.
	°	'	"	°	'	"	Meters.
Easy.....	255	06	31.20	75	28	25.01	4.6528045
Clark.....	283	35	32.08	103	52	11.07	4.5332884



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