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RESULTS OF TRIANGULATION AND PRIMARY TRAVERSE

FOR THE YEARS 1906, 1907, AND 1908

R. B. MARSHALL, CHIEF GEOGRAPHER



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MAP SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL
to Jan. 1, 1909

RESULTS OF TRIANGULATION AND PRIMARY TRAVERSE FOR THE YEARS 1906, 1907, AND 1908.

R. B. MARSHALL, *Chief Geographer.*

INTRODUCTION.

PERSONNEL.

Field work.—The field work of primary control, the computed results of which are given in the following pages, was carried on as follows: In 1906, under the direction of H. M. Wilson and E. M. Douglas, geographers in charge, respectively, of the eastern and western divisions of topography; in 1907, under the direction of Frank Sutton, W. H. Herron, E. C. Barnard, and R. B. Marshall, geographers in charge, respectively, of the Atlantic, Central, Rocky Mountain, and Pacific divisions, and in 1908 under R. B. Marshall, chief geographer, with Frank Sutton, W. H. Herron, E. C. Barnard, and T. G. Gerdine, geographers, in charge, respectively, of the Atlantic, Central, Rocky Mountain, and Pacific divisions.

Credit is given to the various topographers, assistant topographers, and aids directly in charge under the heading of each list.

Computation.—The office work of computation prior to 1907 was carried on under the supervision of S. S. Gannett, geographer, who compiled the data for publication, and since 1907 under the general direction of E. M. Douglas, geographer. With the exception of the work in the Pacific coast States, which was mostly computed by C. F. Urquhart at the Sacramento office, the results were computed by the following members of the topographic branch detailed from time to time to this work: George T. Hawkins, H. L. Baldwin, jr., T. M. Bannon, R. H. Chapman, D. H. Baldwin, E. L. McNair, J. R. Ellis, C. B. Kendall, H. H. Hodgeson, F. J. McMaugh, J. F. McBeth, C. M. Weston, S. G. Lunde, L. E. Tucker, W. H. Lovell, and L. S. Leopold.

DATUM.

Wherever practicable, and unless otherwise stated, positions have been computed on United States standard datum.

SUMMARY.

Summary of published results, 1906, 1907, and 1908: Triangulation and primary traverse.

Locality.	Triangulation stations.	Traverse stations.
Alabama.....		35
Arizona-New Mexico.....	29	
Arkansas.....		100
California.....	188	
California-Nevada.....	18	
California-Oregon.....	21	
Colorado.....	10	
Colorado-New Mexico.....	70	
Florida.....		105
Georgia.....		177
Idaho-Oregon.....	10	
Idaho-Utah-Wyoming.....	15	
Illinois-Kentucky.....		863
Indiana.....		148
Indiana-Illinois.....		46
Iowa.....		159
Kansas-Missouri.....		90
Kentucky.....	24	381
Louisiana.....		276
Maine.....	19	
Maryland-Pennsylvania.....		78
Maryland-Virginia.....		45
Michigan.....		180
Minnesota-Wisconsin.....		156
Mississippi.....		615
Mississippi-Alabama-Tennessee.....		77
Mississippi-Tennessee.....		57
Missouri.....		220
Montana.....	43	
Montana-North Dakota.....	19	
Nevada.....	14	
New Mexico.....	17	
New York.....		104
Ohio.....		678
Oklahoma.....	13	275
Oklahoma-Kansas-Missouri.....		56
Oregon.....	15	
Oregon-Washington.....	27	
Pennsylvania.....	21	512

Summary of published results, 1906, 1907, and 1908: Triangulation and primary traverse—Continued.

Locality.	Triangulation stations.	Traverse stations.
Pennsylvania-Maryland	15	.....
Tennessee		532
Tennessee-Georgia-North Carolina	5	.....
Texas		82
Utah	7	.....
West Virginia	31	.....
Wisconsin		196
Wyoming-Utah	22	.....
Wyoming-Idaho	50	.....
Wyoming	13	.....
	716	6, 243

ALABAMA.

PRIMARY TRAVERSE.

Seale quadrangle.

LEE AND RUSSELL COUNTIES.

The following geographic positions for the control of Seale quadrangle were determined from primary traverse by F. J. McMaugh in 1908. The line begins with adjusted position of primary traverse station No. 3 (Kendall, 1906), 0.5 mile south of Osweechee Church, and follows highways westward to Seale; thence southwest along the Central of Georgia Railway to Colberts Crossing; thence north along highways via Sand Fort, and the line is tied to primary traverse station No. 19 (McNair, 1905).

Magnetic declination: South border, $2^{\circ} 56'$ east; west border, $2^{\circ} 43'$ east.

Geographic positions.

WEST ALONG HIGHWAYS, OSWEECHEE CHURCH TO SEALE.

Station.	Latitude.	Longitude.
Osweechee Church, 1.5 miles southwest of; forks of roads to northwest	32 16 09.2	85 01 26.8
Bridge over Hiaga Creek, 1,000 feet northeast of; T road north, center of east-west road	32 16 17.6	85 02 10.2
Osweechee Church, 3.5 miles west of; 1 mile west of bridge over Hiaga Creek; at southeast corner of schoolhouse on Osweechee-Seale road, iron post stamped "Elev. 343."	32 16 07.3	85 03 25.5
Forks of road to southeast, center of east-west road	32 16 05.3	85 04 28.4

Geographic positions—Continued.

WEST ALONG HIGHWAYS, OSWEECHEE CHURCH TO SCALE—continued.

Station.	Latitude.	Longitude.
Forks of road to south, center of east-west road (elev. painted 384).....	° ' " 32 16 26.9	° ' " 85 05 54.9
T road north, center of east-west road.....	32 16 28.9	85 06 55.6
Seale, 3 miles east of; in southwest corner of intersection of crossroads, 60 feet southwest of center of intersection, iron post stamped "Prim. Trav. Sta. No. 1, 1908, Elev. 391".....	32 16 47.9	85 07 42.8
Seale, 2 miles east of; forks of road to northeast, center of east-west road.....	32 17 08.0	85 08 42.0
Seale, 0.75 mile southeast of; intersection of T lane south and forks of road to northeast with east-west road.....	32 17 31.1	85 09 27.6
Seale, in south face at southwest corner of county jail, aluminum tablet stamped "Elev. 357".....	32 17 55.8	85 10 02.3

SOUTHWEST ALONG CENTRAL OF GEORGIA RAILWAY, SEALE TO COLBERTS.

Seale, 140 feet east of station, road crossing, center of track.....	32 17 53.9	85 09 59.0
Seale, 1.6 miles southwest of station, road crossing (elev. 338), center of track.....	32 17 28.5	85 11 23.2
Milepost 22, 900 feet west of; road crossing, center of track.....	32 17 13.9	85 12 12.5
Milepost 24, 1,600 feet west of; Colberts crossing.....	32 16 41.9	85 14 18.4
Colberts, in brick chimney on west of Colberts Church, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1908".....	32 16 47.4	85 14 12.6

NORTH ALONG HIGHWAYS, COLBERTS TO STATION NINETEEN.

Colberts, 1.18 miles north of; 2,000 feet west of old cabin, forks of road to southeast, center of north-south road....	32 17 50.0	85 14 08.9
Colberts, 2.5 miles north of; T road south, center of east-west road.....	32 18 54.9	85 14 12.4
Sand Fort, 1 mile southwest of old store at 4 corners.....	32 19 27.0	85 13 40.4
Sand Fort, at southwest corner of old store, iron post stamped "Elev. 505".....	32 20 18.3	85 13 22.9
Sand Fort, 1.25 miles northwest of; center of creek crossing, approximate line between secs. 21 and 22, T. 16 N., R. 28 W.....	32 21 22.0	85 13 40.2
T. 16 N., R. 28 W., northeast corner of sec. 21 and of Allen Chadwick's land.....	32 22 05.9	85 13 39.3
Creek crossing, 0.5 mile northwest of; forks of road to south, center of northwest-southeast road.....	32 21 57.2	85 14 07.8
Bridge over McKee Creek, 0.5 mile southwest of; T lane west to house, 250 feet west of main road.....	32 22 52.4	85 14 21.4
Bridge over McKee Creek, 0.8 mile north of; 4 corners....	32 23 50.6	85 14 09.0
Bridge over McKee Creek, 1.5 miles northeast of; 5.25 miles southwest of Crawford, 100 feet east of forks of road to Crawford and Seale, iron post stamped "Prim. Trav. Sta. No. 3, 1908, Elev. 335 ft.".....	32 23 50.4	85 13 32.0

Geographic positions—Continued.

NORTH ALONG HIGHWAYS, COLBERTS TO STATION NINETEEN—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south, center of north-south road.....	32 25 57.4	85 14 42.7
Section corner (no numbers).....	32 26 00.9	85 14 43.3
T road south.....	32 26 45.9	85 15 02.0
T. 16 N., R. 28 W., northeast corner sec. 28.....	32 26 27.2	85 14 45.0
Second-class T road north, 18 feet northwest to oak, 40 feet east to pine.....	32 27 04.6	85 13 53.7
Lee-Russell county-line crossing, 0.75 mile southeast of; forks of road southeast.....	32 27 51.6	85 13 47.9
Lee-Russell county line, center of road at crossing.....	32 28 21.2	85 14 15.4
Lee-Russell county-line crossing, 0.6 mile northwest of; second-class T road east.....	32 28 51.0	85 14 36.4
Small store, 95 feet southeast of; center of intersection of road crossing (elev. bench mark painted 636).....	32 30 12.1	85 15 12.0
Salem station, 4.25 miles south of; 200 feet south of house of Mr. Butler, 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

ARIZONA-NEW MEXICO.

TRIANGULATION STATIONS.

Chiricahua, Cochise, Duncan, Pearce, Lordsburg, and San Simon quadrangles.

COCHISE, GRAHAM, AND SANTA CRUZ COUNTIES, ARIZ.; GRANT COUNTY, N. MEX.

During the winter of 1906-7 T. M. Bannon extended triangulation eastward and northward through the Chiricahua National Forest, from stations Mustang, Stonewhet, Rincon, and Ajax, and closed on stations Guthrie and Section House, thus completing a circuit of more than 300 miles. In addition to reoccupying six old stations, eleven new stations were monumented and occupied, and numerous points were located by intersections. Positions are given on Mari-copa astronomic datum.

ADAMS, COCHISE COUNTY, ARIZ.

(Not occupied.)

[Latitude 32° 01' 56.93". Longitude 110° 06' 58.27'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stonewhet.....	52 04 14	231 54 16	4.57624
Rincon.....	104 00 22	283 47 23	4.59800
Dos Cabezos.....	246 03 47	66 19 47	4.71632

AJAX, COCHISE COUNTY, ARIZ.

On a high hill about 4 miles west of Tombstone, and about the same distance east of Fairbanks.

Station mark: Bronze tablet centered under a very large rock monument.

[Latitude $31^{\circ} 42' 29.06''$. Longitude $110^{\circ} 07' 46.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mustang.....	86 58 58.34	266 48 00.67	4.5186134
Stonewhet.....	114 13 06.71	294 03 37.16	4.4941312
Rincon.....	140 46 53.91	320 34 24.21	4.7693886
Lybell.....	167 34 07	347 32 08	4.43938
Dragon.....	206 32 35.12	26 37 05.12	4.4783872
Gleason.....	258 16 08	78 24 07	4.38846
Hay.....	284 56 30.78	105 04 11.80	4.3790875

BRUNO, COCHISE COUNTY, ARIZ.

On a sharp rock hill at the head of Bruno Creek, about 7 miles southeast of Moore's ranch on White River. A wagon road up Bruno Creek stops at a wood camp about 1 mile south of station.

Signal: Large cairn.

Reference marks: Triangle "U Δ S" chiseled on solid rock 9.3 feet east.

Station mark: Chiseled hole in rock under cairn.

[Latitude $31^{\circ} 43' 19.46''$. Longitude $109^{\circ} 23' 19.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Swisshelm.....	68 49 21	248 44 42	4.17686
Squaretop.....	115 45 10	295 38 23	4.35365
Dos Cabezos.....	159 14 43	339 07 34	4.77303
Tex.....	326 35 21	146 36 44	3.87702

COCHISE HEAD, COCHISE COUNTY, ARIZ.

(Not occupied.)

On the highest point of the prominent mountain known as Cochise Head.

Station mark: A rock monument.

[Latitude $32^{\circ} 03' 28.17''$. Longitude $109^{\circ} 18' 01.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Swisshelm.....	27 42 27	207 34 58	4.68273
Squaretop.....	46 20 02	226 10 25	4.59858

DOS CABEZOS, COCHISE COUNTY, ARIZ.

On the highest point of the North Peak of the Dos Cabezas Peaks, 15 miles east of Wilcox and the same distance southwest of Bowie on the Southern Pacific Railroad. These peaks are very prominent and widely known, being pointed out to all railroad passengers.

Signal: Large monument.

Reference mark: Aluminum bench-mark tablet cemented in solid rock 8.9 feet west of monument.

Station mark: Chiseled cross in solid rock under large monument.

[Latitude 32° 13' 18.89". Longitude 109° 36' 41.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hay.....	22 23 03.17	202 14 21.06	4.8343330
Dragoon.....	49 49 02.89	229 37 04.25	4.6675032
Adams.....	66 19 47	246 03 47	4.71632
Johnson.....	74 58 00	254 42 17	4.67422
Rincon.....	82 38 10.20	262 09 02.19	4.9384158
Guthrie.....	200 39 50.92	20 49 26.10	4.8961574
Section House.....	242 19 28.02	62 39 57.62	4.8306588
Doubtful.....	252 01 01.29	72 18 47.88	4.7392849
San Simon.....	261 36 36.42	81 48 54.91	4.5636734
Station Peak.....	267 31 40.12	87 50 56.92	4.7546069
Cienega Peak.....	282 13 28	102 33 09	4.77466
Shaffer.....	283 08 06	103 11 18	3.98564
Wood Canyon.....	293 17 06	113 25 58	4.45516
Shaw.....	312 02 27	132 13 04	4.62730
Sawmill.....	316 47 26.12	136 58 11.21	4.6686090
Riggs.....	327 59 52	148 05 31	4.49918
Bruno.....	339 07 34	159 14 43	4.77303
Squaretop.....	359 01 38.93	179 01 54.55	4.6593628

DOUBTFUL, COCHISE COUNTY, ARIZ.

On the highest point of the Horseshoe Mountains on the south side of Doubtful Canyon, about 3 miles south of T. R. Pearson's (Horseshoe) ranch, which is the nearest water; 7 miles south of Summit station on the Arizona and New Mexico Railway, and 12 miles northwest of Steins Pass station on the Southern Pacific Railroad. The boundary line between New Mexico and Arizona passes over the mountains somewhere near the station.

Signal and station mark: Cairn with cross cut in solid rock under it.

Reference mark: Tablet set in solid rock 7.2 feet south of center.

[Latitude $32^{\circ} 22' 24.42''$. Longitude $109^{\circ} 03' 25.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sawmill.....	21 59 36.68	201 52 41.06	4.7388052
Shaw.....	24 50 28	204 43 19	4.69756
San Simon.....	54 17 40.93	234 12 13.68	4.2950606
Dos Cabezos.....	72 18 47.88	252 01 01.29	4.7392849
Guthrie.....	157 01 30.79	336 53 10.77	4.7906605
Line.....	186 02 39	6 04 35	4.72581
Section House.....	208 29 49.40	28 32 30.82	4.2165700

DRAGOON, COCHISE COUNTY, ARIZ.

On the highest summit of the Dragoon Mountains, about 12 miles northeast of Pearce. The mountain is very prominent and is visible in all directions and can be approached from all sides, but is most easily reached from the northeast by wagon road from Pearce to the wood camp in basin north of station, then by wood trail to summit up the extreme west draw that heads at the signal, runs north, and then turns east.

Signal: A tripod and rock monument.

Reference mark: Chiseled "US Δ CS" on rock 24.8 feet northwest of station.

Station mark: Bronze triangulation tablet cemented in solid rock under tripod and rock monument.

[Latitude $31^{\circ} 57' 02.68''$. Longitude $109^{\circ} 59' 14.83''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ajax.....	26 37 05.12	206 32 35.12	4.4783872
Mustang.....	58 22 56	238 07 31	4.73671
Stonewhet.....	71 27 11.40	251 13 09.46	4.6455440
Lybell.....	89 56 41	279 50 11	4.28660
Rincon.....	110 17 21.69	290 00 17.87	4.7319630
Johnson.....	150 11 30	330 08 05	4.31008
Dos Cabezos.....	229 37 04.25	49 49 02.89	4.6675032
Squaretop.....	293 05 32.98	113 17 43.02	4.5968752
Swisshelm.....	305 40 39.46	125 54 55.23	4.7213590
South College Peak.....	315 38 02	135 56 02	4.88625
Red Peak.....	323 55 10	144 00 19	4.42818
Hay.....	343 45 45.60	163 48 58.41	4.5375194

GLEESON, COCHISE COUNTY, ARIZ.

(Not occupied.)

[Latitude $31^{\circ} 45' 09.64''$. Longitude $109^{\circ} 52' 36.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hay.....	4 20 44	184 20 27	4. 04828
Ajax.....	78 24 07	258 16 08	4. 38846
Stonewhet.....	98 37 30	278 20 07	4. 72412

GUTHRIE, GRAHAM COUNTY, ARIZ.

On the highest point between Green & Sons' toll-road from Solomonsville to Coronado and Gila River; 2 miles northwest of summit of above road.

Signal: Cairn 8 feet in diameter and 8 feet high.

Station mark: A $\frac{1}{2}$ -inch iron bolt wedged with nails in a hole drilled in a solid rock under cairn.

[Latitude $32^{\circ} 53' 09.17''$; from west, $32^{\circ} 53' 08.75''$. Longitude $109^{\circ} 18' 53.11''$; from west, $109^{\circ} 18' 53.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dos Cabezos.....	20 49 26.10	200 39 50.92	4. 8961574
Graham.....	68 37 48.46	248 19 42.27	4. 7489196
Bryce.....	113 49 43.31	293 38 02.07	4. 5632224
Morenci.....	164 00 19.10	343 58 00.50	4. 3795070
Sunset.....	197 17 57.00	17 20 47.78	4. 4367053
Line.....	277 27 18	97 37 38	4. 47652
Line (from west).....	277 27 30.68	97 37 50.86	4. 4766777
Section House.....	322 50 34.92	143 01 38.38	4. 7249598
Section House (from west).....	322 50 47.82	143 01 51.29	4. 7250061
Doubtful.....	336 53 10.77	157 01 30.79	4. 7906605

HAY, COCHISE COUNTY, ARIZ.

On the highest point of a low hill about 3 miles north of Cowen's ranch on the Tombstone-Douglas wagon road; 12 miles east of Tombstone and about 7 miles southwest of Gleeson. Can be reached from all directions.

Signal: Large rock monument.

Reference mark: Chiseled triangle inclosing a cross on solid rock 19.65 feet south of station.

52752°—Bull. 440—10—2

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Station mark: Aluminum tablet cemented in the solid rock under monument.

[Latitude $31^{\circ} 39' 07.82''$. Longitude $109^{\circ} 53' 08.94''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mustang.....	94 39 07	274 20 50	4. 74992
Ajax.....	105 04 11.80	284 56 30.78	4. 3790875
Dragoon.....	163 48 58.41	343 45 45.60	4. 5375194
Gleeson.....	184 20 27	4 20 44	4. 04828
Dos Cabezos.....	202 14 21.06	22 23 03.17	4. 8343330
Red Peak.....	208 17 44	28 19 47	4. 11344
Squaretop.....	236 40 55.70	56 49 50.27	4. 5050561
Swisshelm.....	265 54 54.44	86 05 54.56	4. 5212773
South College Peak.....	296 27 32	116 42 07	4. 69305

JOHNSON, COCHISE COUNTY, ARIZ.

(Not occupied.)

[Latitude $32^{\circ} 06' 37.80''$. Longitude $110^{\circ} 05' 41.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rincon.....	91 20 29	271 06 49	4. 60708
Dos Cabezos.....	254 42 17	74 58 00	4. 67422
Dragoon.....	330 08 05	150 11 30	4. 31008

LYBELL, COCHISE COUNTY, ARIZ.

(Not occupied.)

Railway station at Lybell, Ariz.

[Latitude $31^{\circ} 57' 01.17''$. Longitude $110^{\circ} 11' 31.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stonewhet.....	58 02 01	237 54 28	4. 42452
Dragoon.....	279 50 11	89 56 41	4. 28660
Ajax.....	347 32 08	167 34 07	4. 43938

MUSTANG, SANTA CRUZ COUNTY, ARIZ.

On the second hill (from the south) of the hills known as the Mustangs, 2 miles north of Elgin station on the Nogales branch of the Southern Pacific Railroad.

Signal: Rock monument.

Station mark: Bronze tablet centered under monument.

[Latitude $31^{\circ} 41' 30.95''$. Longitude $110^{\circ} 28' 38.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cayetano.....	69 06 17.36	248 51 00.95	4.6934490
Baldy.....	90 34 51.29	270 23 08.91	4.5466564
Faggan.....	133 20 29.14	313 12 35.34	4.5118308
Stonewhet.....	197 03 09.26	17 04 38.58	4.1823800
Dragoon.....	238 07 31	58 22 56	4.73671
Ajax.....	266 48 00.67	86 58 58.34	4.5186134
Hay.....	274 20 50	94 39 07	4.74992

RED PEAK, COCHISE COUNTY, ARIZ.

(Not occupied.)

[Latitude $31^{\circ} 45' 18.98''$. Longitude $109^{\circ} 49' 15.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hay.....	28 19 47	208 17 44	4.11344
Dragoon.....	144 00 19	323 55 10	4.42818
Squaretop.....	253 25 10	73 32 06	4.33195

RIGGS, COCHISE COUNTY, ARIZ.

(Not occupied.)

On a low rock hill at the mouth of Piney Canyon, 3 miles southeast of Riggs ranch and the same distance northwest of Shaw's ranch. The Pearce-Paradise county road forks from the sawmill road 0.5 mile south of station.

Station mark: Rock monument.

[Latitude $31^{\circ} 58' 49.44''$. Longitude $109^{\circ} 26' 04.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Squaretop.....	40 17 54	220 12 28	4.39290
Dos Cabezos.....	148 05 31	327 59 52	4.49918
Shaws.....	276 22 07	96 27 05	4.17165

RINCON, PIMA COUNTY, ARIZ.

On the high prominent white peak of the Rincon Mountains, 30 miles a little south of east from Tucson and 10 miles northeast of Vail station.

Signal and station mark: Large rock monument and bronze tablet centered under it.

[Latitude $32^{\circ} 07' 05.94''$. Longitude $110^{\circ} 31' 25.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Faggan.....	37 37 13.95	217 30 45.62	4.4988971
Warner.....	83 35 18.22	282 39 11.20	4.6569384
Wasson.....	106 18 02.24	285 58 05.16	4.7871876
Pusch.....	125 36 54.50	305 23 35.33	4.6827630
Kellogg.....	151 48 16.72	331 42 19.13	4.5687310
Dos Cabezos.....	262 09 02.19	82 38 10.20	4.9384158
Johnson.....	271 06 49	91 20 29	4.60708
Adams.....	283 47 23	104 00 22	4.59800
Dragoon.....	290 00 17.87	110 17 21.69	4.7319630
Ajax.....	320 34 24.21	140 46 53.91	4.7693886
Stonewhet.....	344 52 30.54	164 55 28.62	4.5302026

SAN SIMON, COCHISE COUNTY, ARIZ.

In the desert on north side of railroad about 100 feet north of the west residence at Simon (San Simon) station on the Southern Pacific Railroad. The water tank is about 500 feet southeast.

Signal: Tetrapod.

Station mark: A 3-foot iron pipe driven into the ground so that the top is 10 inches below surface, and over which a tablet cemented into a large rock is centered.

[Latitude $32^{\circ} 16' 10.24''$. Longitude $109^{\circ} 13' 37.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sawmill.....	6 26 54.25	186 25 24.39	4.5972476
Dos Cabezos.....	81 48 54.91	261 36 36.42	4.5636734
Doubtful.....	234 12 13.68	54 17 40.93	4.2950606
Do.....	^a 234 11 57		
Station Peak.....	278 12 38.14	98 19 37	4.3172042

^a Observed azimuth.

SAWMILL, COCHISE COUNTY, ARIZ.

On a rock knob of the Chiracahua Mountains southeast of the pass traversed by the road from the sawmill to Paradise; 0.75 mile east of the sawmill and 6 miles west of Paradise. The hill is timbered on the east and has a clear rock bluff on the west.

Signal: Rock monument.

Reference mark: Tablet cemented in solid rock, 13 feet southwest of center.

Station mark: Chiseled cross on a big rock under center of rock monument.

[Latitude $31^{\circ} 54' 53.99''$. Longitude $109^{\circ} 16' 26.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Swisshelm.....	42 52 11. 69	222 43 54. 13	4. 5630740
Squaretop.....	69 39 58. 95	249 29 33. 11	4. 5218629
Dos Cabezos.....	136 58 11. 21	316 47 26. 12	4. 6686090
Shaffer.....	144 52 35 .	324 45 03	4. 59038
Shaw.....	175 43 07	355 42 58	3. 74871
San Simon.....	186 25 24. 39	6 26 54. 25	4. 5972476
Doubtful.....	201 52 41. 06	21 59 36. 68	4. 7388052
Station Peak.....	214 29 10. 21	34 37 36. 83	4. 6444989

SHAFFER, COCHISE COUNTY, ARIZ.

(Not occupied.)

On a sharp peak northwest of Apache Pass, about 2 miles north of Shaffer's ranch on the Dos Cabezos-Bowie wagon road.

Signal and station mark: Large rock monument and cross chiseled on solid rock centered under it.

[Latitude $32^{\circ} 12' 07.38''$. Longitude $109^{\circ} 30' 42.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Squaretop.....	11 18 40	191 15 45	4. 64628
Dos Cabezos.....	103 11 18	283 08 06	3. 98564
Sawmill.....	324 45 03	144 52 35	4. 59038

SHAW, COCHISE COUNTY, ARIZ.

On the central one of three sharp bare peaks on the main divide of the Chiracahua Mountains, 3 miles south of Hands Pass, 2 miles east of Shaw's camp at the west foot of the peak, 2 miles southeast of Growlers camp on the county road, 1 mile west of Hands Pass,

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about 35 miles a little north of east of Pearce. Can be reached by trail from Shaw's camp.

Signal and station mark: Rock monument and cross chiseled on solid rock centered under it.

Reference mark: Aluminum bench-mark tablet cemented in solid rock, 8.05 feet west of center.

[Latitude $31^{\circ} 57' 55.61''$. Longitude $109^{\circ} 16' 43.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Swisshelm.....	37 03 17	216 55 06	4. 60842
Riggs.....	96 27 05	276 22 07	4. 17165
Dos Cabezos.....	132 13 04	312 02 27	4. 62730
Wood Canyon.....	162 59 51	342 58 01	4. 25324
Doubtful.....	204 43 19	24 50 28	4. 69756
Station Peak.....	219 32 16	39 40 52	4. 60087
Cienega Peak.....	239 34 04	59 43 10	4. 49147
Sawmill.....	355 42 58	175 43 07	3. 74871

SOUTH COLLEGE PEAK, COCHISE COUNTY, ARIZ.

(Not occupied.)

On the southern one of the two peaks locally known as the College Peaks.

Station mark: Highest point of peak.

[Latitude $31^{\circ} 27' 11.58''$. Longitude $109^{\circ} 25' 16.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hay.....	116 42 07	296 27 32	4. 69305
Dragoon.....	135 56 02	315 38 02	4. 88625
Swisshelm.....	155 52 52	335 49 15	4. 42649

SQUARETOP, COCHISE COUNTY, ARIZ.

On a flat, square-appearing butte on the north side of the Pearce-Rucker wagon road, about 15 miles southeast of Pearce, 2 miles north of Whitehead's ranch on White River, and 5 miles northwest of Moore's ranch, formerly Rucker post-office. The station is visible in all directions and easily reached.

Signal and station mark: Large cairn and chiseled cross on solid rock under it.

Reference mark: Aluminum tablet cemented in a solid rock, 15.0 feet northeast.

[Latitude 31° 48' 37.27". Longitude 109° 36' 12.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hay.....	56 49 50.27	236 40 55.70	4.5050561
Red Peak.....	73 32 06	253 25 10	4.33195
Dragoon.....	113 17 43.02	293 05 32.98	4.5968752
Dos Cabezos.....	179 01 54.55	359 01 38.93	4.6593628
Shaffer.....	191 15 45	11 18 40	4.64628
Riggs.....	220 12 28	40 17 54	4.39290
Cochise Head.....	226 10 25	46 20 02	4.59858
Sawmill.....	249 29 33.11	69 39 58.95	4.5218629
Bruno.....	295 38 23	115 45 10	4.35365
Tex.....	303 12 49	123 20 56	4.46688
Swisshelm.....	337 21 04.88	157 23 11.75	4.2173809

STONEWHET, COCHISE COUNTY, ARIZ.

On the highest peak of the Whetstone Mountains, about 15 miles southeast of Pantano railroad station, and 6 miles east of the old Total Wreck pump station on Cienega Creek.

Signal and station mark: Rock monument and bronze tablet centered under it.

[Latitude 31° 49' 23.31". Longitude 110° 25' 48.67".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mustang.....	17 04 38.58	197 03 09.26	4.1823800
Baldy.....	76 20 22.14	250 07 09.15	4.6246192
Faggan.....	105 27 10.46	285 17 46.21	4.4645904
Rincon.....	164 55 28.62	344 52 30.54	4.5302026
Adams.....	231 54 16	52 04 14	4.57624
Lybell.....	237 54 28	58 02 01	4.42452
Dragoon.....	251 13 09.46	71 27 11.40	4.6455440
Gleason.....	278 20 07	98 37 30	4.72412
Ajax.....	294 03 37.16	114 13 06.71	4.4941312

SWISSHELM, COCHISE COUNTY, ARIZ.

On the higher point (south end) of Swisshelm Mountains, 25 miles southeast of Pearce and about the same distance north of Douglas; 6 miles southwest of Moore's ranch (formerly Rucker post-office). Good road from Moore's ranch to Great American Basin at northeast foot of the peak.

Signal: Large tetrapod and stone monument.

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Station mark: Cross chiseled on solid rock under signal.

Reference mark: Triangle chiseled on solid rock 14.05 feet south-west of monument.

[Latitude $31^{\circ} 40' 22.91''$. Longitude $109^{\circ} 32' 11.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hay.....	86 05 54.56	265 54 54.44	4. 5212773
Dragoon.....	125 54 55.23	305 40 39.46	4. 7213590
Squaretop.....	157 23 11.75	337 21 04.88	4. 2173809
Cochise Head.....	207 34 58	27 42 27	4. 68273
Shaw.....	216 55 06	37 03 17	4. 60842
Sawmill.....	222 43 54.13	42 52 11.69	4. 5630740
Bruno.....	248 44 42	68 49 21	4. 17686
Tex.....	272 38 04	92 44 06	4. 25960
South College Peak.....	335 49 15	155 52 52	4. 42649

TEX, COCHISE COUNTY, ARIZ.

(Not occupied.)

On a dome-shaped hill near the south end of Chiricahua Mountains about 3 miles south of Tex ranch and 6 miles north of Bernardino station on the El Paso and Southwestern Railroad.

Signal and station mark: Tripod and chiseled hole in limestone ledge under it.

[Latitude $31^{\circ} 39' 55.48''$. Longitude $109^{\circ} 20' 41.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Swisshelm.....	92 44 06	272 38 04	4. 25960
Squaretop.....	123 20 56	303 12 49	4. 46688
Bruno.....	146 36 44	326 35 21	3. 87702

WOOD CANYON, COCHISE COUNTY, ARIZ.

(Not occupied.)

On the highest point of a round hill in the Chiricahua Mountains, 12 miles south of Bowie station on the Southern Pacific Railroad.

Station mark: Rock monument.

[Latitude $32^{\circ} 07' 11.76''$. Longitude $109^{\circ} 20' 02.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dos Cabezos.....	113 25 58	293 17 06	4. 45516
Station Peak.....	245 58 54	66 09 17	4. 52541
Shaw.....	342 58 01	162 59 51	4. 25324

CIENEGA PEAK, GRANT COUNTY, N. MEX.

(Not occupied.)

On a sharp, round peak on the west side of the Granite Mountains, about 10 miles south of Steins station on the Southern Pacific Railroad.

Station mark: Highest point of peak.

[Latitude, $32^{\circ} 06' 24.32''$. Longitude, $108^{\circ} 59' 43.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Shaw.....	59 43 10	239 34 04	4.49147
Dos Cabezos.....	102 33 09	282 13 28	4.77466
Station Peak.....	175 05 07	355 04 41	4.17947

SECHO, GRANT COUNTY, N. MEX.

On highest of the low isolated hills about 3 miles east of the Arizona and New Mexico Railway and about 4 miles northeast of the section house at Summit station, about halfway between Lordsburg, N. Mex., and Duncan, Ariz.

Signal and station mark: A cairn 7 feet in diameter and $7\frac{1}{2}$ feet high; hole drilled in solid rock under cairn.

Latitude, $32^{\circ} 30' 14.09''$; from west, $32^{\circ} 30' 13.46''$. Longitude, $108^{\circ} 58' 24.85''$; from west, $108^{\circ} 58' 25.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Station Peak.....	6 36 21.79	186 35 13.16	4.4649610
Doubtful.....	28 32 30.82	208 29 49.40	4.2165700
Dos Cabezos.....	62 39 57.62	242 19 28.02	4.8306588
Graham.....	104 43 43.49	284 14 41.16	4.9399787
Guthrie.....	143 01 38.38	322 50 34.92	4.7249598
Guthrie (from west).....	143 01 51.29	322 50 47.82	4.7250061
Sunset.....	160 54 03.87	340 45 48.18	4.8602010
Line.....	176 41 05	356 40 19	4.58532
Line (from west).....	176 41 18.18	356 40 32.01	4.5853982
Bullard.....	240 56 34.21	61 10 38.66	4.6692474

STATION PEAK, GRANT COUNTY, N. MEX.

On a sharp, conical peak about 1 mile north of Steins Pass station on Southern Pacific Railroad, from which railroad station the peak is visible.

Signal and station mark: Large rock monument and cross chiseled on solid rock under it.

Reference mark: A triangulation tablet cemented into solid rock, 32.8 feet south of center.

[Latitude, $32^{\circ} 14' 33.31''$. Longitude, $109^{\circ} 00' 33.035''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sawmill.....	34 37 36.83	214 29 10.21	4. 6444989
Shaw.....	39 40 52	219 32 16	4. 60087
Wood Canyon.....	66 09 17	245 58 54	4. 52541
Dos Cabezos.....	87 50 56.92	267 31 40.12	4. 7546069
San Simon.....	98 19 37.00	278 12 38.14	4. 3172042
Doubtful.....	162 42 52.33	342 41 20.00	4. 1818044
Section House.....	186 35 13.16	6 36 21.79	4. 4649610
Cienega Peak.....	355 04 41	175 05 07	4. 17947

ARKANSAS.

PRIMARY TRAVERSE.

Caddo Gap, Dequeen, Locksburg, and Poteau Mountain quadrangles.

HOWARD, POLK, AND SEVIER COUNTIES.

The following positions on approximate United States standard datum were determined by J. R. Ellis in 1907. A duplicate line starts from adjusted position at Dequeen and follows highways westward to a boundary post between Arkansas and Oklahoma at Ultima Thule. Starting again at Dequeen the line follows the Dequeen and Eastern Railroad to Provo; thence along highways, east, north, and west near the borders of quadrangles, and is tied to adjusted position near Rust. Starting from adjusted position at Hatfield a duplicate line follows highways westward to post on Arkansas-Oklahoma boundary near Nichols.

CADDO GAP QUADRANGLE.

Magnetic declination: West border, $7^{\circ} 27'$ east.*Geographic positions along highways near west border.*

Station.	Latitude.	Longitude.
Center Point, 2 miles west by 0.5 miles north of; at northeast corner of yard to negro cabin, iron post stamped "Prim. Trav. Sta. No. 4, 1907".....	° ' " 34 01 09.0	° ' " 93 59 09.0
Center Point, 1.5 miles west of; road forks.....	34 01 01.8	93 58 29.4
Center Point, 1 mile west of; crossroads.....	34 01 18.1	93 57 46.6
T. 8 S., R. 28 W., center of sec. 26.....	34 02 10.2	93 57 15.5
New Bethel Church, T road south.....	34 02 53.8	93 58 53.2
T. 6 S., R. 28 W., southeast corner sec. 32.....	34 11 19.4	93 59 43.2
Mr. Henry's house, crossroads just north of; 25 feet southeast to corner of fence.....	34 12 14.3	93 59 37.8
T. 6 S., R. 28 W., northeast corner sec. 33.....	34 12 08.2	93 58 40.3
Crossroads.....	34 12 25.4	93 57 32.8
Crossroads.....	34 13 54.6	93 58 11.5
T road south, at north end of lane, 20 feet northeast to guidepost marked "Hot Springs, 75 miles".....	34 14 52.6	93 58 17.8
Athens, 4 miles south of; at forks of road 0.25 miles north of ford of Brushy Creek, iron post stamped "Prim. Trav. Sta. No. 6, 1907".....	34 15 09.3	93 59 01.0
T. 6 S., R. 28 W., northeast corner sec. 9.....	34 15 37.3	93 58 51.5
Pine Hill schoolhouse, crossroads.....	34 17 19.4	93 58 21.7
T. 5 S., R. 28 W., northeast corner sec. 27.....	34 17 34.1	93 58 19.5
T. 5 S., R. 28 W., northeast corner sec. 22.....	34 18 25.8	93 58 18.7
Athens, iron post stamped "Prim. Trav. Sta. No. 7, 1907" (elev. stamped 958-H-S).....	34 18 52.3	93 58 34.0
Athens, 0.5 mile northwest of; T road north.....	34 19 14.0	93 58 49.4

DEQUEEN QUADRANGLE.

Magnetic declination: North border, $7^{\circ} 22'$ east; east border, $7^{\circ} 27'$ east; south border, $7^{\circ} 22'$ east.*Geographic positions near borders.*

WEST ALONG HIGHWAYS, DEQUEEN TO STATE LINE.

Station.	Latitude.	Longitude.
	° ' " 34 02 17.2	° ' " 94 21 24.2
Dequeen, 1 mile west of; T road south.....	34 02 17.2	94 21 24.2
T. 8 S., R. 32 W., northeast corner sec. 36.....	34 01 51.2	94 20 49.0
Dequeen, 2 miles west of; dim T road south.....	34 02 13.1	94 22 43.4
Chapel Hill, T road northeast.....	34 02 03.2	94 23 44.5

28 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

Geographic positions near borders—Continued.

WEST ALONG HIGHWAYS, DEQUEEN TO STATE LINE—continued.

Station.	Latitude.	Longitude.
Chapel Hill, 0.5 mile southeast of; 55 feet southeast of forks of road, in sandstone 26 by 10 by 8 inches, set 22 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907".....	34 01 50.3	94 23 09.9
Road southwest, stump.....	34 02 14.2	94 24 57.3
Rolling Fork, center of steel bridge over.....	34 02 30.6	94 25 58.0
T. 8 S., R. 32 W., center of sec. 19, at bend in road.....	34 03 08.3	94 26 35.5
T. 8 S., R. 33 W., northeast corner sec. 24.....	34 03 34.0	94 27 07.4
Ultima Thule, 0.75 mile east of; T road north, 25 feet north to small bridge.....	34 03 37.0	94 27 39.5
Arkansas-Oklahoma boundary post No. 92 M. at Ultima Thule.....	34 03 25.3	94 28 25.4

EASTWARD ALONG DEQUEEN AND EASTERN RAILROAD, DEQUEEN TO PROVO.

Milepost 2, 1,500 feet east of; road crossing.....	34 01 51.5	94 18 20.2
Milepost 4, 0.33 mile northwest of; road crossing.....	34 02 01.2	94 17 01.7
Milepost 5, 0.25 mile southeast of; north-south road crossing.....	34 01 34.2	94 15 19.9
Geneva, at southeast corner of Baptist Church, iron post stamped "Prim. Trav. Sta. No. 2, 1907".....	34 01 01.2	94 14 05.4
Geneva, section corner (no numbers).....	34 00 50.4	94 14 18.3
Milepost 7, 0.25 mile southeast of; road crossing.....	34 00 40.0	94 13 29.6
Milepost 17, 0.25 mile northeast of; road crossing.....	34 00 46.8	94 06 40.9
T. 8 S., R. 29 W., northeast corner sec. 32.....	34 01 52.6	94 06 10.1
Provo, 0.66 mile southeast of; at corner of board fence just east of road crossing, iron post stamped "Prim. Trav. Sta. No. 3, 1907".....	34 01 31.2	94 06 15.0

EAST, NORTH, AND WEST ALONG HIGHWAYS, SALINE RIVER TO STATE LINE.

Saline River, 20 feet above ford, Sevier-Howard county line.....	34 01 35.6	94 05 01.0
Messner Creek, center of bridge over.....	34 01 26.8	94 04 04.3
Dick Shannon's house, forks of road.....	34 01 19.0	94 03 16.1
T. 8 S., R. 29 W., northeast corner sec. 36.....	34 01 45.5	94 02 00.5
T. 8 S., R. 28 W., southwest corner sec. 30.....	34 01 44.1	94 02 00.5
Schoolhouse, road in front of.....	34 01 41.9	94 01 46.0
Sunshine Church, 50 feet east of; T road north, large pine.....	34 01 53.0	94 00 37.8
Messner Creek, center of bridge over.....	34 03 16.4	94 00 22.8
Westbrook's (T. H.) house, forks of road.....	34 03 42.7	94 00 56.2
Martha, forks of road.....	34 04 30.1	94 01 50.0
Martha post-office, 0.8 mile northeast of; forks of road, 65 feet to bridge, 75 feet to blaze on white oak.....	34 05 03.9	94 01 21.7
T. 8 S., R. 28 W., quarter corner, north side of sec. 6.....	34 06 06.4	94 01 25.3
Dierks, crossing 600 feet west of station.....	34 06 58.0	94 01 08.0

Geographic positions near borders—Continued.

EAST, NORTH, AND WEST ALONG HIGHWAYS, SALINE RIVER TO STATE LINE—continued.

Station.	Latitude.	Longitude.
Dierks, 1.5 miles north of; 20 feet north of crossing of old tramway, iron post stamped "Prim. Trav. Sta. No. 5, 1907".....	34 08 31.1	94 00 52.2
Branch, just west of; forks to northeast.....	34 08 43.4	94 00 05.5
Top of hill at head of long hollow, forks of road.....	34 09 39.4	94 00 16.4
Church, at southeast corner of field near crossroads.....	34 10 39.1	94 00 10.0
Athens, 2 miles northwest of; forks of old mail trail north.....	34 19 42.0	94 00 10.8
Forks of road, north end of lane, blazed black-oak tree... ..	34 20 26.0	94 00 18.3
T. 4 S., R. 28 W., southeast corner sec. 31, on Howard-Polk county line.....	34 21 05.5	94 01 20.1
T. 5 S., R. 28 W., northeast corner sec. 6, on Howard-Polk county line.....	34 21 05.7	94 01 26.7
Old water mill, road opposite.....	34 21 29.1	94 01 38.4
Athens, 3.5 miles west of; southwest corner of J. H. Baber's yard fence, iron post stamped "Prim. Trav. Sta. No. 8, 1907".....	34 22 04.0	94 01 52.7
Blaylock Mountain, where old mail route crosses; black oak with letters "U.S.G.S." cut on west face.....	34 23 19.2	94 01 10.1
Blaylock Mountain, top of; near where old mail route crosses, hickory tree with blaze and notch.....	34 24 30.6	94 01 35.7
Log schoolhouse, red-oak tree with blaze and notch near..	34 25 09.9	94 02 59.0
Mountain, top of; where trail crosses, white oak with blaze and cross.....	34 25 55.8	94 03 21.0
T. 3 S., R. 29 W., southwest corner sec. 36.....	34 26 16.8	94 03 28.8
Missouri Mountain, where trail crosses, notch and blaze on post oak.....	34 27 01.1	94 03 30.3
T. 3 S., R. 29 W., northeast corner sec. 25.....	34 27 59.5	94 02 23.0
T. 3 S., R. 28 W., northwest corner sec. 30.....	34 27 58.0	94 02 23.0
Mark Heath's house, just east of; forks of road.....	34 28 33.8	94 01 50.0
Big Fork, 4 miles northwest of; southwest corner of General Heath's front yard, at T road south, iron post stamped "Prim. Trav. Sta. No. 9, 1907".....	34 28 57.8	94 02 08.4
Lewis store, road opposite.....	34 28 59.6	94 03 24.4
Old sawmill site, at junction of creek near; forks of road..	34 29 05.0	94 03 54.4
Loony's (J.) house, 700 feet southeast of; cross cut on post oak at T road northeast.....	34 29 42.9	94 05 06.0
Hatfield, 0.7 mile west of; west end of lane at crossroads, iron post stamped "Prim. Trav. Sta. No. 12, 1907".....	34 29 06.0	94 23 24.8
Hatfield, 1.25 miles west of; forks of road at top of hill... ..	34 28 53.4	94 23 50.5
Pleasant Hill Methodist Church, T road south, 15 feet southeast to cross in tree.....	34 28 49.2	94 25 10.6
Pleasant Hill Methodist Church, 1.25 miles west of; crossroads.....	34 28 43.8	94 26 47.7
Hatfield, 5 miles west of; Arkansas-Oklahoma state-line post No. 63.....	34 28 37.4	94 27 46.5

LOCKSBURG QUADRANGLE.

Magnetic declination: North border, $7^{\circ} 22'$ east.*Geographic positions along Dequeen and Eastern Railroad, near Locksburg.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 9, 500 feet north of; road crossing.....	33 59 50.1	94 12 18.7
Milepost 11, 0.25 mile north of; road crossing.....	33 58 29.2	94 11 19.6
Locksburg station, crossing.....	33 58 11.8	94 10 17.5
Milepost 13, road crossing.....	33 58 05.3	94 09 08.4
Milepost 14, 0.25 mile southeast of; road crossing.....	33 58 54.1	94 07 58.9
Big Cut crossing, 0.25 mile northeast of.....	33 59 39.6	94 07 29.0

POTEAU MOUNTAIN QUADRANGLE.

Magnetic declination: South border, $7^{\circ} 22'$ east.*Geographic positions along highways near south border.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road east.....	34 30 39.8	94 05 42.5
T. 2 S., R. 29 W., southwest corner sec. 33.....	34 31 30.1	94 06 31.4
White's farm, T road south, 20 feet south to telephone pole.....	34 32 02.0	94 06 45.6
Duncan's blacksmith shop, at southwest corner of crossroads; 45 feet N. 65° E. to crossroads, iron post stamped "Prim. Trav. Sta. No. 10, 1907".....	34 32 08.5	94 08 02.4
Nunly, just east of; crossroads.....	34 32 16.4	94 08 55.8
T. 2 S., R. 30 W., northeast corner sec. 35.....	34 32 25.6	94 09 43.6
Nunly, 1.5 miles northwest of; cross cut on tree at road forks.....	34 32 42.6	94 10 12.7
Dallas, 1.5 miles east of; 25 feet south to elm, crossroads..	34 32 17.0	94 11 29.4
Dallas, T street south, at northeast corner of old courthouse.....	34 32 10.7	94 12 59.0
Dallas Springs, at north side of T road south, about 1 foot south of east-west fence, iron post stamped "Prim. Trav. Sta. No. 11, 1907".....	34 32 08.5	94 14 05.3
T. 2 S., Rs. 30 and 31 W., line between ranges.....	34 32 02.1	94 15 01.8
T. 2 S., R. 31 W., quarter corner east side of sec. 35.....	34 32 12.8	94 16 03.9
Crossroads.....	34 32 36.9	94 17 06.2
Porter (old site), crossroads.....	34 33 00.1	94 18 21.2
Milepost 385 (on Kansas City Southern Railway) crossing near.....	34 33 29.1	94 18 40.1

CALIFORNIA.

TRIANGULATION STATIONS.

Bridgeport quadrangle.

MONO COUNTY.

The following triangulation stations were established in July, 1905, by A. H. Sylvester, using Hoffmann, Conness, and Dana stations as a base. The work was done with a transit reading to 10 seconds.

BUCKEYE, MONO COUNTY, CAL.

On highest point of Buckeye Mountain, sometimes called Eagle Peak, a high, red mountain lying between Buckeye and Robinson creeks, at the head of Eagle Creek, a branch of Buckeye Creek. It is 11 miles southwest of Bridgeport, Cal., from which point it is reached by wagon road to the old mill site on Buckeye Creek, thence by trail up Eagle Creek to foot of mountain. Horses can be taken within half a mile of the top.

Station mark: Bronze triangulation tablet, over which is built a rock cairn.

[Latitude $38^{\circ} 10' 48.90''$. Longitude $119^{\circ} 24' 28.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hoffmann	13 39 21	193 35 35	4. 58007
Jackson.....	201 13 35	21 17 58	4. 45387
Court-house.....	241 43 21	61 50 02	4. 25248
Potato.....	257 45 30	77 57 28	4. 45950
Castle.....	317 21 51	137 27 07	4. 24018
Dana.....	332 03 00	152 10 10	4. 54617
Conness.....	342 01 41	162 04 55	4. 39514

CASTLE PEAK, MONO COUNTY, CAL.

Castle Peak is a high mountain lying between Green Creek and Virginia Creek, about 5 miles northwest of Lundy and 15 miles southwest of Bridgeport. It is about 1 mile southwest of the Dunderberg mine, from which point it is easiest reached.

The station is on the highest and north end of the west top of the mountain.

Station mark: A cairn 8 feet high. A bronze triangulation tablet was cemented into a bottle which was planted firmly in top of the cairn.

[Latitude $38^{\circ} 03' 53.92''$. Longitude $119^{\circ} 16' 25.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Conness.....	20 51 52	200 50 08	4. 06408
Buckeye.....	137 27 07	317 21 51	4. 24018
Jackson.....	177 55 52	357 55 16	4. 59485
Court-house.....	190 40 32	10 42 14	4. 33507
Potato.....	220 59 52	41 06 49	4. 39813
Dana.....	345 38 12	165 40 10	4. 27585

COURT-HOUSE, MONO COUNTY, CAL.

Station mark: The center of the cupola of the court-house of Mono County, at Bridgeport.

[Latitude $38^{\circ} 15' 23.25''$. Longitude $119^{\circ} 13' 40.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Castle.....	10 42 14	190 40 32	4. 33507
Buckeye.....	61 50 02	241 43 21	4. 25248
Potato.....	280 54 24	100 59 40	4. 10114

POTATO, MONO COUNTY, CAL.

(Not occupied.)

Highest point of Potato Butte, sometimes called Bodie Peak, the most prominent point on the ridge east of the Bridgeport Valley.

[Latitude $38^{\circ} 14' 05.61''$. Longitude $119^{\circ} 05' 10.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dana.....	17 37 48	197 32 50	4. 59077
Conness.....	34 45 48	214 37 18	4. 55777
Castle.....	41 06 49	220 59 52	4. 39813
Buckeye.....	77 57 28	257 45 30	4. 45950
Court-house.....	100 59 40	280 54 24	4. 10114

JACKSON, MONO COUNTY, CAL.

Jackson Mountain is a high mountain of many summits lying north of the Bridgeport Valley between the two forks of Walker River. Most of its many tops are white. The point sighted was a black top, probably as high as any. The range of summits among which this top is located was found later to be more generally known as the Sweetwater Mountains. Immediately east of this black top is a white top having a monument on it. This monument was not discovered until after the black point had been observed upon from several stations, so the point was not changed to the monument.

[Latitude $38^{\circ} 25' 09.22''$. Longitude $119^{\circ} 17' 23.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Conness.....	3 04 31	183 03 23	4.70092
Buckeye.....	21 17 58	201 13 35	4.45387
Dana.....	353 56 35.	173 59 10	4.76293
Castle.....	357 55 16	177 55 52	4.59485

Antioch, Clarksburg, Rio Vista, and Vacaville quadrangles.

CONTRA COSTA, SACRAMENTO, SAN JOAQUIN, SOLANO, AND YOLO COUNTIES.

In cooperation with the State, the four 15-minute quadrangles named above were controlled by C. F. Urquhart in 1906. Besides reoccupying 2 stations of the Coast and Geodetic Survey, 24 new stations were occupied, and 18 points were located by intersections.

ANTIOCH, CONTRA COSTA COUNTY, CAL.

(Not occupied.)

Station mark: Cupola of large schoolhouse in town of Antioch.

[Latitude $38^{\circ} 00' 52.88''$. Longitude $121^{\circ} 48' 48.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Young.....	191 23 49.75	11 24 35.62	3.9626712
Anderson.....	215 46 01.59	35 49 15.01	4.1164946

NAYLOR, CONTRA COSTA COUNTY, CAL.

Coast and Geodetic Survey station on north end of low range of hills about 1 mile south of Bay Point, a station on the Southern Pacific Railroad on south side of Suisun Bay.

Station mark: "Established by C. & G. S."

[Latitude $38^{\circ} 02' 04.47''$. Longitude $122^{\circ} 01' 00.01''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barry.....	136 00 26.18	315 56 04.02	4.1732911
Light-house.....	165 41 31.48	345 41 07.42	3.5855254
Suisun.....	179 22 26.24	359 22 20.68	4.3017038
Kirby.....	209 48 37.32	29 52 12.10	4.2315882
Sullivan.....	231 49 48.96	51 56 52.89	4.3279780
Young.....	250 52 06.30	71 00 23.15	4.3177227
Collinsville.....	252 45 17.98	72 51 26.51	4.1835011
Black Diamond.....	272 17 22.63	92 22 44.74	4.1058847

LIGHT-HOUSE, CONTRA COSTA COUNTY, CAL.

(Not occupied.)

Station mark: Center of light-house in Suisun Bay.

[Latitude $38^{\circ} 04' 05.48''$. Longitude $122^{\circ} 01' 39.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Naylor.....	345 41 07.42	165 41 31.48	3.5855254
Barry.....	126 37 56.16	306 33 57.99	4.0687278

BIGHOUSE, SACRAMENTO COUNTY, CAL.

(Not occupied.)

A large yellow house 5 miles east of Isleton.

Station mark: Point of roof at northwest end of house.

[Latitude $38^{\circ} 10' 21.27''$. Longitude $121^{\circ} 31' 22.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Redtank.....	45 35 21.70	225 33 19.16	3.8301612
Young.....	70 16 12.79	250 06 12.51	4.4007840
Rio Vista.....	82 53 52.73	262 47 25.60	4.1867146

ISLETON, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Station mark: The flagstaff of Odd Fellows Hall in town of Isleton.

[Latitude 38° 09' 45.46''. Longitude 121° 36' 37.85''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Redtank.....	321 45 58.71	141 47 11.27	3.6647294
Rio Vista.....	83 54 37.46	263 51 25.48	3.8812713

REDTANK, SACRAMENTO COUNTY, CAL.

A red water tank on tower at the Golden State cannery situated about 2 miles southeast of Isleton.

Station mark: Center of tank.

[Latitude 38° 07' 47.72''. Longitude 121° 34' 40.43''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stack South.....	5 15 20.30	185 14 54.62	4.0448076
Jersey.....	48 13 23.65	228 09 21.55	4.1082298
Windmill.....	50 36 28.79	230 34 15.41	3.8334092
Young.....	78 40 56.48	258 32 58.92	4.2389182
Anderson.....	80 31 25.00	260 25 55.10	4.1205617
Mayhood.....	98 28 54.33	278 22 50.28	4.1617302
Rio Vista.....	105 10 12.94	285 05 48.51	4.0334320
Isleton.....	141 47 11.27	321 45 58.71	3.6647294
Bighouse.....	225 33 19.16	45 35 21.70	3.8301612
Red Tower.....	340 43 09.51	160 44 14.82	3.8928859

SACRAMENTO, SACRAMENTO COUNTY, CAL.

Station mark: The dome of the state capitol in the city of Sacramento.

[Latitude 38° 34' 37.38''. Longitude 121° 29' 34.43''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mound House.....	36 35 52.35	216 28 26.86	4.4647667
Glide.....	45 32 00.56	225 26 35.68	4.2484859
Davis.....	80 10 22.27	260 01 08.16	4.3394244

JERSEY, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

A flagstaff on cupola of large hotel on Jersey Island, which may be reached by boat from Rio Vista or Antioch.

Station mark: Center of staff.

[Latitude $38^{\circ} 03' 10.30''$. Longitude $121^{\circ} 41' 12.87''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Young.....	117 08 40.09	297 04 44.95	4.0187420
Anderson.....	151 29 58.16	331 28 30.59	3.8602791
Mayhood.....	155 48 48.55	335 46 46.96	4.0685795
Rio Vista.....	175 37 46.35	355 37 24.32	4.0571421
Redtank.....	228 09 21.55	48 13 23.65	4.1082298

RED TOWER, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Station mark: Center of a red water-tank tower with conical roof near large white house with red roof.

[Latitude $38^{\circ} 03' 48.48''$. Longitude $121^{\circ} 32' 54.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Young.....	99 33 33.53	279 24 31.04	4.3371454
Rio Vista.....	128 08 01.51	308 02 31.95	4.2182333
Redtank.....	160 44 14.82	340 43 09.51	3.8928859

STACK SOUTH, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

A smokestack at small pumping plant about 10 miles south of Isleton.

Station mark: Center of smokestack.

[Latitude $38^{\circ} 01' 49.64''$. Longitude $121^{\circ} 35' 22.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Young.....	112 09 29.16	292 01 57.80	4.2846850
Rio Vista.....	145 50 10.73	325 46 12.29	4.2241955
Redtank.....	185 14 54.62	5 15 20.30	4.0448076

ANDERSON, SOLANO COUNTY, CAL.

A tetrapod built on a low hill on land worked by Perry Anderson, about 4 miles southwest of Rio Vista. The signal is best reached by way of the Rio Vista-Collinsville road; at a distance of about 3 miles from Rio Vista, at a blacksmith shop, leave main road and turn south continuing down drainage to within half a mile of edge of hills, thence turn east and climb hill on which signal may be seen.

Station mark: The tetrapod signal.

[Latitude $38^{\circ} 06' 36.90''$. Longitude $121^{\circ} 43' 34.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Antioch.....	35 49 15.01	215 46 01.59	4.1164946
Young.....	74 34 13.95	254 31 46.27	3.7817102
Mayhood.....	162 43 32.05	342 42 58.05	3.6546750
Redtank.....	260 25 55.10	80 31 25.00	4.1205617
Jersey.....	331 28 30.59	151 29 58.16	3.8602791

BARRY, SOLANO COUNTY, CAL.

A tetrapod signal on highest point of low range of hills about 4 miles south of Cordelia station on Napa branch of Southern Pacific Railroad. It is best reached by road south from Cordelia to a point about east of signal, which may be seen from road; thence through pasture lands to old barn near summit.

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

[Latitude $38^{\circ} 07' 52.01''$. Longitude $122^{\circ} 08' 05.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Vaca.....	189 16 52.57	9 18 45.90	4.4401222
Bridgeport.....	190 15 35.59	10 16 19.72	3.9891148
Dresser.....	210 49 22.90	30 54 40.90	4.3867843
Fairfield.....	212 31 26.69	32 34 58.65	4.1904631
Suisun.....	227 21 24.43	47 25 41.55	4.1385820
Derrick.....	231 20 24.23	51 28 23.98	4.3829584
Mound House.....	235 56 45.60	56 13 13.32	4.6695233
Kirby.....	257 44 08.26	77 52 05.82	4.2846407
Rio Vista.....	265 51 37.97	86 07 51.64	4.5852630
Young.....	277 21 24.12	97 34 03.84	4.4805991
Collinsville.....	283 53 36.62	104 04 07.82	4.4096458
Black Diamond.....	295 51 18.59	116 01 03.19	4.4097306
Light-house.....	306 33 57.99	126 37 56.16	4.0687278
Naylor.....	315 56 04.02	136 00 26.18	4.1732911

BLACK DIAMOND, SOLANO COUNTY, CAL.

(Not occupied.)

Station mark: Center of large water tank in town of Black Diamond.

[Latitude $38^{\circ} 01' 47.61''$. Longitude $121^{\circ} 52' 17.19''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Naylor.....	92 22 44.74	272 17 22.63	4.1058847
Barry.....	116 01 03.19	295 51 18.59	4.4097306
Kirby.....	164 28 09.61	344 26 21.79	4.2010073

BRIDGEPORT, SOLANO COUNTY, CAL.

A tetrapod built over Coast and Geodetic Survey mark at south end of low timbered hill about 4 miles west of Suisun.

Signal: A lumber tetrapod.

Station mark: Coast and Geodetic Survey mark; a 4 by 4 inch wooden plug set in ground under signal.

[Latitude $38^{\circ} 13' 03.25''$. Longitude $122^{\circ} 06' 53.63''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barry.....	10 16 19.72	190 15 35.59	3.9891148
Vaca.....	183 45 26.53	8 46 35.72	4.2504150
Dresser.....	223 30 25.41	43 34 59.49	4.1935486
Fairfield.....	242 13 53.23	62 16 41.20	3.8726709
Derrick.....	252 13 51.36	72 21 07.37	4.2548314
Suisun.....	271 53 48.58	91 57 21.77	3.9236728
Kirby.....	287 52 30.91	107 59 44.78	4.2540148

BROWN, SOLANO COUNTY, CAL.

On low ridge in Mr. Brown's sheep pasture, 1 mile south and 3 miles east of Elmira.

Signal: A lumber tetrapod.

Station mark: A bench-mark post set under center of signal.

[Latitude $38^{\circ} 20' 10.46''$. Longitude $121^{\circ} 51' 10.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Derrick.....	36 59 34.76	216 57 06.85	3.9841415
Dresser.....	81 22 22.49	261 17 12.10	4.0898191
Vaca.....	102 25 14.75	282 16 38.84	4.3152246
Rocky Point.....	111 08 41.18	291 03 40.39	4.1008915
Teddrick.....	221 00 18.82	41 02 08.94	3.8171755
Peters.....	256 03 42.61	76 06 54.74	3.8891770
Cupola barn.....	315 08 35.19	135 10 59.93	3.9055215

COLLINSVILLE, SOLANO COUNTY, CAL.

(Not occupied.)

A white water-tank tower near a large, square white house in south edge of Collinsville.

Station mark: Center of tower.

[Latitude 38° 04' 30.76". Longitude 121° 51' 02.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Naylor.....	72 51 26.51	252 45 17.98	4.1835011
Barry.....	104 04 07.82	283 53 36.62	4.4096458

CUPOLA BARN, SOLANO COUNTY, CAL.

The cupola on a barn about 5 miles west and 9 miles north from Rio Vista, on Rio Vista-Dixon road.

Station mark: Center of cupola.

[Latitude 38° 17' 05.44". Longitude 121° 47' 17.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sullivan.....	12 43 10.09	192 41 46.09	4.1764752
Kirby.....	41 40 12.85	221 35 19.05	4.2401762
Derrick.....	80 09 51.07	260 04 58.61	4.0662670
Dresser.....	102 14 52.76	282 07 17.83	4.2611532
Vaca.....	111 28 08.07	291 17 07.70	4.4436578
Brown.....	135 10 59.93	315 08 35.19	3.9055215
Peters.....	193 44 27.89	13 45 15.13	3.8915778
Rio Vista.....	330 53 55.65	150 57 24.23	4.2161186
Mayhood.....	344 52 38.34	164 54 27.14	4.1933234

DERRICK, SOLANO COUNTY, CAL.

A derrick over gas well about 7 miles east of Suisun, 1.5 miles northwest of Denverton. It is the only derrick in the country. Good road from Suisun or Denverton.

Station mark: The 6 or 8 inch pipe extending several hundred feet into the ground.

[Latitude $38^{\circ} 16' 00.64''$. Longitude $121^{\circ} 55' 09.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kirby.....	0 20 29.35	180 20 27.69	4.0412664
Barry.....	51 28 23.98	231 20 24.23	4.3829584
Suisun.....	56 42 38.53	236 38 55.84	4.0199622
Bridgeport.....	72 21 07.37	252 13 51.36	4.2548314
Vaca.....	130 08 40.47	310 02 32.92	4.2746721
Dresser.....	132 36 35.72	312 33 53.45	3.9366736
Rocky Point.....	154 00 01.62	333 57 29.03	4.1343682
Brown.....	216 57 06.85	36 59 34.76	3.9841415
Cupola Barn.....	260 04 58.61	80 09 51.07	4.0662670
Sullivan.....	327 04 03.25	147 07 31.30	4.1779402

DRESSER, SOLANO COUNTY, CAL.

On highest point of range of hills about 3 miles south of Vacaville.
Signal: A lumber tetrapod.

Station mark: A bench-mark post a little to west of signal.

[Latitude $38^{\circ} 19' 10.34''$. Longitude $121^{\circ} 59' 31.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barry.....	30 54 40.90	210 49 22.90	4.3867843
Bridgeport.....	43 34 59.49	223 30 25.41	4.1935486
Vaca.....	128 00 33.72	307 57 08.42	4.0083392
Rocky Point.....	183 25 37.75	3 25 47.54	3.8066756
Vacaville.....	188 41 08.96	8 41 25.64	3.6356782
Wilson.....	215 28 17.94	35 31 43.49	4.1412105
Elmira.....	245 05 56.25	65 09 07.27	3.9161704
Teddrick.....	247 28 43.72	67 35 44.36	4.2507507
Peters.....	259 14 03.49	79 22 26.03	4.3015709
Brown.....	261 17 12.10	81 22 22.49	4.0898191
Cupola Barn.....	282 07 17.83	102 14 52.76	4.2611532
Derrick.....	312 33 53.45	132 36 35.72	3.9366736
Kirby.....	339 27 56.15	159 30 36.58	4.2549323

ELMIRA, SOLANO COUNTY, CAL.

(Not occupied.)

The yellow spire of Methodist Church in Elmira.

Station mark: Center of spire.

[Latitude 38° 21' 02.81". Longitude 121° 54' 23.13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dresser.....	65 09 07.27	245 05 56.25	3. 9161704
Vaca.....	100 18 26.63	280 11 50.12	4. 1976051
Rocky Point.....	112 27 11.78	292 24 10.43	3. 8850330

FAIRFIELD, SOLANO COUNTY, CAL.

(Not occupied.)

Station mark: Center of tower on high school building.

[Latitude 38° 14' 55.87". Longitude 122° 02' 22.21".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barry.....	32 34 58.65	212 31 26.69	4. 1904631
Bridgeport.....	62 16 41.20	242 13 53.23	3. 8726709
Suisun.....	334 37 21.24	154 38 06.54	3. 6185849

KIRBY, SOLANO COUNTY, CAL.

A tetrapod built on highest point of low hills locally known as Kirby hills. The signal is about one-fourth mile from Hutchinson's farmhouse. It is best reached via Suisun-Denverton road, thence to Hutchinson's.

Station mark: Center of tetrapod.

[Latitude 38° 10' 03.99". Longitude 121° 55' 11.93".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Naylor.....	29 52 12.10	209 48 37.32	4. 2315882
Barry.....	77 52 05.82	257 44 08.26	4. 2846407
Bridgeport.....	107 59 44.78	287 52 30.91	4. 2540148
Suisun.....	121 08 44.53	301 05 03.75	4. 0064604
Dresser.....	159 30 36.58	339 27 56.15	4. 2549323
Derrick.....	180 20 27.69	0 20 29.35	4. 0412664
Cupola Barn.....	221 35 19.05	41 40 12.85	4. 2401762
Sullivan.....	281 16 52.71	101 20 22.20	3. 9251948
Black Diamond.....	344 26 21.79	164 28 09.61	4. 2010073

MAXWELL, SOLANO COUNTY, CAL.

A windmill on Mr. Maxwell's ranch 1.5 miles north and 7 miles east of Dixon.

Station mark: Center of windmill.

[Latitude $38^{\circ} 27' 52.74''$. Longitude $121^{\circ} 42' 13.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sykes.....	122 19 18.05	302 17 31.82	3.6899101
Glide.....	269 26 54.18	89 29 21.58	3.7592961
Titus.....	336 09 44.63	156 10 52.64	3.8173805

MAYHOOD, SOLANO COUNTY, CAL.

A tetrapod signal built on the highest point of low hills about $2\frac{1}{2}$ miles west of Rio Vista. Station is best reached by Rio Vista-Collinsville road; at a point about 0.5 mile west of Mayhood ranch house take field road through gate on north side of main road; thence over small ridge and down past a barn and house, thence up drainage, and the highest point may be seen to the north.

Station mark: The tetrapod signal.

[Latitude $38^{\circ} 08' 56.73''$. Longitude $121^{\circ} 44' 29.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Young.....	37 10 04.52	217 08 10.77	3.8710598
Cupola Barn.....	164 54 27.14	344 52 38.34	4.1933234
Red School.....°	171 54 25.64	351 54 05.80	3.7441832
Rio Vista.....	259 59 54.96	80 01 34.63	3.6008566
Redtank.....	278 22 50.28	98 28 54.33	4.1617302
Jersey.....	335 46 46.96	155 48 48.55	4.0685795
Anderson.....	342 42 58.05	162 43 32.05	3.6546750

PETERS, SOLANO COUNTY, CAL.

(Not occupied.)

A white windmill tank house, owned by Mr. Peters, about 7 miles south and 3 miles east of Dixon.

Station mark: The center of top of tower.

[Latitude 38° 21' 10.88". Longitude 121° 46' 00.90'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cupola Barn.....	13 45 15.13	193 44 27.89	3.8915778
Brown.....	76 06 54.74	256 03 42.61	3.8891770
Dresser.....	79 22 26.03	259 14 03.49	4.3015709
Rocky Point.....	97 58 39.14	277 50 26.07	4.2893960

RED SCHOOL, SOLANO COUNTY, CAL.

Red-roofed white schoolhouse about 4 miles northwest of Rio Vista on Rio Vista-Suisun road.

Station mark: Flagstaff at east end of house.

[Latitude 38° 11' 54.90". Longitude 121° 45' 02.02'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rio Vista.....	315 32 36.78	135 34 36.35	3.8276858
Mayhood.....	351 54 05.80	171 54 25.64	3.7441832

RIO VISTA, SOLANO COUNTY, CAL.

A large double tank on west edge of the town of Rio Vista.

Station mark: A pole in center of roof over the two tanks.

[Latitude 38° 09' 19.17". Longitude 121° 41' 48.57'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Young.....	51 52 07.61	231 48 34.25	4.0296156
Mayhood.....	80 01 34.63	259 59 54.96	3.6008566
Barry.....	86 07 51.64	265 51 37.97	4.5852630
Vaca.....	125 59 51.16	305 45 28.20	4.6212403
Red School.....	135 34 36.35	315 32 36.78	3.8276858
Cupola Barn.....	150 57 24.23	330 53 55.65	4.2161186
Mound House.....	181 04 25.83	1 04 37.60	4.3689847
Stack.....	212 15 33.84	32 19 09.06	4.1998611
Bighouse.....	262 47 25.60	82 53 52.73	4.1867146
Isleton.....	263 51 25.48	83 54 37.46	3.8812713
Red tank.....	285 05 48.51	105 10 12.94	4.0334320
Red Tower.....	308 02 31.95	128 08 01.51	4.2182333
Windmill.....	324 07 25.76	144 09 36.66	3.9453071
Stack South.....	325 46 12.29	145 50 10.73	4.2241955
Jersey.....	355 37 24.32	175 37 46.35	4.0571421

ROCKY POINT, SOLANO COUNTY, CAL.

On point known as Rocky (or Drakes) Point, about 1.5 miles north northwest from Vacaville.

Signal: A pole with targets on it.

Station mark: Triangulation tablet set in solid rock.

[Latitude $38^{\circ} 22' 37.77''$. Longitude $121^{\circ} 59' 15.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dresser.....	3 25 47.54	183 25 37.75	3.8066756
Vaca.....	89 11 43.91	269 08 08.69	3.9250910
Winters.....	180 23 46.58	0 23 49.23	4.1743629
Scott.....	204 35 25.59	24 39 43.98	4.3830704
Wilson.....	237 28 52.66	57 32 08.54	3.9577187
Peters.....	277 50 26.07	97 58 39.14	4.2893960
Brown.....	291 03 40.39	111 08 41.18	4.1008915
Elmira.....	292 24 10.43	112 27 11.78	3.8850330
Cupola Barn.....	300 22 06.80	120 29 32.23	4.3060162
Derrick.....	333 57 29.03	154 00 01.62	4.1343682
Vacaville.....	352 45 56.04	172 46 02.93	3.3305222

SUISUN, SOLANO COUNTY, CAL.

A tetrapod signal built on low point at west end of low range of hills known as the Suisun Hills. It is best reached via Suisun-Denverton road to a point about 4 miles east of Suisun, then turn south around head of slough, thence west through hills to station.

Signal and station mark: Center of tetrapod; bench-mark post.

[Latitude $38^{\circ} 12' 54.10''$. Longitude $122^{\circ} 01' 09.01''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barry.....	47 25 41.55	227 29 24.43	4.1385820
Bridgeport.....	91 57 21.77	271 53 48.58	3.9236728
Fairfield.....	154 58 06.54	334 37 21.24	3.6185849
Vaca.....	162 26 41.24	342 24 16.86	4.2729781
Derrick.....	236 38 55.84	56 42 38.53	4.0199622
Kirby.....	301 05 03.75	121 08 44.53	4.0064604
Naylor.....	359 22 20.68	179 22 26.24	4.3017038

SULLIVAN, SOLANO COUNTY, CAL.

A tetrapod signal built on low hill in field owned by Mrs. Sullivan, about 1 mile north of Sullivan's house, which is on the road from Birds Landing to Rio Vista.

Signal: A lumber tripod.

[Latitude 38° 09' 10.45". Longitude 121° 49' 32.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Naylor.....	51 56 52.89	231 49 48.96	4.3279780
Kirby.....	101 20 22.20	281 16 52.71	3.9251948
Derrick.....	147 07 31.30	327 04 03.25	4.1779402
Cupola Barn.....	192 41 46.09	12 43 10.09	4.1764752

STACK, SOLANO COUNTY, CAL.

(Not occupied.)

A smokestack of pumping plant on Old River about 10 miles north-east of Rio Vista.

Station mark: Center of smokestack.

[Latitude 38° 16' 33.57". Longitude 121° 36' 00.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rio Vista.....	32 19 09.06	212 15 33.84	4.1998611
Mound House.....	141 17 40.18	321 14 15.65	4.1074211

SYKES, SOLANO COUNTY, CAL.

(Not occupied.)

Two tall, slim eucalyptus trees at the residence of Mr. Sykes, about 4 miles south of Davisville and 1.5 miles east of Tremont, a station on the Southern Pacific Railroad.

Station mark: The taller one of the two trees.

[Latitude 38° 29' 17.62". Longitude 121° 45' 03.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Glide.....	284 30 30.12	104 34 43.79	4.0090162
Maxwell.....	302 17 31.82	122 19 18.05	3.6899101
Titus.....	321 45 02.25	141 47 56.45	4.0405420
Mound House.....	339 06 44.32	159 08 56.87	4.1620168

TEDDRICK, SOLANO COUNTY, CAL.

A windmill on east side of road 4 miles south and 1 mile east of Dixon. A United States Geodetic Survey triangulation tablet on side of road near windmill.

Station mark: Center of windmill.

[Latitude $38^{\circ} 22' 51.08''$. Longitude $121^{\circ} 48' 13.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brown.....	41 02 08.94	221 00 18.82	3.8171755
Dresser.....	67 35 44.36	247 28 43.72	4.2507507
Vaca.....	88 50 24.44	268 39 58.10	4.3890418

VACA, SOLANO COUNTY, CAL.

A Coast and Geodetic Survey station in the southern part of sec. 9, T. 6 N., R. 2 W., Diablo meridian, on the dividing ridge between Solano and Napa counties, about 7 miles a little north of west from Vacaville. The mountain slopes gently toward the east, and is much more precipitous on the western slope, but the station can be approached from either side. Mr. A. J. Raney, living in 1880 at Gordon Valley, west of the mountain, is referred to as knowing the locality well. The underground mark is a soda-water bottle filled with sand, buried neck upward; the top is 1.18 feet below the surface, and a copper nail is stuck in the sand. Over this was built a rough stone pier laid in Portland cement. The center mark at the surface is a copper bolt set in cement in a large stone in the center of the pier. The bolt is five-eighths inch in diameter by 5 inches long, projects about one-fourth inch, and has a silver pin set in it.

The top of the pier is 3.44 feet above the underground mark. The concrete astronomical piers serving as reference marks are situated as follows: Vertical circle pier bears S. $6^{\circ} 02'$ E. (true), distant 15.9 meters; the zenith telescope pier S. $58^{\circ} 42'$ E. (true), distant 72.1 feet from geodetic point.

[Latitude $38^{\circ} 22' 33.808''$. Longitude $122^{\circ} 05' 01.988''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bridgeport.....	8 46 35.72	188 45 26.53	4.2504150
Barry.....	9 18 45.90	189 16 52.57	4.4401222
Tamalpais.....	41 59 19.676	221 40 21.039	4.8279801
Helena.....	124 25 48.796	304 05 18.186	4.7627578
Winters.....	209 26 10.93	29 29 49.12	4.2380606
Scott.....	219 50 32.69	39 58 26.77	4.4592354
Davis.....	238 11 06.87	58 23 57.24	4.5477666
Wilson.....	252 40 03.28	72 46 54.48	4.2259167
Glide.....	255 37 12.08	75 53 50.04	4.6041396
Teddrick.....	268 39 58.10	88 50 24.44	4.3890418
Rocky Point.....	269 08 08.69	89 11 43.91	3.9250910
Mound House.....	271 44 47.18	91 59 23.38	4.5350633
Elmira.....	280 11 50.12	100 18 26.63	4.1976051
Brown.....	282 16 38.84	102 25 14.75	4.3152246
Vacaville.....	282 56 33.24	103 00 15.31	3.9500220
Cupola Barn.....	291 17 07.70	111 28 08.07	4.4436578
Rio Vista.....	305 45 28.20	125 59 51.16	4.6212403
Dresser.....	307 57 08.42	128 00 33.72	4.0683392
Derrick.....	310 02 32.92	130 08 40.47	4.2746721
Young.....	320 35 34.91	140 46 23.41	4.6044314
Suisun.....	342 24 16.86	162 26 41.24	4.2729781
Diablo.....	344 42 00.56	164 48 19.44	4.7545806

VACAVILLE, SOLANO COUNTY, CAL.

(Not occupied.)

Station mark: The flagstaff on high school at Vacaville.

[Latitude $38^{\circ} 21' 28.90''$. Longitude $121^{\circ} 59' 04.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dresser.....	8 41 25.64	188 41 08.96	3.6356782
Vaca.....	103 00 15.31	282 56 33.24	3.9500220
Rocky Point.....	172 46 02.93	352 45 56.04	3.3305222

WILSON, SOLANO COUNTY, CAL.

Center of windmill in Mr. Wilson's field, 5 miles north of Elmira.

[Latitude $38^{\circ} 25' 15.83''$. Longitude $121^{\circ} 53' 59.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dresser.....	35 31 43.49	215 28 17.94	4. 1412105
Rocky Point.....	57 32 08.54	237 28 52.66	3. 9577187
Vaca.....	72 46 54.48	252 40 03.28	4. 2259167

YOUNG, SOLANO COUNTY, CAL.

A tetrapod signal built on low hill on land farmed by Rodney Young and about 1 mile north of his residence. Station is best reached via Rio Vista-Collinsville road; at a point about 6 miles west of Rio Vista turn down lane to south, pass one house to left of road and then turn to west. Continue along road to slough, at which Mr. Young's house is situated; thence north through fields to signal.

[Latitude $38^{\circ} 05' 44.63''$. Longitude $121^{\circ} 47' 34.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Antioch.....	11 24 35.62	191 23 49.75	3. 9626712
Naylor.....	71 00 23.15	250 52 06.30	4. 3177227
Barry.....	97 34 03.84	277 21 24.12	4. 4805991
Vaca.....	140 46 23.41	320 35 34.91	4. 6044314
Mayhood.....	217 08 10.77	37 10 04.52	3. 8710598
Rio Vista.....	231 48 34.25	51 52 07.61	4. 0296156
Bighouse.....	250 06 12.51	70 16 12.79	4. 4007840
Anderson.....	254 31 46.27	74 34 13.95	3. 7817102
Redtank.....	258 32 58.92	78 40 56.48	4. 2839182
Red Tower.....	279 24 31.04	99 33 33.53	4. 3371454
Stack South.....	292 01 57.80	112 09 29.16	4. 2846850
Jersey.....	297 04 44.95	117 08 40.09	4. 0187420

DAVIS, YOLO COUNTY, CAL.

A very high eucalyptus tree with the limbs cut off to within 15 feet of top; in town of Davis.

Station mark: Center of tree.

[Latitude 38° 32' 35.50". Longitude 121° 44' 23.38".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Vaca.....	58 23 57.24	238 11 06.87	4. 5477666
Winters.....	80 51 23.64	260 42 10.72	4. 3381222
Scott.....	107 03 10.24	286 58 13.14	4. 0816503
Sacramento.....	260 01 08.16	80 10 22.27	4. 3394244
Glide.....	314 12 12.35	134 16 01.02	4. 0941764
Titus.....	338 26 41.18	158 29 10.36	4. 1995110
Mound House.....	347 57 21.93	167 59.09.44	4. 3034578

DERRICK NO. 2, YOLO COUNTY, CAL.

(Not occupied.)

Center of an abandoned derrick on plain northeast of Mound House.

[Latitude 38° 23' 15.30". Longitude 121° 38' 53.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mound House.....	57 50 41.11	237 49 03.65	3. 6534408
Titus.....	139 21 14.44	319 20 18.45	3. 5260399
Glide.....	186 00 58.46	6 01 21.72	3. 9373046

GLIDE, YOLO COUNTY, CAL.

White water-tank tower about 9 miles east and 2 miles north of Dixon near large white house owned by Mr. Glide.

Station mark: Center of tower.

[Latitude 38° 27' 54.47". Longitude 121° 38' 16.09".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Derrick No. 2.....	6 01 21.72	186 00 58.46	3. 9373046
Mound House.....	23 13 03.03	203 11 02.24	4. 0782188
Titus.....	27 03 16.31	207 01 57.01	3. 8328087
Vaca.....	75 53 50.04	255 37 12.08	4. 6041396
Maxwell.....	89 29 21.58	269 26 54.18	3. 7592961
Sykes.....	104 34 43.79	284 30 30.12	4. 0090162
Davis.....	134 16 01.02	314 12 12.35	4. 0941764
Sacramento.....	225 26 35.68	45 32 00.56	4. 2484859
South Chimney.....	237 19 54.29	57 23 40.98	4. 0204531
Waterbury.....	308 04 17.30	128 07 49.46	4. 0219548

MOUND HOUSE, YOLO COUNTY, CAL.

A house built on small mound about 8 miles east and 8 miles south of Dixon, locally known as Mound House.

Station mark: Chimney at south end.

[Latitude $38^{\circ} 21' 57.55''$. Longitude $121^{\circ} 41' 30.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rio Vista.....	1 04 37.60	181 04 25.83	4.3689847
Barry.....	56 13 13.32	235 56 45.60	4.6695233
Vaca.....	91 59 23.38	271 44 47.18	4.5350633
Sykes.....	159 08 56.87	339 06 44.32	4.1620168
Davis.....	167 59 09.44	347 57 21.93	4.3034578
Titus.....	198 09 50.36	18 10 31.88	3.7163334
Glide.....	203 11 02.24	23 13 03.03	4.0782188
Sacramento.....	216 28 26.86	36 35 52.35	4.4647667
Derrick.....	237 49 03.65	57 50 41.11	3.6534408
Stack.....	321 14 15.65	141 17 40.18	4.1074211

SCOTT, YOLO COUNTY, CAL.

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

Signal: A lumber tetrapod with black cloth on it.

Station mark: A bench-mark post set 36 inches in the ground.

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky Point.....	24 39 43.98	204 35 25.59	4.3830704
Vaca.....	39 58 26.77	219 50 32.69	4.4592354
Winters.....	54 50 18.74	234 46 02.62	4.0856900
Davis.....	286 58 13.14	107 03 10.24	4.0816503

SOUTH CHIMNEY, YOLO COUNTY, CAL.

(Not occupied.)

The south and highest one of two brick chimneys of brick factory about 5 miles south of Sacramento on east bank of Sacramento River.

Station mark: Center of chimney.

[Latitude 38° 30' 57.81". Longitude 121° 32' 11.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Waterbury.....	2 37 29.95	182 37 15.68	4. 0848035
Titus.....	45 33 00.23	225 27 54.33	4. 2230964
Glide.....	57 23 40.98	237 19 54.29	4. 0204531

TITUS, YOLO COUNTY, CAL.

A large barn near a small deserted house about 8 miles east and 3 miles south of Dixon. The barn has a corrugated iron roof.

Station mark: Shaft of old windmill at west end of roof.

[Latitude 38° 24' 37.91". Longitude 121° 40' 23.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mound House.....	18 10 31.88	198 09 50.36	3. 7163334
Sykes.....	141 47 56.45	321 45 02.25	4. 0405420
Maxwell.....	156 10 52.64	336 09 44.63	3. 8173805
Davis.....	158 29 10.36	338 26 41.18	4. 1995110
Glide.....	207 01 57.01	27 03 16.31	3. 8328087
South Chimney.....	225 27 54.33	45 33 00.23	4. 2230964
Waterbury.....	272 07 23.28	92 12 14.56	4. 0562811
Derrick No. 2.....	319 20 18.45	139 21 14.44	3. 5260399

WATERBURY, YOLO COUNTY, CAL.

A large yellow house owned by Mrs. Waterbury, on east edge of overflow land about 1.5 miles southwest of Clarksburg.

Station mark: Point of roof at west end of house.

[Latitude 38° 24' 23.97". Longitude 121° 32' 34.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Titus.....	92 12 14.56	272 07 23.28	4. 0562811
Glide.....	128 07 49.46	308 04 17.30	4. 0219548
South Chimney.....	182 37 15.68	2 37 29.95	4. 0848035

WINTERS, YOLO COUNTY, CAL.

On a prominent bald hill with large oak tree near the northwest end of it. It is about 1 mile southwest from the town of Winters on the Southern Pacific Railroad between Elmirā and Rumsey.

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

Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude $38^{\circ} 30' 42.303''$. Longitude $121^{\circ} 59' 11.054''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky Point.....	0 23 49.23	180 23 46.58	4. 1743629
Vaca.....	29 29 49.12	209 26 10.93	4. 2380606
Scott.....	234 46 02.62	54 50 18.74	4. 0856900
Davis.....	260 42 10.72	80 51 23.64	4. 3381222

Auburn, Bangor, Biggs, Fair Oaks, Folsom, Galt, Hatchville, Kingan, Lincoln, Lockeford, Knights Landing, Roseville, Wheatland, Woodbridge, and Yuba City quadrangles.

ALAMEDA, AMADOR, BUTTE, CALAVERAS, ELDORADA, NEVADA, PLACER, SACRAMENTO, SAN JOAQUIN, SANTA CLARA, SOLANO, SUTTER, AND YUBA COUNTIES.

In cooperation with the State, during the seasons of 1907 and 1908, C. F. Urquhart, C. L. Nelson, and A. H. Sylvester extended triangulation over the above-named quadrangles from Coast and Geodetic Survey stations Diablo and Mocho and checked on positions of Marysville Butte and Sacramento Capitol.

BRUSHY, ALAMEDA COUNTY, CAL.

About 8 miles by road from Livermore on a mountain locally known as Brushy Peak. It is best reached from Livermore by road to Joseph Laughlin's residence, 6.5 miles, thence up mountain covered with live-oak trees, except at the summit, from which the trees have been cut. No other timbered mountain is near.

Signal: Rock monument with small tree in center.

Station mark: A hole drilled in rock and filled with lead, under signal.

[Latitude 37° 46' 04.42''. Longitude 121° 42' 08.96''.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Trenouth.....	26 30 49.72	206 24 40.21	4. 5224301
Sunol.....	49 48 47.05	229 40 44.55	4. 4036711
Wiedeman.....	82 54 01.66	262 43 18.78	4. 4134343
Diablo.....	124 22 25.82	304 14 40.12	4. 3518752
Rio Vista.....	180 39 13.42	0 39 25.81	4. 6335039
Byron.....	191 24 54.45	11 26 09.60	4. 1796710
Red Tower.....	202 21 05.18	22 26 45.44	4. 5501650.
Headreach.....	214 03 16.44	34 11 24.48	4. 5391497
Lodi.....	223 16 22.04	43 32 23.49	4. 7446704
Stockton.....	240 24 22.70	60 39 40.13	4. 6229231
Bridge.....	246 44 12.87	66 49 55.48	4. 1727068
Manteca.....	264 53 04.81	85 10 59.95	4. 6344782
Brown.....	337 48 17.29	157 51 19.54	4. 2868343
Mocho.....	337 58 21.85	158 03 45.51	4. 5407469

BUENA VISTA, AMADOR COUNTY, CAL.

(Not occupied.)

Trunk of tall pine tree in center of most northern of Buena Vista Buttes; about 2 miles south of Buena Vista, Cal., inscribed "U. S. G. S."

Station and reference mark: Bronze tablet set in boulder 2.3 feet north of center of tree.

[Latitude 38° 16' 13.43''. Longitude 120° 54' 48.39''.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue Gum.....	29 36 58.85	209 32 49.83	4. 2978153
Yellow Hill.....	99 03 17.44	279 00 00.99	3. 8923827
Yerba Buena.....	146 51 24.64	326 48 25.45	4. 1082905
Bunker Hill.....	357 45 53.60	177 46 21.54	4. 4501128

IONE, AMADOR COUNTY, CAL.

(Not occupied.)

Center of top of tower of State Industrial School at Ione.

[Latitude $38^{\circ} 21' 41.04''$. Longitude $120^{\circ} 56' 10.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yellow Hill.....	32 48 41.65	212 46 15.68	4. 0236292
Yerba Buena.....	97 15 55.57	277 13 46.93	3. 7052253

YELLOW HILL, AMADOR COUNTY, CAL.

On summit of hill locally known as Bald Mountain, on Jones's ranch, 7 miles southwest of Ione, 1,000 feet south of bend in road, 4,100 feet east of the Amador county line, and 500 feet north of Arroya Seco Grant line.

Signal: A tripod of 2 by 4 inch poles.

Station mark: An iron post.

[Latitude $38^{\circ} 16' 53.15''$. Longitude $121^{\circ} 00' 05.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue Gum.....	6 26 06.83	186 25 13.90	4. 2696637
Lodi.....	54 36 34.63	234 26 40.86	4. 4575905
Galt.....	83 11 52.29	263 00 36.86	4. 4265972
Stroup.....	122 55 24.40	302 50 38.81	4. 1247090
Yerba Buena.....	184 06 23.18	4 06 40.63	3. 9795939
Ione.....	212 46 15.68	32 48 41.65	4. 0236292
Buena Vista.....	279 00 00.99	99 03 17.44	3. 8923827

YERBA BUENA, AMADOR COUNTY, CAL.

On top of Dusky Mountain, 3 miles west of Ione, 1 mile southwest of Clarksonia station, on the Amador branch of the Southern Pacific Railroad.

Signal and station mark: A tetrapod; aluminum tablet set in solid rock.

[Latitude 38° 22' 01.79". Longitude 120° 59' 37.39".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yellow Hill.....	4 06 40.63	184 06 23.18	3.9795939
Lodi.....	42 39 07.35	222 28 55.59	4.5504796
M. T. Tree.....	54 46 10.49	234 40 44.31	4.1945100
Galt.....	65 00 44.70	244 49 11.18	4.4772753
Stroup.....	79 09 42.58	259 04 39.26	4.0822479
Elk Grove.....	98 32 04.38	278 18 19.44	4.5130978
Rain.....	117 50 15.07	297 44 07.88	4.2098557
Tree E.....	125 28 24.25	305 20 04.90	4.3785374
Clump No. 3.....	139 45 29.92	319 38 01.58	4.4316568
Bunch Tree.....	142 43 48.62	322 37 16.04	4.4020622
Y. H. Tree.....	178 12 37.20	358 12 19.32	4.3480188
Ione.....	277 13 46.93	97 15 55.57	3.7052253
Buena Vista.....	326 48 25.45	146 51 24.64	4.1082905

BIGGS, BUTTE COUNTY, CAL.

Water-tank house in Biggs, a town on the Southern Pacific Railroad.

Station mark: Center of house.

[Latitude 39° 24' 47.83". Longitude 121° 42' 47.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marysville Butte.....	21 51 40.95	201 47 37.45	4.3938739
Professor.....	141 22 12.75	321 19 10.13	4.0414353
Sugar Loaf.....	212 41 15.27	32 44 58.39	4.1909325
Farnan.....	273 41 00.98	93 48 40.07	4.2390085

FARNAN, BUTTE COUNTY, CAL.

On a low timbered hill 3 miles southeast of Palermo, a station on the Southern Pacific Railroad between Marysville and Oroville; it is on land owned by Mr. Farnan and about half a mile east of his residence.

Signal: Oak tree trimmed up. The tree is on the highest point of hill but there are other trees on the east side which show higher, and it is necessary to have white cloth on it.

Station mark: Triangulation tablet set in solid rock, 1.75 meters northwest of tree.

[Latitude $39^{\circ} 24' 11.09''$. Longitude $121^{\circ} 30' 44.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Marysville Church.....	12 39 57.78	192 37 05.12	4. 4752964
Honcut.....	12 53 04.50	192 52 13.52	3. 9361973
Marysville Butte.....	50 37 07.86	230 25 26.31	4. 5363001
Fowl.....	70 48 39.92	250 45 40.82	3. 8544005
Biggs.....	93 48 40.07	273 41 00.98	4. 2390085
Professor.....	112 00 36.90	291 49 54.83	4. 4157596
Palermo.....	138 23 44.91	318 22 27.39	3. 6431844
Sugar Loaf.....	147 57 00.62	327 53 04.05	4. 2240136
I. O. O. F.....	155 29 24.84	335 26 57.32	4. 1260198
Trainer.....	355 29 54.53	175 30 26.63	4. 1894612

FAWL, BUTTE COUNTY, CAL.

In pasture owned by Mr. Fawl. The Gridley-Oroville road passes within three-quarters of a mile of signal at point about 7 miles from Gridley.

Signal: A tripod with two targets at right angles to each other extending above it.

Station mark: Iron post under center of targets.

[Latitude $39^{\circ} 22' 54.77''$. Longitude $121^{\circ} 35' 26.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sugar Loaf.....	172 36 03.44	352 35 06.27	4. 2223185
Palermo.....	214 10 02.63	34 11 44.28	3. 8337169
Farnan.....	250 45 40.82	70 48 39.92	3. 8544005
Honcut.....	321 25 35.42	141 27 43.40	3. 8894813
Trainer.....	328 34 56.71	148 38 27.63	4. 1849191

HONCUT, BUTTE COUNTY, CAL.

(Not occupied.)

Flag-staff on brick store in town of Honcut on the Southern Pacific Railroad between Marysville and Oroville.

Station mark: Center of flag-staff.

[Latitude $39^{\circ} 19' 38.17''$. Longitude $121^{\circ} 32' 04.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fowl.....	141 27 43.40	321 25 35.42	3. 8894813
Farnan.....	192 52 13.52	12 53 04.50	3. 9361973

I. O. O. F., BUTTE COUNTY, CAL.

(Not occupied.)

Center of cupola on Odd Fellows building near Oroville, on north side of Feather River.

[Latitude $39^{\circ} 30' 45.39''$. Longitude $121^{\circ} 34' 36.29''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Farnan.....	335 26 57.32	155 29 24.84	4.1260198
Sugar Loaf.....	121 17 08.35	301 15 39.23	3.5926166

NELSON, BUTTE COUNTY, CAL.

(Not occupied.)

Center of cupola on large school building in town of Nelson on the Southern Pacific Railroad.

[Latitude $39^{\circ} 33' 02.71''$. Longitude $121^{\circ} 45' 57.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugar Loaf.....	279 37 41.23	99 43 25.72	4.1175380
Marysville Butte.....	6 56 46.37	186 54 43.14	4.5858529

PALERMO, BUTTE COUNTY, CAL.

(Not occupied.)

Church spire in settlement of Palermo on the Southern Pacific Railroad between Marysville and Oroville.

[Latitude $39^{\circ} 25' 57.69''$. Longitude $121^{\circ} 32' 46.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fawl.....	34 11 44.28	214 10 02.63	3.8337169
Sugar Loaf.....	151 17 36.59	331 14 57.65	4.0946495
Farnan.....	318 22 27.39	138 23 44.91	3.6431844
Trainer.....	347 31 09.20	167 32 58.71	4.2824080

PROFESSOR, BUTTE COUNTY, CAL.

(Not occupied.)

A water tank at ranch about 9 miles northwest of Biggs, a town on the Southern Pacific Railroad. There are two large barns west of tank and a small residence northeast.

Signal: The windmill.

Station mark: Center of water tank.

[Latitude $39^{\circ} 29' 26.40''$. Longitude $121^{\circ} 47' 34.73''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marysville Butte.....	4 12 47.59	184 11 46.12	4.5006155
Sugar Loaf.....	253 36 55.15	73 43 41.30	4.2011703
Farnan.....	291 49 54.83	112 00 36.90	4.4157596
Biggs.....	321 19 10.13	141 22 12.75	4.0414353

SUGAR LOAF, BUTTE COUNTY, CAL.

On a round bald hill about 4 miles west and 1 mile north of Oroville. It is prominent and well known locally as Sugar Loaf.

Signal: A lumber structure 12 feet high with two targets at right angles to each other extending above it.

Station mark: Triangulation tablet set in rock 2.15 meters west of northwest from signal.

[Latitude $39^{\circ} 31' 51.27''$. Longitude $121^{\circ} 36' 56.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marysville Butte.....	26 05 26.47	205 57 40.04	4.6033425
Biggs.....	32 44 58.39	212 41 15.27	4.1909325
Professor.....	73 43 41.30	253 36 55.15	4.2011703
Nelson.....	99 43 25.72	279 37 41.23	4.1175380
I. O. O. F.....	301 15 39.23	121 17 08.35	3.5926166
Farnan.....	327 53 04.05	147 57 00.62	4.2240136
Palermo.....	331 14 57.65	151 17 36.59	4.0946495
Fawl.....	352 35 06.27	172 36 03.44	4.2223185

CHINN, AT LINE OF BUTTE AND YUBA COUNTIES, CAL.

On a hill locally known as Chinn Butte, about 0.5 mile east of James E. McMillan's ranch; it is about 4 miles northwest by north of Browns Valley post-office.

Signal: Small tree placed in crack in rock with rocks piled around it.

Station mark: Triangulation tablet set in large rock standing above everything on hill and just under top of tree.

[Latitude $39^{\circ} 16' 15.62''$. Longitude $121^{\circ} 25' 57.27''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cordua.....	51 00 22.18	230 57 27.26	3.9310964
Trainer.....	82 23 36.86	262 21 07.32	3.7569627
Power.....	267 58 42.93	88 03 54.92	4.0726766
Yuba.....	294 31 55.91	114 39 53.10	4.2988870
Smartsville.....	300 54 09.35	120 59 18.64	4.1358382
Walsh.....	315 02 05.32	135 06 59.23	4.1983871

STALLION, CALAVERAS COUNTY, CAL.

(Not occupied.)

At north end of eastern one of two bald, flat-topped buttes, 4 miles south of Wallace, 1 mile south of Bald Mountain schoolhouse, about 0.5 mile east of Calaveras county line, and 18 miles east of Lodi.

Signal: Small oak shrub set in ground.

Station mark: Iron post.

[Latitude $38^{\circ} 08' 18.86''$. Longitude $120^{\circ} 56' 57.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bellota.....	34 15 05.86	214 12 43.46	3.9997759
Blue Gum.....	68 27 39.59	248 24 50.73	3.8550734
Bunker Hill.....	342 33 40.03	162 35 27.53	4.1519337

Y. H. TREE, EL DORADO COUNTY, CAL.

(Not occupied.)

On long bald mountain about 0.25 mile north of highest point, near south end of ridge, about 28 miles a little south of east of Sacramento and about 1 mile northwest of Latrobe. Can be reached by road which leads to the summit from railroad station via the cemetery.

Signal: Tree.

Station mark: Iron post, 5.8 feet east of center of tree trunk.

[Latitude $38^{\circ} 34' 04.19''$. Longitude $121^{\circ} 00' 06.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stroup.....	24 28 10.77	204 23 24.65	4.4308852
Rain.....	42 50 49.51	222 44 59.40	4.3022541
Tree E.....	65 53 22.75	245 45 20.20	4.3131846
Yerba Buena.....	358 12 19.32	178 12 37.20	4.3480188

YUBA, NEVADA COUNTY, CAL.

On north end of a hill about 5.5 miles from Smartsville, from which place take Smartsville and Grass Valley road, pass toll gate and continue on same road to summit of hill, thence south through gate about 0.25 mile, where signal can be seen.

Signal: Pine tree with several limbs cut off near top.

Station mark: Triangulation tablet set in rock; distance 5.52 meters, azimuth 122° .

[Latitude $39^{\circ} 11' 46.99''$. Longitude $121^{\circ} 13' 22.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walsh.....	67 24 37.61	247 21 34.61	3.8768480
Trainer.....	107 39 35.68	287 29 09.09	4.3966571
Chinn.....	114 39 53.10	294 31 55.91	4.2988870
Power.....	144 12 02.93	324 09 17.46	4.0301965

DOWD, PLACER COUNTY, CAL.

(Not occupied.)

Top of Mr. Dowd's residence, about 5 miles west and 0.5 mile south of Lincoln. The top of the building has a railing which incloses a space about 7 feet square. Follow Lincoln-Nicolaus road west 5 miles, then turn south 0.5 mile.

Signal and station mark: Center of railing on top of house.

[Latitude $38^{\circ} 53' 29.10''$. Longitude $121^{\circ} 22' 36.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chandler.....	98 21 44.67	278 17 24.21	4.0043897
Wheatland.....	164 27 19.82	344 25 41.34	4.1480756
Sheridan.....	182 10 07.31	2 10 17.39	4.0087600
Excelsior.....	211 01 00.93	31 04 14.09	4.1568421
Lincoln.....	267 58 09.31	88 01 15.61	3.8546311
Telegraph.....	302 52 05.34	122 56 19.27	4.0652538

EXCELSIOR, PLACER COUNTY, CAL.

A prairie hill with three or four oak trees on it, in pasture, owned by the Excelsior Land and Water Company, about 8 miles north of Lincoln and about the same distance east from Wheatland. The Lincoln-Spencerville road passes 0.5 mile east of point; there is also a road from Wheatland.

Signal and station mark: Lumber tripod 12 feet high; iron post set in ground under center.

[Latitude 39° 00' 07.79''. Longitude 121° 17' 29.21''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lincoln.....	1 12 40.96	181 12 34.32	4.0808713
Kaseburg.....	20 29 15.42	200 25 07.65	4.4357945
Dowd.....	31 04 14.09	211 01 00.93	4.1568421
Pleasant Grove.....	40 42 48.59	220 35 26.20	4.4157477
Chandler.....	58 08 26.98	238 00 53.03	4.3114284
Peter.....	65 40 44.33	245 30 45.50	4.4011311
Prairie School.....	67 14 31.34	247 05 44.48	4.3401714
Sheridan.....	73 21 42.74	253 18 39.48	3.8642986
Wheatland.....	96 26 46.37	276 21 54.36	4.0504869
Marysville Butte.....	116 31 27.47	296 11 27.51	4.7077141
Knoll.....	119 09 32.91	299 03 07.01	4.2269838
Marysville Church.....	120 59 19.14	300 48 06.17	4.4758359
Walsh.....	176 49 03.74	356 48 36.48	4.2717132
Telegraph.....	352 48 14.47	172 49 15.66	4.2731117

KASEBURG, PLACER COUNTY, CAL.

On land owned by the Kaseburg estate in a sheep pasture about 5 miles west and 1 mile north of Roseville, a town on the Southern Pacific Railroad. From Roseville go west on the county road 3 miles, or until power line is reached; thence north 1 mile, to first gate on left; go through this gate and west along second-class road by a large locust tree to a small cabin about 2 miles distant from gate.

Signal: A 4 by 4 inch by 16-foot pole fastened to south end of cabin, supporting two targets at right angles to each other.

Station mark: Iron post set in ground at base of signal.

[Latitude 38° 46' 18.99". Longitude 121° 24' 04.69'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Capitol.....	20 15 33.04	200 12 06.91	4. 3628552
Ryan.....	89 05 07.23	269 00 27.06	4. 0335163
Verona.....	94 42 56.93	274 34 51.87	4. 2731396
Pleasant Grove.....	127 54 12.37	307 50 58.88	3. 9750147
Excelsior.....	200 25 07.65	20 29 15.92	4. 4357945
Telegraph.....	239 39 25.05	59 44 33.91	4. 1390902
Reservoir.....	269 38 13.46	89 45 24.86	4. 2208961
Carpenter.....	297 15 08.60	117 26 29.32	4. 4714032

LINCOLN, PLACER COUNTY, CAL.

(Not occupied.)

Spire on Methodist Church in the town of Lincoln on the Southern Pacific Railroad.

[Latitude 38° 53' 37.21". Longitude 121° 17' 39.78'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dowl.....	88 01 15.61	267 58 09.31	3. 8546311
Wheatland.....	140 39 16.52	320 34 31.49	4. 2356404
Excelsior.....	181 12 34.32	1 12 40.96	4. 0808713
Telegraph.....	338 21 23.61	158 22 31.36	3. 8488453

RESERVOIR, PLACER COUNTY, CAL.

On about the highest point on ridge on line of old north-south rock fence; about 2 miles southeast of Rocklin, a station on the Southern Pacific Railroad; in a pasture on a rather high ridge; summit of hill is bald and very rocky, but north and south sides have trees on them. From Rocklin or Roseville go to reservoir which supplies Roseville, thence south through the gate and up on ridge by old road. Just before reaching summit of ridge turn east and go up ridge, passing through two wire fences; distance from gate about 1.25 miles.

Signal: Cairn 6 feet high with 4 by 4 inch by 12-foot pole in center supporting 2 targets at right angles to each other.

Station mark: Triangulation tablet in rock 72½ inches south of signal.

[Latitude 38° 46' 21.84''. Longitude 121° 12' 35.81''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tree E.....	1 06 45.80	181 06 30.21	4. 4938116
Fairoaks.....	19 11 45.93	199 09 35.83	4. 1847638
Capitol.....	48 40 12.81	228 29 36.19	4. 5163990
Roseville.....	69 27 06.70	249 23 58.64	3. 8891053
Kaseburg.....	89 45 24.86	269 38 13.46	4. 2208961
Telegraph.....	145 26 27.57	325 24 24.74	3. 9208493
Carpenter.....	324 46 16.53	144 50 26.43	4. 2240420

ROSEVILLE, PLACER COUNTY, CAL.

(Not occupied.)

Center of water tank at new hotel in Roseville, a town on the Southern Pacific Railroad.

[Latitude 38° 44' 53.56''. Longitude 121° 17' 36.19''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Telegraph.....	194 42 59.87	14 44 05.26	3. 9960608
Reservoir.....	249 23 58.64	69 27 06.70	3. 8891053

SHERIDAN, PLACER COUNTY, CAL.

(Not occupied.)

Cupola on schoolhouse in town of Sheridan on the Southern Pacific Railroad.

[Latitude 38° 58' 59.75''. Longitude 121° 22' 20.46''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dowd.....	2 10 17.39	182 10 07.31	4. 0087600
Wheatland.....	128 53 57.84	308 52 09.17	3. 7274141
Excelsior.....	253 18 39.48	73 21 42.74	3. 8642986

TELEGRAPH, PLACER COUNTY, CAL.

On a low, rocky hill locally known as Telegraph Hill, in pasture on the Whitney ranch, about 1 mile northwest from the Whitney residence, about 3 miles from Rocklin, 6 miles from Roseville, and 5 miles from Lincoln. There are roads leading from all of the above-mentioned places to the ranch.

Signal: Cairn 7 feet at base and 5 feet high with a 4 by 4 inch by 12-foot pole supporting two white targets in center.

Station mark: Triangulation tablet set in rock $3\frac{1}{2}$ feet south of pole; the rock forms part of base of cairn.

[Latitude $38^{\circ} 50' 04.37''$. Longitude $121^{\circ} 15' 51.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fairoaks.....	0 46 55.63	180 46 53.75	4.3287331
Roseville.....	14 44 05.26	194 42 59.87	3.9960608
Capitol.....	34 53 13.01	214 44 38.53	4.5418286
Kaseburg.....	59 44 33.91	239 39 25.05	4.1390902
Pleasant Grove.....	86 39 22.10	266 30 59.44	4.2871754
Peter.....	108 02 50.26	287 51 51.38	4.4249649
Chandler.....	111 33 22.42	291 24 48.16	4.3269598
Dowd.....	122 56 19.27	302 52 05.34	4.0652538
Wheatland.....	145 47 59.47	325 42 06.79	4.3806975
Lincoln.....	158 22 31.36	338 21 23.61	3.8488453
Excelsior.....	172 49 15.66	352 48 14.47	4.2731117
Reservoir.....	325 24 24.74	145 26 27.57	3.9208493

BUNCH TREE, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Highest point of tree in small clump; 18 miles east of Sacramento.

[Latitude $38^{\circ} 32' 52.70''$. Longitude $121^{\circ} 10' 08.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tree E.....	33 52 30.65	213 50 43.41	3.8744593
Yerba Buena.....	322 37 16.04	142 43 48.62	4.4020622
Rain.....	355 33 45.93	175 34 10.85	4.0986284

CARPENTER, SACRAMENTO COUNTY, CAL.

On a bald, rocky hill in pasture owned by the Carpenter estate. The road from Folsom to Clarksville passes about 0.25 mile north of station at point about 4.5 miles from Folsom.

Signal: Rock cairn 6 feet high with 4 by 4 inch by 12-foot pole in center.

Station mark: Triangulation tablet set in a large rock which forms part of base of cairn.

[Latitude 38° 38' 57.91''. Longitude 121° 05' 56.22''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tree E.....	30 29 28.02	210 25 03.31	4.3070286
Capitol.....	76 56 33.71	256 41 48.58	4.5470799
Fairoaks.....	87 04 31.65	266 58 12.18	4.1677395
Kaseburg.....	117 26 29.32	297 15 08.60	4.4714032
Reservoir.....	144 50 26.43	324 46 16.53	4.2240420

CLUMP NO. 3, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Highest point of rounding eucalyptus tree near center of clump, about 2 miles west of Bunch Tree.

[Latitude 38° 33' 10.04''. Longitude 121° 11' 38.21''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tree E.....	16 30 18.37	196 29 26.94	3.8478262
Yerba Buena.....	319 38 01.58	139 45 29.92	4.4316568
Rain.....	346 26 32.35	166 27 53.09	4.1277552

CYPRESS, SACRAMENTO COUNTY, CAL.

(Not occupied.)

A point in base of leaning slender tree resembling cypress near ranch house, a point 1 mile northeast by east of Rain station.

[Latitude 38° 26' 22.37''. Longitude 121° 08' 32.11''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rain.....	70 47 27.23	250 46 52.17	3.1608401
Stroup.....	353 49 46.09	173 50 14.61	4.0160224

EAST GABLE, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Center of east gable of small rectangular house on knoll near large unpainted barn, 10 miles southeast by east of Elk Grove.

[Latitude $38^{\circ} 23' 29.08''$, Longitude $121^{\circ} 10' 53.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tree E.....	164 30 41.30	344 29 21.98	4. 0637283
Rain.....	202 52 46.15	22 53 38.77	3. 7228484
Stroup.....	317 35 23.41	137 37 19.49	3. 8282036

ELK GROVE, SACRAMENTO COUNTY, CAL.

Center of large water tank 100 yards northeast of the railway station at Elk Grove on the Southern Pacific Railroad.

[Latitude $38^{\circ} 24' 36.57''$, Longitude $121^{\circ} 21' 45.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Capitol.....	148 31 14.16	328 26 22.40	4. 3370325
Florin.....	163 03 40.36	343 02 25.77	3. 9989847
School.....	207 01 17.55	27 03 43.47	4. 0972903
Tree E.....	234 27 43.67	54 33 10.16	4. 1941351
Rain.....	261 05 00.27	81 12 38.48	4. 2577091
Yerba Buena.....	278 18 19.44	98 32 04.38	4. 5130978
Stroup.....	289 01 04.78	109 09 46.07	4. 3337709
Galt.....	343 45 05.20	163 47 15.25	4. 2605809

FAIROAKS, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Cupola on schoolhouse at Fair Oaks.

[Latitude $38^{\circ} 38' 33.12''$, Longitude $121^{\circ} 16' 03.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Capitol.....	69 43 44.75	249 35 18.86	4. 3205525
Telegraph.....	180 46 53.75	0 46 55.63	4. 3287331
Reservoir.....	199 09 35.83	19 11 45.93	4. 1847638
Carpenter.....	266 58 12.18	87 04 31.65	4. 1677395
Tree E.....	345 08 05.55	165 09 59.68	4. 2378894

FLORIN, SACRAMENTO COUNTY, CAL.

Center of water tank at Florin station on the Southern Pacific Railroad.

[Latitude $38^{\circ} 29' 46.07''$. Longitude $121^{\circ} 23' 45.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Capitol.....	136 46 39.37	316 43 02.06	4.0909162
Elk Grove.....	343 02 25.77	163 03 40.36	3.9989847

GALT, SACRAMENTO COUNTY, CAL.

Center of western one of two water tanks on roof of Galt Hotel.

[Latitude $38^{\circ} 15' 09.16''$. Longitude $121^{\circ} 18' 16.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elk Grove.....	163 47 15.25	343 45 05.20	4.2605809
Tall Eucalyptus.....	179 03 05.78	359 03 02.05	3.9459766
Rain.....	212 14 17.87	32 19 45.19	4.3800185
Stroup.....	235 38 44.44	55 45 14.86	4.2678581
Yerba Buena.....	244 49 11.18	65 00 44.70	4.4772753
M. T. Tree.....	255 36 14.29	75 42 21.41	4.1723948
Yellow Hill.....	263 00 36.86	83 11 52.29	4.4265972
Lodi.....	346 41 06.67	166 42 27.40	4.1401335

M. T. TREE, SACRAMENTO COUNTY, CAL.

(Not occupied.)

A tall eucalyptus tree with double top, 9 miles northeast by east of Galt.

Station mark: Point midway between the two tops.

[Latitude $38^{\circ} 17' 08.67''$. Longitude $121^{\circ} 08' 23.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lockeford.....	3 42 05.28	183 41 43.07	4.1318025
Lodi.....	33 19 58.46	213 15 12.59	4.3114258
Galt.....	75 42 21.41	255 36 14.29	4.1723948
Rain.....	174 33 49.76	354 33 09.34	4.2219655
Stroup.....	187 36 50.67	7 37 13.73	3.8335932
Yerba Buena.....	234 40 44.31	54 46 10.49	4.1945100

RAIN, SACRAMENTO COUNTY, CAL.

On summit of low hill on Hooper ranch, about 6 miles southeast of Slough House at Cosumne, 7 miles north of Clay, and 1,100 feet south of bend in road.

Signal and station mark: A tetrapod; iron post.

[Latitude $38^{\circ} 26' 06.92''$. Longitude $121^{\circ} 09' 28.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
East Gable.....	22 53 38.77	202 52 46.15	3. 7228484
Galt.....	32 19 45.19	212 14 17.87	4. 3800185
Tall Eucalyptus.....	48 33 50.05	228 28 18.71	4. 2377628
Elk Grove.....	81 12 38.48	261 05 00.27	4. 2577091
Tree E.....	140 44 18.36	320 42 06.32	3. 9100567
Clump No. 3.....	166 27 53.09	346 26 32.35	4. 1277552
Bunch Tree.....	175 34 10.85	355 33 45.93	4. 0986284
Y. H. Tree.....	222 44 59.40	42 50 49.51	4. 3022541
Cypress.....	250 46 52.17	70 47 27.23	3. 1608401
Yerba Buena.....	297 44 07.88	117 50 15.07	4. 2098557
Stroup.....	345 49 39.37	165 50 42.91	4. 0063654
M. T. Tree.....	354 33 09.34	174 33 49.76	4. 2219655

CAPITOL, SACRAMENTO COUNTY, CAL.

Center of dome of the state capitol at Sacramento.

[Latitude $38^{\circ} 34' 37.29''$. Longitude $121^{\circ} 29' 34.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Windmill.....	162 44 39.04	342 42 29.94	4. 2262326
Ryan.....	172 28 01.40	352 26 47.95	4. 3353522
Kaseburg.....	200 12 06.91	20 15 33.04	4. 3628552
Telegraph.....	214 44 38.53	34 53 13.01	4. 5418286
Reservoir.....	228 29 36.19	48 40 12.81	4. 5163990
Fairoaks.....	249 35 18.86	69 43 44.75	4. 3205525
Carpenter.....	256 41 48.58	76 56 33.71	4. 5470799
Tree E.....	291 20 16.67	111 30 35.78	4. 4125623
School.....	293 21 49.21	113 29 07.48	4. 2686492
Florin.....	316 43 02.06	136 46 39.37	4. 0909162
Elk Grove.....	328 26 22.40	148 31 14.16	4. 3370325

SCHOOL, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Center of belfry in center of square school building 5.5 miles east of Florin, a station on the Southern Pacific Railroad.

[Latitude $38^{\circ} 30' 37.96''$. Longitude $121^{\circ} 17' 51.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elk Grove.....	27 03 43.47	207 01 17.55	4. 0972903
Capitol.....	113 29 07.48	293 21 49.21	4. 2686492
Tree E.....	286 19 36.11	106 22 36.91	3. 8653424

STROUP, SACRAMENTO COUNTY, CAL.

On top of conical hill on Stroup's ranch, 1.5 miles northeast of Clay, 0.5 mile south of Amador branch of the Southern Pacific Railroad.

Signal and station mark: A tetrapod; iron post.

[Latitude $38^{\circ} 20' 47.81''$. Longitude $121^{\circ} 07' 46.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
M. T. Tree.....	7 37 13.73	187 36 50.67	3. 8335932
Galt.....	55 45 14.86	235 38 44.44	4. 2678581
Tall Eucalyptus.....	84 05 38.13	263 59 03.63	4. 1911357
Elk Grove.....	109 09 46.07	289 01 04.78	4. 3337709
East Gable.....	137 37 19.49	317 35 23.41	3. 8282036
Tree E.....	154 42 29.55	334 39 14.05	4. 2515429
Rain.....	165 50 42.91	345 49 39.37	4. 0063654
Cypress.....	173 50 14.61	353 49 46.09	4. 0160224
Y. H. Tree.....	204 23 24.65	24 28 10.77	4. 4308852
Yerba Buena.....	259 04 39.26	79 09 42.58	4. 0822479
Yellow Hill.....	302 50 38.81	122 55 24.40	4. 1247090

TALL EUCALPYTUS, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Center of tall eucalyptus tree with large bunch top, 5.5 miles north of Galt and about 1 mile east of railroad track.

70 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $38^{\circ} 19' 55.51''$. Longitude $121^{\circ} 18' 22.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rain.....	228 28 18.71	48 33 50.05	4.2377628
Stroup.....	263 59 03.63	84 05 38.13	4.1911357
Galt.....	359 03 02.05	179 03 05.78	3.9459766

TREE E, SACRAMENTO COUNTY, CAL.

On land owned by Mr. Archie Mull, about 1 mile southwest of Slough House on the Jackson road from Sacramento and near Cosumne post-office. Distance from Sacramento, about 18 miles.

Signal: Lone eucalyptus tree about 0.5 mile south of Jackson on road just before its down-hill approach to Slough House.

Station mark: Iron post set in ground at foot of tree on west side; projects about 16 inches above ground.

[Latitude $38^{\circ} 29' 31.00''$. Longitude $121^{\circ} 13' 00.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elk Grove.....	54 33 10.16	234 27 43.67	4.1941351
School.....	106 22 36.91	286 19 36.11	3.8653424
Capitol.....	111 30 35.78	291 20 16.67	4.4125623
Fairoaks.....	165 09 59.68	345 08 05.55	4.2378894
Reservoir.....	181 06 30.21	1 06 45.80	4.4938116
Clump No. 3.....	196 29 26.94	16 30 18.37	3.8478262
Carpenter.....	210 25 03.31	30 29 28.02	4.3070286
Bunch Tree.....	213 50 43.41	33 52 30.65	3.8744593
Y. H. Tree.....	245 45 20.20	65 53 22.75	4.3131846
Yerba Buena.....	305 20 04.90	125 28 24.25	4.3785374
Rain.....	320 42 06.32	140 44 18.36	3.9100567
Stroup.....	334 39 14.05	154 42 29.55	4.2515429
East Gable.....	344 29 21.98	164 30 41.30	4.0637283

WINDMILL, SACRAMENTO COUNTY, CAL.

(Not occupied.)

Center of lone windmill about 3 miles southeast of F. D. Ryan's ranch (Ryan station).

[Latitude 38° 43' 18.65". Longitude 121° 33' 01.29'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Barney.....	162 01 17.84	342 00 19.04	3.8659731
Ryan.....	201 48 28.16	21 49 23.98	3.7631355
Capitol.....	342 42 29.94	162 44 39.04	4.2262326

BELLOTA, SAN JOAQUIN COUNTY, CAL.

On summit of hill on Cody's ranch, 1 mile north of Bellota, 200 feet east of road on hill, 800 feet east of road forks.

Signal: Two muslin targets on a 4 by 4 inch pole.

Station mark: Iron bench-mark post set 3 feet in ground.

[Latitude 38° 03' 50.85". Longitude 121° 00' 48.40'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stockton.....	63 07 10.28	242 57 03.26	4.4310647
Lodi.....	108 34 36.56	288 25 10.67	4.3722643
Bluegrass.....	169 31 35.35	349 31 08.99	3.7578899
Stallion.....	214 12 43.46	34 15 05.86	3.9997759
Bunker Hill.....	298 03 49.37	118 07 58.99	4.0491279

BLUE GUM, SAN JOAQUIN COUNTY, CAL.

Five eucalyptus poles with two targets at right angles to each other, 1.5 miles south of Round Timber ranch.

Station mark: Iron post under center of targets.

[Latitude 38° 06' 53.48". Longitude 121° 01' 31.13'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clump No. 1.....	27 43 09.51	217 39 49.82	4.1109693
Stockton.....	52 14 21.24	232 04 40.21	4.4642170
Tree A.....	81 46 48.86	261 38 07.70	4.3179766
Tree B.....	81 58 37.86	261 51 38.37	4.2234547
School.....	83 49 05.15	263 43 25.91	4.1294077
Lodi.....	95 01 38.06	274 52 38.23	4.3299782
Lockeford.....	116 34 35.62	296 29 58.85	4.0863262
North Tree.....	167 49 13.82	347 48 58.92	3.4448891
Yellow Hill.....	186 25 13.90	6 26 06.83	4.2696637
Buena Vista.....	209 32 49.83	29 36 58.85	4.2978153
Stallion.....	248 24 50.73	68 27 39.59	3.8550734
Bunker Hill.....	314 55 56.18	135 00 32.29	4.1883631
Bellota.....	349 31 08.99	169 31 35.35	3.7578899

BUNKER HILL, SAN JOAQUIN COUNTY, CAL.

Tetrapod on highest point of conical hill, $2\frac{1}{2}$ miles west of Milton; iron post under center.

[Latitude $38^{\circ} 00' 59.79''$. Longitude $120^{\circ} 54' 03.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Manteca.....	49 15 45.92	229 04 11.09	4. 5624438
Stockton.....	78 31 46.29	258 17 30.28	4. 5396729
Lodi.....	111 41 55.25	291 28 19.85	4. 5398104
Bellota.....	118 07 58.99	198 03 49.37	4. 0491279
Blue Gum.....	135 00 32.29	314 55 56.18	4. 1883631
Stallion.....	162 35 27.53	342 33 40.03	4. 1519337
Buena Vista.....	177 46 21.54	357 45 53.60	4. 4501128

CLUMP NO. 1, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of tallest tree in clump of eucalyptus trees, 11 miles south-east of Lodi.

[Latitude $38^{\circ} 01' 22.11''$. Longitude $121^{\circ} 06' 54.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stockton.....	63 12 12.16	243 05 51.06	4. 2287871
Lodi.....	131 59 59.36	311 54 19.81	4. 2563211
Blue Gum.....	217 39 49.82	37 43 09.51	4. 1109693

CLUMP NO. 2, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of tallest tree in clump of eucalyptus trees 2 miles southwest of Clump No. 1.

[Latitude $37^{\circ} 59' 45.07''$. Longitude $121^{\circ} 08' 15.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stockton.....	70 32 40.72	250 27 09.22	4. 1445602
Lodi.....	142 45 29.36	322 40 39.50	4. 2769323

HEADREACH, SAN JOAQUIN COUNTY, CAL.

Flagstaff on observing platform at Headreach Gun clubhouse, 12 miles northwest by west from Stockton.

[Latitude $33^{\circ} 01' 33.61''$. Longitude $121^{\circ} 28' 54.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brushy.....	34 11 24.48	214 03 16.44	4.5391497
Red Tower.....	125 23 32.38	305 21 03.96	3.8574135
West Poplar.....	169 03 24.55	349 02 35.85	4.0057157
Stockton.....	295 02 13.17	115 09 24.20	4.2757522

LA FOLLETTE, SAN JOAQUIN COUNTY, CAL.

Top of buckeye tree, 100 yards south of east-west road, 5 miles south of Lodi and 0.25 mile east of Western Pacific Railway grade.

Station mark: Iron post 2.5 feet southwest of center of tree trunk (post centered as nearly as possible under flag).

[Latitude $38^{\circ} 03' 26.10''$. Longitude $121^{\circ} 19' 14.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lodi.....	209 07 25.07	29 09 21.37	3.9746793
Stockton.....	345 41 01.67	165 42 15.50	4.0732985

LOCKEFORD, SAN JOAQUIN COUNTY, CAL.

Center of high tower in rear of post-office in Lockeford.

[Latitude $38^{\circ} 09' 50.26''$. Longitude $121^{\circ} 08' 59.29''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
School.....	19 41 28.39	199 40 25.70	3.8657574
Lodi.....	70 52 59.33	250 48 36.03	4.0408926
North School.....	97 00 40.33	276 56 33.54	3.9909326
M. T. Tree.....	183 41 43.07	3 42 05.28	4.1318025
North Tree.....	284 45 48.12	104 50 10.06	4.0285150
Blue Gum.....	296 29 58.85	116 34 35.62	4.0863262

LODI, SAN JOAQUIN COUNTY, CAL.

Flagstaff on tower of grammar school in southeast part of Lodi.

[Latitude $38^{\circ} 07' 53.34''$. Longitude $121^{\circ} 16' 05.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stockton.....	4 51 26.65	184 50 44.37	4.2962699
La Follette.....	29 09 21.37	209 07 25.07	3.9746793
Brushy.....	43 32 23.49	223 16 22.04	4.7446704
Galt.....	166 42 27.40	346 41 06.67	4.1401335
North School.....	187 46 51.42	7 47 08.05	3.6847659
M. T. Tree.....	213 15 12.59	33 19 58.46	4.3114258
Yerba Buena.....	222 28 55.59	42 39 07.35	4.5504796
Yellow Hill.....	234 26 40.86	54 36 34.63	4.4575905
Lockeford.....	250 48 36.03	70 52 59.33	4.0408926
North Tree.....	267 30 05.30	87 38 50.37	4.3165169
Blue Gum.....	274 52 38.23	95 01 38.06	4.3299782
Bellota.....	288 25 10.67	108 34 36.56	4.3722643
Bunker Hill.....	291 28 19.85	111 41 55.25	4.5398104
School.....	292 39 39.20	112 42 59.65	3.9331818
Tree B.....	311 29 55.42	131 31 55.55	3.8015536
Clump No. 1.....	311 54 19.81	131 59 59.36	4.2563211
Clump No. 2.....	322 40 39.50	142 45 29.36	4.2769323
Tree A.....	351 28 06.36	171 28 24.77	3.6900979

MANTECA, SAN JOAQUIN COUNTY, CAL.

Center of cupola on barn.

[Latitude $37^{\circ} 48' 05.43''$. Longitude $121^{\circ} 12' 54.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brushy.....	85 10 59.95	264 53 04.81	4.6344782
Stockton.....	159 26 06.75	339 23 27.14	4.2569029
Bunker Hill.....	229 04 11.09	49 15 45.92	4.5624438

NORTH TREE, SAN JOAQUIN COUNTY, CAL.

On summit of low hill 0.25 mile north of Round Timber ranch house, 13 miles east of Lodi, 6 miles north of Bellota.

Signal: Large oak tree leaning to west.

Station mark: Iron post set 5.3 feet west of center of tree.

[Latitude 38° 08' 21.79". Longitude 121° 01' 55.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stockton.....	47 29 56.45	227 20 30.13	4. 4832781
Lodi.....	87 38 50.37	267 30 05.30	4. 3165169
Lockeford.....	104 50 10.06	284 45 48.12	4. 0285150
Blue Gum.....	347 48 58.92	167 49 13.82	3. 4448891

NORTH SCHOOL, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of cupola in corner of large square school 3 miles north of Lodi.

[Latitude 38° 10' 28.84". Longitude 121° 15' 38.63".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lodi.....	7 47 08.05	187 46 51.42	3. 6847659
Lockeford.....	276 56 33.54	97 00 40.33	3. 9909326

RED TOWER, SAN JOAQUIN COUNTY, CAL.

Center of large tank tower (located in 1906, at present painted gray) on Venice Island, 10 miles southeast of Rio Vista, and 16 miles northwest of Stockton.

[Latitude 38° 03' 48.82". Longitude 121° 32' 55.24".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Brushy.....	22 26 45.44	202 21 05.18	4. 5501650
West Poplar.....	214 17 57.17	34 19 37.02	3. 8449112
Stockton.....	297 51 04.00	118 00 43.50	4. 4147303
Headreach.....	305 21 03.96	125 23 32.38	3. 8574135

SCHOOL, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of cupola on east end of school building 5 miles east by south of Lodi.

[Latitude 38° 06' 06.08". Longitude 121° 10' 40.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lodi.....	112 42 59.65	292 39 39.20	3. 9331818
Lockeford.....	199 40 25.70	19 41 28.39	3. 8657574
Blue Gum.....	263 43 25.91	83 49 05.15	4. 1294077

STOCKTON, SAN JOAQUIN COUNTY, CAL.

Center of dome of court-house at Stockton.

[Latitude 37° 57' 14.03". Longitude 121° 17' 14.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mocho.....	24 10 02.27	204 00 12.16	4. 7626280
Brushy.....	60 39 40.13	240 24 22.70	4. 6229231
Headreach.....	115 09 24.20	295 02 13.17	4. 2757522
Red Tower.....	118 00 43.50	297 51 04.00	4. 4147303
Rio Vista.....	122 00 00.41	301 44 51.42	4. 6267127
West Poplar.....	133 26 11.75	313 18 11.64	4. 4173259
La Follette.....	165 42 15.50	345 41 01.67	4. 0732985
Lodi.....	184 50 44.37	4 51 26.65	4. 2962699
Tree A.....	189 09 56.96	9 10 57.59	4. 1777970
Tree B.....	202 27 36.44	22 30 18.59	4. 2250540
North Tree.....	227 20 30.13	47 29 56.45	4. 4832781
Blue Gum.....	232 04 40.21	52 14 21.24	4. 4642170
Clump No. 1.....	243 05 51.06	63 12 12.16	4. 2287871
Bellota.....	242 57 03.26	63 07 10.28	4. 4310647
Clump No. 2.....	250 27 09.22	70 32 40.72	4. 1445602
Bunker Hill.....	258 17 30.28	78 31 46.29	4. 5396729
Manteca.....	339 23 27.14	159 26 06.75	4. 2569029

TREE A, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of the taller of two tall eucalyptus trees with bare trunks and bush tops 3 miles south of Lodi.

[Latitude 38° 05' 16.21''. Longitude 121° 15' 35.73''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stockton.....	9 10 57.59	189 09 56.96	4.1777970
Lodi.....	171 28 24.77	351 28 06.36	3.6900979
Blue Gum.....	261 38 07.70	81 46 48.86	4.3179766

TREE B, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of a very tall eucalyptus tree 5.5 miles east by south of Lodi.

[Latitude 38° 05' 37.21''. Longitude 121° 12' 50.92''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stockton.....	22 30 18.59	202 27 36.44	4.2250540
Lodi.....	131 31 55.55	311 29 55.42	3.8015536
Blue Gum.....	261 51 38.37	81 58 37.86	4.2234547

WEST POPLAR, SAN JOAQUIN COUNTY, CAL.

(Not occupied.)

Center of most western of three poplar trees standing in an east-west line, 16 miles northwest of Stockton and 13 miles west of Lodi.

[Latitude 38° 06' 56.26''. Longitude 121° 30' 13.38''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Red Tower.....	34 19 37.02	214 17 57.17	3.8449112
Stockton.....	313 18 11.64	133 26 11.75	4.4173259
Headreach.....	349 02 35.85	169 03 24.55	4.0057157

MOCHO, SANTA CLARA COUNTY, CAL.

A Coast and Geodetic Survey station on highest point of mountain locally known as Eylar Mountain. From Livermore follow good mountain road up Mocho Creek to cabin at foot of Eylar Mountain, 18 miles from Livermore; thence a good trail leads to station, which is about 1.5 miles up ridge from old cabin at Banta Springs.

Station mark: Stone pier 4 feet high.

Reference mark: A rock monument with tree 14 feet high in center, 3.5 feet east of station mark.

[Latitude $37^{\circ} 28' 39.696''$. Longitude $121^{\circ} 33' 18.781''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tamalpais.....	118 41 27.02	298 03 15.85	5.01831589
Wiedeman.....	126 54 23.02	306 38 18.69	4.6847231
Diablo.....	144 57 40.03	324 44 31.77	4.73949421
Brushy.....	158 03 45.51	337 58 21.85	4.5407469
Stockton.....	204 00 12.16	24 10 02.27	4.7626280
Round Top.....	225 32 32.159	46 30 04.187	5.2778606
Mount Conness.....	253 53 43.874	75 15 46.277	5.3104077
Leal.....			4.18725
Lone Pine.....			4.15909
Brown.....			4.18684

RIO VISTA, SOLANO COUNTY, CAL.

Pole in center of roof over the two tanks of a large double-tank tower in west edge of Rio Vista.

[Latitude $38^{\circ} 09' 19.17''$. Longitude $121^{\circ} 41' 48.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brushy.....	0 39 25.81	180 39 13.42	4.6335039
Young.....	51 52 07.61	231 48 34.25	4.0296156
Mayhood.....	80 01 34.63	259 59 54.96	3.6008566
Barry.....	86 07 51.64	265 51 37.97	4.5852630
Vaca.....	125 59 51.16	305 45 28.20	4.6212403
Red School.....	135 34 36.35	315 32 36.78	3.8276858
Cupola Barn.....	150 57 24.23	330 53 55.65	4.2161186
Mound House.....	181 04 25.83	1 04 37.60	4.3689847
Stack.....	212 15 33.84	32 19 09.06	4.1998611
Bighouse.....	262 47 25.60	82.53 52.73	4.1867146
Isleton.....	263 51 25.48	83 54 37.46	3.8812713
Redtank.....	285 05 48.51	105 10 12.94	4.0334320
Stockton.....	301 44 51.42	122 00 00.41	4.6267127
Red Tower.....	308 02 31.95	128 08 01.51	4.2182333
South Windmill.....	324 07 25.76	144 09 36.66	3.9453071
Stack South.....	325 46 12.29	145 50 10.73	4.2241955
Jersey.....	355 37 24.32	175 37 46.35	4.0571421

BARNEY MOUND, SUTTER COUNTY, CAL.

On a very low mound on land owned by Mr. Bennett. It is in the overflow country, but this point was about 3 feet above water during the extreme high water of 1907. It is 6 or 7 miles southwest of Pleasant Grove and about 2 miles east of Verona post-office; about 0.5 mile north of Mr. Bennett's residence.

Signal: Redwood pole (formerly a telegraph pole) 19.5 feet high set 4 feet in the ground, supporting two targets at right angles to each other.

Station mark: Iron post set in ground at base of pole.

[Latitude 38° 47' 05.20''. Longitude 121° 34' 35.22'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pleasant Grove.....	240 35 15.38	60 38 36.99	3. 9498354
Ryan.....	289 56 13.88	109 58 08.57	3. 6723293
Windmill.....	342 00 19.04	162 01 17.84	3. 8659731

CHANDLER, SUTTER COUNTY, CAL.

(Not occupied.)

Center of cupola of barn at the Chandler ranch about 10 miles west and 1 mile north of Lincoln, on Lincoln-Nicolaus road.

[Latitude 38° 54' 16.53''. Longitude 121° 29' 31.27'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peter.....	94 24 34.02	274 22 09.31	3. 7457117
Wheatland.....	207 11 36.04	27 14 18.34	4. 1331974
Excelsior.....	238 00 53.03	58 08 26.98	4. 3114284
Dowd.....	278 17 24.21	98 21 44.67	4. 0043897
Telegraph.....	291 24 48.16	111 33 22.42	4. 3269598
Pleasant Grove.....	357 15 03.26	177 15 14.42	3. 9513155

MARYSVILLE BUTTE, SUTTER COUNTY, CAL.

Coast and Geodetic Survey station on the southernmost and highest butte of Marysville Buttes, rising abruptly from the plains about 15 miles west of Marysville, 77 meters southeast of highest point of mountain, near edge of summit, 4½ feet from brow of hill on northeast side and 9 feet on south side.

Signal: Monument on highest point.

Reference marks: Half-inch hole in rock 8½ feet distant in direction of Diablo, another 8 feet distant toward Downieville Buttes, and a third 9½ feet distant toward Snow Mountain.

Station mark: Drill hole in the top of a fast rock.

Position of monument on highest point: Latitude $39^{\circ} 12' 24.14''$; longitude $121^{\circ} 49' 13.85''$.

[Latitude $39^{\circ} 12' 22.29''$ ($39^{\circ} 12' 22.361'' a$). Longitude $121^{\circ} 49' 11.69''$ ($121^{\circ} 49' 11.540'' a$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Monticello.....	28 09 17.68	207 55 21.34	4.8337037
Mount Helena.....	50 03 28.78	229 32 49.63	4.9650596
Lola.....	258 10 48.681	79 06 09.074	5.1073057
Round Top.....	290 18 36.528	111 27 13.322	5.2275239
Yolo, southeast base.....	358 39 13.288	178 39 58.108	4.8766025
Diablo.....	3 12 19.840	183 08 49.947	5.1679399
Yolo, northwest base.....	3 14 22.437	183 12 56.316	4.7679519
Vaca.....	14 03 37.004	193 53 41.545	4.9775702
Professor.....	184 11 46.12	4 12 47.59	4.5006155
Nelson.....	186 54 43.14	6 56 46.37	4.5858529
Biggs.....	201 47 37.45	21 51 40.95	4.3938739
Sugar Loaf.....	205 57 40.04	26 05 26.47	4.6033425
Farnan.....	230 25 26.31	50 37 07.86	4.5363001
Trainer.....	256 51 04.36	77 03 16.90	4.4550447
Walsh.....	274 56 23.46	95 15 58.27	4.6512675
Marysville Church.....	289 55 21.30	110 04 08.59	4.3288651
Excelsior.....	296 11 27.51	116 31 27.47	4.7077141
Wheatland.....	301 38 04.11	121 53 11.56	4.6090618
Peter.....	325 16 17.67	145 26 16.27	4.6040118

a Coast and Geodetic Survey.

PETER, SUTTER COUNTY, CAL.

Center of high tank house at the residence of Adam Peter, about 1 mile east of Nicolaus post-office.

[Latitude $38^{\circ} 54' 30.35''$. Longitude $121^{\circ} 33' 21.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marysville Butte.....	145 26 16.27	325 16 17.67	4.6040118
Wheatland.....	225 12 40.01	45 17 47.20	4.2190964
Prairie School.....	235 16 38.43	55 17 50.44	3.5263047
Excelsior.....	245 30 45.50	65 40 44.33	4.4011311
Chandler.....	274 22 09.31	94 24 34.02	3.7457117
Telegraph.....	287 51 51.38	108 02 50.26	4.4249649
Pleasant Grove.....	327 22 35.44	47 25 11.18	4.0455270

PLEASANT GROVE, SUTTER COUNTY, CAL.

Center of cupola on schoolhouse at Pleasant Grove. It is the tallest building in the place and about 400 yards west of the post-office. There is a station on the Northern Electric Railroad called Pleasant Grove, which is 2 miles west of the post-office. The Western Pacific Railroad is between this station and the post-office. The distance from Sacramento is about 18 or 19 miles by wagon road.

[Latitude $38^{\circ} 49' 26.96''$. Longitude $121^{\circ} 29' 13.50''$.

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ryan.....	29 14 48.83	209 13 21.99	3.8355936
Barney.....	60 38 36.99	240 35 15.38	3.9498354
Verona.....	69 12 15.16	249 07 23.34	4.0799905
Peter.....	147 25 11.18	327 22 35.44	4.0455270
Prairie School.....	164 04 02.96	344 02 39.14	4.0689095
Chandler.....	177 15 14.42	357 15 03.26	3.9513155
Excelsior.....	220 35 26.20	40 42 48.59	4.4157477
Telegraph.....	266 30 59.44	86 39 22.10	4.2871754
Kaseburg.....	307 50 58.88	127 54 12.37	3.9750147

PRAIRIE SCHOOL, SUTTER COUNTY, CAL.

(Not occupied.)

Cupola on schoolhouse locally known as Prairie School, about 2.5 miles northeast of Peter station.

[Latitude $38^{\circ} 55' 32.40''$. Longitude $121^{\circ} 31' 27.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peter.....	55 17 50.44	235 16 38.43	3.5263047
Excelsior.....	247 05 44.48	67 14 31.34	4.3401714
Pleasant Grove.....	344 02 39.14	164 04 02.96	4.0689095

RYAN, SUTTER COUNTY, CAL.

The windmill on F. D. Ryan's ranch, 16 miles north of Sacramento; it is 2 miles southwest of Sankey station on the Northern Electric Railroad.

Station mark: Iron post set in ground; distance 19 feet 10 inches from center of windmill, azimuth from station mark to signal $252^{\circ} 07'$.

[Latitude 38° 46' 13.16". Longitude 121° 31' 32.10".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Windmill.....	21 49 23.98	201 48 28.16	3.7631355
Verona.....	102 10 44.97	282 07 20.13	3.9071769
Barney.....	109 58 08.57	289 56 13.88	3.6723293
Pleasant Grove.....	209 13 21.99	29 14 48.83	3.8355936
Kaseburg.....	269 00 27.06	89 05 07.23	4.0335163
Capitol.....	352 26 47.95	172 28 01.40	4.3353522

VERONA, SUTTER COUNTY, CAL.

(Not occupied.)

Center of the northernmost of the high electric power poles on the east side of Sacramento River at Verona post-office.

[Latitude 38° 47' 08.28". Longitude 121° 36' 59.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pleasant Grove.....	249 07 23.34	69 12 15.16	4.0799905
Kaseburg.....	274 34 51.87	94 42 56.93	4.2731396
Ryan.....	282 07 20.13	102 10 44.97	3.9071769

BARN, YUBA COUNTY, CAL.

(Not occupied.)

Center of cupola on an old barn about 6 or 7 miles west of Wheatland. It is very near to and east of the Western Pacific and the Northern Electric railroads.

[Latitude 39° 00' 21.66". Longitude 121° 32' 01.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Old Mill.....	207 59 10.47	28 02 03.05	4.1467789
Knoll.....	218 42 08.07	38 44 51.36	3.9985559
Wheatland.....	265 09 28.26	85 13 45.08	3.9935022

CORDUA, YUBA COUNTY, CAL.

(Not occupied.)

Center of cupola on schoolhouse known as the Cordua School, about 8 or 9 miles by road from Marysville. Follow Browns Valley road from Marysville about 7 miles; thence north, and then east.

[Latitude 39° 13' 21.42''. Longitude 121° 30' 33.74'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Trainer.....	191 48 05.06	11 48 30.50	3. 6733223
Chinn.....	230 57 27.26	51 00 22.18	3. 9310964
Walsh.....	288 01 00.62	108 08 49.11	4. 2721416

EAGLE SCHOOL, YUBA COUNTY, CAL.

(Not occupied.)

The flagstaff on schoolhouse about 1.5 miles west of Knoll station.

[Latitude 39° 04' 31.03''. Longitude 121° 29' 11.06'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Old Mill.....	207 59 57.97	28 01 03.42	3. 7251623
Knoll.....	267 41 53.19	87 42 49.40	3. 3314406

KNOLL, YUBA COUNTY, CAL.

The highest point of a low prairie hill in pasture about 2 miles west and 4.5 miles north of Wheatland. The Marysville-Wheatland road passes within less than a mile of station at point where it turns south before going over another hill.

Signal and station mark: Lumber tripod and iron post set under center of it.

[Latitude 39° 04' 33.81''. Longitude 121° 27' 41.90'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barn.....	38 44 51.36	218 42 08.07	3. 9985559
Eagle School.....	87 42 49.40	267 41 53.19	3. 3314406
Marysville Church.....	123 14 35.24	303 09 48.21	4. 1161471
Old Mill.....	184 21 45.40	4 21 54.62	3. 6642970
Walsh.....	232 32 27.13	52 38 26.45	4. 2360713
Excelsior.....	299 03 07.01	119 09 32.91	4. 2269838
Wheatland.....	332 45 07.48	152 46 41.19	3. 3930299

MARYSVILLE CHURCH, YUBA COUNTY, CAL.

(Not occupied.)

Spire on the Presbyterian Church in Marysville.

[Latitude $39^{\circ} 08' 25.84''$. Longitude $121^{\circ} 35' 16.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marysville Butte.....	110 04 08.59	289 55 21.30	4.3288651
Farnan.....	192 37 05.12	12 39 57.78	4.4752964
Trainer.....	209 26 53.43	29 30 17.84	4.1978294
Walsh.....	262 15 12.19	82 25 59.08	4.3948013
Old Mill.....	282 42 25.46	102 47 21.84	4.0631784
Excelsior.....	300 48 06.17	120 59 19.14	4.4758359
Knoll.....	303 09 48.21	123 14 35.24	4.1161471
Wheatland.....	314 07 49.38	134 14 09.99	4.3061794

OLD MILL, YUBA COUNTY, CAL.

An old windmill at an unoccupied ranch owned by Mr. Boardman, who lives at the adjoining ranch. It is on a very small hill about 2 miles south and 7 miles east of Marysville. Follow from Marysville the lower Smartsville road, which passes within 0.5 mile and north of point.

Station mark: The pipe extending into ground.

[Latitude $39^{\circ} 07' 03.08''$. Longitude $121^{\circ} 27' 27.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Knoll.....	4 21 54.62	184 21 45.40	3.6642970
Eagle School.....	28 01 03.42	207 59 57.97	3.7251623
Barn.....	28 02 03.05	207 59 10.47	4.1467789
Tank.....	34 38 18.32	214 36 07.86	3.9421838
Marysville Church.....	102 47 21.84	282 42 25.46	4.0631784
Pole School.....	146 30 20.63	326 29 15.80	3.6502791
Walsh.....	246 12 52.13	66 18 42.38	4.1630318
Wheatland.....	344 23 32.30	164 24 56.84	4.0789932

POLE SCHOOL, YUBA COUNTY, CAL.

(Not occupied.)

Schoolhouse on Marysville-Smartsville road, 6 miles from Marysville.

[Latitude 39° 09' 03.94". Longitude 121° 29' 10.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walsh.....	262 15 03.03	82 21 58.88	4. 2022361
Old Mill.....	326 29 15.80	146 30 20.63	3. 6502791

POWER, YUBA COUNTY, CAL.

On a hill on east side of Dry Creek about 1.5 miles northeast of the power house, on the east side of same creek. From power house follow power line east to summit of first ridge; thence north along ridge to first high point.

Signal and station mark: Center of tall pine tree with lower limbs cut off.

[Latitude 39° 16' 28.85". Longitude 121° 17' 44.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walsh.....	3 19 29.50	183 19 11.77	4. 0647438
Chinn.....	88 03 54.92	267 58 42.93	4. 0726766
Yuba.....	324 09 17.46	144 12 02.93	4. 0301965

SMARTSVILLE, YUBA COUNTY, CAL.

(Not occupied.)

Spire on Catholic Church at Smartsville.

[Latitude 39° 12' 27.64". Longitude 121° 17' 48.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walsh.....	7 56 35.27	187 56 20.03	3. 6221818
Chinn.....	120 59 18.64	300 54 09.35	4. 1358382

TANK, YUBA COUNTY, CAL.

(Not occupied.)

Center of water tank near a two-story house 5 miles west and 2.5 miles north of Wheatland. It is between the Southern Pacific and the Western Pacific railroads.

[Latitude 39° 03' 09.48". Longitude 121° 30' 54.20".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Old Mill.....	214 36 07.86	34 38 18.32	3.9421838
Walsh.....	234 24 58.06	54 32 58.60	4.3518994
Wheatland.....	297 54 14.91	117 57 49.70	3.9677798

TRAINER, YUBA COUNTY, CAL.

About 8.5 miles north and 4.5 miles east of Marysville, on rolling prairie land owned by Mr. Trainer; the station is on the highest point of these hills. The Marysville-Olive Hill road passes south of and within less than half a mile of signal.

Signal: A tripod with 2 targets at right angles to each other on pole extending above tripod.

Station mark: A bench-mark post under center of pole.

[Latitude 39° 15' 51.03". Longitude 121° 29' 53.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cordua.....	11 48 30.50	191 48 05.06	3.6733223
Marysville Church.....	29 30 17.84	209 26 53.43	4.1978294
Marysville Butte.....	77 03 16.90	256 51 04.36	4.4550447
Fowl.....	148 38 27.63	328 34 56.71	4.1849191
Palermo.....	167 32 58.71	347 31 09.20	4.2824080
Farnan.....	175 30 26.63	355 29 54.53	4.1894612
Chinn.....	262 21 07.32	82 23 36.86	3.7569627
Yuba.....	287 29 09.09	107 39 35.68	4.3966571
Walsh.....	301 43 20.34	121 50 43.61	4.2963583

WALSH, YUBA COUNTY, CAL.

On a timbered hill about 3.5 miles south of Smartsville. The Wheatland-Smartsville road passes northwest of point. It is on land owned by Mr. Walsh, who lives on the north side of the hill. A road leads from his residence to the summit.

Signal: A large dead pine tree.

Station mark: Triangulation tablet set in rock; distance, 2.30 meters; azimuth from signal, 24°.

[Latitude 39° 10' 13.08". Longitude 121° 18' 12.44'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wheatland	30 10 42.37	210 06 17.09	4.3039484
Knoll	52 38 26.45	232 32 27.13	4.2360713
Tank	54 32 58.60	234 24 58.06	4.3518994
Old Mill	66 18 42.38	246 12 52.13	4.1630318
Marysville Church	82 25 59.08	252 15 12.19	4.3948013
Pole School	82 21 58.88	262 15 03.63	4.2022361
Marysville Butte	95 15 58.27	274 56 23.46	4.6512675
Cordua	108 08 49.11	288 01 00.62	4.2721416
Trainer	121 50 43.61	301 43 20.34	4.2963583
Chinn	135 06 59.23	315 02 05.32	4.1983871
Power	183 19 11.77	3 19 29.50	4.0647438
Smartsville	187 56 20.03	7 56 35.27	3.6221888
Yuba	247 21 34.61	67 24 37.61	3.8768480
Excelsior	356 48 36.48	176 49 03.74	4.2717132

WHEATLAND, YUBA COUNTY, CAL.

The town water tank at Wheatland which is supported by a steel structure about 100 feet high. The electric-light fixture in center and on top of tank was used for signal. Instrument can be set up on platform at base of tank.

Signal and station mark: Electric-light fixture in center and on top of tank.

[Latitude 39° 00' 48.43". Longitude 121° 25' 13.15'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chandler	27 14 18.34	207 11 36.04	4.1331974
Peter	45 17 47.20	225 12 40.01	4.2190964
Barn	85 13 45.08	265 09 28.26	3.9935022
Tank	117 57 49.70	297 54 14.91	3.9677798
Marysville Buttes	121 53 11.56	301 38 04.11	4.6090618
Marysville Church	134 14 09.99	314 07 49.38	4.3061794
Knoll	152 46 41.19	332 45 07.48	3.8930299
Old Mill	164 24 56.84	344 23 32.30	4.0789932
Walsh	210 06 17.09	30 10 42.37	4.3039484
Excelsior	276 21 54.36	96 26 46.37	4.0504869
Sheridan	308 52 09.17	128 53 57.84	3.7274141
Lincoln	320 34 31.49	140 39 16.52	4.2356404
Telegraph	325 42 06.79	145 47 59.47	4.3806975
Dowd	344 25 41.34	164 27 19.82	4.1480756

Coalinga, Hollister, Las Bonas, Newman, Panoche, San Ardo, and San Lucas quadrangles.

FRESNO, MERCED, MONTEREY, SAN BENITO, AND SANTA CLARA COUNTIES.

Triangulation was extended over the Salinas Valley and oil belt region in 1908 by C. F. Urquhart. The work is based upon the positions of Mount Toro, Santa Ana, and Gavilan, as redetermined by the Coast and Geodetic Survey after the earthquake of April 18, 1906.

BARNEY, FRESNO COUNTY, CAL.

(Not occupied.)

Center of windmill derrick at a ranch (owner not known) about 3 miles south by south of the Miller & Lux Company's headquarters sheep ranch, and 2.5 miles east by north of Miller No. 3 (or Whistler) ranch.

[Latitude $36^{\circ} 46' 22.817''$. Longitude $120^{\circ} 31' 32.844''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Miller No. 3.....	59 44 32.56	239 43 19.21	3.5464257
Miller No. 2.....	125 36 48.94	305 32 29.89	4.1198395
Miller Headquarters.....	147 10 01.97	327 08 56.09	3.7014854

CANTUA, FRESNO COUNTY, CAL.

On the flat country known as The Plains, about 7 miles north of Cantua Creek and about 1 mile south of the Mendota-Cantua Creek road, which runs along township line. The common corner of sections 24, 25, 19, and 30, on township line, is about 1 mile northwest of signal. There is a new cabin (1 room) about half a mile north of point.

Signal: Cottonwood tree set 4 feet in ground and about 15 or 20 feet high, probably the only tree between Cantua and Panoche creeks.

Station mark: Triangulation tablet set in rock; distance 1.28 meters from signal, azimuth $228^{\circ} 40'$ to signal.

[Latitude 36° 30' 44.517". Longitude 120° 22' 30.295'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Joaquin.....	19 21 35.75	199 18 37.72	4. 3534305
San Benito.....	56 50 05.50	236 40 30.42	4. 4598650
Indian.....	114 31 04.13	294 18 30.89	4. 5379847
Telephone.....	148 00 14.53	327 55 15.38	4. 3712011
Mendota.....	180 35 37.56	0 36 04.24	4. 4240449
Tanks.....	203 02 19.79	23 04 34.72	4. 1576377

CHANNEY, FRESNO COUNTY, CAL.

The windmill derrick at the Chaney ranch, 14 miles from Mendota, on the Mendota-Idria road. This is the only ranch of importance on this road between Mendota and Idria. There is sufficient hay and water at this place, though drinking water has to be hauled from Mendota. The place is owned by the Hollister Company, and is sometimes called the Hollister ranch.

Station mark: The pipe extending into ground.

[Latitude 36° 39' 14.758". Longitude 120° 34' 36.094'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
San Benito.....	10 50 47.71	190 48 23.51	4. 5065752
Buck.....	65 31 57.59	245 21 22.56	4. 4639689
Indian.....	83 48 00.67	263 42 39.39	4. 1287127
Telephone.....	232 56 20.56	52 58 34.39	3. 8432915

INDIAN, FRESNO COUNTY, CAL.

On a bald mountain at the head of Indian Valley and on the north side of Panoche Creek. It is about 7 miles northeast by east of Panoche post-office. The Panoche-Mendota road intersects the road from Idria 4 miles south of the Kern oil well. From the Kern oil well the signal can be seen, probably 5 miles distant. Animals can be ridden up almost any of the ridges leading to highest point.

Signal: Rock cairn 7 feet high.

Station mark: Triangulation tablet set in rock; distance 1.60 meters from signal, azimuth 41° to signal.

90 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $36^{\circ} 38' 27.298''$. Longitude $120^{\circ} 43' 34.341''$]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buck.....	50 58 13.48	230 52 59.42	4. 2270767
Panoche.....	64 03 24.40	243 59 32.66	4. 0309438
Call.....	83 34 52.92	263 22 48.63	4. 4823341
Bonanza.....	128 57 25.73	308 48 18.34	4. 4651214
Miller No. 1.....	175 34 45.82	355 33 56.50	4. 4229378
Miller No. 2.....	197 47 18.15	17 50 11.11	4. 3701193
Miller Headquarters.....	218 44 00.83	38 50 06.50	4. 3842510
Miller No. 3.....	229 02 20.90	49 08 18.84	4. 2938858
Mendota Oil.....	242 45 45.88	62 57 32.37	4. 5180460
Mendota.....	248 41 18.18	68 54 00.24	4. 5309150
Telephone.....	253 17 06.26	73 24 41.49	4. 2957845
Chaney.....	263 42 39.39	83 48 00.67	4. 1287127
Tanks.....	271 28 51.98	91 43 41.41	4. 5687108
Cantua.....	294 18 30.89	114 31 04.13	4. 5379847
San Benito.....	346 12 58.83	166 15 54.86	4. 4907897

JOAQUIN, FRESNO COUNTY, CAL.

(Not occupied.)

Center of pine tree near the summit of mountain known as "The Joaquin Rocks." From Coalinga follow up Los Gatos Creek to White Creek; thence up White Creek to summit; thence east along ridge to point, which can also be reached from the Cantua Creek side.

[Latitude $36^{\circ} 19' 13.740''$. Longitude $120^{\circ} 27' 30.172''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Benito.....	108 16 37.27	288 10 01.22	4. 2441341
Buck.....	123 59 20.71	303 44 35.23	4. 6505700
Telephone.....	173 04 07.98	353 02 07.91	4. 6182998
Cantua.....	199 18 37.72	19 21 35.75	4. 3534305

MILLER NO. 2, FRESNO COUNTY, CAL.

Center of windmill derrick at the Miller & Lux Company's sheep ranch, about 0.75 mile southeast of the Sullivan ranch (which is also owned by the Miller & Lux Company). It is about 8 or 9 miles south of South Dos Palos, a station on the Southern Pacific Railroad, on the west side of San Joaquin River. There is a barn and a very small cabin near windmill.

Station mark: The pipe extending into ground.

[Latitude 36° 50' 31.536". Longitude 120° 38' 45.218".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian.....	17 50 11.11	197 47 18.15	4.3701193
Bonanza.....	82 27 21.95	262 15 19.98	4.4788602
White.....	114 32 43.23	294 25 41.90	4.2811679
Bareillas.....	120 21 51.29	300 07 41.49	4.6076025
Oil Stack.....	162 11 06.98	342 08 57.84	4.2400084
South Dos Palos.....	176 37 48.17	356 37 28.81	4.1324830
Miller Headquarters.....	293 16 45.16	113 19 58.39	3.9394580
Barney.....	305 32 29.89	125 36 48.94	4.1198395
Miller No. 3.....	320 50 31.92	140 53 37.51	4.0853095
San Benito.....	359 48 55.54	179 48 59.58	4.7192960

MILLER HEADQUARTERS, FRESNO COUNTY, CAL.

The windmill derrick at the Miller & Lux Company's headquarters sheep ranch. It is about 7 miles south of the superintendent's ranch, which is about halfway between South Dos Palos and Firebaugh, stations west of the San Joaquin River on the Southern Pacific Railroad.

Station mark: The iron pipe extending into ground.

[Latitude 36° 48' 39.888". Longitude 120° 33' 22.848".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Miller No. 3.....	2 58 04.93	182 57 57.42	3.7786616
Indian.....	38 50 06.50	218 44 00.83	4.3842510
Bonanza.....	89 16 18.47	269 01 03.61	4.5781093
Miller No. 2.....	113 19 58.39	293 16 45.16	3.9394580
Barney.....	327 08 56.09	147 10 01.97	3.7014854

MILLER NO. 3, FRESNO COUNTY, CAL.

The windmill derrick at the Miller & Lux Company's sheep camp, known as the Whistler ranch, 3.5 or 4 miles south of the Headquarters sheep ranch, which is about 8 or 9 miles southwest of Firebaugh and about 10 or 11 miles west of Mendota, towns on the Southern Pacific Railroad. A barn and two small white cabins are near the windmill, but there are no trees.

Station mark: The pipe extending into ground.

[Latitude $36^{\circ} 45' 25.275''$. Longitude $120^{\circ} 33' 35.388''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Benito.....	9 58 33.22	189 55 32.69	4. 6395952
Indian.....	49 08 18.84	229 02 20.90	4. 2938858
Bonanza.....	98 21 35.12	278 06 28.35	4. 5791323
Miller No. 2.....	140 53 37.51	320 50 31.92	4. 0853095
Miller Headquarters.....	182 57 57.42	2 58 04.98	3. 7786616
Barney.....	239 43 19.21	59 44 32.56	3. 5464257
Mendota Oil.....	261 28 56.92	81 34 45.86	4. 1648756
Telephone.....	330 40 42.19	150 42 19.89	3. 9181290

MENDOTA, FRESNO COUNTY, CAL.

(Not occupied.)

Center of water tank at the Southern Pacific Railroad roundhouse at Mendota.

[Latitude $36^{\circ} 45' 05.760''$. Longitude $120^{\circ} 22' 19.100''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cantua.....	0 36 04.24	180 35 57.56	- 4. 4240449
San Benito.....	29 58 51.00	209 49 07.63	4. 6889183
Telephone.....	62 33 47.13	242 28 40.44	4. 1567673
Indian.....	68 54 00.24	248 41 18.18	4. 5309150

MENDOTA OIL, FRESNO COUNTY, CAL.

(Not occupied.)

Center of tall smokestack at oil tanks about 3 miles northwest of Mendota, a town on the Southern Pacific Railroad.

[Latitude $36^{\circ} 46' 35.115''$. Longitude $120^{\circ} 23' 52.429''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Telephone.....	48 01 57.80	227 57 46.84	4. 1464244
Indian.....	62 57 32.37	242 45 45.88	4. 5180460
Miller No. 3.....	81 34 45.86	261 28 56.92	4. 1648756

TANKS, FRESNO COUNTY, CAL.

Center of windmill at group of large oil tanks, owned by the Standard Oil Company; about 10 miles south of Mendota.

[Latitude $36^{\circ} 37' 53.646''$. Longitude $120^{\circ} 18' 43.845''$]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cantua.....	23 04 34.72	203 02 19.79	4. 1576377
Indian.....	91 43 41.41	271 28 51.98	4. 5687108
Telephone.....	110 23 17.63	290 16 02.85	4. 2852279

TELEPHONE, FRESNO COUNTY, CAL.

The windmill derrick at the Miller & Lux Company's sheep camp, known as the Telephone ranch, 10 miles from Mendota, a town on the Southern Pacific Railroad, and 0.5 mile north of the Idria-Mendota road. The Chaney ranch is 4 miles west on same road and is the only ranch of importance between Mendota and Idria. Hay and stock water can be had at the Telephone ranch, but no water fit for drinking.

Station mark: The pipe extending into ground.

[Latitude $36^{\circ} 41' 30.991''$. Longitude $120^{\circ} 30' 52.018''$]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Benito.....	18 01 42.54	197 57 04.89	4. 5748389
Chaney.....	52 58 34.39	232 56 20.56	3. 8432915
Buck.....	63 08 46.06	242 55 57.09	4. 5555836
Indian.....	73 24 41.49	253 17 06.26	4. 2957845
Miller No. 3.....	150 42 19.89	330 40 42.19	3. 9181290
Mendota Oil.....	227 57 46.84	48 01 57.80	4. 1464244
Mendota.....	242 28 40.44	62 33 47.13	4. 1567673
Tanks.....	290 16 02.85	110 23 17.63	4. 2852279
Cantua.....	327 55 15.38	148 00 14.53	4. 3712011
Joaquin.....	353 02 07.91	173 04 07.98	4. 6182998

BAREILLAS, MERCED COUNTY, CAL.

On a bald peak, the lowest and most eastern of three peaks on land owned by J. C. Bareillas. It is about 3 miles a little east of south of the San Luis ranch, which is about 15 miles from Los Banos on the road to Hollister. The signal can be seen from this ranch.

Signal: A rock cairn 7 feet high.

Station mark: Triangulation tablet set in rock 1.72 meters south of cairn.

[Latitude $37^{\circ} 01' 33.559''$. Longitude $121^{\circ} 02' 19.450''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Santa Ana.....	52 17 17.12	232 10 17.21	4.3394971
Paoheco.....	84 56 48.03	264 47 49.87	4.3460746
Volta.....	231 57 39.22	52 01 38.54	4.0952256
Los Banos.....	257 28 07.49	77 34 57.41	4.2360987
Oil Stack.....	277 19 30.87	97 31 32.73	4.4756665
South Dos Palos.....	281 14 30.42	101 28 22.03	4.5422771
Miller No. 2.....	300 07 41.49	120 21 51.29	4.6076025
White.....	305 16 29.54	125 23 37.82	4.3343198
Bonanza.....	347 58 53.17	168 00 59.10	4.3972398

BONANZA, MERCED COUNTY, CAL.

On a high bald peak (with oak trees growing just below the summit on the north side) about 3 miles northeast of Bonanza post-office. A road leads to Bonanza from Tres Pinos on the Southern Pacific Railroad (distance 24 miles); thence up canyon 1 mile to Mr. Sepulveda's ranch. From this place follow trail or wood road about 1 mile farther up canyon, and a trail thence to summit. Animals can be ridden all the way up. Station can also be reached from the San Joaquin side by going up a wood road to summit; thence south along ridge to highest point.

Signal and station mark: A cairn 8 feet high and triangulation tablet in rock placed under its center.

[Latitude $36^{\circ} 48' 21.558''$. Longitude $120^{\circ} 58' 49.786''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Call.....	18 49 51.53	198 46 53.03	4.3615909
Armstrong.....	54 09 12.15	233 57 14.52	4.5659355
Santa Ana.....	116 11 52.03	296 02 47.44	4.3988290
Bareillas.....	168 00 59.10	347 58 53.17	4.3972398
White.....	226 11 02.36	46 16 03.78	4.2364938
Miller No. 1.....	248 32 29.67	68 40 49.17	4.3456994
Miller No. 2.....	262 15 19.98	82 27 21.95	4.4788602
Miller Headquarters.....	269 01 03.61	89 16 18.47	4.5781093
Miller No. 3.....	278 06 28.35	98 21 35.12	4.5791323
Indian.....	308 48 18.34	128 57 25.73	4.4651214
San Benito.....	328 00 19.79	148 12 21.82	4.7558232

MILLER NO. 1, MERCED COUNTY, CAL.

A windmill derrick at the Miller & Lux Company's sheep ranch farthest north. It is probably in Merced County, but very near the Fresno line. It is about 9 miles southwest of South Dos Palos, a small town west of San Joaquin River on the Southern Pacific Railroad. A barn, residence, and several small cabins are near the windmill. Another windmill in a grove of trees with several old houses near is 0.5 mile east. No trees are near the derrick used.

Station mark: The iron pipe extending into ground.

[Latitude $36^{\circ} 52' 43.813''$. Longitude $120^{\circ} 44' 56.759''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bonanza.....	68 40 49.17	248 32 29.67	4.3456994
White.....	115 10 22.20	295 07 03.74	3.9562094
Oil Stack.....	197 14 57.40	17 16 35.09	4.1157473
Indian.....	355 33 56.50	175 34 45.82	4.4229378

SOUTH DOS PALOS, MERCED COUNTY, CAL.

(Not occupied.)

Center of windmill at water tank which supplies the town of South Dos Palos. It is on the west side of railroad and one block north of post-office.

[Latitude $36^{\circ} 57' 50.890''$. Longitude $120^{\circ} 39' 17.457''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White.....	71 18 47.80	251 12 05.25	4.2431390
Bareillas.....	101 28 22.03	281 14 30.42	4.5422771
Miller No. 2.....	356 37 28.81	176 37 48.17	4.1324830

VOLTA, MERCED COUNTY, CAL.

(Not occupied.)

Center of spire on the church on the north side of town of Volta on the Southern Pacific Railroad west of San Joaquin River.

[Latitude $37^{\circ} 05' 42.272''$. Longitude $120^{\circ} 55' 42.339''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bareillas.....	52 01 38.54	231 57 39.22	4.0952256
White.....	338 50 39.26	158 53 48.87	4.3346184

WHITE, MERCED COUNTY, CAL.

On a bald plateau about 4 miles southwest of the Miller & Lux Company's Jamison ranch, which is on the westernmost canal and 9 miles south of Los Banos. It is about 11 miles (by road) west of South Dos Palos. The signal is on a smooth, grass-covered hill with no rocks on it. There is a point a little higher about 0.25 mile south. Animals can be ridden to point; a light wagon, even, may be driven to it, though the hill is rather steep.

Signal: A 4 by 4 inch pole 12 feet above ground with two targets at right angles to each other.

Station mark: Triangulation tablet in rock placed in ground 0.65 meters northwest of signal. The rock is 6 inches above ground on the northwest side of tablet.

[Latitude $36^{\circ} 54' 48.435''$. Longitude $120^{\circ} 50' 27.300''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bonanza.....	46 16 03.78	226 11 02.36	4.2364938
Bareillas.....	125 23 37.82	305 16 29.54	4.3343198
Volta.....	158 53 48.87	338 50 39.26	4.3346184
Los Banos.....	177 14 08.56	357 13 49.50	4.2102514
Oil stack.....	234 22 12.82	54 27 05.63	4.1708242
South Dos Palos.....	251 12 05.25	71 18 47.80	4.2431390
Miller No. 2.....	294 25 41.90	114 32 43.23	4.2811679
Miller No. 1.....	295 07 03.74	115 10 22.20	3.9562094

BARDIN, MONTEREY COUNTY, CAL.

On the summit of a brushy ridge in foothills about 8 miles east of Salinas, on land owned by the Bardin Brothers. From Salinas follow road east to near foothills; thence south to the gate entering Bardin ranch; through this gate cross small flat and go up ridge to station. Saddle animals can be taken all the way up.

Signal and station mark: Live-oak tree with "U.S.G.S." and a triangle cut on it.

[Latitude $36^{\circ} 40' 06.669''$. Longitude $121^{\circ} 31' 10.729''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Toro.....	26 53 19.91	206 50 08.21	4.2476897
Chalk.....	57 42 56.21	237 34 31.84	4.3958912
Spreckels.....	66 51 29.22	246 47 02.67	4.0815897
Blanco.....	85 05 40.90	264 56 42.64	4.3517023
Salinas.....	92 49 32.45	272 44 35.30	4.0923727
Castroville.....	117 23 50.78	297 15 21.02	4.3769032
Gavilan.....	179 54 36.93	359 54 36.57	3.9862352
Armstrong.....	288 59 29.20	109 06 51.06	4.2891121

BLANCO, MONTEREY COUNTY, CAL.

A small, very brushy hill about 8 miles west and a little south of Salinas. From Salinas follow road west to Blanco post-office, across Salinas River, and until first left-hand road is passed. Buck-board can be driven to station, about 0.25 mile south of road.

Signal: A 4 by 4 inch pole 12 feet high, with two targets placed at right angles to each other.

Station mark: Iron bench-mark post set in ground at foot of signal.

[Latitude $36^{\circ} 39' 03.373''$. Longitude $121^{\circ} 46' 12.262''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Salinas.....	255 41 42.13	75 45 43.34	4. 0150287
Bardin.....	264 56 42.64	85 05 40.90	4. 3517023
Chalk.....	353 02 35.22	173 03 08.46	4. 0587699
Castroville.....	185 22 37.45	5 23 06.68	4. 1120016

CASTROVILLE, MONTEREY COUNTY, CAL.

(Not occupied.)

Center of very prominent church spire in the town of Castroville, on the Southern Pacific Railroad where branch to Monterey and Pacific Grove leaves main line.

[Latitude $36^{\circ} 46' 01.379''$. Longitude $121^{\circ} 45' 23.362''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blanco.....	5 23 06.68	185 22 37.45	4. 1120016
Gavilan.....	273 18 11.57	93 26 41.49	4. 3257095
Bardin.....	297 15 21.02	117 23 50.78	4. 3769032
Salinas.....	319 30 51.57	139 34 23.87	4. 1328976
Mount Toro.....	333 40 28.00	153 45 44.99	4. 4741210
Chalk.....	359 35 49.69	179 35 53.78	4. 3847198

CHALK, MONTEREY COUNTY, CAL.

On a low ridge about 11 miles from Salinas. From Salinas follow the Monterey road to about 0.75 mile beyond summit, where there is a water trough and a signboard reading "To Del Monte ranch." From this point follow left road to point where there are three roads. The middle road leads to the Salinas Gun Club, just before reaching which the signal can be seen, not more than half a mile distant.

Signal: A tree supported by three poles.

52752°—Bull. 440—10—7

Station mark: Triangulation tablet set in rock; azimuth from tablet to signal 153° , distance 15.67 meters.

[Latitude $36^{\circ} 32' 54.674''$. Longitude $121^{\circ} 45' 16.506''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blanco.....	173 03 08.46	353 02 35.22	4.0587699
Castroville.....	179 35 53.78	359 35 49.69	4.3847198
Salinas.....	211 50 41.93	31 54 09.60	4.2145242
Bardin.....	237 34 31.84	57 42 56.21	4.3958912
Mount Toro.....	280 39 22.41	100 44 34.51	4.1228971

GAVILAN, MONTEREY COUNTY, CAL.

Coast and Geodetic Survey station on the crest of the mountain separating the Pajaro Valley from the Valley of Salinas, about 4 miles south of San Juan mission. The crest is composed of a line of sharp rocky peaks 2,800 to 3,000 feet high, and the station is on the western extremity, on a small platform of level land, just at top of steep slope.

Station mark: Stone block with a drill hole in top filled with lead, set 2.5 feet below surface of ground.

Reference marks: Three lead bolts in fixed rock in approximate distances and directions from the center as follows: One $13\frac{1}{4}$ feet south by west, one $13\frac{3}{4}$ feet southeast, and one $5\frac{3}{4}$ feet north by east.

[Latitude $36^{\circ} 45' 20.961''$. Longitude $121^{\circ} 31' 11.341''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Toro.....	17 24 34.19	197 21 22.65	4.4262930
Salinas.....	53 39 31.54	233 34 34.45	4.1852436
Castroville.....	93 26 41.49	273 18 11.57	4.3257095
Loma Prieta.....	143 56 25.47	323 44 45.39	4.6890356
Pacheco.....	216 28 36.89	36 37 01.53	4.5422113
Santa Ana.....	236 58 19.93	57 08 39.53	4.4845916
Armstrong.....	311 01 20.99	131 08 43.66	4.3875319
Bardin.....	359 54 36.57	179 54 36.93	3.9862352

MOUNT TORO, MONTEREY COUNTY, CAL.

Coast and Geodetic Survey station on a smooth, grassy hill of the smooth, untimbered range of mountains bordering the Salinas Valley on the west; about 500 yards south of house on A. B. Parson's land.

Station mark: A copper bolt set in a flat-topped rock, 2 feet beneath surface of ground, in center of a concrete pier; a cross on a copper bolt in the top of the pier constitutes the surface mark, 1.498 meters above the subsurface mark.

Reference marks: No. 1, northwest of the station, the vertical pier; distance 10.18 meters. No. 2, the zenith telescope pier (concrete); distance 19.81 meters, azimuth $135^{\circ} 55'$. No. 3, the transit pier (concrete); distance 20.85 meters, azimuth $132^{\circ} 25'$.

[Latitude $36^{\circ} 31' 34.742''$. Longitude $121^{\circ} 36' 32.283''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chalk.....	100 44 34.51	280 39 22.41	4.1228971
Castroville.....	153 45 44.99	333 40 28.00	4.4741210
Loma Prieta.....	162 12 31.32	342 04 05.43	4.8338624
Salinas.....	165 03 43.38	345 01 58.44	4.2292924
Mocho.....	182 34 42.13	2 36 38.58	5.0240270
Gavilan.....	197 21 22.65	17 24 34.19	4.4262930
Bardin.....	206 50 08.21	26 53 19.91	4.2476897
Santa Ana.....	218 31 06.92	38 44 36.72	4.7311612
Armstrong.....	250 15 48.18	70 26 20.87	4.4477396

SPRECKELS, MONTEREY COUNTY, CAL.

(Not occupied.)

Center of cupola on schoolhouse at Spreckels, a small town about 4 miles south of Salinas.

[Latitude $36^{\circ} 37' 32.587''$. Longitude $121^{\circ} 38' 37.298''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Salinas.....	166 41 09.74	346 40 39.31	3.7402281
Bardin.....	246 47 02.67	66 51 29.22	4.0815897

LOS BANOS, MERCED COUNTY, CAL.

(Not occupied.)

Center of cupola on schoolhouse in the town of Los Banos, on the Southern Pacific Railroad west of San Joaquin River.

[Latitude $37^{\circ} 03' 34.238''$. Longitude $120^{\circ} 50' 58.976''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bareillas.....	77 34 57.41	257 28 07.49	4.2360987
White.....	357 13 49.50	177 14 08.56	4.2102514

OIL STACK, MERCED COUNTY, CAL.

(Not occupied.)

Center of smokestack at an oil station about 3 or 4 miles northwest of South Dos Palos, a town on the Southern Pacific Railroad west of San Joaquin River.

[Latitude $36^{\circ} 59' 28.207''$. Longitude $120^{\circ} 42' 20.218''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Miller No. 1.....	17 16 35.09	197 14 57.40	4.1157473
White.....	54 27 05.63	234 22 12.82	4.1708242
Bareillas.....	97 31 32.73	277 19 30.87	4.4756665
Miller No. 2.....	342 08 57.84	162 11 06.98	4.2400084

SALINAS, MONTEREY COUNTY, CAL.

Center of cupola on court-house at Salinas.

[Latitude $36^{\circ} 40' 26.163''$. Longitude $121^{\circ} 39' 28.290''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chalk.....	31 54 09.60	211 50 41.93	4.2145242
Blanco.....	75 45 43.34	255 41 42.13	4.0150287
Castroville.....	139 34 23.87	319 30 51.57	4.1328976
Gavilan.....	233 34 34.45	53 39 31.54	4.1852436
Bardin.....	272 44 35.30	92 49 32.45	4.0923727
Armstrong.....	282 38 15.35	102 50 34.18	4.4987001
Mount Toro.....	345 01 58.44	165 03 43.38	4.2292924
Spreckels.....	346 40 39.31	166 41 09.74	3.7402281

ARMSTRONG, SAN BENITO COUNTY, CAL.

The highest and easternmost of three hills on the summit of ridge forming the divide between Salinas and San Benito rivers; probably in San Benito County, but very near the Monterey line. An old road (traveled very little), between Mulberry post-office and Gonzales, passes just under hill on the north and west sides. By this road the station is about 7 or 8 miles from Mulberry. It is a good horseback route, but very poor for buggy or wagon. The land on which the station is situated is owned by the Armstrong Brothers, of Salinas.

Signal: Oak tree in center of rock cairn about 4 or 5 feet high.

Station mark: Triangulation tablet set in rock; distance 1.03 meters from signal, azimuth 184° to signal.

[Latitude 36° 36' 40.597". Longitude 121° 18' 50.350".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Toro.....	70 26 20.87	250 15 48.18	4.4477396
Salinas.....	102 50 34.18	282 38 15.35	4.4987001
Bardin.....	109 06 51.06	288 59 29.20	4.2891121
Gavilan.....	131 08 43.66	311 01 20.99	4.3875319
Hollister.....	163 23 38.15	343 20 25.50	4.4459584
Santa Ana.....	192 30 48.53	12 33 43.64	4.5241889
Bonanza.....	233 57 14.52	54 09 12.15	4.5659355
Call.....	270 19 47.40	90 28 45.29	4.3505389
San Benito.....	293 50 35.86	114 14 30.21	4.8177979
Hepsedam.....	306 40 45.35	126 58 13.71	4.7393296

BUCK, SAN BENITO COUNTY, CAL.

On a rather high mountain known as Buck Mountain, about 5 or 6 miles southwest of Panoche post-office, on the Hollister-Idria stage road. From Panoche follow road west through field to within 200 yards of Mr. Toreador's residence; thence south along fence and up gulch to summit of ridge; thence along ridge to station. Animals can be taken up, but the last part of climb is very steep.

Signal: Pine tree 30 feet high, with lower limbs cut off.

Station mark: Triangulation tablet set in rock under center of top of signal tree.

[Latitude 36° 32' 42.359". Longitude 120° 52' 21.179".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Call.....	112 51 53.38	292 45 03.85	4.2680060
Panoche.....	210 06 26.63	30 07 49.05	3.8359821
Indian.....	230 52 59.42	50 58 13.48	4.2270767
Telephone.....	242 55 57.09	63 08 46.06	4.5555836
Chaney.....	245 21 22.56	65 31 57.59	4.4639689
Joaquin.....	303 44 35.23	123 59 20.71	4.6505700
San Benito.....	313 25 41.56	133 33 50.45	4.4508777

CALL, SAN BENITO COUNTY, CAL.

On a brushy peak on ridge south of Tres Pinos Creek and east of San Benito River. From Hollister follow the Hollister-Idria road to grade between mile posts 25 and 26; thence turn south up ridge about 5 or 6 miles. Shortly after leaving main road the Bradford quick-silver mine is passed and thence up ridge two deserted houses. At the end of open live-oak country on summit of ridge signal can be seen about 0.25 mile south on a brushy peak. Mr. Call once lived near the summit, and the ridge is sometimes known by his name.

Signal: Cairn 7 feet high on highest point of peak.

Station mark: Triangulation tablet set in large rock; distance 1 meter from signal, azimuth 318°.

[Latitude 36° 36' 35.463''. Longitude 121° 03' 48.417'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Armstrong.....	90 28 45.29	270 19 47.40	4.3505389
Santa Ana.....	155 18 27.69	335 12 23.05	4.5576284
Bonanza.....	198 46 53.03	18 49 51.53	4.3615909
Indian.....	263 22 48.63	83 34 52.92	4.4823341
Buck.....	292 45 03.85	112 51 53.38	4.2680060
San Benito.....	305 11 17.80	125 26 15.75	4.6633038
Hepsedam.....	326 40 15.64	146 48 47.96	4.5926168

HEPSEDAM, SAN BENITO COUNTY, CAL.

Coast and Geodetic Survey station on a prominent peak of the Mount Diablo Range in the southern part of the county. From Coalinga follow road via King City, Marthan Canyon, and Priest Valley, and down Lewis Creek to Captain Hollett's.

Station marks: A hole drilled in outcropping rock and filled with lead and a copper tack. Three similar marks were made: One north 6.9 feet away; one south 7.98 feet away, and one west 6.7 feet away. Over the center mark is concrete pier with copper bolt in top. The meridian instrument pier is 1.57 meters due east of station, and wooden pier for vertical circle is 9.753 meters a little south of west.

[Latitude $36^{\circ} 18' 53.644''$ ($36^{\circ} 18' 53.603''^a$). Longitude $120^{\circ} 49' 26.357''$ ($120^{\circ} 49' 26.362''^a$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Toro.....	108 39 45.65	288 11 47.86	4. 8704389
Armstrong.....	126 58 13.71	306 40 45.35	4. 7393296
Call.....	146 48 47.96	326 40 15.64	4. 5926168
Santa Ana.....	150 57 28.97	330 42 51.48	4. 8752783
San Benito.....	249 14 45.55	69 21 09.51	4. 2373492
Oak Flat.....	299 44 51.81	119 55 16.47	4. 4829865
Center Peak.....	304 30 56	124 38 04	4. 341479
Castle Mount.....	313 34 08.71	133 51 16.62	4. 7804191

^a Coast and Geodetic Survey.

HOLLISTER, SAN BENITO COUNTY, CAL.

(Not occupied.)

Center of cupola on court-house at Hollister.

[Latitude $36^{\circ} 51' 08.544''$ Longitude $121^{\circ} 24' 12.466''$]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Santa Ana.....	248 49 22.53	68 55 31.44	4. 2127407
Armstrong.....	343 20 25.50	163 23 38.15	4. 4459584

PANOCHÉ, SAN BENITO COUNTY, CAL.

(Not occupied.)

A derrick about 250 yards north of Panoche post-office on the Hollister-Idria stage road.

Station mark: The pipe extending into ground under center of derrick.

[Latitude $36^{\circ} 35' 54.713''$. Longitude $120^{\circ} 50' 02.842''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buck.....	30 07 49.05	210 06 26.63	3. 8359821
Indian.....	243 59 32.66	64 03 24.40	4. 0309438

SAN BENITO, SAN BENITO COUNTY, CAL.

On the highest point of San Benito Mountain, the highest mountain in range south of Idria post-office. The Idria-Coalinga wagon road passes about 1 mile north of signal at point about 4 miles from Idria.

The mountain has a rather flat top, but there is a small peak at west end, on which signal is built. There are several pine trees on flat part of mountain.

Signal and station mark: Small cairn on highest point of peak and triangulation tablet cemented in solid rock under its center.

[Latitude $36^{\circ} 22' 11.727''$. Longitude $120^{\circ} 38' 38.447''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hepsedam.....	69 21 09.51	249 14 45.55	4.2373492
Armstrong.....	114 14 30.21	293 50 35.86	4.8177979
Call.....	125 26 15.75	305 11 17.80	4.6633038
Buck.....	133 33 50.45	313 25 41.56	4.4508777
Bonanza.....	148 12 21.82	328 00 19.79	4.7558232
Indian.....	166 15 54.86	346 12 58.83	4.4907897
Miller No. 2.....	179 48 59.58	359 48 55.54	4.7192960
Miller No. 3.....	189 55 32.69	9 58 33.22	4.6395952
Chaney.....	190 48 23.51	10 50 47.71	4.5065752
Telephone.....	197 57 04.89	18 01 42.54	4.5748389
Mendota.....	209 49 07.63	29 58 51.00	4.6889183
Cantua.....	236 40 30.42	56 50 05.50	4.4598650
Joaquin.....	288 10 01.22	108 16 37.27	4.2441341

SANTA ANA, SAN BENITO COUNTY, CAL.

Coast and Geodetic Survey station on western summit of rocky point known as Henrietta Peak, 2 miles from one known as Santa Ana Peak. From Hollister follow main street and first road east for 2 miles, then turn north until a second road to right is reached; thence proceed eastward, crossing creek at mouth of Dos Picachos Canyon. Follow grade winding up ridge on north side of canyon for 6 or 8 miles to near summit of grade halfway between Herrington ranch house and Stayton mine; thence follow backbone of ridge southwest 1.5 miles to station.

Station marks: A rock irregular in shape with a copper bolt in top, laid in concrete foundation 3 feet square and 10 inches deep, supporting a concrete pier hexagonal in shape and 26 inches in diameter. A copper bolt with cross cut upon it set in pier marks station center, 5 feet 2.5 inches above subsurface mark. A concrete pier, occupied in 1885 for latitude observations, is $37\frac{1}{2}$ feet from the station; azimuth $129^{\circ} 07' 01''$.

[Latitude 36° 54' 19.368''. Longitude 121° 13' 57.738'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Armstrong.....	12 33 43.64	192 30 48.53	4.5241889
Mount Toro.....	38 44 36.72	218 31 06.92	4.7311612
Gavilan.....	57 08 39.53	236 58 19.93	4.4845916
Hollister.....	68 55 31.44	248 49 22.53	4.2127407
Loma Prieta.....	112 59 29.35	292 37 25.88	4.7706278
Mocho.....	155 49 43.93	335 38 02.09	4.8430541
Pacheco.....	157 01 12.21	336 59 14.62	4.0929220
Bareillas.....	232 10 17.21	52 17 17.12	4.3394971
Bonanza.....	296 02 47.44	116 11 52.03	4.3988290
Call.....	335 12 23.05	155 18 27.69	4.5576284

PACHECO PEAK, SANTA CLARA COUNTY, CAL.

(Not occupied.)

The highest point of Pacheco Peak, a well-known mountain in the southeast corner of Santa Clara County.

[Latitude 37° 00' 29.231''. Longitude 121° 17' 13.321'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gavilan.....	36 37 01.53	216 28 36.89	4.5422113
Bareillas.....	264 47 49.87	84 56 48.03	4.3460746
Santa Ana.....	336 59 14.62	157 01 12.21	4.0829220

Mariposa quadrangle.

FRESNO, MADERA, AND MARIPOSA COUNTIES.

In cooperation with the State, during the season of 1908, C. F. Urquhart extended triangulation control over Mariposa quadrangle from Devil and Big Shuteye stations. Twelve stations were occupied and five points were located by intersections.

COPPER, FRESNO COUNTY, CAL.

(Not occupied.)

On the most northern peak of a high bald hill on south side of San Joaquin River, about 6 or 7 miles southeast of Pollasky.

Signal: Rock cairn 7 feet high.

[Latitude 36° 55' 58.57''. Longitude 119° 38' 42.97'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Adobe.....	120 25 30.71	300 17 43.21	4.3477863
Crook.....	189 15 02.57	9 16 04.24	4.1971765

ADOBE, MADERA COUNTY, CAL.

On a small bald hill belonging to the Krohn estate, situated on the south side of the Adobe ranch. The hill is about 1 mile north of Mr. Wootten's ranch, which is 12 miles from Madera, on the Madera-O'Neals road.

Signal and station mark: Rock cairn 5 feet high and triangulation tablet set in rock under its center.

[Latitude 37° 02' 03.77". Longitude 119° 51' 40.07'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Monument.....	126 09 05.55	306 05 50.39	3.9959300
Rabbit.....	151 35 42.05	331 33 11.64	4.1120062
Green.....	155 59 26.04	335 54 45.56	4.4490909
Deadwood.....	206 42 22.93	26 48 45.93	4.5407001
Quartz.....	221 49 46.72	41 56 08.37	4.3690625
Crook.....	258 46 37.84	78 55 27.84	4.3453986
Copper.....	300 17 43.21	120 25 30.71	4.3477863

BIG SHUTEYE, MADERA COUNTY, CAL.

On the large granite summit of Big Shuteye (Chiquito) Peak, the highest point of Chiquito Range, at southeast end of ridge. Follow trail from Jackass Meadows to where it crosses ridge; then turn south. A trail from North Fork post-office also crosses ridge at same point as above trail.

Signal: Rock cairn 6 feet high, with a 4-foot base.

Station mark: Bronze triangulation tablet cemented in solid granite under the cairn.

[Latitude 37° 21' 00.26". Longitude 119° 25' 38.53'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crook.....	28 43 39.68	208 36 47.29	4.5446769
Quartz.....	52 29 24.55	232 20 01.99	4.4606828
Deadwood.....	80 04 59.00	259 55 36.42	4.3653006
Devil.....	125 53 10.71	305 41 47.10	4.5325137
Raymond.....	146 34 31.04	326 29 35.66	4.3358553
Red.....	182 47 24.19	2 48 05.05	4.5289143
Lyell.....	197 41 04.96	17 46 48.27	4.6571504
Silver.....	249 33 51.80	69 48 41.16	4.5842369
Hilgard.....	268 29 47.16	88 51 40.06	4.7264787
Kaiser.....	285 51 29.47	106 00 18.72	4.3493243
Three Sisters.....	305 14 15.24	125 27 35.30	4.6014723

CROOK, MADERA COUNTY, CAL.

On a rock-topped hill overlooking the San Joaquin River, about 8 miles from O'Neals and 6 miles from Bellevue. George Brown lives immediately under the hill on north side, and there are roads from the above-mentioned places to his ranch.

Signal and station mark: Rock cairn 7 feet high; triangulation tablet under center.

[Latitude $37^{\circ} 04' 22.71''$. Longitude $119^{\circ} 37' 00.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Copper.....	9 16 04.24	189 15 02.57	4.1971765
Adobe.....	78 55 27.84	258 46 37.84	4.3453986
Quartz.....	155 06 41.93	335 04 12.79	4.1607411
Deadwood.....	167 14 41.18	347 12 12.64	4.4378369
Big Shuteye.....	208 36 47.29	28 43 39.68	4.5446769

DEADWOOD, MADERA COUNTY, CAL.

On a high, round hill, locally known as Deadman (or Deadwood) Peak, between Fresno River and Coarsegold Creek. On the summit, along the edge, are several large trees that can not be seen over. All sights to triangulation stations are open from signal. Is best reached from Coarsegold post-office by wagon road to Dr. Topps's mine, which is not more than 1 mile from the summit; thence by a dim trail to station, which is about 4.5 miles from Coarsegold.

Signal: A black-oak tree about 30 feet high, with middle limbs cut out.

Station mark: Triangulation tablet; azimuth to signal, 255° , distance 4 meters.

[Latitude $37^{\circ} 18' 49.70''$. Longitude $119^{\circ} 41' 06.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quartz.....	0 08 20.74	180 08 19.93	4.1333727
Adobe.....	26 48 45.93	206 42 22.93	4.5407001
Rabbit.....	48 02 34.90	227 53 40.55	4.4671127
Green.....	78 57 13.77	258 46 08.37	4.4404747
Moore Hill.....	107 55 48.13	287 44 49.91	4.4479206
Bullion.....	128 56 41.44	308 44 07.97	4.5926105
Devil.....	168 35 34.98	348 33 35.35	4.3881194
Raymond.....	206 07 55.15	26 12 23.48	4.3914043
Big Shuteye.....	259 55 36.42	80 04 59.00	4.3653006
Crook.....	347 12 12.64	167 14 41.18	4.4378369

MONUMENT, MADERA COUNTY, CAL.

(Not occupied.)

Station mark: An old pile of rock resembling a chimney on bald hill 4 miles south by south of Rabbit station.

[Latitude $37^{\circ} 05' 13.23''$. Longitude $119^{\circ} 57' 03.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rabbit.....	198 20 39.44	18 21 24.36	3.7662806
Adobe.....	306 05 50.39	126 09 05.55	3.9959300

QUARTZ, MADERA COUNTY, CAL.

(Not occupied.)

Cupola on a large residence on summit of Quartz Mountain, a well-known point north of O'Neals post-office.

[Latitude $37^{\circ} 11' 28.71''$. Longitude $119^{\circ} 41' 07.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Adobe.....	41 56 08.37	221 49 46.72	4.3690625
Rabbit.....	74 34 34.80	254 25 42.01	4.3537500
Deadwood.....	180 08 19.93	0 08 20.74	4.1333727
Big Shuteye.....	232 20 01.99	52 29 24.55	4.4606828
Crook.....	335 04 12.79	155 06 41.93	4.1607411

RABBIT, MADERA COUNTY, CAL.

On a bald hill about 5 miles from Raymond. The road from Raymond to Berenda passes within one-half mile of station at point where there is a water trough near gate. Go through gate and up the hill.

Signal and station mark: Rock cairn 7 feet high; triangulation tablet under center.

[Latitude $37^{\circ} 08' 12.98''$. Longitude $119^{\circ} 55' 49.51''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Monument.....	18 21 24.36	198 20 39.44	3.7662806
Green.....	159 40 38.41	339 38 28.41	4.1833582
Deadwood.....	227 53 40.55	48 02 34.90	4.4671127
Quartz.....	254 25 42.01	74 34 34.80	4.3537500
Adobe.....	331 33 11.64	151 35 42.05	4.1120062

BULLION, MARIPOSA COUNTY, CAL.

On the highest point on the southeast end of Mount Bullion (not the point formerly used by the United States Geological Survey). From Mariposa follow the Merced road 1.5 miles to where two roads turn to right (at saloon); follow middle road about 2.5 miles until in sight of ranch; then cross creek and go up mountain on old road to top of ridge; thence along ridge to station.

Signal: Large pine tree, with the middle limbs cut out.

Station mark: Triangulation tablet; azimuth to signal 98° . distance 3.90 meters.

[Latitude $37^{\circ} 32' 05.92''$. Longitude $120^{\circ} 01' 46.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Princeton.....	21 36 49.96	201 36 12.61	3.6117447
Devil.....	271 13 48.33	91 24 23.72	4.4084882
Deadwood.....	308 44 07.97	128 56 41.44	4.5926105
Court-house.....	312 11 41.46	132 13 59.94	3.8774229
Mariposa.....	324 18 14.56	144 19 41.03	3.7766029
Moore Hill.....	346 33 41.42	166 35 15.67	4.2148929
Green.....	353 20 24.66	173 21 50.63	4.4782044

DEVIL, MARIPOSA COUNTY, CAL.

On mountain locally known as Signal Peak, at the southeast end of a short, sharp ridge, 9 miles southwest of Wawona Park, bare on top and covered with loose rock. It can be reached by wagon road from Wawona. The nearest camping place is 1.25 miles northeast of summit.

Signal: Rock cairn 6 feet high.

Station mark: Triangulation tablet set in rock; azimuth to signal 121° , distance $6\frac{3}{4}$ feet.

110 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $37^{\circ} 31' 46.80''$. Longitude $119^{\circ} 44' 23.09''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Green.....	37 12 26.66	217 03 19.18	4. 5650238
Moore Hill.....	54 55 45.41	234 46 45.30	4. 4263477
Mariposa.....	79 09 43.40	259 00 34.79	4. 3528654
Bullion.....	91 24 23.72	271 13 48.33	4. 4084882
Pilot.....	146 23 49.18	326 16 39.63	4. 4928478
Cottonwood.....	180 37 19.76	00 37 31.81	4. 6445464
Flat.....	194 51 35.15	14 54 59.19	4. 5030993
Hoffman.....	209 50 37.68	29 59 03.70	4. 6092431
Conness.....	217 07 08.88	37 22 32.54	4. 7855484
Clouds Rest.....	219 51 32.29	40 00 43.66	4. 5381966
Clarks Peak.....	235 55 55.04	56 07 20.30	4. 5212361
Red.....	244 35 09.78	64 47 16.70	4. 5097490
Raymond.....	276 41 29.60	96 47 58.49	4. 1983545
Kaiser.....	297 47 02.53	118 07 16.04	4. 7451616
Big Shuteye.....	305 41 47.10	125 53 10.71	4. 5325137
Deadwood.....	348 33 35.35	168 35 34.98	4. 3881194

GREEN, MARIPOSA COUNTY, CAL.

On a bald hill locally known as Green Mountain. The Green Mountain copper mine is just under the hill on the south side. The road from Raymond to Mariposa passes within a mile of the hill at Seaton's saloon, 8 miles from Raymond. Animals can be ridden to the point.

Signal: Rock cairn 8 feet high.

Station mark: Triangulation tablet; azimuth to signal 146° , distance 1.10 meters.

[Latitude $37^{\circ} 15' 56.92''$. Longitude $119^{\circ} 59' 24.51''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bullion.....	173 21 50.63	353 20 24.66	4. 4782044
Moore Hill.....	181 21 24.88	1 21 33.01	4. 1437321
Devil.....	217 03 19.18	37 12 26.66	4. 5650238
Raymond.....	233 57 48.00	54 13 23.09	4. 6699597
Deadwood.....	258 46 08.37	78 57 13.77	4. 4404747
Adobe.....	335 54 45.56	155 59 26.04	4. 4490909
Rabbit.....	339 38 28.41	159 40 38.41	4. 1833582

MARIPOSA, MARIPOSA COUNTY, CAL.

On a small rocky hill about 1 mile west of Mariposa. Can be reached by trail up Mariposa Creek one-half or three-fourths mile; thence up ridge to summit; thence along ridge northwest a short distance to station.

Signal: Rock cairn 5 feet high with pine tree in center. Cloth will have to be kept on this signal.

Station mark: Triangulation tablet set in rock which forms part of base of cairn.

[Latitude $37^{\circ} 29' 28.40''$. Longitude $119^{\circ} 59' 24.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Princeton.....	101 55 33.28	281 53 29.51	3.7079796
Bullion.....	144 19 41.03	324 18 14.56	3.7766029
Devil.....	259 00 34.79	79 09 43.40	4.3528654
Court-house.....	275 43 28.78	95 44 20.76	3.3240293
Moore Hill.....	358 21 17.68	178 21 25.55	4.0454039

COURT-HOUSE, MARIPOSA COUNTY, CAL.

(Not occupied.)

Cupola on court-house in Mariposa.

[Latitude $37^{\circ} 29' 21.57''$. Longitude $119^{\circ} 57' 58.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mariposa.....	95 44 20.76	275 43 28.78	3.3240293
Bullion.....	132 13 59.94	312 11 41.46	3.8774229

MOORE HILL, MARIPOSA COUNTY, CAL.

On a high hill, known locally as Moore Hill, about 3 miles from Ben Hur post-office, on road between Raymond and Mariposa. From Ben Hur follow road 1.5 miles north to barn owned by P. J. Harris; thence through gate on west side of road; thence through two more gates to summit ridge. Land is owned by Samuel Brenham.

Signal: An oak tree 12 feet high. There are 5 or 6 very large oak trees on summit of hill, consequently white cloth will have to be kept on signal.

Station mark: Triangulation tablet; azimuth from station to signal 329° , distance 3.33 meters.

[Latitude $37^{\circ} 23' 28.42''$. Longitude $119^{\circ} 59' 11.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Green.....	1 21 33.01	181 21 24.88	4. 1437321
Bullion.....	166 35 15.67	346 33 41.42	4. 2148929
Mariposa.....	178 21 25.55	358 21 17.68	4. 0454039
Devil.....	234 46 45.30	54 55 45.41	4. 4263477
Raymond.....	250 04 09.17	70 19 37.45	4. 6007414
Deadwood.....	287 44 49.91	107 55 48.13	4. 4479206

PRINCETON, MARIPOSA COUNTY, CAL.

(Not occupied.)

A flagstaff on hoist at Mount Bullion mine.

[Latitude $37^{\circ} 30' 02.57''$. Longitude $120^{\circ} 02' 47.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bullion.....	201 36 12.61	21 36 49.96	3. 6117447
Mariposa.....	281 53 29.51	101 55 33.28	3. 7079796

RAYMOND, MARIPOSA COUNTY, CAL.

On mountain locally known as Mount Raymond, which overlooks the Mariposa Grove of big trees. It can be reached by road from Wawona to the grove; also by road and trail from Fish Camp. There is a road to Mount Raymond mine, thence to summit of ridge by trail. Animals can be taken to near the summit.

Signal and station mark: Rock cairn with a 5-foot base, 7 feet high; triangulation tablet set in solid rock under its center.

[Latitude $37^{\circ} 30' 46.64''$. Longitude $119^{\circ} 33' 44.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Deadwood.....	26 12 23.48	206 07 55.15	4. 3914043
Green.....	54 13 23.09	233 57 48.00	4. 6699597
Moore Hill.....	70 19 37.45	250 04 09.17	4. 6007414
Devil.....	96 47 58.49	276 41 29.60	4. 1983545
Big Shuteye.....	326 29 35.66	146 34 31.04	4. 3358553

CALIFORNIA-NEVADA.

TRIANGULATION STATIONS.

Ballarat, Furnace Creek, and Las Vegas quadrangles.

INYO AND SAN BERNARDINO COUNTIES, CAL.; LINCOLN AND NYE COUNTIES, NEV.

During 1906 Benjamin D. Stewart occupied two primary and several secondary stations northwest of Las Vegas, Nev., and in the same and the following year a scheme of figures was carried westward from these points by Messrs. R. H. Chapman, J. E. Blackburn, and D. F. C. Moor and tied to points established in 1905. This work, done in connection with topographic mapping, under varying and unfavorable conditions, like that upon which it depends, is preliminary in nature, the points in nearly every case sighted before signals were erected. New computations for position of stations Cane and Furnace (both of 1905) were made, and from these and other positions of that year the coordinates and azimuths were computed southward and eastward.

The latitude and longitude of Charleston Peak obtained from these computations differ but slightly from that brought from the Fort Wingate base by H. M. Wilson in 1884. Checks with the Wheeler stations of 1874 are large but approximately constant with those made to the northward in 1905. No station or figure adjustment has been made.

DEATH, INYO COUNTY, CAL.

Westernmost and highest of group of bare, rounded summits southeast of Bullfrog-Ballararat wagon road. About 15 miles northwest 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: Bronze triangulation tablet cemented in block of stone, 16 by 14 by 10 inches, under a small heap of stones and flagstaff 9 feet high.

52752°—Bull. 440—10—8

[Latitude 36° 30' 00.61". Longitude 117° 07' 47.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Maturango	38 01 04	217 48 05	4.72779
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
Boundary	227 55 26	48 04 35	4.50587
Furnace	284 19 00	104 37 27	4.68108
Funeral	313 55 43	134 14 31	4.80135
Telescope	354 15 50	174 17 17	4.56582

EAGLE MOUNTAIN, INYO COUNTY, CAL.

(Not occupied.)

Highest point of a high, very steep, isolated rock ridge in Amargosa Valley, 15 miles due south of Ash Meadows.

[Latitude 36° 12' 41.8". Longitude 116° 21' 22.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Funeral	63 35 36	243 26 07	4.42991
Furnace	131 11 42	311 02 37	4.48386
Cane	194 25 11	14 31 37	4.81103

FUNERAL, INYO COUNTY, CAL.

In Black Mountains, or Southern Funeral Range, on summit of rocky ridge about 5 miles south of town of Greenwater. It is best reached from Greenwater or from Hidden Spring, which is 4 miles southeast of peak. A point 1 mile west of station is about 4 feet higher.

Station mark: Aluminum tablet in large volcanic rock under a cairn 5 feet high with 4-foot base.

Reference marks: Rock with drill hole $1\frac{1}{2}$ inches deep $5\frac{3}{4}$ feet southwest of center; rock with drill hole $1\frac{1}{2}$ inches deep 4 feet 5 inches southeast; rock with drill hole $1\frac{1}{2}$ inches deep $4\frac{1}{2}$ feet north.

[Latitude 36° 06' 12.25". Longitude 116° 37' 25.42'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Telescope.....	100 10 59	279 54 31	4. 62868
Death.....	134 14 31	313 55 43	4. 80135
Furnace.....	181 56 24	361 56 50	4. 50598
Cane.....	208 09 28	28 24 54	4. 92839
Amargosa.....	218 45 30	39 02 03	4. 82317
Eagle Mountain.....	243 26 07	63 35 36	4. 42991
Charleston.....	257 07 10	77 40 04	4. 93243
Nopah.....	282 13 21	102 32 32	4. 70009

FURNACE, INYO COUNTY, CAL.

A high, rocky peak, southernmost in Amargosa Range, about 15 miles north of Greenwater, 15 miles east of Furnace Creek ranch (Death Valley), 6 miles west-southwest of Lees well, and 10 miles northwest of Franklin well, Amargosa Desert. Local name, Pyramid Peak. It was ascended on foot from southeast.

Station mark: Bronze triangulation tablet set in slab of black limestone and surmounted by cylindrical cairn 75 feet high and 5 feet in diameter.

Reference marks: Crosses cut in solid rock, one about 20 feet southwest and another about 30 feet north.

[Latitude 36° 23' 31.90". Longitude 116° 36' 41.95'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Funeral.....	1 56 50	181 56 24	4. 50598
Telescope.....	60 16 41	239 59 44	4. 69419
Death.....	104 37 27	284 19 00	4. 68120
Tin.....	126 17 49	305 47 17	4. 97025
Grape.....	143 05 47	322 46 31	4. 90172
Boundary.....	146 04 36	325 55 36	4. 60556
Bare.....	170 51 42	350 48 19	4. 72675
Timber.....	189 52 34	9 57 59	4. 89419
Cane.....	222 20 33	42 36 09	4. 76190
Amargosa.....	243 56 07	64 12 17	4. 65491
Charleston.....	278 56 54	99 29 28	4. 92099
Olcott.....	295 01 06	115 40 31	5. 04353
Eagle Mountain.....	311 02 37	131 11 42	4. 48386
Nopah.....	311 40 46	131 59 36	4. 80710

MATURANGO, INYO COUNTY, CAL.

About 16 miles northwest of Ballarat on peak, the highest of Argus Range. It is about 5 miles north of Millspah and $3\frac{1}{2}$ miles northeast of Junction ranch, from which place it was ascended by following north side of gulch which heads 1 mile south of station and thence along divide to peak. With no snow on range it can probably be best ascended from the north or northeast.

Station mark: Aluminum tablet cemented in solid granite.

Reference mark: Flagstaff 2 feet southeast of tablet.

[Latitude $36^{\circ} 07' 13.82''$. Longitude $117^{\circ} 29' 43.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tin.....	182 22 54	2 22 51	4. 93032
Grape.....	198 10 11	18 21 19	4. 99479
Death.....	217 48 05	38 01 04	4. 72779
Telescope.....	261 17 48	81 32 11	4. 56812

NOPAH, INYO COUNTY, CAL.

On highest point of range lying west of Pahrump Valley. It is about 3 miles a little south of east of Twelvemile Spring, about 10 miles northeast of Resting Spring, and about 20 miles southwest of Pahrump and Manse ranches. Ascent was from Twelvemile Spring, and horses were taken to peak from the south.

Station mark: Aluminum tablet set in solid rock under a cairn 5 feet high.

[Latitude $36^{\circ} 00' 23.64''$. Longitude $116^{\circ} 04' 49.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Telescope.....	101 36 01	281 00 42	4. 96683
Funeral.....	102 32 32	282 13 21	4. 70009
Furnace.....	131 59 36	311 41 46	4. 80710
Cane.....	174 19 03	354 15 40	4. 93362
Charleston.....	229 34 19	49 47 53	4. 65786
Olcott.....	274 47 46	95 08 12	4. 71971
Kingston.....	334 18 10	154 24 04	4. 53715

TELESCOPE, INYO COUNTY, CAL.

The highest point of Panamint or Telescope Range, and probably a station of the Wheeler survey in 1873. It is about 11 miles northeast of the town of Ballarat, and 23 miles southwest of Furnace

Creek ranch in Death Valley. It is best reached from the west side, following wagon road up Tuber Canyon. From end of road follow trail northeast to summit of Baldy Mountain; thence southward about 3 miles, following a good trail along summit of range. Animals may be taken to station when there is little or no snow.

Station mark: Aluminum tablet cemented in slate stone, 12 by 10 by 4 inches, under cairn with 4-foot base and 5 feet high. This is on site of small monument which was destroyed. No record of Wheeler station found.

[Latitude $36^{\circ} 10' 12.88''$. Longitude $117^{\circ} 05' 20.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Maturango.....	81 32 11	261 17 48	4. 56812
Tin.....	157 41 10	337 26 44	4. 93495
Death.....	174 17 17	354 15 50	4. 56582
Grape.....	176 31 04	356 27 46	4. 94670
Furnace.....	239 59 44	60 16 41	4. 69419
Charleston.....	264 26 55	85 16 11	5. 09965
Funeral.....	279 54 31	100 10 59	4. 62868
Nopah.....	281 00 42	101 36 01	4. 96683

TIN, INYO COUNTY, CAL.

Highest and northernmost peak of Panamint Range, 15 miles southwest of Staininger's (Grapevine) ranch, 10 miles southwest of Mesquite Spring, and 6 miles north and a little west of Pinon 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: Bronze triangulation tablet cemented in solid rock.

[Latitude $36^{\circ} 53' 13.13''$. Longitude $117^{\circ} 27' 20.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Maturango.....	2 22 51	182 22 54	4. 93032
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
Furnace.....	305 47 17	126 17 49	4. 97025
Death.....	325 45 14	145 57 07	4. 71493
Telescope.....	337 26 44	157 41 10	4. 93495

118 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

IVANPAH, SAN BERNARDINO COUNTY, CAL.

(Not occupied.)

Highest point of big black mountain in group southeast of Kingston Range. A higher peak lies west of point sighted.

[Latitude 35° 31' 32.4". Longitude 115° 35' 18.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Charleston.....	173 23 28	353 19 43	4. 92090
Olcott.....	189 09 32	9 12 35	4. 69421

KINGSTON, SAN BERNARDINO COUNTY, CAL.

(Not occupied.)

High peak near south end of Kingston Range.

[Latitude 35° 43' 36.40". Longitude 115° 54' 55.04".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Furnace.....	139 50 31	319 25 55	4. 98632
Nopah.....	154 24 04	334 18 10	4. 53715
Charleston.....	198 06 52	18 14 39	4. 80381
Olcott.....	234 34 34	54 49 00	4. 66141

CHARLESTON, LINCOLN COUNTY, NEV.

Highest peak of Charleston (or Spring Mountain) Range. It lies about 30 miles a little north of west from Las Vegas. From Manse post-office follow a dim wagon track northeast 12 miles to Lee's camp; thence 5 miles by trail to Lee's spring; thence northward about 3 miles to peak. Horses may be taken to summit by this route when snow is not too deep.

Station mark: Aluminum tablet cemented in rock under a cairn 7 feet high.

[Latitude $36^{\circ} 16' 18.53''$ ($36^{\circ} 16' 18.0''^a$). Longitude $115^{\circ} 41' 42.60''$ ($115^{\circ} 41' 38.7''^a$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kingston.....	18 14 39	198 06 52	4. 80381
Nopah.....	49 47 53	229 34 19	4. 65786
Funeral.....	77 40 04	257 07 10	4. 93243
Telescope.....	85 16 11	264 26 55	5. 09965
Furnace.....	99 29 28	278 56 54	4. 92099
Cane.....	142 35 47	322 18 38	4. 84886
Quartz.....	189 29 22	9 34 15	4. 86910
Sheep.....	229 06 43	49 22 37	4. 72350
Virgin ^a	255 01 30. 6	75 57 55. 9	5. 1662173
Tipton ^a	300 30 02. 9	121 22 54. 8	5. 1989854
Olcott.....	332 43 49	152 50 41	4. 58203
Ivanpah.....	353 19 43	173 23 28	4. 92090

^a Position determined from Wingate, N. Mex., base by H. M. Wilson in 1884.

GASS PEAK, LINCOLN COUNTY, NEV.

(Not occupied.)

Highest point on prominent mountain of local name 16 miles nearly due north of town of Las Vegas.

[Latitude $36^{\circ} 24' 03.20''$. Longitude $115^{\circ} 10' 47.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cane.....	115 21 16	294 45 39	4. 99284
Sheep.....	163 10 05	343 07 39	4. 32486

OLCOTT, LINCOLN COUNTY, NEV.

Highest point on Mount Olcott, about 36 miles southwest of Las Vegas, 40 miles southeast of Manse post-office, and 3 miles east of the Potosi mine. From Mountain Spring follow road 2.25 miles southeast to forks; thence southwest to Hussey mine via Potosi mine; thence eastward on south slope of mountain to peak.

Station mark: Tablet cemented in rock.

[Latitude 35° 57' 56.53''. Longitude 115° 30' 03.82'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ivanpah.....	9 12 35	189 09 32	4. 69421
Kingston.....	54 49 00	234 34 34	4. 66141
Nopah.....	95 08 12	274 47 46	4. 71971
Furnace.....	115 40 31	295 01 06	5. 04353
Charleston.....	152 50 41	332 43 49	4. 58203
Sheep.....	198 16 08	18 25 06	4. 85839

QUARTZ, LINCOLN COUNTY, NEV.

On higher and northernmost of two summits of a double black rock peak of Desert (or Pint Water) Range, about 25 miles north by east of Indian Spring and 5 miles east by south of Quartz Spring. The black rock of the summit is very steep on north face and shows a white band below when seen from the west. From Indian Spring-Quartz Spring wagon road follow a route up west slope of peak.

Station mark: Aluminum tablet in solid rock, over which is a cairn 6½ feet high.

[Latitude 36° 55' 45.34''. Longitude 115° 33' 30.02'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Charleston.....	9 34 15	189 29 22	4. 86910
Cane.....	73 03 23	252 41 10	4. 76049
Sheep.....	324 07 37	144 18 46	4. 67536

SHEEP, LINCOLN COUNTY, NEV.

On highest part of bare rock peak, in Sheep Range, about 12 miles north by east of Corn Creek Spring. Go west from a dry camp on Corn Creek-Mormon Well road. There is no water near station nor on west slope of range. Seven miles north of station is a higher point.

Station mark: Tablet loose in drill hole in rock under a small cairn.

[Latitude 36° 34' 59.07''. Longitude 115° 14' 53.90'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Olcott.....	18 25 06	198 16 08	4. 85839
Charleston.....	49 22 37	229 06 43	4. 72350
Cane.....	104 46 47	284 13 33	4. 93258
Quartz.....	144 18 46	324 07 37	4. 67536
Gass.....	343 07 39	163 10 05	4. 32486
Las Vegas.....	348 41 58		

AMARGOSA, NYE COUNTY, NEV.

(Not occupied.)

Middle of railroad water tank on Las Vegas and Tonapah Railroad, 75 miles northwest of Las Vegas.

[Latitude $36^{\circ} 34' 12.7''$. Longitude $116^{\circ} 09' 29.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Funeral.....	39 02 03	218 45 30	4. 82317
Furnace.....	64 12 17	243 56 07	4. 65491

CANE, NYE COUNTY, NEV.

Highest point on east-west flat ridge, at 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: 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: Crosses cut in solid rock; one 38 feet southwest of center, and another 44 feet southeast of center.

[Latitude $36^{\circ} 46' 34.90''$. Longitude $116^{\circ} 10' 32.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Eagle Mountain.....	14 31 37	194 25 11	4. 81103
Funeral.....	28 24 54	208 09 28	4. 92839
Furnace.....	42 36 09	222 20 33	4. 76190
Boundary.....	81 40 46	261 16 06	4. 79313
Bare.....	102 04 28	281 45 22	4. 68501
Grape.....	103 53 33	283 18 32	4. 95094
Timber.....	143 48 54	323 37 27	4. 63227
Mesa ^a	173 35 36	353 33 26	4. 68573
Quartz.....	252 41 10	73 03 23	4. 76049
Sheep.....	284 13 33	104 46 47	4. 93258
Gass.....	294 45 39	115 21 16	4. 99284
Charleston.....	322 18 38	142 35 47	4. 84886
Nopah.....	354 15 40	174 19 03	4. 93362

^a Computed.

GRAPE, NYE COUNTY, NEV.

Highest peak of Grapevine Range, 20 miles northwest of Bullfrog and 15 miles from Thorp's mill (on Bullfrog-Goldfield wagon road); nearest water is spring on Bullfrog-Grapevine ranch trail about

5 miles northwest. Station is one used by the Coast and Geodetic Survey in establishing Nevada-California state boundary. Center left by that survey found and occupied. No additional marks made.

Station mark: Half-inch square drill hole in rock, 14 by 12 by 10 inches, over which is a monument 4 feet high.

[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.
Maturango.....	18 21 19	198 10 11	4.99479
Tin.....	72 21 38	252 10 36	4.45705
Gold Mountain.....	156 33 46	336 28 08	4.54060
Tolicha.....	221 48 45	42 01 02	4.65454
Timber.....	257 18 09	77 42 03	4.79779
Jumbo.....	273 02 52	93 16 06	4.51472
Cane.....	283 18 26	103 53 25	4.95099
Bare.....	285 27 46	105 43 43	4.61240
Boundary.....	319 44 18	139 54 35	4.59698
Furnace.....	322 46 31	143 05 47	4.90172
Telescope.....	356 27 46	176 31 04	4.94670
Death.....	358 02 54	178 03 37	4.71332
Nye ^a	305 29 00	.....	3.68880
Nye.....	305 28 30	.....	3.68850

^a Coast and Geodetic Survey.

CALIFORNIA-OREGON.

TRIANGULATION STATIONS.

Big Bar, Etna, Grants Pass, Sawyer Bar, and Seiad quadrangles.

HUMBOLDT, SISKIYOU, AND TRINITY COUNTIES, CAL.; JACKSON AND JOSEPHINE COUNTIES, OREG.

During the seasons of 1906 and 1907 triangulation was extended over the above-mentioned quadrangles by A. I. Oliver and C. F. Urquhart. Positions are derived from Sterling, Bolivar, and Bally stations of the Coast and Geodetic Survey and from Tannen station, United States Geological Survey.

BEAR, SISKIYOU COUNTY, CAL.

On peak between two meadows well known as Big Bear Valley and Little Bear Valley. From Happy Camp go down Klamath River to Goodwin's ranch; thence on old Crescent City trail about 14 miles to peak. Little Bear Valley is beyond peak about one-half mile.

Signal and station mark: Tripod built of trees; triangulation tablet set in rock under center.

Reference marks: Two holes 4 inches deep; one 10.6 feet south, and another 5.8 feet east.

[Latitude $41^{\circ} 41' 30.21''$. Longitude $123^{\circ} 34' 32.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Preston.....	169 35 33.10	349 34 08.41	4. 2105990
Tannen.....	202 34 30.23	22 41 31.50	4. 5780774
Sterling.....	237 27 01.34	57 54 37.04	4. 8307852
Marble.....	285 51 36.35	106 05 45.52	4. 4878747
Red.....	286 58 18.72	107 17 38.00	4. 6259432
Crapo.....	317 14 51.96	137 28 52.49	4. 6371266
Salmon.....	346 08 02.86	166 14 38.28	4. 7642330

BOLIVAR, SISKIYOU COUNTY, CAL.

On highest point of mountain locally known as Bolivar. The Coast and Geodetic Survey station is 260.8 feet, azimuth $212^{\circ} 29'$ from point used by Geological Survey. The best way to reach station: From Callahan follow trail about 6 miles around north side of Scotts Mountain; just before crossing a good-sized creek (one-half mile) turn up ridge to right. It is very fair riding all the way, except that snow may hinder early in the season.

Signal: Tripod built of trees.

Station mark: A circular brass disk with letters "U.S.C.G.S.," beneath which is a copper bolt embedded in rock. A cross on disk marks station point.

Reference marks: Two bolts embedded in rock; one east $259^{\circ} 45'$ 6.57 meters, the other west $94^{\circ} 51'$ 9.88 meters.

[Latitude $41^{\circ} 15' 33.53''$ ($41^{\circ} 15' 35.62''^a$). Longitude $122^{\circ} 46' 48.71''$ ($122^{\circ} 46' 46.88''^a$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Weaver.....	19 20 41.59	199 12 55.29	4. 7009543
Sawtooth.....	38 08 22.91	217 57 49.74	4. 5614305
Salmon.....	81 09 51.77	260 44 58.05	4. 7280599
Russian.....	100 31 05.73	280 24 20.40	4. 1626932
Red.....	143 56 49.27	323 44 28.74	4. 6440405
Sterling.....	174 01 49.26	353 57 34.88	4. 9278898
Dog Creek.....	334 49 29.02	154 59 19.94	4. 6949337
Bally.....	351 24 12.66	171 29 19.49	{ 4. 8672557 ^a 4. 8676130
Bully Choop.....	359 08 21.96	179 08 54.63	

^a Coast and Geodetic Survey.

CRAPO, SISKIYOU COUNTY, CAL.

(Not occupied.)

On the highest point of prominent mountain near Crapo Meadows. A sharp rock used for signal on highest point is not very much larger than an ordinary cairn. Probably most easily approached from the trail up Evans Creek, crossing mountains and going down Ukonom Creek to Klamath River.

[Latitude $41^{\circ} 24' 16.14''$. Longitude $123^{\circ} 13' 25.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Salmon.....	32 29 40.14	212 22 18.12	4.4632714
Bear.....	137 28 52.49	317 14 51.96	4.6371266
Red.....	209 37 08.10	29 42 24.51	4.3499691
Russian.....	300 27 34.12	120 38 23.10	4.4236288

MARBLE, SISKIYOU COUNTY, CAL.

(Not occupied.)

About 4 miles a little north of west of Red station, and can probably be reached by same trail.

Station mark: A cairn on highest point of mountain.

[Latitude $41^{\circ} 36' 55.83''$. Longitude $123^{\circ} 13' 15.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bear.....	106 05 45.52	285 51 36.35	4.4878747
Tannen.....	161 05 30.81	340 58 19.98	4.6617463
Red Butte.....	185 05 30.87	5 07 01.01	4.5455650
Red.....	290 10 26.19	110 15 36.37	4.0618470

PRESTON PEAK, SISKIYOU COUNTY, CAL.

(Not occupied.)

Small cairn on highest point of Preston Peak, well known as probably the highest point in northwestern California. From Happy Camp follow up South Fork Indian Creek.

[Latitude $41^{\circ} 50' 07.93''$. Longitude $123^{\circ} 36' 40.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tannen.....	222 35 56.38	42 44 23.19	4.4114611
Bear.....	349 34 08.41	169 35 33.10	4.2105990

RED, SISKIYOU COUNTY, CAL.

On highest point of mountain locally known by this name. From Fort Jones follow Scott River road 9 miles to mouth of Shackleford Creek; thence up Shackleford Creek 2 miles to where plain trail turns to right up the ridge. Follow this trail 3 miles to large open meadow; thence through meadow ascending gradually 2 miles to small ridge point coming from ridge to right. After passing this point signal can be seen and easily reached. It is about 8 miles from mouth of Shackleford Creek to station.

Signal and station mark: Rock cairn 6 feet high over center of triangulation tablet set in solid rock on highest point.

Reference marks: Two holes $3\frac{1}{2}$ inches deep in rocks; one 16.9 feet north, and the other 23.9 feet southwest.

[Latitude $41^{\circ} 34' 46.67''$. Longitude $123^{\circ} 05' 28.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crapo.....	29 42 24.51	209 37 08.10	4.3499691
Salmon.....	31 19 52.09	211 07 13.58	4.7112003
Bear.....	107 17 38.00	286 58 18.72	4.6259432
Marble.....	110 15 36.37	290 10 26.19	4.0618470
Tannen.....	151 37 17.25	331 24 55.20	4.7316722
Red Butte.....	168 53 51.93	348 50 10.90	4.5989388
Sterling.....	199 11 32.97	19 19 43.86	4.7122048
Bolivar.....	323 44 28.74	143 56 49.27	4.6440405
Russian.....	340 21 40.31	160 27 14.39	4.5435397

RED BUTTE, SISKIYOU COUNTY, CAL.

The most northern of several rocky points locally known as Red Buttes. From Grants Pass, Oreg., follow Applegate River road via Watkins to mouth of Elliott Creek (a tributary of Applegate River); thence by trail to just beyond Cook and Green creeks; thence by trail up ridge to left. A trail leads to a good meadow near ridge top. Saddle animals can be taken to about 1,000 feet (elevation) of top.

Signal and station mark: Rock cairn 8 feet high built over triangulation tablet set in solid rock.

[Latitude $41^{\circ} 55' 49.68''$. Longitude $123^{\circ} 10' 59.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marble.....	5 07 01.01	185 05 30.87	4.5455650
Tannen.....	115 08 44.67	295 00 02.04	4.2981507
Sterling.....	248 23 20.02	68 35 14.57	4.4222781
Red.....	348 50 10.90	168 53 51.93	4.5989388

RUSSIAN, SISKIYOU COUNTY, CAL.

On high mountain locally known as Russian Peak. From Gazelle follow road 25 miles to Callahan; thence the Cecilville trail about 12 miles to mouth of South Fork Scott River; thence old trail to right up ridge to within 1 mile of Highland mine, where good feed can be found; thence (on foot) west about 3 miles over summit of ridge and across head of White Gulch, passing lower edge of lake to station.

Signal and station mark: A tripod 12 feet high centered over triangulation tablet in 4 by 7 rock 2 feet thick. The rock is not the highest on the mountain, but others (southeast) come to sharp point and could not be used.

Reference marks: Two holes $3\frac{1}{2}$ inches deep in rocks; one 20.5 feet south, and the other 7.2 feet northeast, of triangulation station.

[Latitude $41^{\circ} 16' 59.14''$. Longitude $122^{\circ} 57' 03.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sawtooth.....	14 33 38.02	194 29 49.00	4.5100215
Pony.....	32 38 22.30	212 27 14.00	4.6441737
Trinity.....	54 30 21.83	234 12 07.67	4.6785170
Salmon.....	74 08 11.85	253 50 02.81	4.6024141
Crapo.....	120 38 23.10	300 27 34.12	4.4236288
Red.....	160 27 14.39	340 21 40.31	4.5435397
Sterling.....	183 44 13.42	3 46 47.37	4.9126016
Bolivar.....	280 24 20.40	100 31 05.73	4.1626932

SALMON, SISKIYOU, TRINITY, AND HUMBOLDT COUNTIES, CAL.

On high peak locally known as Salmon Mountain. It is on highest point of mountain southwest of Forks of Salmon post-office. From Scotts Valley follow wagon road via Sawyers Bar to Forks of Salmon; thence by old trail across mountains to Hoopa. Turn north along ridge after summit is reached (2 miles to peak), about 10 miles from Forks of Salmon.

Signal and station mark: Tripod built of trees over center of triangulation tablet cemented in rock on highest point.

[Latitude 41° 11' 01.13". Longitude 123° 24' 35.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Trinity.....	0 49 11.38	180 49 04.63	4. 2241638
Bear.....	166 14 38.28	346 08 02.86	4. 7642330
Red.....	211 07 13.58	31 19 52.09	4. 7112003
Crapo.....	212 22 18.12	32 29 40.14	4. 4632714
Russian.....	253 50 02.81	74 08 11.85	4. 6024141
Bolivar.....	260 44 58.05	81 09 51.77	4. 7280599
Sawtooth.....	303 33 29.51	123 47 46.69	4. 5631910
Weaver.....	316 51 28.07	137 08 29.48	4. 7270325
Pony.....	330 18 47.38	150 25 45.15	4. 4776182
Chaparral.....	351 13 09.42	171 16 46.85	4. 7075117

BALLY, TRINITY COUNTY, CAL.

On summit of a mountain of same name. Station is near center of a large clump of rocks. From Redding, via Shasta and Stella, after leaving Shasta follow toll road 10 miles to milestone marked "T house 2;" 100 yards farther turn to left and cross creek, 200 yards beyond which is a ranch owned by a Chinaman; the summit is thence approached by pack trail from north probably $5\frac{1}{2}$ to 6 miles.

Station mark: A brass circular disk 3 inches in diameter marked "U.S.C. & G.S." with a cross cut on the raised surface marking center of station. Under the disk is a $\frac{3}{8}$ -inch copper bolt set in rock.

Reference marks: Two $\frac{5}{16}$ by 3 inch copper bolts with punch holes in top; one east 4.29 meters and the other north 10.62 meters.

[Latitude 40° 36' 12.08" (40° 36' 11.97" ^a). Longitude 122° 39' 00.39" (122° 39' 00.39" ^a).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bully Choop.....	61 46 05.82	241 41 33.63	4. 0482120
Weaver.....	132 42 20.48	312 29 31.75	4. 5748914
Sawtooth.....	142 54 37.42	322 39 02.38	4. 7439327
Bolivar.....	171 29 19.49	351 24 12.66	4. 8672557
Dog Creek.....	199 50 53.00	19 55 34.45	4. 4735907

^a Coast and Geodetic Survey.

BULLY CHOOP, TRINITY COUNTY, CAL.

On highest point of the well-known Bully Choop Mountain. There is a wagon road from Weaverville to the Bully Choop mine which is just under the peak. From Tower House on Redding-Weaverville

road take a trail at sawmill on west side of summit. There is a sign-board directing to Bully Choop.

Signal and station mark: A tripod of trees over center of triangulation tablet set in rock under small cairn.

[Latitude $40^{\circ} 33' 20.51''$. Longitude $122^{\circ} 45' 58.83''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dubit Kelly.....	58 46 31.95	238 31 32.96	4.5822052
Chanchelulla.....	64 30 35.88	244 21 51.61	4.3234613
Chaparral.....	112 41 42.77	292 20 09.91	4.7031911
Weaver.....	149 55 19.36	329 47 03.83	4.5506049
Sawtooth.....	154 26 44.51	334 15 43.22	4.7392233
Bolivar.....	179 08 54.63	359 08 21.96	4.8929050
Dog Creek.....	210 51 59.74	31 01 13.94	4.5887924
Bally.....	241 41 33.63	61 46 05.82	4.0482120

CHANCHELULLA, TRINITY COUNTY, CAL.

On highest point of mountain locally known as Chanchelulla Peak. From Weaverville follow Hayfork road to the mouth of Hayfork Creek (a tributary of Trinity River); thence up this creek to East Fork Hayfork Creek; thence up the creek to Smith's ranch. A trail from Smith's ranch leads to summit of mountain. Can also be reached by a trail from Wildwood down Hayfork Creek to the East Fork, thence up as above stated.

Station mark: Triangulation tablet set in solid rock on highest point under a cairn 6 feet high.

Reference marks: Two holes 4 inches deep drilled in rock; one 20 feet south, and the other 22.8 feet west.

[Latitude $40^{\circ} 28' 25.89''$. Longitude $122^{\circ} 59' 25.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dubit Kelly.....	51 40 41.04	231 34 26.12	4.2401883
Weaver.....	181 35 05.30	1 35 35.93	4.6001864
Bully Choop.....	244 21 51.61	64 30 35.88	4.3234613

CHAPARRAL, TRINITY COUNTY, CAL.

On the highest bald mountain 6 miles southwest of Big Bar post-office. Follow wagon road from Weaverville to Junction City; thence by trail 18 miles to Big Bar; thence by trail up mountain to Patterson's ranch. From Patterson's ranch trail leads to station

about 4 miles. There are higher mountains in the vicinity but they are covered with timber.

Signal and station mark: A tripod built of trees over center of triangulation tablet set in rock.

[Latitude $40^{\circ} 43' 47.30''$. Longitude $123^{\circ} 19' 03.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Trinity.....	166 38 42.33	346 34 58.51	4.5388996
Salmon.....	171 16 46.85	351 13 09.42	4.7075117
Pony.....	196 19 30.38	16 22 49.33	4.4034032
Sawtooth.....	217 00 22.21	37 10 58.46	4.5770154
Weaver.....	248 15 22.57	68 28 42.65	4.4899428
Bully Choop.....	292 20 09.91	112 41 42.77	4.7031911
Dubit Kelly.....	340 09 20.16	160 15 50.07	4.6198826

DOG CREEK, TRINITY COUNTY, CAL.

On low mountain at source of Dog Creek and east of Clear Creek. From French Gulch follow road 11 miles up Clear Creek to Hunter's ranch; thence along trail up same creek (on west side) 5 miles to point locally known as Dutchman's mine. Cross creek here and go east up ridge on faint trail to summit. The top of ridge is locally known as Dog Creek Mountain. Two dead trees have been left standing on top of ridge and the tops of several green trees can not be seen over. Top of ridge is covered with manzanita brush about 3 feet high.

Signal and station mark: Tripod built of trees; triangulation tablet set in 12-inch rock cube placed in ground under center.

[Latitude $40^{\circ} 51' 19.24''$. Longitude $122^{\circ} 31' 49.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bally.....	19 55 34.45	199 50 53.00	4.4735907
Bully Choop.....	31 01 13.94	210 51 59.74	4.5887924
Weaver.....	86 16 41.45	265 59 08.66	4.5774658
Bolivar.....	154 59 19.94	334 49 29.02	4.6949337

DUBIT KELLY, TRINITY COUNTY, CAL.

On highest bald top of mountain about 7 miles northwest of Wildwood or Landis's ranch. From this ranch follow Hayfork road $1\frac{1}{2}$ miles; thence west about $5\frac{1}{2}$ miles on trail which passes just under

east base of peak. A higher peak about 1 mile north is locally known as Dubit Kelly.

Signal and station mark: Tripod of trees 12 feet high over triangulation tablet in solid rock.

[Latitude $40^{\circ} 22' 35.98''$. Longitude $123^{\circ} 09' 04.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chaparral.....	160 15 50.07	340 09 20.16	4. 6198826
Weaver.....	196 08 24.11	16 15 11.01	4. 7217840
Chanchelulla.....	231 34 26.12	51 40 41.04	4. 2401883
Bully Choop.....	238 31 32.96	58 46 31.95	4. 5822052

PONY, TRINITY COUNTY, CAL.

(Not occupied.)

On highest point of prominent ridge, at source of Pony Creek. Follow the trail from North Fork Trinity River up ridge between North Fork and East Fork of North Fork to Rattlesnake Creek; cross Rattlesnake Creek and continue up North Fork; cross North Fork and continue on New River trail up long steep hill until two small lakes on summit are reached. One can camp here, but feed is not very good. From these lakes the station is distant about 2 miles, along the ridge southwest.

Station mark: Small cairn.

[Latitude $40^{\circ} 56' 54.81''$. Longitude $123^{\circ} 13' 59.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chaparral.....	16 22 49.33	196 19 30.38	4. 4034032
Trinity.....	121 49 29.63	301 42 25.76	4. 2496028
Salmon.....	150 25 45.15	330 18 47.38	4. 4776182
Russian.....	212 27 14.00	32 38 22.30	4. 6441737
Sawtooth.....	249 29 20.77	69 36 38.92	4. 2220233
Weaver.....	300 49 13.04	120 59 15.73	4. 4000071

SAWTOOTH, TRINITY COUNTY, CAL.

On a high, rough mountain in the Sawtooth Range. From Weaver-ville follow road to Helena post-office 16 miles; thence by trail up backbone 20 miles to mouth of Rattlesnake Creek (a tributary of North Fork Trinity River); thence up Rattlesnake Creek to Bear Valley about 8 miles. Feed can be found at Bear Valley. Animals can be taken to top of ridge west of Bear Valley. From this point the station is about 2 miles distant, across Left Branch of Rattlesnake

Creek, with about 1,500 feet elevation to climb; but as it is near the source of Left Branch it is not necessary to go down very much, but keep around the head of basin.

Signal and station mark: Rock cairn 6 feet high over center of triangulation tablet set in center of rock 4 by 8 feet in size and 20 feet high.

Reference marks: Two holes drilled 3 inches deep in top of rocks, one 19.5 feet south and the other 13.1 feet south by east.

[Latitude 41° 00' 03.66''. Longitude 123° 02' 51.31''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chaparral.....	37 10 58.46	217 00 22.21	4.5770154
Pony.....	69 36 38.92	249 29 20.77	4.2220233
Trinity.....	96 40 20.42	276 25 57.80	4.4901518
Salmon.....	123 47 46.69	303 33 29.51	4.5631910
Russian.....	194 29 49.00	14 33 38.02	4.5100215
Bolivar.....	217 57 49.74	38 08 22.91	4.5614305
Bally.....	322 39 02.38	142 54 37.42	4.7439327
Bully Choop.....	334 15 43.22	154 26 44.51	4.7392233
Weaver.....	342 27 59.73	162 30 45.10	4.2930698

TRINITY, TRINITY AND HUMBOLDT COUNTIES, CAL.

On highest peak of Trinity Mountains. Follow old Forks of Salmon-Hoopa trail to summit of Salmon Mountains, thence along backbone south to point. There is some brush to pass through. Station can also be reached from New River by trail down New River to mouth of Virgin Creek. Cross Virgin Creek on bridge; thence down same creek 200 yards; thence to right up ridge on very old trail to summit of ridge; thence along ridge to station. Much brush is found along this route.

Signal and station mark: A lone fir tree with lower limbs cut off, about 40 feet high, on highest point of mountain and 24.7 feet west of triangulation tablet set in rock.

[Latitude 41° 01' 58.02''. Longitude 123° 24' 45.71''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Salmon.....	180 49 04.63	0 49 11.38	4.2241638
Russian.....	234 12 07.67	54 30 21.83	4.6795170
Sawtooth.....	276 25 57.80	96 40 20.42	4.4901518
Pony.....	301 42 25.76	121 49 29.63	4.2496028
Chaparral.....	346 34 58.51	166 38 42.33	4.5388896

WEAVER, TRINITY COUNTY, CAL.

On prominent mountain locally known as Weaver Bally, 11 miles from Weaverville. From Weaverville follow wagon road 7 miles to Day & Hafley's sawmill on east Weaver Creek; thence by trail 3 miles to small meadow about 1 mile southeast from peak. Animals can be taken up mountain from meadow to within 300 feet of station.

Signal and station mark: Rock cairn 7 feet high built over triangulation tablet set in rock $1\frac{1}{2}$ by 4 by 6 feet on highest point of peak.

Reference marks: Two holes drilled 4 inches deep in rocks; one 8.9 feet north by west, and the other 5.7 feet south.

[Latitude $40^{\circ} 49' 56.58''$. Longitude $122^{\circ} 58' 38.83''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chanchelulla.....	1 35 35.93	181 35 05.30	4.6001864
Dubit Kelly.....	16 15 11.01	196 08 24.11	4.7217840
Chaparral.....	68 28 42.65	248 15 22.57	4.4899428
Pony.....	120 59 15.73	300 49 13.04	4.4000071
Salmon.....	137 08 29.48	316 51 28.07	4.7270325
Sawtooth.....	162 30 45.10	342 27 59.73	4.2930698
Bolivar.....	199 12 55.29	19 20 41.59	4.7009543
Dog Creek.....	265 59 08.66	86 16 41.45	4.5774658
Bally.....	312 29 31.75	132 42 20.48	4.5748914
Bully Choop.....	329 47 03.83	149 55 19.36	4.5506049

STERLING, JACKSON COUNTY, OREG.

Reached from north as described by Coast and Geodetic Survey. From the south as follows: From junction of Klamath River between Oak Bar and Hamburg Bar follow Horse Creek to junction of Buckhorn Creek; thence to right up ridge trail to connection on ridge top with road to Cinnabar Springs; thence follow road to cabin and here take trail which leads to left around ridge side and descends into saddle, about 4 miles to cabin and meadow; thence continue on main trail north to divide; thence leave trail and follow ridge to station.

Signal: A tripod 15 feet high centered over tablet.

Station mark: A copper bolt embedded in rock answers as sub-surface mark and brass disk set in rock is surface mark of the Coast and Geodetic Survey.

Reference marks: One to south, 34.85 meters; another northwest, 20.44 meters.

[Latitude 42° 01' 03.94". Longitude 122° 53' 11.56".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Russian.....	3 46 47.37	183 44 13.42	4.9126016
Red.....	19 19 43.86	199 11 32.97	4.7122048
Bear.....	57 54 37.04	237 27 01.34	4.8307852
Red Butte.....	68 35 14.57	248 23 20.02	4.4222781
Tannen.....	88 27 16.70	268 06 38.55	4.6292773
Bolivar.....	353 57 34.88	174 01 49.26	4.9278898

TANNEN, JOSEPHINE COUNTY, OREG.

A well-known bare peak very near Oregon-California line. From Happy Camp, Siskiyou County, Cal., follow a wagon road up Indian Creek to beginning of descent to cross bridge to Plassic mine. At this point take Waldo trail, cross Indian Creek on bridge, then up creek; cross West Fork on bridge, then follow plain right-hand downhill trail (Waldo trail is uphill). Follow right-hand trail up the creek, pass a cabin and cross creek four times; 2 or 3 miles from cabin the trail forks; take right-hand fork and cross creek near small signboard on tree. Take trail to Weston mine; after top of hill is reached take first right-hand trail which goes directly to Weston cabins; thence go east on trail along ridge to station.

Signal and station mark: Cairn 7 feet high with small tree wired in center; bronze tablet cemented in solid rock under center of monument.

[Latitude 42° 00' 22.57". Longitude 123° 24' 01.50".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bear	22 41 31.50	202 34 30.23	4.5780774
Preston.....	42 44 23.19	222 35 56.38	4.4114611
Sterling.....	268 06 38.55	88 27 16.70	4.6292773
Red Butte.....	295 00 02.04	115 08 44.67	4.2981507
Red.....	331 24 55.20	151 37 17.25	4.7316722
Marble.....	340 58 19.98	161 05 30.81	4.6617463

COLORADO.

TRIANGULATION STATIONS.

Eaton quadrangle.

WELD COUNTY.

In 1906 Frank Tweedy located 3 occupied and 3 unoccupied points for the control of the Eaton quadrangle. Positions are based on Pisen and Harrison stations.

AULT, WELD COUNTY, COLO.

(Not occupied.)

Top of hoist roof of grain elevator at Ault.

[Latitude $40^{\circ} 34' 55.70''$. Longitude $104^{\circ} 43' 47.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harrison.....	21 29 07	201 25 00	4. 38940
Dover.....	147 57 38	327 51 41	4. 38352

BUTTE, WELD COUNTY, COLO.

(Not occupied.)

Conical butte 20 miles east by north from Dover station on the Union Pacific Railroad and 22 miles northeast of Eaton.

[Latitude $40^{\circ} 47' 42.58''$. Longitude $104^{\circ} 34' 16.09''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harrison.....	25 48 30	205 38 10	4. 71252
Pisen.....	65 46 00	245 31 37	4. 53300

DEW, WELD COUNTY, COLO.

On high prairie 9 miles northeast of Greeley. About 200 yards north of an old secondary station of H. L. Baldwin, the exact position of which is now uncertain.

Station mark: Iron bench-mark post set 3 feet in ground.

[Latitude $40^{\circ} 30' 26.01''$. Longitude $104^{\circ} 33' 16.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harrison.....	58 47 50	238 36 54	4. 44574
Dover.....	136 14 23	316 01 36	4. 60161
Olive.....	168 47 47	348 46 17	4. 23742

DOVER, WELD COUNTY, COLO.

On high mesa 5 miles west of Dover station on the Union Pacific Railroad and 8 miles northeast of Wellington.

Station mark: Aluminum bolt cemented in boulder on level with ground surface.

[Latitude 40° 45' 59.92''. Longitude 104° 52' 54.47''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pisen.....	23 57 56	203 55 42	4.07652
Olive.....	295 55 16	116 06 30	4.43210
Dew.....	316 01 36	136 14 23	4.60161
Ault.....	327 51 40	.....	4.38352
Harrison.....	354 49 11	174 50 59	4.63830

EATON, WELD COUNTY, COLO.

(Not occupied.)

Smokestack of beet-sugar factory at Eaton.

[Latitude 40° 31' 35.20''. Longitude 104° 42' 24.63''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Harrison.....	33 20 00	213 15 00	4.29879
Pisen.....	128 49 04	308 40 00	4.40149

OLIVE, WELD COUNTY, COLO.

Grassy knob on prairie about 4 miles east by north of Olive Branch settlement.

Station mark: Iron bench-mark post set 3 feet in ground.

[Latitude 40° 39' 35.36''. Longitude 104° 35' 38.94''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Harrison.....	33 07 49	212 58 24	4.57417
Dew.....	348 46 17	168 47 47	4.23742

Uncompahgre Peak quadrangle.

GUNNISON AND HINSDALE COUNTIES.

Secondary triangulation control for Uncompahgre Peak quadrangle was obtained by D. F. C. Moore in 1908 by locating two new stations. Positions on approximate United States standard datum were computed from Coast and Geodetic Survey station Uncompahgre, but distances were necessarily based on Hayden values of lines from Uncompahgre to Agency station and from Station 33 to Agency.

CEBOLLA, GUNNISON COUNTY, COLO.

About 2 miles south of Cebolla post-office on south side of Gunnison River.

Signal and station mark: Rock cairn with a 4-foot base and 5 feet high; bronze tablet under cairn.

[Latitude $38^{\circ} 26' 55.34''$. Longitude $107^{\circ} 13' 21.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre.....	26 38 28	206 29 35	4. 67002
Sapinero.....	112 54 56	292 50 25	4. 05998
Agency.....			4. 56427

SAPINERO, GUNNISON COUNTY, COLO.

Two miles northwest of Sapinero summit of Aspen ridge.

Signal and station mark: White cloth on tripod; bronze tablet cemented in large boulder under tripod.

[Latitude $38^{\circ} 29' 20.10''$. Longitude $107^{\circ} 20' 37.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre.....	12 35 11	192 30 48	4. 67609
Cebolla.....	292 50 25	112 54 56	4. 05998

SAWMILL, GUNNISON COUNTY, COLO.

(Not occupied. No check on this position.)

[Latitude $38^{\circ} 39' 36.70''$. Longitude $107^{\circ} 24' 32.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cebolla.....	325 15 55	145 22 53	4. 45556
Sapinero.....	343 21 40	163 24 06	4. 29758

UNCOMPAHGRE, HINSDALE COUNTY, COLO.

On summit of Uncompahgre Peak, Coast and Geodetic Survey transcontinental triangulation station.

Station mark: A cross cut in top of $\frac{1}{2}$ -inch copper bolt leaded into the solid rock under masonry pier for theodolite support. The circular stone ring wall, inner diameter 11 feet, was left standing.

[Latitude 38° 04' 18.42". Longitude 107° 27' 41.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sneffels.....	75 32 46.6	255 20 34.1	4. 4764217
Treasury Mountain.....	196 43 01.82	16 56 36.24	5. 0387020
Mount Ouray.....	249 49 54.38	70 35 52.02	5. 0611148
Lake.....	282 30 36.9	102 38 39.2	4. 2913527
Sherman.....	348 59 42.2	169 01 03.2	4. 2261074
South River.....	322 24 10.27	142 41 50.92	4. 8424016
Pyramid.....	351 57 49.33	172 00 23.20	4. 6427600
San Luis.....	281 16 05.02	101 35 42.15	4. 6770930
Bristol.....	310 41 43.1	130 56 43.65	4. 6746191
La Garite.....	287 11 57.6	107 34 53.28	4. 7568771
Sapinero.....	192 30 48	12 35 11	4. 67609
Cebolla.....	206 29 35	26 38 28	4. 67002
Agency.....			4. 75408

COLORADO-NEW MEXICO.

TRIANGULATION STATIONS.

Bloomfield, Dulce, Durango, Farmington, Lumberton, Pagosa, San Cristobal, and Shiprock quadrangles.

ARCHULETA, CONEJOS, HINSDALE, LA PLATA, MINERAL, AND RIO GRANDE COUNTIES, COLO.; RIO ARRIBA AND SAN JUAN COUNTIES, N. MEX.

During the season of 1906 H. L. Baldwin, jr., extended triangulation over an area of 2,700 square miles in Colorado and 3,200 square miles in New Mexico; 33 primary stations were occupied and numerous points were located by intersections.

Positions are based on Uncompahgre and Ouray stations of the Coast and Geodetic Survey.

At Langley station connection was made with the New Mexico triangulation of 1882-1888, based on the Fort Wingate astronomic station, the position on United States standard agreeing closely with the previously determined Fort Wingate position. For comparison, see Langley station, page 154.

CHAMA PEAK, ARCHULETA COUNTY, COLO.

On peak of same name near the Colorado-New Mexico state line and on an offshoot of the Continental Divide. If ascended from the west or south, cross over a divide southeast of station, descend, and then ascend to the saddle just south of peak. If ascent is made from the north, follow the divide southward from Banded Peak. Descent to the west is possible, but very steep.

Station mark: Aluminum tablet in a solid projecting rock a little north of the pointed summit of the peak, over which is erected a rock monument 8 feet high with 6-foot base.

[Latitude $37^{\circ} 02' 25.67''$. Longitude $106^{\circ} 37' 43.19''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jicarilla.....	46 34 07.41	226 23 42.35	4.5502820
Gallina.....	11 33 25.04	191 28 25.93	4.7929806
Chromo.....	46 25 14.90	226 21 27.75	4.1102354
Archuleta.....	78 23 09.61	258 10 49.29	4.4920642
Oakbrush.....	111 25 09.46	291 08 26.26	4.6439792
Chama.....			4.1990978

CLIFF 57, ARCHULETA COUNTY, COLO.

(Not occupied.)

Highest point of cliff.

[Latitude $37^{\circ} 05' 31.46''$. Longitude $106^{\circ} 44' 01.16''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jicarilla.....			4.53571
Chromo.....			4.16504
Oakbrush.....			4.52278

OAKBRUSH, ARCHULETA COUNTY, COLO.

On the west portion of a high mesa, near the south end as seen from Pagosa Springs or from the east. The top and sides are clear of timber but thickly covered with oak brush, making ascent from any direction difficult, as sides are very steep. The only practicable route of ascent is to leave the railroad and wagon road at Army ranch, 4 miles east of Dyke station, and follow trail south through fields. The trail leads up on the ridge, after which travel is easy. Station is about 5 feet east of the west crest.

Station mark: Aluminum bench-mark tablet set in a rock 8 by 16 inches and 8 inches deep, under which is a glass bottle buried upright.

Reference marks: No. 1, a 10-penny nail in top of small scrub-oak stump; true azimuth $130^{\circ} 22'$, distance 10.9 feet. No. 2, a 20-penny nail in top of a small scrub-oak stump; true azimuth $119^{\circ} 30'$, distance 8.5 feet. No. 3, a 10-penny nail in top of small scrub-oak stump; true azimuth $40^{\circ} 00'$, distance 10.5 feet.

[Latitude $37^{\circ} 11' 04.31''$. Longitude $107^{\circ} 05' 25.83''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Apache.....	357 00 49.70	177 01 39.64	4. 5962010
Piedra.....	72 04 23.37	251 51 09.52	4. 5331556
Graham.....	144 02 13.79	323 51 51.06	4. 6328998
Pagosa.....	184 14 26.21	4 15 18.88	4. 4606272
Chama Peak.....	291 08 26.26	111 25 09.46	4. 6439792
Chromo.....			4. 6057582
Jicarilla.....	339 06 52.45	159 13 07.00	4. 6361332

PIEDRA PARODA, ARCHULETA COUNTY, COLO.

(Not occupied.)

[Latitude $37^{\circ} 11' 41.25''$. Longitude $107^{\circ} 18' 00.54''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pagosa.....			4. 53863
Oakbrush.....			4. 27067

ROUNDED HILL 54, ARCHULETA COUNTY, COLO.

(Not occupied.)

[Latitude $37^{\circ} 08' 31.28''$. Longitude $107^{\circ} 13' 14.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pagosa.....			4. 55874
Oakbrush.....			4. 09630
Chromo.....			4. 67940

SUMMIT, AT LINE OF ARCHULETA AND CONEJOS COUNTIES, COLO.

Summit Mountain is the highest point on that portion of the Continental Divide forming the boundary line between Conejos and Archuleta counties. A fallen cairn marking position of triangulation;

station No. 3 of the Wheeler Survey, occupied September 2, 1874, as evidenced by a record found in the old cairn, stands about 10 feet west of station. It is about 4 miles south of the abandoned town of Elmwood, and easily reached by trail leading therefrom. After proceeding 1 mile take the right-hand trail up Bear Gulch to head of creek; pass over the divide and beyond the peak 1 mile farther southwest. Ascent of the south slope may be made with horses to summit of mountain.

Station mark: Aluminum tablet set in solid rock, over which is erected a rock cairn with 5-foot base and 6 feet high.

[Latitude $37^{\circ} 21' 02.69''$. Longitude $106^{\circ} 41' 46.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pagosa.....	107 39 13.60	287 25 44.64	4. 5360494
South River.....	134 37 57.63	314 27 34.07	4. 5484071
Bellevue.....	216 19 59.08	36 23 20.74	4. 1390418

GRAHAM, HINSDALE COUNTY, COLO.

On the divide between Pine River and the western tributary of the Weminuche Creek, the second peak from the south, which rises above timber line. Summit can be reached with animals by wagon road up Pine River (to Kirkpatrick's ranch at the junction of Graham Creek and Pine River); thence by trail about 8 miles to 1 mile past the divide; thence across country and up and down ridges, finally ascending the peak from the south.

Station mark: An aluminum tablet set in granite boulder at summit.

Reference mark: Rock monument with 6-foot base and 8 feet high; true bearing from station $120^{\circ} 20'$, distance 8.2 feet.

[Latitude $37^{\circ} 29' 50.57''$. Longitude $107^{\circ} 22' 32.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Piedra.....	8 56 01.60	188 53 06.95	4. 6612630
Crevasse.....	87 17 43.25	267 09 29.12	4. 3002946
Pyramid.....	175 56 24.01	355 55 48.22	4. 3075692
South River.....	256 08 33.20	76 22 58.54	4. 5550681
Pagosa.....	282 06 34.25	102 17 51.67	4. 4470891
Oakbrush.....	323 51 51.06	144 02 13.79	4. 6328998

BANDED PEAK, CONEJOS COUNTY, COLO.

(Not occupied.)

Center of rock monument.

[Latitude 37° 06' 16.60". Longitude 106° 37' 35.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Summit.....	4. 44730
Pagosa.....	4. 73421

CONEJOS, CONEJOS COUNTY, COLO.

(Not occupied.)

Center of rock monument.

[Latitude 37° 17' 19.97". Longitude 106° 34' 13.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bellevue.....	4. 26015
Summit.....	4. 11731

MONTEZUMA PEAK, CONEJOS COUNTY, COLO.

(Not occupied.)

[Latitude 37° 22' 23.38". Longitude 106° 41' 27.54".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bellevue.....	4. 06212
Pagosa.....	4. 53344
Summit.....	3. 40373

PYRAMID, HINSDALE COUNTY, COLO.

On the summit of Rio Grande Pyramid, about 5 miles south of the Rio Grande, on the divide between Ute Creek (a tributary of the Rio Grande) and the headwaters of Los Pinos River. The Weminuche trail passes about 3 miles east of station; a blazed trail leads thence through the woods to timber line on the east side of the peak.

Station mark: Bronze tablet cemented in solid rock under a cairn 4 feet in diameter and 6 feet high.

[Latitude 37° 40' 47.48". Longitude 107° 23' 31.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sneffels.....	135 44 50.3	315 30 07.1	4.70181
Uncompahgre.....	172 00 23.20	351 57 49.33	4.6427600
South River.....	287 47 38.97	108 02 41.92	4.5811070
Bristol.....	246 56 01.50	67 08 24.71	4.5090936
San Luis.....	229 50 50.48	50 07 48.75	4.7242982
Pagosa.....	312 11 31.24	132 23 25.83	4.5898559
Graham.....	355 55 48.22	175 56 24.01	4.3075692

BASIN, LA PLATA COUNTY, COLO.

About 12 miles south of Durango, 1.5 miles east of the east road down La Plata River, and 3 miles west of Brown's sawmill (reached by going south on the Las Animas River road from Durango 10 miles, thence west 3 miles). Ascent of the ridge is very steep, and the Brown's mill route, while longer, is somewhat easier. Station is on the highest point of the bare ridge, 0.5 mile northwest of pine forest.

Station mark: Aluminum tablet set in a boulder about 6 feet east of a small rock monument.

[Latitude 37° 10' 18.11". Longitude 107° 59' 57.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cox.....	358 31 14.37	178 31 27.85	4.3310582
Crevasse.....	224 58 27.88	45 12 57.28	4.6975133
Bench Mark 8169.....	232 18 20.07	52 24 41.52	4.2929427
Piedra.....	280 33 12.98	100 52 54.44	4.6917007

BENCH MARK 8169, LA PLATA COUNTY, COLO.

On the high hogback ridge about 4 miles east of Durango, whence station is easily reached by road. Ascent up steep north side of ridge can be made with difficulty by pack animals; ascend to first saddle west of peak, cross head of gulch south of peak; thence climb to within 50 feet of top along sloping south side of mountain.

Signal and reference mark: Rock monument with 3-foot base and 5 feet high; true azimuth from station 213° 30', distance 0.8 foot.

Station marks: (1) Copper bolt set in solid rock in 1895 marked "U.S. Δ G.S." (2) Copper bolt stamped 8169; true azimuth from station 32°, distance 0.8 foot.

[Latitude 37° 16' 47.02". Longitude 107° 49' 27.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Basin.....	52 24 41.52	232 18 20.07	4. 2929427
Crevasse.....	220 21 50.35	40 29 57.98	4. 4838041
Piedra.....	302 44 32.69	122 57 54.52	4. 5905675

CHURCH, LA PLATA COUNTY, COLO.

(Not occupied.)

Center of church spire 8 miles southeast of Durango.

[Latitude 37° 14' 12.5". Longitude 107° 46' 38.5".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bench Mark 8169.....			3. 80123
Basin.....			4. 32218

CREVASSE, LA PLATA COUNTY, COLO.

On divide between Vallecito Creek and Rio Florida, and about 6 miles north of the junction of the former with Pine River. Can be best reached from the Rio Florida side, as the route from the east side up Falls Creek is very difficult. If reached from Vallecito Creek, the wagon road should be followed to Falls Creek; thence up the old trail about 2 miles to top of rocky spur. Here leave trail and follow up north side of Falls Creek to crossing above the falls; thence along south side follow a tolerably plain but difficult game trail. A good north-south trail leads along west side of divide for an unknown distance. Follow south to last bare point, which is of limestone formation, flat on top, and crevassed (in all directions, but especially north and south) by very deep cracks several feet in width.

Station mark: Aluminum tablet set in solid rock.

Reference mark: Rock monument with 6-foot base and 7 feet high; true azimuth from station 261° 43', distance 8.72 feet. Altitude of station 12,300 feet.

[Latitude 37° 29' 19.23". Longitude 107° 36' 04.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bench Mark 8169	40 29 57.98	220 21 50.35	4. 4838041
Basin.....	45 12 57.28	224 58 27.88	4. 6975133
Graham.....	267 09 29.12	87 17 43.25	4. 3002946
Piedra.....	343 43 56.30	163 49 56.30	4. 6642748

IGNACIO, LA PLATA COUNTY, COLO.

(Not occupied.)

Center of standpipe at the Ignacio Ute Indian Agency.

[Latitude $37^{\circ} 07' 56.4''$. Longitude $107^{\circ} 38' 03.0''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Basin.....			4. 51511
Bench Mark 8169.....			4. 37112
Piedra.....			4. 21912

PEAK, LA PLATA COUNTY, COLO.

(Not occupied.)

Rock monument on a peak 2 miles southwest of Graham station.

[Latitude $37^{\circ} 28' 09.40''$. Longitude $107^{\circ} 24' 40.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pagosa.....			4. 48637
Graham.....			3. 64657
Oakbrush.....			4. 62848

PIEDRA, LA PLATA COUNTY, COLO.

On the south end of the high bare portion of the ridge west of Piedra River, visible from all directions.

Station mark: Aluminum tablet cemented in solid rock about 6 feet south of a break-off on north side. Over the tablet is erected a white cloth signal on framework held in place by 4 guy wires.

[Latitude $37^{\circ} 05' 21.48''$. Longitude $107^{\circ} 27' 20.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Largo.....	23 29 12.06	203 21 58.13	4. 6532150
Juanimas.....	51 34 22.75	231 20 35.77	4. 6384119
Cox.....	75 45 34.47	255 26 09.12	4. 6934836
Basin.....	100 52 54.44	280 33 12.98	4. 6917007
Bench Mark 8169.....	122 57 54.52	302 44 32.69	4. 5905675
Crevasse.....	163 49 13.48	343 43 56.30	4. 6642748
Graham.....	188 53 06.95	8 56 01.60	4. 6612630
Pagosa.....	221 08 31.66	41 22 40.49	4. 7191152
Oakbrush.....	251 51 09.52	72 04 23.37	4. 5331556
Apache.....	309 42 43.19	129 56 43.66	4. 6535134
Snyder.....	347 53 05.61	167 57 25.31	4. 7096209

PIEDRA PEAK 2, LA PLATA COUNTY, COLO.

(Not occupied.)

One mile southeast of Piedra triangulation station.

[Latitude $37^{\circ} 04' 25.08''$. Longitude $107^{\circ} 26' 48.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Juanimas.....	4. 63428
Piedra.....	3. 28206

TIMBERED CONE, LA PLATA COUNTY, COLO.

(Not occupied.)

[Latitude $37^{\circ} 04' 43.2''$. Longitude $107^{\circ} 46' 08.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Piedra.....	4. 44515
Bench Mark 8169.....	4. 35888

TREE 26, LA PLATA COUNTY, COLO.

(Not occupied.)

Highest tree on sparsely timbered ridge, 8 miles southeast of Bayfield.

[Latitude $37^{\circ} 06' 59.04''$. Longitude $107^{\circ} 28' 38.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Oakbrush.....	4. 54646
Piedra.....	3. 55271
Pagosa.....	4. 71172

BRISTOL, MINERAL COUNTY, COLO.

On the end of the western bluff point of Bristol Head, the southern extremity of a high mesa west of the Rio Grande about 10 miles southwest of Creede. The station is directly east of Lake Santa Maria, and may be reached from the northeast with pack and saddle animals.

Station mark: Bronze tablet cemented in rock over which a cairn 3.5 feet in diameter and 5.5 feet high was erected.

52752°—Bull. 440—10—10

146 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 37° 47' 36.11''. Longitude 107° 03' 16.84''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Uncompahgre.....	130 56 43.65	310 41 43.10	4.6746192
Pyramid.....	67 08 24.71	246 56 01.50	4.5090936
San Luis.....	206 51 13.03	26 55 46.82	4.3817226
La Garita.....	233 37 02.73	53 44 54.94	4.3682102
South River.....	345 02 58.99	165 05 40.79	4.4009798

HOPE, MINERAL COUNTY, COLO.

(Not occupied.)

[Latitude 37° 32' 37.68''. Longitude 106° 52' 13.10''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Summit.....	4.42128
Pagosa.....	4.31329
Bellevue.....	4.41002

LA GARITA, AT LINE OF MINERAL AND SAGUACHE COUNTIES, COLO.

On the southeastern high summit of the La Garita Mountains opposite the head of Saguache Creek and about 6 miles northeast of the town of Creede.

Station mark: Bronze tablet in rock just beneath surface under cairn 4 feet in diameter and 7 feet high.

[Latitude 37° 55' 04.58''. Longitude 106° 50' 27.36''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pyramid.....	61 36 11.4	241 15 55.5	4.74242
South River.....	17 59 30.83	197 54 21.81	4.6031924
Bristol.....	53 44 54.94	233 37 02.73	4.3682102
Uncompahgre.....	107 34 53.28	287 11 57.80	4.7568771
Ouray.....	223 46 04.29	44 08 56.29	4.8912699

PAGOSA, MINERAL COUNTY, COLO.

Pagosa Peak is best reached from the south and east by the road from Pagosa Springs north 10 miles to the ranch of Lloyd Clark (formerly Cabe's); thence on road 2 miles to sheep-dipping corral. A blazed trail leads thence along north side of creek and some dis-

tance therefrom to the foot of two falls. Cross creek on line of snow-slide from southwest and ascend hill between the falls, finally crossing at the head of the larger fall. Continue upstream 2 miles and at the upper end of a large open park turn south, keeping east of the rocky ridges, to a good camp ground 1.5 miles northeast of the peak. From here ascent is easy with animals.

Station mark: Bronze tablet cemented in a rock on highest portion of peak under rock cairn with 6-foot base and 8 feet high.

[Latitude 37° 26' 38.61''. Longitude 107° 03' 58.94'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Oakbrush.....	4 15 18.88	184 14 26.21	4.4606272
Piedra.....	41 22 40.49	221 08 31.66	4.7191152
Graham.....	102 17 51.67	282 06 34.25	4.4470891
Pyramid.....	132 23 25.83	312 11 31.24	4.5898559
South River.....	207 31 27.76	27 34 34.55	4.2119146
Bellevue.....	268 49 43.89	89 06 35.64	4.6118040
Summit.....	287 25 44.64	107 39 13.60	4.5360494

PINNACLE, MINERAL COUNTY, COLO.

(Not occupied.)

The highest point of a summit 3 miles east of Pagosa station.

[Latitude 37° 26' 20.08''. Longitude 107° 00' 52.59'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bellevue.....			4.56041
South River.....			4.18476
Pagosa.....			3.66431

SOUTH RIVER, MINERAL COUNTY, COLO.

On the summit of South River Peak, situated at the head of Red Mountain Creek, which enters the Rio Grande from the south at the bend in river about 12 miles northwest of the peak. The station is east of the east branch of the creek. A road via Red Mountain Creek reaches the basin about 1 mile distant from the peak. From the terminus of this road follow a trail across the divide toward Pagosa Springs.

Station mark: Bronze tablet cemented in rock under cairn 3.5 feet in diameter and 6 feet high.

148 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 37° 34' 27.08". Longitude 106° 58' 52.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pagosa.....	27 34 34.550	207 31 27.76	4.2119146
Graham.....	76 22 58.54	256 08 33.20	4.5550681
Pyramid.....	108 02 41.92	287 47 38.97	4.5811070
Uncompahgre.....	142 41 50.92	322 24 10.27	4.8424016
Bristol.....	165 05 40.79	345 02 58.99	4.4009798
San Luis.....	185 30 42.19	5 32 33.17	4.6629397
La Garite.....	197 54 21.81	17 59 30.83	4.6031924
Ouray.....	214 58 56.69	35 26 54.26	5.0618017
Bellevue.....	292 14 20.07	112 28 06.51	4.5567810
Summit.....	314 27 34.07	134 37 57.63	4.5484071

BELLEVUE, RIO GRANDE COUNTY, COLO.

On the east end of Bellevue Mountain, locally known as North Mountain, about 1 mile north of the nearly abandoned town of Summitville.

Station mark: Rock monument with 7-foot base and 9 feet high, probably erected by the Wheeler Survey.

Reference mark: The point occupied by theodolite is a hole drilled in a large cracked rock in which is cemented a nail with the head projecting 0.25 inch, over which a rock monument with 2-foot base and 3 feet high was erected. True bearing from station 227° 43', distance 9.9 feet.

[Latitude 37° 27' 02.48". Longitude 106° 36' 14.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Summit.....	36 23 20.74	216 19 59.08	4.1390418
Pagosa.....	89 06 35.64	268 49 43.89	4.6118040
South River.....	112 28 06.51	292 14 20.07	4.5567810

DEL NORTE, RIO GRANDE COUNTY, COLO.

(Not occupied.)

Center of rock monument.

[Latitude 37° 29' 00.27". Longitude 106° 26' 01.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South River.....			4.69404
Bellevue.....			4.19079

HOGBACK MESA, RIO GRANDE COUNTY, COLO.

(Not occupied.)

Center of rock monument.

[Latitude $37^{\circ} 35' 23.68''$. Longitude $106^{\circ} 33' 46.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
South River.....			4. 56800
Bellevue.....			4. 20073

OURAY, SAGUACHE COUNTY, COLO.

Coast and Geodetic Survey station on summit of Mount Ouray.

[Latitude $38^{\circ} 25' 22.202''$. Longitude $106^{\circ} 13' 27.330''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bison.....	214 39 20.16	35 06 41.17	5. 04288022
Pikes Peak.....	245 20 55.42	66 02 08.82	5. 05221188
South River.....	35 26 54.26	214 58 56.69	5. 0618017
La Garite.....	44 08 56.29	223 46 04.29	4. 8912699
San Luis.....	52 11 54.19	231 45 40.96	4. 8952053
Uncompahgre.....	70 35 52.02	249 49 54.38	5. 0611148

SAN LUIS, SAGUACHE COUNTY, COLO.

On summit of San Luis Peak, about 10 miles north of town of Creede. Spring Creek heads on the southwest and Cocketopa Creek on the east side of the peak, from either of which animals can be taken to top of peak. From Creede the station may be easily reached by following a wagon road up Willow Creek to a sawmill near timber line. From this point with saddle and pack animals cross the divide line into the basin of Spring Creek, and thence to the peak.

Station mark: Bronze tablet cemented in embedded rock, under cairn 3.5 feet in diameter and 7 feet high.

[Latitude $37^{\circ} 59' 12.79''$. Longitude $106^{\circ} 55' 51.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Uncompahgre.....	101 35 42.15	281 16 05.02	4. 6770930
Ouray.....	231 45 40.96	52 11 54.19	4. 8952053
South River.....	5 32 33.17	185 30 42.19	4. 6629397
Bristol.....	26 55 46.82	206 51 13.03	4. 3817226
Pyramid.....	50 07 48.75	229 50 50.48	4. 7242982

APACHE, RIO ARriba COUNTY, N. MEX.

About 8 miles southwest of the Jicarilla Apache Indian Agency and a few feet southwest of the summit of the highest volcanic dike in the vicinity. From Dulce follow the graded wagon road leading to the Indian farm, going south thereon 3 miles to the reservoir. Here take the right-hand road 0.25 mile northwest; thence southwest 3 miles along the left-hand valley, and when trail approaches a gap in dike pass through same. One-half mile farther pass through a similar gap; ascend trail through saddle at head of ravine; thence to high point 0.12 mile farther and to the right.

Station mark: Aluminum triangulation tablet in volcanic rock.

Reference mark: Highest point of dike; true bearing from station $200^{\circ} 23''$, distance 36.75 feet.

[Latitude $36^{\circ} 49' 45.84''$. Longitude $107^{\circ} 04' 02.87''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snyder.....	48 28 16.02	228 18 38.87	4.5054581
Piedra.....	129 56 43.66	309 42 43.19	4.6535134
Oakbrush.....	177 01 39.64	357 00 49.70	4.5962010
Jicarilla.....	274 20 29.28	94 25 52.55	4.1273028
Gallina.....	324 16 23.70	144 27 08.52	4.6630675

ARCHULETA, RIO ARriba COUNTY, N. MEX.

On the bare rocky bluff at the southern extremity of the summit of Archuleta Mesa, 4 miles (air line) north-northwest of Lumberton, N. Mex. From ranch of Ed. Cordova follow trail 2 miles to the summit. An unobstructed view can be had in all directions except north.

Station mark: Copper bolt in the solid rock, under rock cairn 5 feet in diameter and 5 feet high.

[Latitude $36^{\circ} 59' 01.12''$ ($36^{\circ} 58' 53.74''^a$). Longitude $106^{\circ} 58' 12.99''$ ($106^{\circ} 58' 25.60''^a$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Navajoe ^a	39 20 11.7	219 19 15.1	3.56503
Astronomic Pier ^a	330 26 51.9	150 28 10.7	3.81794
Chama Peak.....	258 10 49.29	78 23 09.61	4.4920642
Chromo.....	276 55 08.69	97 03 41.32	4.3271758
Jicarilla.....	345 29 10.10	165 31 03.87	4.2727459

^a Lumberton base.

ASPEN, RIO ARRIBA COUNTY, N. MEX.

On the high swell 5 miles south of Gallina and a little west of Gallina River, 0.25 mile southeast of the small and prominent clump of very large fir trees. The station is very difficult of access on account of the heavy growth of aspen and oak. From the north follow up the canyon which leads northward from a point just east of the tree clump above mentioned. It is not possible to extend triangulation to the east or southeast from this point, as the country is about 300 feet higher and heavily timbered. Altitude, 10,309 feet.

Station mark: Aluminum tablet set in a solid rock at summit.

Reference mark: Crotch of a tall dead tree trunk; true azimuth from station $333^{\circ} 27'$, distance, 57.5 feet.

[Latitude $36^{\circ} 09' 05.31''$. Longitude $106^{\circ} 52' 16.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Gallina.....	4.59044
Pedernal.....	4.51987

BROWN, RIO ARRIBA COUNTY, N. MEX.

About 10 miles a little west of south of the town of Coyote. Follow main road up Coyote Creek until 2 miles north of the top of divide; turn southwest for about 1.5 miles to station. Altitude, 9,595 feet.

Signal and reference mark: Lone tree at highest point leans considerably to east.

Station mark: Bronze tablet set in solid rock very nearly under center of top of tree.

[Latitude $36^{\circ} 02' 11.48''$. Longitude $106^{\circ} 39' 54.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Penasco.....	4.83798
Gallina.....	4.71097

CHAMA, RIO ARRIBA COUNTY, N. MEX.

On southeast end of mesa 0.75 mile west of Chama.

Station mark: Bronze tablet set in solid rock about 25 feet from southeast edge of mesa. Large pine tree blazed on four sides is 150 feet distant.

[Latitude $36^{\circ} 53' 58.67''$. Longitude $106^{\circ} 36' 05.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gallina.....	18 13 22.00	198 07 24.79	4. 6774132
Horse Lake.....	43 41 50.65	223 36 32.42	4. 2799600
Chromo.....			4. 1322760
Chama Peak.....			4. 1990978

CHROMO, RIO ARriba COUNTY, N. MEX.

On Chromo Mountain 8 miles west of Chama. Altitude about 10,200 feet; highest point in vicinity. From Chama follow the road to Bond's sawmill, Biggs's old sawmill, and Willow Creek; thence ascent is easy along winding trail through brush and timber.

Signal and station mark: Fir tree braced in position over bronze tablet set in solid rock a few inches below surface, 5 feet southwest of highest point of mountain.

[Latitude $36^{\circ} 57' 37.27''$. Longitude $106^{\circ} 44' 00.63''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Apache.....			4. 5202020
Archuleta.....	97 03 41.32	276 55 08.69	4. 3271758
Oakbrush.....			4. 6057582
Chama Peak.....	226 21 27.75	46 25 14.90	4. 1102354
Chama.....			4. 1322760
Horse Lake.....			4. 3132207

FIR TREE 61, RIO ARriba COUNTY, N. MEX.

(Not occupied.)

Highest fir tree in clump.

[Latitude $36^{\circ} 09' 18.14''$. Longitude $106^{\circ} 52' 32.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prior.....			3. 80668
Coyote.....			4. 52488

GALLINA, RIO ARRIBA COUNTY, N. MEX.

On the north and highest end of the Cerrito Gallina, about 50 feet southeast of the highest part. Easy ascent of 2,000 feet through open timber. Turn aside from the Elvado-Gallina wagon road soon after the large arroyo is crossed, 7 miles south of Elvado. Timber was cut on top to open sight to various points.

Station mark: Bronze tablet set in solid rock.

Reference mark: Large pine tree leaning slightly to east used as a signal; true bearing from station $220^{\circ} 40'$, distance 8.6 feet.

[Latitude $36^{\circ} 29' 32.14''$. Longitude $106^{\circ} 46' 02.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prior.....	11 02 51.95	191 00 23.59	4. 5136932
Prismatic.....	28 23 52.18	208 17 21.21	4. 5395613
One.....	64 42 48.10	244 38 37.17	4. 0654808
Apache.....	144 27 08.52	324 16 23.70	4. 6630675
Elvado.....	175 41 18.85	355.40 57.70	4. 0697283
Chama Peak.....	191 28 25.93	11 33 25.04	4. 7929806
Horse Lake.....	183 01 36.32	3 02 16.29	4. 4978167
Chama.....	198 07 24.79	18 13 22.00	4. 6774132
Penasco.....	227 04 47.29	47 12 21.56	4. 4126353
Pedernal.....	326 55 32.93	147 04 55.68	4. 6385662
Jicarilla.....	159 47 27.47	339 42 04.73	4. 5886616

HORSE LAKE, RIO ARRIBA COUNTY, N. MEX.

On the highest point of ridge which extends east from Horse Lake, about 2 miles east of lake.

Station mark: Bronze tablet set in solid rock about 25 feet from highest point.

[Latitude $36^{\circ} 46' 31.46''$. Longitude $106^{\circ} 44' 55.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gallina.....	3 02 16.29	183 01 36.32	4. 4978167
Elvado.....			4. 2983160
Jicarilla.....	108 17 56.51	288 11 52.57	4. 2003154
Chromo.....			4. 3132207
Chama Peak.....			4. 4956042
Chama.....	223 36 32.42	43 41 50.65	4. 2799600
Penasco.....	308 38 53.91	128 45 49.64	4. 3447346

JICARILLA, RIO ARriba COUNTY, N. MEX.

On the easternmost point of the mesa forming a part of the Continental Divide, about 2 miles northwest of Hillcrest station on the railroad between Elvado and Lumberton, 10 miles south of Lumberton. A wagon road from Lumberton passes 1 mile east of the mesa. Station is easily reached by following a good trail through break in mesa on north side.

Station mark: Bronze tablet.

Reference mark: Tall pine tree; true azimuth from station 99° , distance 140.5 feet.

[Latitude $36^{\circ} 49' 12.58''$. Longitude $106^{\circ} 55' 03.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Apache.....	94 25 52.55	274 20 29.28	4. 1273028
Oakbrush.....	159 13 07.00	339 06 52.45	4. 6361332
Archuleta.....	165 31 03.87	345 29 10.10	4. 2727459
Chama Peak.....	226 23 42.35	46 34 07.41	4. 5502820
Horse Lake.....	288 11 52.57	108 17 56.51	4. 2003154
Gallina.....	339 42 04.73	159 47 27.47	4. 5886616

LANGLEY, RIO ARriba COUNTY, N. MEX.

(Not occupied.)

Large cairn on the highest peak of the Tewan Mountains, 17 miles west of Espanola railroad station. This peak was called Santa Clara by the Wheeler Survey and Langley by the United States Geological Survey triangulation of the plateau region of New Mexico in 1887.

[Latitude $36^{\circ} 00' 27.24''$ ($36^{\circ} 00' 25.8''^a$; $36^{\circ} 00' 27.96''^b$). Longitude $106^{\circ} 23' 03.84''$ ($106^{\circ} 22' 54.0''^a$; $106^{\circ} 23' 03.31''^b$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pedernal.....			4. 30864
North Langley.....			3. 78479

^a From Santa Fe astronomic station.

^b From Fort Wingate astronomic station.

NORTH LANGLEY, RIO ARriba COUNTY, N. MEX.

On a prominent mountain on the Polvadera land grant, about 8 miles south of the Mexican town of Canones, altitude 11,200 feet. Top appears to have been cleared of timber about sixteen years ago. A large signal tree left standing was blazed on the northwest side in 1906 and three large spikes driven therein form an equilateral triangle.

Station marks: Aluminum tablet set in a projecting rock and a rock monument with 4-foot base and 4 feet high, evidently erected at time station was formerly occupied. The monument is about 2.5 feet southwest of tablet.

Reference mark: The pine tree above mentioned; true bearing from station $278^{\circ} 50'$, distance 11.4 feet.

[Latitude $36^{\circ} 03' 35.42''$. Longitude $106^{\circ} 24' 18.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prior.....	4. 62351
Gallina.....	4. 76334

ONE, RIO ARRIBA COUNTY, N. MEX.

On a north-south rocky ridge nearly bare of timber, about 3 miles west of the Elvado-Gallina wagon road and about 2 miles south of the divide west of Gallina Mountain on that road. Station is very difficult of access from all directions, owing to rocky ridges and canyons, but can be reached by following up the main gulch southwest about 3 miles from the point where it crosses the road about northwest of Gallina triangulation station, 7 miles south of Elvado. Animals can thence be taken to top of ridge, which can be readily followed south to station. Another route, perhaps slightly better, turns south 1.5 miles after leaving the wagon road, as mentioned above, and follows the grassy valley to low divide and sheep pond, thence turns west and ascends north of rocky point, following this spur nearly to its head. Across canyon and about a mile south of the head thereof is the station.

Station mark: Aluminum triangulation tablet set in a rock a few feet west of highest point.

Reference mark: Lone pine tree 40 feet high, with brushy top; true azimuth from station $21^{\circ} 37'$, distance $137\frac{1}{2}$ feet.

[Latitude $36^{\circ} 26' 50.80''$. Longitude $106^{\circ} 53' 05.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prismatic.....	13 05 06.29	193 02 45.64	4. 4181548
Companero.....	109 50 34.01	289 33 59.55	4. 6451475
Snyder.....	117 45 17.98	297 29 10.76	4. 6585433
Apache.....	158 58 13.84	338 51 41.29	4. 6573051
Gallina.....	244 38 37.17	64 42 48.10	4. 0654808
Prior.....	350 59 11.99	171 00 53.78	4. 4377096

PEDERNAL, RIO ARRIBA COUNTY, N. MEX.

On the northwest end of the high butte 5 miles east of the Mexican town and post-office of Coyote. The butte is of volcanic origin. The only point where ascent is known to be possible is 200 feet below the summit near the middle of the south side, about 100 feet west of a cavern in the perpendicular rock ledge. Horses can be taken to this point, 400 feet east of summit. A 40-foot rope is necessary to carry up the instruments. Ascent is said to be possible on the north side; but the place was not visited, and a much longer climb on foot would be necessary.

Station mark: Aluminum tablet set in solid rock.

Reference mark: Rock cairn with 6-foot base and 6 feet high; true azimuth from station $15^{\circ} 20'$, distance 6.8 feet.

[Latitude $36^{\circ} 09' 48.26''$. Longitude $106^{\circ} 30' 12.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prior.....	98 33 04.77	278 21 16.16	4.4817568
One.....			4.6677502
Gallina.....	147 04 55.68	326 55 32.93	4.6385662
Penasco.....	175 04 39.27	355 02 47.97	4.7346508

PENASCO, RIO ARRIBA COUNTY, N. MEX.

On the westernmost (though not the highest) point of the mesa known by same name. Mesa breaks off in a sheer bluff to west, which is visible for long distances south and west. About 3 miles south of Tierra Amarilla, whence it can be easily reached by leaving the Tierra Amarilla-Coyote wagon road soon after crossing creek.

Station mark: Bronze tablet in solid rock about 6 feet from west edge. A witness tree blazed on four sides is distant 49 feet.

[Latitude $36^{\circ} 39' 04.78''$. Longitude $106^{\circ} 33' 20.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gallina.....	47 12 21.56	227 04 47.29	4.4126353
Elvado.....	73 32 38.59	253 24 42.57	4.3155593
Horse Lake.....	128 45 49.64	308 38 53.91	4.3447346
Pedernal.....	355 02 47.97	175 04 39.27	4.7346508

PRIOR, RIO ARRIBA COUNTY, N. MEX.

On the highest point 2 miles southeast of town of Gallina, 2,000 feet lower than the mountain 3 miles south. Most of timber on

east end has been cleared off by some survey party. A large signal tree stands 83.5 feet northeast of the station. Three 40-penny spikes driven in blaze on southwest side form an equilateral triangle. Triangulation can not be extended south from this point.

Station mark: Aluminum tablet set in solid rock ledge 3 feet northeast of the highest point.

[Latitude $36^{\circ} 12' 12.88''$. Longitude $106^{\circ} 50' 13.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prismatic.....	98 38 22.80	278 34 21.05	4. 0144508
One.....	171 00 53.78	350 59 11.99	4. 4377096
Gallina.....	191 00 23.59	11 02 51.95	4. 5136932
Pedernal.....	278 21 16.16	98 33 04.77	4. 4817569

PRISMATIC, RIO ARRIBA COUNTY, N. MEX.

On the north end of a prismatic-colored ridge 5 miles west of the town of Gallina. From the road which passes one-half mile east of the station follow up the spur which joins the ridge from the east at the lower part between the two summits.

Station mark: Aluminum tablet in sandstone.

Reference mark: Piñon tree 10 inches in diameter, marked with a triangle on northeast side; true bearing from station 81° , distance 3.3 feet.

[Latitude $36^{\circ} 13' 03.07''$. Longitude $106^{\circ} 57' 02.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snyder.....	143 36 42.55	323 22 58.90	4. 7635331
One.....	193 02 45.65	13 05 06.29	4. 4181548
Gallina.....	208 17 21.21	28 23 52.18	4. 5395613
Prior.....	278 34 21.05	98 38 22.80	4. 0144508

TREE CLUMP 60, RIO ARRIBA COUNTY, N. MEX.]

(Not occupied.)

Clump of trees on a hill 10 miles southeast of Gallina triangulation station.

[Latitude $36^{\circ} 20' 26.0''$. Longitude $106^{\circ} 44' 53.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pedernal.....	4. 46954
Prior.....	4. 23481

SNYDER, RIO ARRIBA COUNTY, N. MEX.

On the butte of same name at the west end of the high mesa north-east of the Gobernador Canyon, about 20 miles west of the Jicarilla Indian farm and 1 mile north of the road. Traces of previous occupation by cliff dwellers are plentiful on and near the summit. The easiest approach to the station is from the west side by following up rock ridge to a point near south end of the high point of mesa. Animals can be taken to a point 300 feet below summit and 0.25 mile distant.

Station mark: Aluminum tablet set in a rock buried with its top even with surface of sandy soil.

Reference mark: Piñon tree 12 feet high trimmed to symmetrical shape (the only tree on the summit); true azimuth from station $70^{\circ} 26'$, distance 5.4 feet.

[Latitude $36^{\circ} 38' 15.99''$. Longitude $107^{\circ} 20' 07.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Largo.....	107 10 33.30	286 59 03.08	4. 4773512
Piedra.....	167 57 25.31	347 53 05.61	4. 7096209
Apache.....	228 18 38.87	48 28 16.02	4. 5054581
One.....	297 29 10.76	117 45 17.98	4. 6585433
Prismatic.....	323 22 58.90	143 36 42.55	4. 7635331

TREE 73, RIO ARRIBA COUNTY, N. MEX.

(Not occupied.)

Highest tree on hill.

[Latitude $36^{\circ} 07' 19.62''$. Longitude $106^{\circ} 23' 49.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prior.....			4. 60851
Gallina.....			4. 72305

ANGEL PEAK, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

The north rock of Angel Peak.

[Latitude $36^{\circ} 33' 44.47''$. Longitude $107^{\circ} 52' 00.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Huerfanita.....			3. 90414
Cox.....			4. 67720
Juanimas.....			4. 49810

AZIMUTH, SAN JUAN COUNTY, N. MEX.

On highest ground in the vicinity, 5 miles N. 20° W. of Simpson triangulation station and 1 mile east of the road from Pene Vado Chini; marked by a sandstone rock set in the sandy soil in which is drilled a hole to receive tablet. It is nearly east of the junction of a faint road southeast of main road and about 10 miles south of the San Juan Bluffs. Reached from Farmington by same route as Simpson triangulation station.

Station mark: Aluminum tablet set in sandstone boulder; stamped "Elev. 6210" (unadjusted).

[Latitude 36° 32' 31.05''. Longitude 108° 16' 50.80'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hogback.....			4. 4282371
Dune.....			4. 1662038
Huerfanita.....	270 36 20 52	90 54 07. 27	4. 6490633
Simpson.....	336 18 47. 21	156 20 02. 65	3. 8952676

BENNET PEAK, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

[Latitude 36° 22' 47.66''. Longitude 108° 44' 16.41'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hogback.....			4. 52661
Dune.....			4. 74087
Azimuth.....			4. 65082

BUTTE 93, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

Middle of butte 3 miles northwest of Largo triangulation station.

[Latitude 36° 45' 01.30''. Longitude 107° 41' 17.90'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Largo.....			3. 66719
Huerfanita.....			4. 40108

COX, SAN JUAN COUNTY, N. MEX.

At the head of Cox Canyon and about 7 miles west of Cedar Hill station and post-office. From Cedar Hill follow main road up Cox Canyon to road crossing just after state line is passed near summit of divide; thence follow divide south 2 miles to station on high pointed hill.

Station mark: Aluminum triangulation tablet set in rock on summit of gravel and bowlder hill.

Reference mark: Lone cedar tree on east end of top of mesa; true bearing from station, $241^{\circ} 25'$, distance 12.7 feet.

[Latitude $36^{\circ} 58' 43.12''$. Longitude $107^{\circ} 59' 35.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Farmington.....	36 47 22.46	216 40 44.96	4.4381423
Basin.....	178 31 27.85	358 31 14.37	4.3310582
Piedra.....	255 26 09.12	75 45 34.47	4.6934836
Largo.....	313 54 23.15	134 06 30.12	4.6207259
Juanimas.....	316 52 44.58	136 58 20.73	4.3072210
Huerfanita.....	338 59 57.21	159 07 29.96	4.7202673

DUNE, SAN JUAN COUNTY, N. MEX.

On the summit of the sandy mesa south of San Juan River about 6 miles from Farmington by road. Cross the river at the King Ford, nearly on the reservation line, and follow the road to top of bluff; take the left-hand fork of road along bluff to highest point, about 1 mile distant; station is about 50 feet south of road.

Signal: White cloth supported by guy wires and a cedar stump.

Station mark: Iron bench-mark post set 3 feet in ground; stamped "Elev. 6,071" (unadjusted).

[Latitude $36^{\circ} 40' 10.86''$. Longitude $108^{\circ} 14' 19.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hogback.....	84 09 39.15	263 58 24.64	4.4504314
Verde.....	142 22 48.16	322 14 44.52	4.5152922
Huerfanita.....	289 45 45.80	110 02 04.06	4.6371425
Simpson.....	1 37 17.47	181 37 02.99	4.3299610

EERIE, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

Small rocky butte 3 miles east of Auget Peak.

[Latitude $36^{\circ} 34' 24.06''$. Longitude $107^{\circ} 50' 07.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Huerfanita.....			3. 79250
Cox.....			4. 67332

FARMINGTON, SAN JUAN COUNTY, N. MEX.

On the high gravelly and bowldery hill 1 mile north of Browns Mesa, on divide between Las Animas and La Plata rivers, about 5 miles northeast of the town of Farmington. From Farmington follow road north past the public school to divide 0.25 mile west of the mesa. Ascent is easy, on foot or with animals.

Station mark: Aluminum tablet set in waterworn boulder near north end of flat-topped summit.

[Latitude $36^{\circ} 46' 50.12''$. Longitude $108^{\circ} 10' 37.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Simpson.....	10 18 31. 81	190 16 05. 01	4. 5343646
Dune.....			4. 1297292
Cox.....	216 40 44. 96	36 47 22. 46	4. 4381423
Juanimas.....			4. 4931049
Huerfanita.....	307 24 33. 15	127 38 40. 30	4. 6477246

HOGBACK, SAN JUAN COUNTY, N. MEX.

On very prominent monoclinical north-south sandstone ridge, which is broken through by San Juan River and other streams in several places and which becomes higher toward the south. Station is on the last but one high point, or third south, about 9 miles from San Juan River. The wagon road shown on the map from Burnham (Fruitland) southwest probably does not now exist, but country can be crossed in any direction on horseback. Plenty of very alkaline water in Chaco Wash.

Station mark: Aluminum triangulation tablet set in solid rock.

Reference mark: Rock monument 8 feet high with 5-foot base; true azimuth from station $290^{\circ} 46'$, distance 11.5 feet.

[Latitude $36^{\circ} 38' 36.26''$. Longitude $108^{\circ} 33' 09.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Verde.....	195 27 30.50	15 30 43.37	4.4760232
Dune.....	263 58 24.64	84 09 39.15	4.4504314
Azimuth.....	294 45 00.87	.....	4.4282371
Huerfanita.....	279 31 42.89	99 59 14.32	4.8443458
Simpson.....	303 46 45.40	123 57 43.92	4.5199628

HUERFANITA, SAN JUAN COUNTY, N. MEX.

About 50 feet from west end of small rock-topped mesa and near south edge. Can be easily reached from Blanco Canyon, ascending the mountain from northeast—the only possible way with animals. From Largo post-office via Araminta Canyon follow a well-traveled trail which passes up on west side of the second valley west of the mesa and about half way between the station and Angel Peak. A small reservoir 0.25 mile east of the mesa will have water for a few weeks after rains.

Station mark: Aluminum triangulation tablet set in solid rock.

Reference marks: (1) A piñon tree with 12-inch base, 10 feet high, blazed on northwest side and marked with three 40-penny spikes driven to form triangle, heads projecting one-half inch; true azimuth from station 311° , distance 8.4 feet. (2) A large symmetrical pinon tree 14 feet high; true azimuth from station $259^{\circ} 45'$, distance 100.1 feet. The west summit of mesa was cleared of all except these two reference trees.

[Latitude $36^{\circ} 32' 12.03''$. Longitude $107^{\circ} 46' 59.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Simpson.....	81 04 25.82	260 47 55.32	4.6227880
Hogback.....	99 59 14.32	279 31 42.89	4.8443458
Azimuth.....	90 54 07.27	270 36 20.52	4.6490633
Dune.....	110 02 04.06	289 45 45.80	4.6371425
Farmington.....	127 38 40.30	307 24 33.15	4.6477246
Cox.....	159 07 29.96	338 59 57.21	4.7202673
Largo.....	209 26 01.46	29 30 33.33	4.3619701

HUERFANO, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

The highest of a group of mesas, about 15 miles south of San Juan River, used as a station in the triangulation of the plateau region of New Mexico in 1883–1885.

Station mark: Highest point of summit.

[Latitude $36^{\circ} 25' 34.03''$ ($36^{\circ} 25' 34.1''^a$). Longitude $107^{\circ} 50' 40.53''$ ($107^{\circ} 50' 41.2''^a$).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Huerfanita.....			4. 12871
Simpson.....			4. 56096

^a From Fort Wingate astronomic station.

JUANIMAS, SAN JUAN COUNTY, N. MEX.

On a high gravelly and bowldery peak on the divide between San Juan and Las Animas rivers, about 8 miles north of Largo post-office. A wagon road from Las Animas River to San Juan River passes about one-half mile south of the station.

Station mark: Aluminum tablet set in large waterworn boulder on summit.

Reference mark: The central upright portion of a branching cedar tree 12 feet high; true azimuth from station $246^{\circ} 20'$, distance 28.7 feet.

[Latitude $36^{\circ} 50' 42.37''$. Longitude $107^{\circ} 50' 15.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cox.....	136 58 20.73	316 52 44.58	4. 3072210
Piedra.....	231 20 35.77	51 34 22.75	4. 6384119
Largo.....	311 11 52.73	131 18 23.45	4. 3328938

LARGO, SAN JUAN COUNTY, N. MEX.

On a small conical hill forming a part of and about the same general level as the mesa east of Largo post-office, about 10 miles east of Largo. From the reservoir and rock house at bench mark 10 miles east from San Juan River, follow the Gobernador road southwest to the middle point in the reentrant valley, which can be ascended by animals to the top of the mesa; travel is thence easy through cedar timber and along a faint trail to about 6 miles southwest from the reservoir.

Station mark: Aluminum triangulation tablet cemented in rock 50 feet northeast of highest part of hill.

Reference mark: Piñon tree 9 feet high with 10-foot spread at base on northeast end of hill; true azimuth from station, $255^{\circ} 24'$; distance, 28.90 feet.

[Latitude $36^{\circ} 43' 01.99''$. Longitude $107^{\circ} 39' 23.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Huerfanita.....	29 30 33.33	209 26 01.46	4.3619701
Juanimas.....	131 18 23.45	311 11 52.73	4.3328938
Cox.....	134 06 30.12	313 54 23.15	4.6207259
Piedra.....	203 21 58.13	23 29 12.06	4.6532150
Snyder.....	286 59 03.08	107 10 33.30	4.4773512

SHIPROCK, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

A well-known prominent rocky needle 10 miles southwest of Shiprock post-office.

[Latitude $36^{\circ} 41' 16.16''$. Longitude $108^{\circ} 50' 09.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Verde.....	4.61261
Hogback.....	4.41189
Dune.....	4.72768

SIMPSON, SAN JUAN COUNTY, N. MEX.

On the east edge of summit of broken mesa about 6 miles southwest of Simpson trading post and about 4 miles from Pene Vado Chini trading post. Probably best reached from Farmington by going west 2 miles and crossing river at King's ford. Follow road to top of bluff and right-hand fork which leads south across the open prairie for about 10 miles; thence follow left-hand fork 2 miles; thence cross country to one of the northeast projections of the low mesa upon which the signal is situated.

Station mark: Iron bench-mark post set 3 feet in ground; elevation 6,575 feet (unadjusted).

[Latitude 36° 28' 37.59''. Longitude 108° 14' 44.00''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hogback.....	123 57 43.92	303 46 45.40	4. 5199628
Verde.....			4. 7087053
Azimuth.....	156 20 02.65	336 18 47.21	3. 8952676
Dune.....	181 37 02.99	1 37 17.47	4. 3299610
Farmington.....			4. 5343646
Juanimas.....			4. 7383360
Huerfanita.....			4. 6227880

TIMBERED CONE, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

Timbered cone on a mesa.

[Latitude 36° 56' 30.79''. Longitude 107° 48' 55.94''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Piedra.....			4. 55577
Cox.....			4. 21332
Juanimas.....			4. 03867

VERDE, SAN JUAN COUNTY, N. MEX.

On the western of the two southernmost prongs of the Verde Mesa, about 4 miles north of West Waters and about 120 feet west of the point of mesa. From West Waters follow trail up the wash to about 2 miles above Upper West Waters; thence up over divide into the very prominent wash flowing southeast; thence follow faint trail northwestward nearly to head of canyon, on south side of which is a break in rim rock up which animals can be taken; thence easy course over mesa, first in a southwest and afterward in a southeast direction to avoid head of box canyon. Return can be easily made (although ascent with animals would be dangerous) as follows: Go north from station 0.25 mile and start down about 100 yards east of the angle made by cliff; follow valley east to first trail about south of point of mesa. Triangulation can be extended west but not north from this point.

Station mark: Aluminum triangulation tablet set in solid sandstone ledge.

Reference mark: Cedar tree 7 feet high, 7-foot spread of limbs, standing in south edge of mesa; true bearing from station 338° 42', distance 9.3 feet.

[Latitude $36^{\circ} 54' 11.79''$. Longitude $108^{\circ} 27' 47.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hogback.....	15 30 43.37	195 27 30.50	4.4760232
Dune.....	322 14 44.52	142 22 48.16	4.5152922

WEST TWIN MOUND, SAN JUAN COUNTY, N. MEX.

(Not occupied.)

Five miles west of Farmington; latitude $36^{\circ} 44' 59.02''$, longitude $108^{\circ} 18' 39.51''$.

FLORIDA.

PRIMARY TRAVERSE.

Chaires, Greenville, Lamont, Lovett, Monticello, St. Marks, and Tallahassee quadrangles.

JEFFERSON, LEON, MADISON, AND WAKULLA COUNTIES.

The following geographic positions were determined in 1907 by L. E. Tucker. Positions are based on North Base triangulation station of the Coast and Geodetic Survey at St. Marks, Charleston-Savannah datum.

ST. MARKS QUADRANGLE.

Geographic positions north along Seaboard Air Line Railway, St. Marks to north border.

Station.	Latitude.	Longitude.
St. Marks, North Base triangulation station, 150 meters from south bank of St. Marks River, in middle of railway tracks, marked by bottle under center, 2 stone blocks in line, draintile pipe 8 inches in diameter set in ground flush with surface ^a	30 09 08.90	84 12 05.85
St. Marks, inside yard and 15 feet south of fence of W. B. Drake, 58.6 feet west of railroad, iron post stamped "Prim. Trav. Sta. No. 1, 1907".....	30 09 25.5	84 12 13.4
St. Marks, 2 miles north of road crossing.....	30 11 24.9	84 13 02.3
Burns flag station.....	30 13 13.0	84 13 39.3
Wakulla station.....	30 13 58.6	84 13 49.1

^a Recovered as described, 1907.

CHAIRES QUADRANGLE.

Magnetic declination: East border, 2° 25' east.

Geographic positions near borders.

NORTH AND EAST ALONG SEABOARD AIR LINE RAILWAY TO MILL CREEK.

Station.	Latitude.	Longitude.
Vereen, about 100 feet south of station warehouse; 20 feet east of St. Marks branch of Seaboard Air Line Railway, at southwest corner of ice house, iron post stamped "Prim. Trav. Sta. No. 2, 1907".....	30° 16' 02.6"	84° 14' 15.7"
Wakulla-Leon county line.....	30 16 25.7	84 14 21.1
Wakulla-Leon county line.....	30 18 11.1	84 14 44.1
Bridge over stream.....	30 27 04.4	84 13 47.1
Bridge over stream.....	30 26 40.9	84 11 24.1
Road crossing.....	30 26 05.4	84 08 02.9
Chaires station.....	30 26 10.6	84 06 54.8
Upchurch's mill, road crossing.....	30 27 04.1	84 05 23.5
Newport-Monticello road crossing.....	30 28 01.8	84 03 48.8
Bridge over stream.....	30 28 13.9	84 03 12.9
Leon-Jefferson county line.....	30 28 25.3	84 02 18.7
Lloyd station, road crossing.....	30 28 39.6	84 01 08.5
T. 1 N., R. 3 E., northeast corner sec. 21.....	30 28 41.5	84 01 18.3
Lloyd station, in front of; on south side of track and west of road crossing, 50 feet south of railroad, 55 feet west of highway, iron post stamped "Prim. Trav. Sta. No. 4, 1907".....	30 28 39.1	84 01 08.7
Mill Creek, center of bridge over.....	30 28 41.0	84 00 22.1

SOUTH ALONG HIGHWAYS TO DELPH.

Bridge over stream.....	30 25 35.6	84 06 03.6
Crossing of Tallahassee-St. Augustine and Newport-Monticello roads.....	30 25 06.3	84 05 08.0
Colored church and schoolhouse, road in front of.....	30 24 44.7	84 04 35.7
Forks of road.....	30 24 09.2	84 04 07.0
Forks of road.....	30 22 56.2	84 03 08.0
Forks of road to southeast.....	30 22 25.8	84 02 56.3
Crossing of Tallahassee, Perry and Southeastern Railroad..	30 20 40.9	84 02 49.9
Forks of road.....	30 21 41.0	84 02 58.1
Carmell's (J. H.) farm, 0.25 mile south of; forks of road...	30 20 06.5	84 02 30.6
Road crossing.....	30 19 00.3	84 02 27.6
Road crossing.....	30 18 29.8	84 02 44.0
Road crossing.....	30 17 34.7	84 02 46.4
Leon, Wakulla, and Jefferson counties, pine post at corner of.....	30 16 25.1	84 04 25.1
Delph; 90 feet southeast of southeast corner of Tallahassee sawmill commissary, 60 feet east of main line of Natural Bridge Railroad, at southwest corner of blacksmith shop, iron post stamped "Prim. Trav. Sta. No. 3, 1907".....	30 16 00.2	84 03 22.6

Geographic positions near borders—Continued.

WEST ALONG NATURAL BRIDGE RAILROAD TO VEREEN.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pinhook Company's turpentine still, road crossing.....	30 16 10.7	84 06 05.1
St. Marks River, center of railroad bridge.....	30 15 49.2	84 08 57.2
Plank road crossing.....	30 15 54.5	84 09 40.6
The Jackson lot, Magnolia road crossing.....	30 15 56.0	84 11 34.6

GREENVILLE QUADRANGLE.

Magnetic declination: West border of quadrangle, 2° 06' east.

Geographic positions along Seaboard Air Line Railway, Aucilla to Greenville.

[Duplicated.]

Station.	Latitude.	Longitude.
	° ' "	° ' "
Aucilla River, Jefferson-Madison county line, center of river.....	30 28 29.8	83 43 31.4
Jeff coach mill and siding, road crossing.....	30 28 32.5	83 41 58.3
Brice & English mill, station.....	30 28 22.2	83 39 52.3
Greenville, near intersection of railroads, 25 feet east of Southern Georgia Railway, 30 feet south of Seaboard Air Line Railway, iron post stamped "Prim. Trav. Sta. No. 9, 1907".....	30 28 08.1	83 37 56.3
Greenville station, Southern Georgia Railway.....	30 28 14.7	83 37 52.6

LAMONT QUADRANGLE.

Magnetic declination: East border, 2° 06' east; west border, 2° 25' east.

Geographic positions near north and east borders.

EAST ALONG SEABOARD AIR LINE RAILWAY.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lloyd station, 2.5 miles east of; road crossing.....	30 28 42.4	83 58 44.2
Lloyd station, 3.5 miles east of; road crossing.....	30 28 49.9	83 57 43.0
Brashwells still, flag station, front of furnace.....	30 29 19.6	83 55 16.4
Pinhook, road crossing.....	30 29 22.0	83 54 41.3
Drifton, railroad crossing near.....	30 29 46.4	83 52 28.0
Drifton, south of Seaboard Air Line Railway, 55 feet southeast of station, iron post stamped "Prim. Trav. Sta. No. 7, 1907".....	30 29 45.2	83 52 18.4
Woodrick road crossing.....	30 29 10.5	83 50 29.9
Road crossing.....	30 29 03.2	83 49 08.3
Center of bridge over large stream.....	30 29 08.7	83 46 51.8
Aucilla, 230 feet west of station, south of Seaboard Air Line Railway, at northeast corner of A. D. Walker's yard fence, iron post stamped "Prim. Trav. Sta. No. 8, 1907".....	30 28 49.2	83 45 08.8
Aucilla station.....	30 28 49.0	83 45 06.3

Geographic positions near north and east borders—Continued.

SOUTH ALONG HIGHWAYS, AUCILLA TO NEAR MADISON—TAYLOR COUNTY LINE.

Station.	Latitude.	Longitude.
J. M. Hampton's mail box, forks of road.....	30 28 08.3	83 44 55.7
Watkins Bridge, signboard at forks of road.....	30 27 56.4	83 45 02.1
Milepost 2.....	30 27 18.7	83 45 19.3
Milepost 3.....	30 26 33.8	83 45 41.8
T road east to Walkers Bridge.....	30 25 51.0	83 45 37.2
Milepost 4.....	30 25 47.3	83 45 37.8
Milepost 5.....	30 25 31.0	83 46 34.1
Beasleys Creek Bridge.....	30 23 30.7	83 48 26.4
Lamont, 0.25 mile north of; junction of Aucilla-St. Augustine roads.....	30 22 54.9	83 48 46.6
Lamont, 3 feet south of southwest corner of Olive Branch Baptist Church, 55 feet east of center of road, iron post stamped "Prim. Trav. Sta. No. 10, 1907".....	30 22 31.4	83 48 36.1
Aucilla River, Jefferson-Madison county line, center of river.....	30 22 01.0	83 48 16.7
Intersection of St. Augustine-Red Oak roads.....	30 21 39.8	83 47 22.9
Wheeler's water mill, 10 feet east of; Wheeler Creek crossing.....	30 20 59.6	83 47 13.0
Forks of road.....	30 20 47.1	83 47 04.4
Colored church, forks of road near.....	30 20 00.6	83 46 59.3
T. 2 S., R. 6 E., center sec. 12.....	30 19 20.8	83 46 26.4
Red Oak, center of road in front of former post-office.....	30 18 20.6	83 46 52.5
Madison-Taylor county line, at highway crossing.....	30 18 15.2	83 46 56.0
T. 2 S., R. 5 E., northeast corner sec. 23, Madison-Taylor county line, at J. S. Caves's yard fence.....	30 18 15.0	83 47 12.5
Colored church, in front of.....	30 18 06.3	83 47 13.5
Road southwest to Whiddens Bridge, signboard at.....	30 18 15.2	83 47 59.5
Jefferson-Madison county line, center of bridge over Aucilla River.....	30 18 26.4	83 49 10.1
T. 2 S., R. 5 E., northeast corner sec. 21.....	30 18 12.7	83 49 13.0
McCardy Bros. mail box.....	30 20 08.1	83 49 36.4
Forks of road, Frank Stevens's mail box.....	30 20 25.3	83 49 28.2
Stream crossing road.....	30 21 20.7	83 49 08.6

LOVETT QUADRANGLE.

Magnetic declination: North border, $2^{\circ} 14'$ east.*Geographic positions along Southern Georgia Railway, Greenville to Lovett.*

[Duplicated.]

Station.	Latitude.	Longitude.
	° ' "	° ' "
Stokes's mill, road crossing.....	30 30 02. 4	83 37 28. 9
Spray, road crossing near post-office.....	30 30 45. 4	83 37 08. 2
Denett's flag station.....	30 32 09. 6	83 36 35. 1
McCheim, McCloud & Co.'s turpentine still, switch stand.	30 33 08. 2	83 35 52. 8
Maysland flag station, crossing.....	30 35 52. 1	83 34 12. 6
Lovett station, road crossing.....	30 37 41. 4	83 34 15. 9
Road northeast.....	30 38 09. 0	83 34 48. 2
Jefferson-Madison county line, Gum Creek highway cross- ing.....	30 38 49. 6	83 35 35. 5
Florida-Georgia state-line post.....	30 39 01. 0	83 35 51. 1

MONTICELLO QUADRANGLE.

Magnetic declination: Center of quadrangle, $2^{\circ} 19'$ east.

The line starts from an adjusted position at Drifton and follows highways north to Monticello; thence along Atlantic Coast Line Railroad to Metcalf; thence along highways to line of Thomas County, Ga., corner of Leon and Jefferson counties, Fla.; thence duplicated.

Geographic positions along Atlantic Coast Line Railroad, Monticello to Metcalf.

Station.	Latitude.	Longitude.
	° ' "	° ' "
FLORIDA.		
Monticello, 1 foot west of iron fence around Confederate Soldiers' monument in public square, in front of court- house, iron post stamped "Prim. Trav. Sta. No. 5, 1907".	30 32 43. 8	83 52 03. 7
T. 2 N., Rs. 4 and 5 E., quarter corner between secs. 25 and 30.....	30 32 38. 4	83 52 13. 0
Road crossing at section house.....	30 33 56. 8	83 52 13. 8
Barnes's still, road crossing.....	30 35 59. 4	83 53 03. 3
Road crossing, north of switch.....	30 36 51. 9	83 54 35. 5
Jarrett station, road crossing.....	30 37 41. 6	83 55 00. 9
Road crossing near switch.....	30 39 36. 4	83 57 48. 9
Florida-Georgia state line (Jefferson-Thomas county line).	30 40 13. 8	83 58 24. 1
Florida-Georgia state line, at approximate corner of Jeffer- son and Leon counties, milepost 52.....	30 40 21. 1	84 00 22. 1
GEORGIA.		
Metcalf, on east side of Atlantic Coast Line Railroad on south side of road crossing about 600 feet south of station, 20 feet east of railroad, 20 feet south of highway, iron post stamped "Prim. Trav. Sta. No. 6, 1907".....	30 41 59. 9	83 59 08. 4

TALLAHASSEE QUADRANGLE.

Geographic positions along Seaboard Air Line Railroad—North to Tallahassee; thence east to east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rhodes's still, road crossing.....	30 19 47.6	84 15 05.1
Road crossing.....	30 22 52.6	84 16 15.1
Junction of St. Marks branch and main line of Tallahassee, Perry and Southeastern Railroad, switch stand.....	30 24 16.2	84 16 56.9
Tallahassee station.....	30 26 01.2	84 17 12.1
Tallahassee, 0.75 mile east of station, road crossing.....	30 26 00.9	84 16 27.2
Road crossing.....	30 26 15.9	84 16 14.4

GEORGIA.

PRIMARY TRAVERSE.

Apalachee, Crawfordville, Eatonton, Milledgeville, Unionpoint, and White Plains quadrangles.

BALDWIN, GREENE, HANCOCK, MORGAN, PUTNAM, AND TALIAFERRO COUNTIES.

The following geographic positions, determined by C. B. Kendall in 1906, are based on the positions of Madison (located in 1894) and Crawfordville (located in 1903).

APALACHEE QUADRANGLE.

Magnetic declination: South border, 1° 50' east; west border, 1° 46' east.

Geographic positions.

EAST ALONG GEORGIA RAILROAD, MADISON TO CAREY.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Madison, northwest corner of station, in brick foundation to pillar, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1906".....	33 35 57.0	83 28 11.6
Madison, 1.4 miles northeast of; road crossing.....	33 36 38.6	83 27 04.7
Madison, 2.1 miles northeast of; second-class road crossing.....	33 36 45.2	83 26 23.8
Madison, 3.2 miles northeast of; road crossing.....	33 36 11.4	83 25 30.6
Smyrna Church, 400 feet west of; road crossing.....	33 35 53.6	83 24 18.8
Milepost 98, 700 feet west of; public T road crossing.....	33 35 23.6	83 23 46.2
Overhead road crossing.....	33 34 39.2	83 22 56.0
Buckhead, crossing at west corporation limits.....	33 34 20.2	83 22 13.8
Buckhead, Broad Street crossing.....	33 34 08.0	83 21 45.7
Buckhead, 125 feet south of crossing of First street, in north wall at northeast corner of brick store of P. H. McWharter, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1906" (also bench mark stamped "625. Atlanta 1903").....	33 34 06.6	83 21 45.5

Geographic positions—Continued.

EAST ALONG GEORGIA RAILROAD, MADISON TO CAREY—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Buckhead, 0.8 mile east of; road crossing.....	33 34 17.9	83 20 54.7
Buckhead, 1.5 miles east of; second-class road crossing....	33 33 55.6	83 20 14.3
Blue Springs, 1 mile west of siding; road crossing.....	33 32 53.1	83 19 16.0
Blue Springs siding, road crossing.....	33 32 38.9	83 18 30.2
Road crossing, second class.....	33 32 16.1	83 17 36.3
Carey, 0.25 mile west of station; railway bridge over Oconee River, south wing of east abutment, in coping stone, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1906" (also bench mark stamped "645 Atlanta 1903").....	33 32 42.4	83 16 33.6

SOUTH ALONG CENTRAL OF GEORGIA RAILWAY, BETWEEN MADISON AND WARING.

Madison, 1.2 miles southwest of; road crossing.....	33 35 15.0	83 29 11.6
Milepost 69, 700 feet north of; second-class road crossing...	33 33 29.8	83 29 30.9
Waring, 2.2 miles north of; road crossing.....	33 32 47.6	83 29 39.9
Waring, 1.5 miles north of; second-class road crossing.....	33 32 13.0	83 29 45.6
Waring, 0.8 mile north of; second-class road crossing.....	33 31 34.5	83 29 28.9
Waring, road crossing.....	33 30 56.9	83 29 26.1
Waring (Cortelyou post-office), 200 feet southeast of station water tank and 58 feet southeast of road crossing, at northwest corner of building of W. W. Clark, iron post stamped "Prim. Trav. Sta. No. 12, 1906".....	33 30 56.5	83 29 25.6

UNIONPOINT QUADRANGLE.

Magnetic declination: South border, 1° 44' east.

Geographic positions east along Georgia Railroad, Carey to Milepost 72.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 86, 0.5 mile west of; second-class road crossing...	33 33 17.8	83 13 36.4
Morse siding, road crossing.....	33 33 15.3	83 12 36.5
Greensboro, 1.6 miles southwest of; second-class road crossing.....	33 33 29.3	83 12 06.8
Greensboro, intersection of Main and Broad streets.....	33 34 34.3	83 10 59.5
Greensboro, northwest corner of court-house, in west wall, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1906" (also "650 Atlanta 1903").....	33 34 36.9	83 10 57.9
Greensboro, 0.3 mile northeast of; overhead crossing.....	33 34 51.3	83 10 51.1
Greensboro, 1.5 miles northeast of; road crossing.....	83 35 19.4	83 09 56.3
Milepost 81, 400 feet west of; second-class road crossing...	33 35 41.5	83 09 13.0
Sawmill siding, second-class road crossing.....	33 36 02.4	83 08 32.0

Geographic positions east along Georgia Railroad, Carey to Milepost 72—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, road crossing.....	33 36 13.9	83 07 50.2
Schoolhouse, 0.8 mile east of; road crossing.....	33 36 09.4	83 07 01.7
Junction Georgia Railroad and Unionpoint and White Plains Railroad, switch stand.....	33 36 16.4	83 05 52.9
Unionpoint, 0.5 mile west of; road crossing.....	33 36 53.3	83 05 00.5
Unionpoint, southeast corner of station.....	33 36 57.3	83 04 36.4
Unionpoint, about 300 feet southeast of station; in north wall between two brick stores, 150 feet west of center of bank building, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1906" (also "667 Atlanta 1903").....	33 36 55.1	83 04 33.8
Unionpoint, 0.3 mile east of; road crossing.....	33 36 40.7	83 03 59.4
Unionpoint, east line of corporation limits.....	33 36 39.4	83 03 56.6
Milepost 74, 0.2 mile west of second-class road crossing....	33 36 19.8	83 02 55.0
Milepost 74, 900 feet east of; road crossing.....	33 36 16.0	83 02 26.2
Milepost 73, 1,500 feet east of; road crossing.....	33 36 04.8	83 01 17.8
Milepost 72, 600 feet west of; road crossing.....	33 35 53.5	83 00 43.2

CRAWFORDVILLE QUADRANGLE.

Geographic positions east along Georgia Railroad, Robinson to Crawfordville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	33 35 21.1	82 59 51.5
Robinson, 500 feet east of Georgia Railway, 125 feet north of post-office, at southwest corner of store of R. C. Monk, iron post stamped "Prim. Trav. Sta. No. 10, 1906" (also "626 feet Atlanta 1903").....	33 35 07.32	82 59 30.65
Robinson, 0.8 mile east of station; road crossing.....	33 34 40.2	82 58 55.6
Road crossing.....	33 34 14.8	82 57 36.3
Road crossing.....	33 33 53.6	82 56 30.2
Crawfordville, 2 miles west of; road crossing.....	33 33 47.9	82 55 47.5
Crawfordville, 1,000 feet west of station; road crossing....	33 33 23.4	82 53 52.7
Crawfordville, court-house spire (located 1903).....	33 33 17.5	82 53 51.1
Crawfordville, north side of east entrance to court-house, brick pillar, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1906" (also "617 Atlanta 1903").....	33 33 17.7	82 53 50.9

EATONTON QUADRANGLE.

Magnetic declination: South border, 1° 28' east; east border, 1° 21' east; west border, 1° 29' east.

Geographic positions.

ALONG CENTRAL OF GEORGIA RAILWAY, WARING TO GODFREY.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 65, 600 feet south of; second-class road crossing..	33 29 59.5	83 28 57.6
Milepost 64, 600 feet north of; road crossing.....	33 29 21.3	83 28 58.1
Indian Creek, center of railway bridge over.....	33 28 50.3	83 29 08.9
Godfrey, 0.5 mile north of; road crossing.....	33 27 27.1	83 30 09.8
Godfrey, 100 feet south of station; road crossing.....	33 27 04.9	83 30 24.6
Godfrey, at northwest corner of station; 20 feet south of center of main track, iron post stamped "Prim. Trav. Sta. No. 13, 1906, GA" (also "615 Atlanta 1903").....	33 27 05.7	83 30 23.7

ALONG HIGHWAYS, GODFREY TO EATONTON.

Godfrey, 1 mile southwest of; at Putnam-Morgan county line.....	33 26 23.4	83 30 34.3
Forks of road south and southwest, large oak.....	33 25 34.2	83 30 33.6
Forks of road, northwest and northeast, 35 feet southwest to oak at corner of fence, 30 feet northwest to oak in front of house.....	33 24 34.5	83 29 43.8
Road north and west, 20 feet northwest to H. Wilson's mail box.....	33 23 32.2	83 29 31.8
Hudson's mill, 0.5 mile west of; T road north.....	33 22 34.1	83 28 31.9
Hudson's mill, 0.5 mile west of; in center of triangle, at 3 corners, iron post stamped "Prim. Trav. Sta. No. 14, 1906".....	33 22 34.2	83 28 32.2
Church, 600 feet west of; T road to north, 20 feet northeast to corner fence, 50 feet east to oak at corner of large house.....	33 21 55.9	83 29 25.3
Forks of road, northeast and southeast, 2 small oaks.....	33 21 25.7	83 29 37.5
Forks of road.....	33 21 09.4	83 30 58.3
Central of Georgia Railway, road crossing 150 feet east of milepost "S 219".....	33 19 55.1	83 30 30.0
Willard, 200 feet west of station; at southeast corner of store of C. D. Leonard, iron post stamped "Prim. Trav. Sta. No. 15, 1906 Ga".....	33 18 52.8	83 29 36.1
Willard, 50 feet southeast of station; road crossing.....	33 18 49.3	83 29 32.5
Willard, 0.7 mile southeast of station; road crossing.....	33 18 28.8	83 29 00.6
Milepost "S 216," 1,300 feet east of; road crossing.....	33 18 46.3	83 28 05.7
Lynchburg station; road crossing.....	33 18 52.4	83 27 13.8
Little River, 0.25 mile west of; road crossing.....	33 19 18.0	83 26 39.6
Eatonton, 2 miles west of; road crossing.....	33 19 20.1	83 25 12.2
Eatonton, forks of road at west edge of.....	33 19 41.1	83 23 56.0
Eaton, northwest corner of court-house, iron post stamped "Prim. Trav. Sta. No. 16, 1906".....	33 19 33.3	83 23 22.2

Geographic positions—Continued.

ALONG HIGHWAYS, EATONTON TO TEXAS METHODIST CHURCH.

Station.	Latitude.	Longitude.
Eatonton, forks of road at east edge of; roads east and southeast.....	° ' " 33 19 31.1	° ' " 83 22 59.4
T road south, 15 feet southeast to corner of wire fence.....	33 19 35.5	83 22 25.0
Milepost "E 2," 350 feet east of; second-class T road south.....	33 19 39.3	83 21 14.0
Four corners, 15 feet southeast to corner post of wire fence.....	33 19 23.4	83 19 48.5
T road north, 25 feet southeast to oak, 15 feet south to telephone pole.....	33 19 20.2	83 18 30.0
Four corners, 300 feet east of two-story white house.....	33 19 37.2	83 17 42.1
Forks of second-class road east, pine tree.....	33 19 18.4	83 16 47.2
T road south, second class, 20 feet east to telephone pole.....	33 19 35.9	83 15 45.0
Texas (colored) Methodist Church, second-class road crossing.....	33 19 43.0	83 15 11.4
Texas Methodist Church, cupola of.....	33 19 44.0	83 15 11.4

ALONG HIGHWAYS, PHOENIX TO REEDS FERRY.

Forks of road at Spivey's mail box.....	33 21 25.8	83 15 32.8
Phoenix, 300 feet south of, 4 corners.....	33 21 58.8	83 16 41.2
Four corners at store, 40 feet north to oak, 15 feet southeast to pine.....	33 23 28.5	83 16 36.6
Lee Creek, center of bridge over.....	33 24 14.2	83 16 23.7
Reeds Ferry, 1.5 miles south of; hollow oak at forks of road.....	33 25 22.0	83 16 02.8
Reeds Ferry, 0.25 mile southwest of; on Eatonton-Reeds Ferry road, at junction with road to Park's mill, 2 feet north of milepost "Eatonton 10.75 miles," iron post stamped "Prim. Trav. Sta. No. 25, 1906".....	33 26 16.0	83 15 56.1
Reeds Ferry, center of Oconee River.....	33 26 39.6	83 15 47.7

WHITE PLAINS QUADRANGLE.

Geographic positions along highways.

TEXAS METHODIST CHURCH TO ROCKVILLE.

Station.	Latitude.	Longitude.
T road south, 10 feet north to W. S. Bonner's mail box.....	° ' " 33 19 32.4	° ' " 83 14 22.2
Jones Bros. store, forks of road.....	33 19 28.2	83 13 52.8
Rockville, forks of road.....	33 19 38.9	83 13 07.6
Rockville, in angle at forks of road, 125 feet north of store, iron post stamped "Prim. Trav. Sta. No. 17, 1906 Ga".....	33 19 39.4	83 13 07.3
Rockville, 1.33 miles northeast of; T road south.....	33 20 37.0	83 12 23.9
Forks of road, 3 mail boxes.....	33 20 42.7	83 13 04.4
Spivey, 0.5 mile southeast of; forks of road.....	33 20 46.3	83 13 56.6
Spivey, 0.5 mile northwest of; second-class fork to north.....	33 20 57.1	83 14 48.6

Geographic positions along highways—Continued.

NEAR REEDS FERRY TO FOUR CORNERS.

Station.	Latitude.	Longitude.
Reeds Ferry, 1.75 miles northeast of; 3 corners, T road west at mail box.....	° ' " 33 27 28.5	° ' " 83 14 28.8
Forks of road, second-class road northwest, 30 feet north to A. L. Holmes's mail box.....	33 28 13.0	83 14 44.6
Large white house on hill, forks of road 500 feet east of....	33 28 55.4	83 14 24.4
Parks Ferry, 2.5 miles east of; 0.25 mile south of school-house, 4 corners.....	33 29 59.7	83 14 52.3
Four corners, 40 feet southeast to oak.....	33 31 49.3	83 15 09.8
T road south, second class.....	33 32 36.7	83 15 55.8

SOUTHEASTWARD FROM ROCKVILLE.

Rockville, 1.25 miles southeast of; forks of road.....	33 18 29.6	83 12 20.9
Oconee Springs Ferry, 0.5 mile west of; forks of road.....	33 17 31.8	83 12 00.6
Oconee Springs, center of Oconee River, Putnam-Hancock county line.....	33 17 15.2	83 11 33.9
Oconee Springs Ferry, near east bank, 3 corners, T road south.....	33 17 12.7	83 11 30.8
Oconee Springs Ferry, 1 mile southeast of; T road north, double oak.....	33 16 27.8	83 11 14.9
Three corners, T road northeast, 25 feet east to pine, 60 feet north to oak.....	33 15 56.0	83 09 40.3
Four corners, near negro cabin, 30 feet southeast to road east, 40 feet northwest to road west, peach tree.....	33 15 13.5	83 09 05.6

GLENFORD TO ROCKVILLE.

Glenford, 600 feet north of cotton gin at 3 corners, T road west, 20 feet southwest to telephone pole, 40 feet north to double oak.....	33 15 29.4	83 02 00.2
Glenford station, 1 mile northeast of; on south side of Milledgeville-Sparta road, at junction with road west to Oconee Springs Ferry, at corner of garden fence, iron post stamped "Prim. Trav. Sta. No. 23, 1906".....	33 16 10.9	83 01 17.2
Forks of road, T road north, 10 feet south to black stump, 40 feet north to pine.....	33 16 44.0	83 02 32.3
Three corners, T road north, 60 feet west to large dead oak..	33 16 55.1	83 03 44.6
Ford Creek, center of bridge over.....	33 17 05.9	83 04 47.2
Three corners, second-class T road north, 100 feet south to second-class T road south.....	33 16 44.4	83 05 34.5
Harpers Corners, T road northeast, 60 feet west to corner yard fence, 45 feet southwest to corner of old store.....	33 16 39.7	83 06 39.8
Roads west and northwest, 40 feet northwest to pine, 40 feet northeast to G. S. Rives's mail box.....	33 17 10.0	83 07 05.8
Forks of second-class road northwest, 20 feet northwest to A. Richardson's mail box.....	33 17 37.0	83 08 01.2
Junction of Oconee Springs Ferry-Sparta road with road south to Sylvan Hill, iron post stamped "Prim. Trav. Sta. No. 24, 1906, Ga".....	33 17 30.0	83 08 56.3

Geographic positions along highways—Continued.

GLENFORD TO ROCKVILLE—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Forks of T road north, 10 feet northwest to peach tree.....	33 17 38.2	83 09 52.7
Oconee Springs Ferry, 0.3 mile east of; roads southwest and northwest, large post at corner of wire fence.....	33 17 06.7	83 10 55.9

MILLEDGEVILLE QUADRANGLE.

Magnetic declination: North border, 1° 26' east; south border, 1° 24' east; east border, 1° 30' east; west border, 1° 42' east.

Geographic positions along highways.

NEAR ISLAND CREEK CHURCH TO MILLEDGEVILLE.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Three corners, T road southwest, 25 feet south to fence corner, 30 feet west to small oak.....	33 13 58.9	83 09 04.5
Island Creek Church, 2 miles east of; 3 corners.....	33 13 04.0	83 09 36.0
Four corners, second-class road, 40 feet north to dead oak, 50 feet southwest to walnut.....	33 12 55.8	83 10 22.0
Island Creek Church, 0.25 mile north of; at southeast corner of voting house of 104th precinct, 200 feet southwest of fork to southeast, iron post stamped "Prim. Trav. Sta. No. 18, 1906, Ga.".....	33 12 32.7	83 11 03.4
Cotton gin, 200 feet east of; forks of road.....	33 12 27.9	83 11 34.4
Island Creek, 450 feet east of; forks of road, 35 feet south to pine, 40 feet west to dogwood.....	33 12 19.1	83 12 12.6
Four corners, second-class road north and south.....	33 12 05.6	83 13 13.1
Jackson schoolhouse, 3 corners, T road south, 100 feet northwest to corner of schoolhouse, 20 feet north to pine.....	33 12 08.1	83 13 51.7
Mount Moriah Church, 600 feet west of; 3 corners, T road south leading to Fraley's ferry.....	33 10 55.7	83 13 45.0
Fraley's ferry, 200 feet west of west landing, large poplar tree.....	33 09 57.6	83 14 16.9
Fraley's ferry, 1 mile southwest of; 4 corners, second-class crossroads.....	33 09 13.4	83 14 01.3
Four corners, second-class road east, 15 feet east to corner of plank fence, 40 feet southwest to water oak.....	33 07 59.6	83 13 49.2
Toby Creek, 600 feet south of; 4 corners at top of hill.....	33 06 50.5	83 13 57.3
Three corners, second-class road west, 20 feet west to corner of plank fence, 30 feet south to T road east.....	33 05 55.5	83 13 50.0
Milledgeville, 50 feet west of Georgia Railroad station; crossing of railroad and Jefferson streets.....	33 05 29.6	83 13 41.8
Milledgeville, southeast corner of iron picket fence at court-house, iron post stamped "Prim. Trav. Sta. No. 19, 1906".....	33 04 50.8	83 13 44.2
Milledgeville, center of court-house cupola.....	33 04 51.6	83 13 45.4

Geographic positions along highways—Continued.

MILLEDGEVILLE TO LINTON.

Station.	Latitude.	Longitude.
Milledgeville, 1.25 miles east of; 3 corners at store, T road south.....	° ' " 33 05 00.10	° ' " 83 12 34.3
Milledgeville, 2 miles east of; forks of road 300 feet east of milepost, roads northeast and east.....	33 05 21.0	83 11 46.1
Forks of road, second-class road northwest, pine tree....	33 05 28.8	83 10 55.4
Mount Teliah Church, 800 feet northeast of; roads northeast and east.....	33 04 49.6	83 09 42.5
Forks of roads west and northwest, 60 feet northwest to small pine, 20 feet northeast to peach tree.....	33 04 44.5	83 08 38.1
Four corners, second-class road crossing, 20 feet north to oak, 40 feet east to mail box.....	33 03 58.6	83 08 02.8
Milepost 8, 1,100 feet west of schoolhouse, southwest corner of 3 corners; iron post stamped "Prim. Trav. Sta. No. 20, 1906, Ga".....	33 03 09.7	83 07 19.6
Three corners at new schoolhouse, T road south.....	33 03 09.4	83 07 20.2
Allen's mill, 0.2 mile west of; roads west and southwest, 15 feet northwest to sweet gum, 15 feet northeast to locust..	33 02 52.7	83 06 14.9
Allen's mill, 0.2 mile east of; roads east and northeast, J. S. Lundy's mail box.....	33 03 16.2	83 05 35.0
Harmony Church, 4 corners at schoolhouse, 40 feet north to 2 dead oaks.....	33 03 08.7	83 04 17.0
Creek crossing, 200 feet east of; second-class road crossing..	33 02 31.8	83 03 18.0
Mount Pleasant Church, 3 corners, 100 feet west of milepost 15, 125 feet east of corner of church.....	33 02 10.9	83 02 03.6
Deepstep, 3 miles west of; Giles crossroads, 500 feet west of court-house 99th district, at junction of Milledgeville-Sanders road and Indian trail road leading north to Devereux; iron post stamped "Prim. Trav. Sta. No. 21, 1906, Ga".....	33 01 51.9	83 00 32.4
T road southwest, second class, 20 feet southwest to farm gate, 30 feet north to oak.....	33 02 27.7	83 00 54.7
Schoolhouse, 200 feet west of; roads northwest and west, 20 feet northeast to oak.....	33 03 10.7	83 01 16.8
Three corners, second-class T road east, mail box.....	33 03 53.2	83 01 28.0
Friendship Church, 40 feet west of; Hancock-Washington county line, 4 corners.....	33 04 51.5	83 01 50.0
Friendship Church, 1 mile east of; roads east and southeast, 60 feet northeast to dead pine, 50 feet southeast to pine.....	33 04 48.2	83 00 41.2
Friendship Church, 2 miles east of; roads south and northeast, forked pine.....	33 05 08.3	82 59 56.5
Linton, 1 mile south of; 180 feet east of milepost 16, T road north.....	33 06 05.5	82 58 56.4
Linton, 3 corners at T road south, 80 feet southeast to corner of post-office store, 30 feet north to corner of yard fence....	33 06 44.8	83 58 59.7

Geographic positions along highways—Continued.

LINTON TO GLENFORD.

Station.	Latitude.	Longitude.
Linton, 1.3 miles northwest of; 3 corners T road southwest, 10 feet south to center of bridge.....	° ' " 33 07 21.7	° ' " 83 00 08.1
Three corners, T road east, 12 feet northeast to gum tree, 12 feet west to rail fence.....	33 08 48.1	83 00 18.2
Junction of Milledgeville-Sparta and Linton roads, 3 corners.....	33 09 27.3	83 00 43.8
Three corners, 500 feet east of old 2-story house, second-class T road north.....	33 10 44.6	83 00 02.9
Zebulon Church, 600 feet southwest of schoolhouse at junction of Milledgeville-Sparta road with road to Sassenett's mills, 400 feet northwest of residence of G. E. Walker, in triangle at junction; iron post stamped "Prim. Trav. Sta. No. 22, 1906, Ga".....	33 11 02.6	82 59 52.9
Rock Creek, 0.2 mile north of; forks of road on top of hill..	33 11 48.3	82 59 46.6
Forks of road, second-class road east at bend of main road to west.....	33 12 22.6	82 59 54.0
Four corners, 40 feet west to pine, 60 feet south to peach tree.....	33 12 35.6	83 00 22.9
Four corners, second-class northeast-southwest road.....	33 13 05.2	83 01 11.4
Forks of road, second-class road southeast, 10 feet east to small bridge.....	33 14 14.4	83 01 50.4

IDAHO-OREGON.

TRIANGULATION STATIONS.

Cambridge, Carson, and Meadows quadrangles.

BOISE AND WASHINGTON COUNTIES, IDAHO; BAKER COUNTY, OREG.

Early in the season of 1907 G. T. Hawkins extended triangulation eastward from Sparta and Lookout stations, Baker County, Oreg., so as to control two 30-minute quadrangles in Idaho. Besides reoccupying the two base stations in Oregon, six new stations in Idaho were occupied and two points were located by intersections. Positions are based on the Baker City base and astronomic position.

LONE TREE, BOISE COUNTY, IDAHO.

(Not occupied.)

Tree nearest the top of divide between Long Valley and Weiser Valley on high summit which has a few trees on north end.

[Latitude 44° 39' 29.22". Longitude 116° 10' 15.55'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' " ° ' "	° ' " ° ' "	Meters.
Goodrich.....	81 08 24	260 53 11	4.46231
Rush.....	98 30 16	278 07 06	4.64698
Council.....	126 43 08	306 38 55	3.99451

VANWYCK, AT LINE OF WASHINGTON AND BOISE COUNTIES, IDAHO.

On Washington-Boise county line, on the main divide nearly due west of the village of Vanwyck on a high sharp peak at northern end of a high group of peaks. An old trail between Long Valley and Indian Valley crosses the divide half a mile north of the signal.

Signal and reference mark: Rock cairn 6 feet high, 6 feet in diameter at base.

Station mark: Aluminum tablet in solid rock 6 feet southwest of cairn.

[Latitude $44^{\circ} 31' 20.16''$. Longitude $116^{\circ} 09' 45.19''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stirgil.....	100 14 43.70	279 41 47.62	4. 7999055
Goodrich.....	109 56 01.21	289 40 27.74	4. 4940983
Rush.....	115 55 52.68	295 32 11.35	4. 6948304
Council.....	157 47 09.12	337 42 35.51	4. 3556739

COUNCIL, WASHINGTON COUNTY, IDAHO.

On a prominent peak about 6 miles east of Council Village, near head of Cottonwood Fork Weiser River. A trail leads up Cottonwood Fork to a sawmill, from which it is three hours' climb to top. The signal is on the highest peak of the group.

Signal and station mark: A cairn 6 feet high, 6 feet in diameter at base; aluminum tablet in rock under center.

[Latitude $44^{\circ} 42' 40.24''$. Longitude $116^{\circ} 16' 14.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goodrich.....	63 23 19.95	243 12 18.76	4. 3653958
Stirgil.....	79 34 02.47	259 05 36.93	4. 7354951
Rush.....	90 58 27.60	270 39 17.99	4. 5559421
Cuddy.....	99 34 07.45	279 12 22.69	4. 6163112
Lone Tree.....	306 38 55	126 43 08	3. 99451
Vanwyck.....	337 42 35.51	157 47 09.12	4. 3556739

CUDDY, WASHINGTON COUNTY, IDAHO.

On the highest peak of Cuddy Mountain. There are three peaks on west face of the range and this station is on the south one. The surrounding country is very rough and at the west toward Snake River the descent is abrupt. From Heath post-office a sheep trail leads up the canyon and to top of ridge 3 miles, thence to signal.

Signal and reference mark: A cairn 5 feet high, 6 feet in diameter at base, with small spruce tree in center.

Station mark: Aluminum tablet in large boulder 4 feet nearly west from cairn.

[Latitude $44^{\circ} 46' 18.65''$. Longitude $116^{\circ} 47' 08.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stirgil.....	36 55 13.42	216 48 30.72	4. 3224910
Lookout.....	65 25 36.95	245 04 46.48	4. 6346012
Sparta.....	106 31 43.21	286 08 30.77	4. 6552715
Council.....	279 12 22.69	99 34 07.45	4. 6163112
Rush.....	322 11 14.63	142 13 49.22	3. 8967734

GOODRICH, WASHINGTON COUNTY, IDAHO.

On a prominent bald hill about 2 miles southeast of Goodrich. Station is about center of hill at highest point.

Signal and reference mark: A cairn 5 feet high, 6 feet in diameter at base.

Station mark: Aluminum tablet in large boulder 9 feet nearly north from cairn.

[Latitude $44^{\circ} 37' 02.57''$. Longitude $116^{\circ} 31' 55.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stirgil.....	90 45 47.88	270 28 24.44	4. 5152698
Rush.....	125 39 51.14	305 31 43.69	4. 2738212
Council.....	243 12 18.76	63 23 19.95	4. 3653958
Loné Tree.....	260 53 11	81 08 24	4. 46231
Vanwyck.....	289 40 27.74	109 56 01.21	4. 4940983

IRONS POINT, WASHINGTON COUNTY, IDAHO.

(Not occupied.)

On well-known peak 1 mile southeast of Mineral post-office. Wagon road crosses ridge one-half mile south of signal.

Reference mark: Aluminum tablet cemented in solid rock 15 feet southeast of signal.

Station mark: Pine signal tree on north end of peak.

[Latitude $44^{\circ} 33' 05.41''$. Longitude $117^{\circ} 01' 46.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lookout.....	108 03 39	287 53 08	4. 31946
Sparta.....	147 07 44	326 55 01	4. 64687
Stirgil.....	221 17 37	41 21 12	4. 00931

RUSH, WASHINGTON COUNTY, IDAHO.

A prominent peak on south end of Cuddy Mountain, about 1 mile west of where Rush Creek leaves the mountain and about 10 miles north and 2 miles west of Cambridge. From Cambridge, follow Snake River road to point near gap in mountain; thence climb about 3,000 feet to top. There is no trail.

Signal and reference mark: A cairn 4 feet in diameter and 7 feet high.

Station mark: Aluminum tablet in solid rock 7 feet nearly south from signal.

[Latitude $44^{\circ} 42' 56.81''$. Longitude $116^{\circ} 43' 28.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stirgil.....	58 50 47.82	238 41 30.93	4. 3097896
Lookout.....	75 09 57.39	254 46 33.15	4. 6586696
Sparta.....	111 39 35.25	291 13 48.71	4. 7145332
Cuddy.....	142 13 49.22	322 11 14.63	3. 8967734
Council.....	27 039 17.99	90 58 27.6	4. 5559421
Lone Tree.....	278 07 06	98 30 16	4. 64698
Vanwyck.....	295 32 11.35	115 55 52.68	4. 6948304
Goodrich.....	305 31 43.69	125 39 51.14	4. 2738212

STIRGIL, WASHINGTON COUNTY, IDAHO.

On highest peak of Stirgil Mountain, about 6 miles northeast of Mineral post-office and 12 or 13 miles nearly west from Cambridge. From Mineral follow trail to top of the ridge; thence along top of ridge.

Signal and reference mark: A cairn 6 feet high, 6 feet in diameter at base.

Station mark: Aluminum tablet cemented in solid rock 5 feet northeast of cairn.

[Latitude $44^{\circ} 37' 14.02''$. Longitude $116^{\circ} 56' 40.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Irons Point.....	41 21 12	221 17 37	4. 00931
Lookout.....	87 27 22.11	267 13 15.43	4. 4250275
Sparta.....	133 52 54.48	313 36 26.98	4. 6304825
Cuddy.....	216 48 30.72	36 55 13.42	4. 322491
Rush.....	238 41 30.93	58 50 47.82	4. 3097896
Council.....	259 05 36.93	79 34 02.47	4. 7354951
Goodrich.....	270 28 24.44	90 45 47.88	4. 5152698
Vanwyck.....	279 41 47.62	100 14 43.7	4. 7999055

LOOKOUT, BAKER COUNTY, OREG.

On the summit of Big Lookout Mountain, a well-known high point near the head of Manning Creek. From Durkee or Express follow wagon road to the head of Manning Creek.

Station mark: A cairn 8 or 9 feet at base and 10 feet high.

[Latitude $44^{\circ} 36' 33.99''$. Longitude $117^{\circ} 16' 46.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lone Pine.....	113 52 32.67	293 33 04.86	4.6015032
Magpie.....	131 44 39.42	311 22 19.04	4.7475534
Little Lookout.....	143 56 39.86	323 53 01.94	4.0644696
Sparta.....	171 59 54.71	351 57 35.98	4.4923145
Imnaha.....	182 52 04.81	2 53 26.56	4.7049400
Cuddy.....	245 04 46.48	65 25 36.95	4.6346013
Rush.....	254 46 33.15	75 09 57.39	4.6586696
Stirgil.....	267 13 15.43	87 27 22.11	4.4250275
Iron Point.....	287 53 08	108 03 39	4.31946

SPARTA, BAKER COUNTY, OREG.

On the summit of a bald hill locally known as Little Baldy, about 1 mile north-northwest of Sparta, a small mining town 32 miles east-northeast of Baker City. A pole about 30 feet high, used for 4th of July purposes, is near summit of hill. This pole was not used for signal, but use was made of a cairn about 6 feet high on highest point.

Station mark: Bronze triangulation tablet set in solid rock under cairn.

[Latitude $44^{\circ} 53' 10.62''$. Longitude $117^{\circ} 20' 03.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lookout.....	351 57 35.98	171 59 54.71	4.4923145
Little Lookout.....	6 38 11.69	186 36 52.07	4.3331114
Lone Pine.....	65 34 51.51	245 17 39.76	4.5484964
Magpie.....	99 46 12.88	279 26 08.38	4.5792338
Imnaha.....	199 01 01.00	19 04 42.26	4.3225192
Cuddy.....	286 08 30.77	106 31 43.21	4.6552715
Rush.....	291 13 48.71	111 39 35.25	4.7145332
Stirgil.....	313 36 26.98	133 52 54.48	4.6304825
Iron Point.....	326 55 01	147 07 44	4.64687

IDAHO-UTAH-WYOMING.

TRIANGULATION STATIONS.

Cokeville, Evanston, Kemmerer, Montpelier, and Randolph quadrangles.

BEAR LAKE COUNTY, IDAHO; RICH COUNTY, UTAH; UINTA COUNTY, WYO.

During the season of 1907 George T. Hawkins extended triangulation northward from stations Bridger and Medicine, Uinta County, Wyo., so as to control three 30-minute quadrangles. Twelve stations were occupied and three points were located by intersections.

PARIS, BEAR LAKE COUNTY, IDAHO.

On high, rocky peak about 6 miles west of Paris, Idaho, on the Wasatch Range. From Paris follow trail up gulch to small lake on north side of peak, where good water and fine place to camp can be found.

Signal: A cairn 6 feet high, 4 feet in diameter, on west point of summit.

Station mark: Aluminum tablet cemented in solid rock 6 feet northeast of cairn.

[Latitude $42^{\circ} 12' 11.64''$. Longitude $111^{\circ} 32' 54.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Soda.....	180 01 38	0 01 38	4. 46468
Preuss.....	217 10 36.52	37 22 44.60	4. 6111118
Sublette.....	262 29 23.25	82 51 22.83	4. 6570059
Paris School.....	257 08 13	77 13 31	4. 07998
Lakeview.....	315 33 57.03	135 46 43.97	4. 5756778

PARIS SCHOOL, BEAR LAKE COUNTY, IDAHO.

(Not occupied.)

Center of the central tower on college building at Paris, Idaho.

[Latitude $42^{\circ} 13' 38.14''$. Longitude $111^{\circ} 24' 23.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Paris.....	77 13 31	257 08 13	4. 07998
Preuss.....	203 33 17	23 39 45	4. 51261
Sublette.....	264 30 26	84 46 42	4. 52428
Lakeview.....	333 45 49	153 52 53	4. 51826

PREUSS, BEAR LAKE COUNTY, IDAHO.

On the highest and sharpest peak of the Preuss Range, about 7 miles nearly east of Georgetown, Idaho, 1 mile east of Power reservoir, and 12 miles nearly north of Montpelier.

From Montpelier follow road toward Georgetown, but turn east and follow creek 4 miles to point near its head where good camp ground can be found; thence follow creek to top of saddle and sheep trail on ridge to station.

Signal: A cairn 6 feet high and 5 feet in diameter.

Station mark: Aluminum tablet cemented in solid rock 17 feet south of cairn.

[Latitude 42° 29' 44.91". Longitude 111° 14' 53.70".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Paris School.....	23 39 45	203 33 17	4. 51261
Paris.....	37 22 44. 60	217 10 36. 52	4. 6111118
Soda.....	82 22 26	262 10 16	4. 39622
Wyoming Peak.....	256 32 29	76 57 50	4. 72212
Sublette.....	322 49 38. 63	142 59 33. 49	4. 5248298
Lakeview.....	358 35 20. 66	178 36 03. 36	4. 7741109

SODA PEAK, BEAR LAKE COUNTY, IDAHO.

(Not occupied.)

A rock cairn on a high well-known peak (sometimes called Sherman Peak), about 10 miles south of Soda Springs station and 8 miles west of Georgetown.

[Latitude 42° 27' 56.44". Longitude 111° 32' 53.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Paris.....	0 01 38	180 01 38	4. 46468
Preuss.....	262 10 16	82 22 26	4. 39622
Sublette.....	297 17 24	117 39 27	4. 70444

LAKEVIEW, RICH COUNTY, UTAH.

A sharp peak about 2 miles east of Bear Lake and about 4 miles southwest of the corner of Utah and Idaho at boundary of Wyoming. The summit is sharp, bald, and rocky. A pack train can get to a good spring 100 yards north of station in grove of quaking-aspen trees.

Signal: A cairn 6 feet high and 5 feet in diameter.

Station mark: Aluminum tablet cemented in rock under center of cairn.

[Latitude $41^{\circ} 57' 38.89''$. Longitude $111^{\circ} 13' 50.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Paris.....	135 46 43.97	315 33 57.03	4. 5756778
Paris School.....	153 52 53	333 45 49	4. 51826
Preuss.....	178 36 03.36	358 35 20.66	4. 7741109
Sublette.....	209 49 48.36	29 58 57.55	4. 5768345
Coke.....	252 19 16.40	72 36 43.23	4. 5768584
Rock.....	270 29 00.75	90 45 50.93	4. 5415462
Fossil.....	296 42 02.15	117 05 53.91	4. 7443841
Nugget.....	308 00 35.51	128 16 51.95	4. 6328962

BRIDGER BUTTE, UINTA COUNTY, WYO.

At the northeast corner of the butte locally known as Bridger Butte, about 4 miles west of site of the abandoned Fort Bridger.

Station mark: Copper bolt cemented in rock set in ground.

[Latitude $41^{\circ} 17' 50.40''$. Longitude $110^{\circ} 27' 49.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
La Motte Peak.....	22 42 12.37	202 30 52.24	4. 7989716
Elizabeth Mountain.....	32 16 10.43	212 05 39.46	4. 6232448
Medicine Butte.....	99 33 14.11	279 15 39.35	4. 5758129
Sage Creek.....	299 51 00.03	120 04 18.12	4. 5126707
Gilbert Peak.....	348 44 47.41	168 49 40.71	4. 7293086
Chimney.....	126 15 02.99	305 58 12.29	4. 6426971
Cumberland.....	145 50 40.97	325 44 56.43	4. 3333824

CHIMNEY, UINTA COUNTY, WYO.

A prominent butte about 20 miles north of Evanston, Wyo., and 8 miles east of Randolph, Utah, on the Bear River divide. It has about an acre of level summit.

Signal: A cairn 7 feet high, 5 feet in diameter, on west end of butte.

Station mark: Aluminum tablet cemented in solid rock 7 feet northeast of signal.

[Latitude 41° 31' 49.49". Longitude 110° 53' 16.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Medicine Butte.....	4 40 32.33	184 39 46.38	4.2966026
Nugget.....	194 03 50.56	14 06 23.75	4.3411760
Fossil.....	222 52 37.33	43 02 43.71	4.4913700
Cumberland.....	288 57 48.08	109 08 55.04	4.3927804
Bridger.....	305 58 12.29	126 15 02.99	4.6426971

COKE, UINTA COUNTY, WYO.

On highest part of bald ridge, about 8 miles east and 1 mile south of Cokeville. Sheep trail on top of ridge passes close to station. Grove of tamarack about 2,000 feet south of station.

Signal: A cairn 6 feet high and 6 feet in diameter.

Station mark: Aluminum tablet in granite boulder 12.5 feet nearly west from cairn.

[Latitude 42° 03' 47.45". Longitude 110° 47' 46.01".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rock.....	5 57 22.51	185 56 46.89	4.0723859
Lakeview.....	72 36 43.23	252 19 16.40	4.5768584
Sublette.....	141 21 45.70	321 13 25.60	4.4370209
Fossil.....	339 45 52.37	159 52 21.01	4.5896474

CUMBERLAND, UINTA COUNTY, WYO.

The most prominent peak on ridge which runs from Kemmerer to the Union Pacific Railroad east of Little Muddy Creek, about 7 miles southwest of Cumberland and 4 miles north of Bridger station.

Signal: A cairn 7 feet high, 5 feet diameter, on highest part of peak.

Station mark: Aluminum tablet cemented in rock under center of cairn.

[Latitude 41° 27' 28.04". Longitude 110° 36' 30.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Medicine Butte.....	65 04 48.05	244 52 56.34	4.4406485
Chimney.....	109 08 55.04	288 57 48.08	4.3927804
Nugget.....	148 34 52.19	328 26 17.06	4.5366981
Fossil.....	175 57 44.86	355 56 42.50	4.4889665
Bridger Butte.....	325 44 56.43	145 50 40.97	4.3333824

FOSSIL, UINTA COUNTY, WYO.

On highest point of ridge about 2 miles long, 8 miles southeast of Fossil station, same distance southwest of Kemmerer, and 10 miles northwest of Cumberland.

Signal: A cairn 6 feet high and 5 feet in diameter.

Station mark: Aluminum tablet cemented in solid rock 6 feet north of cairn.

[Latitude $41^{\circ} 44' 04.85''$. Longitude $110^{\circ} 38' 04.23''$.]

To station--	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chimney.....	43 02 43.71	222 52 37.33	4.4913700
Nugget	84 57 16.87	264 49 42.85	4.1994342
Lakeview.....	117 05 53.91	296 42 02.15	4.7443841
Rock.....	149 25 21.99	329 18 18.35	4.4586238
Coke.....	159 52 21.01	339 45 52.37	4.5896474
Cumberland.....	355 56 42.50	175 57 44.86	4.4889665

MEDICINE BUTTE, UINTA COUNTY, WYO.

On the butte of same name (also called Alma Mountain), a few miles east of Alma and about 6 miles north of Evanston, Wyo.

Station mark: Copper bolt cemented in limestone rock on summit.

Reference point: Rock monument; distance 3.8 feet, true azimuth 173° .

[Latitude $41^{\circ} 21' 09.90''$. Longitude $110^{\circ} 54' 26.39''$.]

To station--	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kamas.....	18 29 16.19	198 17 51.24	4.8880062
Porcupine.....	24 39 22.57	204 31 22.53	4.6109744
Wanship.....	41 14 32.92	220 51 58.21	4.8645769
Bridger Butte.....	279 15 39.35	99 33 14.11	4.5758129
Gilbert Peak.....	320 44 12.65	141 06 35.92	4.8789648
Elizabeth Mountain.....	340 18 21.14	160 25 21.23	4.6461719
La Motte Peak.....	348 25 15.56	168 31 24.33	4.8168173
Chimney.....	184 39 46.38	4 40 32.33	4.2966026
Cumberland.....	244 52 56.34	65 04 48.05	4.4406485

NUGGET, UINTA COUNTY, WYO.

On prominent butte (sometimes called Elk Mountain), about 7 miles south of Nugget station, on Oregon Short Line Railroad.

Signal: A cairn 5 feet high, 3 feet in diameter, about 100 yards east of the west end of butte and on highest part.

Station mark: Aluminum tablet cemented in rock under center of cairn.

[Latitude $41^{\circ} 43' 19.17''$. Longitude $110^{\circ} 49' 26.35''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chimney.....	14 06 23.75	194 03 50.56	4. 3411760
Lakeview.....	128 16 51.95	308 00 35.51	4. 6328962
Rock.....	182 22 32.37	2 23 03.79	4. 4177749
Fossil.....	264 49 42.85	84 57 16.87	4. 1994342
Cumberland.....	328 26 17.06	148 34 52.19	4. 5366981

ROCK, UINTA COUNTY, WYO.

On knob on ridge east of Rock Creek, about 8 miles nearly north of Nugget station. A sheep trail passes over ridge near station.

Signal: A cairn 6 feet high and 5 feet in diameter.

Station mark: Aluminum tablet cemented in large boulder 6 feet north of cairn.

[Latitude $41^{\circ} 57' 26.61''$. Longitude $110^{\circ} 48' 39.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nugget.....	2 23 03.79	182 22 32.37	4. 4177749
Lakeview.....	90 45 50.93	270 29 00.75	4. 5415462
Sublette.....	154 24 30.73	334 16 46.85	4. 5648516
Coke.....	185 56 46.89	5 57 22.51	4. 0723859
Fossil.....	329 18 18.35	149 25 21.99	4. 4586238

SUBLETTE, UINTA COUNTY, WYO.

On highest point of Sublette Mountain, 5 miles north and 1 mile east of Border station, on Oregon Short Line Railroad, about 2 miles east of Wyoming-Idaho state boundary and $1\frac{1}{2}$ miles south of the canyon which cuts through the ridge. It is best approached from the west by climbing the spur 1.5 miles south of the mouth of the canyon and following the ridge to summit.

Signal: Scrub pine on north end of summit.

Station mark: "U.S.G.S." cut on large boulder with pile of rocks over it, 95 feet south from tree; true bearing from tree to station $341^{\circ} 48'$.

[Latitude $42^{\circ} 15' 19.28''$. Longitude $111^{\circ} 00' 11.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lakeview.....	29 58 57.55	209 49 48.36	4.5768345
Paris.....	82 51 22.83	262 29 23.25	4.6570059
Paris school.....	84 46 42	264 30 26	4.52428
Soda.....	117 39 27	297 17 24	4.70444
Preuss.....	142 59 33.49	322 49 38.63	4.5248298
Wyoming Peak.....	218 43 18	38 59 11	4.69741
Coke.....	321 13 25.60	141 21 45.70	4.4370209
Rock.....	334 16 46.85	154 24 30.73	4.5648516

WYOMING PEAK, UINTA COUNTY, WYO.

(Not occupied; sighted from two stations only.)

Cairn on a well-known high peak, a station of the Hayden Survey, in very rough country. For more complete description and additional azimuths and distances see page 654.

[Latitude $42^{\circ} 36' 16.59''$; $42^{\circ} 36' 15.95''$ (from east). Longitude $110^{\circ} 37' 23.74''$; $110^{\circ} 37' 22.57''$ (from east).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sublette.....	38 59 11	218 43 48	4.69741
Preuss.....	76 57 50	256 32 29	4.72212
Preuss (from east).....	76 56 57	.....	4.72215

ILLINOIS.

PRIMARY TRAVERSE.

Alto Pass, Carbondale, Duquoin, Herrin, Murphysboro, and Pinckneyville quadrangles.

FRANKLIN, JACKSON, PERRY, AND WILLIAMSON COUNTIES.

In cooperation with the State, the following geographic positions were determined by L. E. Tucker in 1906. A line was run from Fountain Bluff triangulation station of the Mississippi River Commission, following the Illinois Central Railroad east via Murphysboro and Carbondale to the southeast corner of Herrin quadrangle; thence, beginning with adjusted position at Carbondale, the line follows the Illinois Central Railroad to Duquoin; thence east along highway to adjusted position at northwest corner of Thompsonville quadrangle.

For the control of Murphysboro quadrangle, the line begins with adjusted position at Duquoin and follows public highways west to Denmark, where it turns south and is tied to Fountain Bluff triangulation station.

HERRIN QUADRANGLE.

Magnetic declination: South border, $4^{\circ} 41'$ east; north border, $4^{\circ} 48'$ east; west border, $5^{\circ} 21'$ east.

Geographic positions.

ALONG THE ILLINOIS CENTRAL RAILROAD.

Station.	Latitude.	Longitude.
	[°] ' "	[°] ' "
T. 9 S., R. 1 E., quarter corner between secs. 5 and 8.....	37 45 40.4	89 07 23.7
Four corners.....	37 45 39.4	89 05 42.3
Carterville, southwest part of yard of city school, 1 foot north of east-west sidewalk, 1.3 feet west of line of north-south cross walk across alley, 30 feet west of cinder walk south from schoolhouse, southwest corner of brick schoolhouse bears N. 57° E. 104 feet, iron post stamped "Prim. Trav. Sta. No. 31, 1906".....	37 45 52.7	89 04 46.1
T. 9 S., R. 1 E., northeast corner sec. 3, stone post in center of 4 corners.....	37 46 29.0	89 04 36.1
Road north, quarter corner between sections.....	37 46 28.7	89 02 55.7
Ts. 8 and 9 S., Rs. 1 and 2 E., lane north, stone post at corner.....	37 46 28.6	89 02 22.3
Bench mark 10, 1906, near northeast corner sec. 6, T. 9 S., R. 2 E.....	37 46 28.70	89 01 12.26
East-west road crossing about 2 miles north of Carbondale.....	37 45 39.4	89 13 11.7
Big Muddy River, about 2,000 feet south of bridge, east-west road crossing.....	37 46 54.8	89 13 21.1
Crossing of the Illinois Central Railroad and the St. Louis, Iron Mountain and Southern Railways.....	37 49 16.4	89 13 38.6
Ward station, road crossing.....	37 51 01.9	89 13 51.5
Ward, 1 mile north of station, east-west road crossing.....	37 51 52.0	89 13 57.6
Hollidaysboro coal mine, just south of, east-west road crossing.....	37 53 05.0	89 14 05.2
East and west road crossing.....	37 53 55.5	89 14 07.0
Elkville station, 1 foot north and 10 feet west of northeast corner of station platform, 12 feet east of northwest corner, 16 feet east of east rail of Illinois Central Railroad, and about 170 feet north of semaphore post, iron post stamped "Prim. Trav. Sta. No. 34, 1906".....	37 54 41.5	89 14 08.4
Elkville, 0.8 mile north of; east-west road crossing.....	37 55 18.6	89 14 10.0
East-west road crossing.....	37 58 23.3	89 14 16.9
T. 6 S., R. 1 W., sec. 29, on half section line; 3 corners....	37 58 23.3	89 14 15.8
Duquoin, 1.2 miles south of station; east-west road crossing.....	37 59 43.5	89 14 19.8

Geographic positions—Continued.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Blue Grass schoolhouse, just east of; in northeast corner of crossroads, at northeast corner sec. 20, T. 6 S., R. 1 E., iron post stamped "Prim. Trav. Sta. No. 33, 1906".....	37 59 41.7	89 06 47.8
T. 6 S., R. 1 E., near northeast corner sec. 20, nail in a blazed oak at southeast corner of crossroads bears due south 83 feet; nail in blazed oak at southwest corner of crossroads bears S. 36° W. 83 feet.....	37 59 41.5	89 06 48.0
T. 6 S., R. 1 E., near northeast corner sec. 21, T road north.....	37 59 42.6	89 05 41.5
T. 6 S., R. 1 E., northeast corner sec. 22, at road north.....	37 59 42.2	89 04 34.2
T. 6 S., R. 1 E., quarter corner between secs. 14 and 23, at road south.....	37 59 42.3	89 04 00.7
Three corners, roads south to Christopher, west to Duquoin, and north to Sisser station.....	37 59 42.1	89 03 10.4
T. 6 S., R. 1 E., point on township line in middle of north half of east line of sec. 24.....	37 59 28.6	89 02 20.4
T road south; 30 feet southeast to black locust tree.....	37 59 28.5	89 02 03.5
T. 6 S., R. 2 E., 3 corners on line between secs. 19 and 20, at a point midway between the north full corner and the quarter corner.....	37 59 28.6	89 01 13.1
T. 6 S., R. 1 E., north-south road crossing Illinois Central Railroad on section line between secs. 20 and 21.....	37 59 17.2	89 00 06.0
Residence of W. N. Wolf, on north side of; 150 feet south of Illinois Central Railroad, east of wagon road, iron post stamped "Illinois, 1906, Elev. 438".....	37 59 25.7	88 57 00.6
Herrin, about 1.1 miles south of; T road west to mine No. 2, stone.....	37 47 09.0	89 01 29.2
T. 9 S., R. 2 E., south of road at northeast corner of sec. 6 (a dead shellbark hickory in dooryard of Mr. Anderson is 95 feet southwest), iron post stamped "Prim. Trav. Sta. No. 10, 1906".....	37 46 28.7	89 01 12.3
T. 9 S., R. 2 E., northeast corner sec. 8, 200 feet southwest of Baptist Church.....	37 45 39.7	89 00 07.6

ALONG THE CHICAGO, BURLINGTON AND QUINCY RAILROAD.

Herrin, about 1 mile north of; east-west road crossing.....	37 49 12.7	89 00 55.4
Herrin, 0.5 mile north of; highway crossing northeast, north rail.....	37 48 50.7	89 01 28.5
Herrin, corner of Maple street and public road southeast ..	37 48 06.6	89 01 28.5

DUQUOIN QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Duquoin, west rail main east track Illinois Central Railroad, 37 feet northwest of northwest post of station.....	38 00 43.0	89 14 22.0
Duquoin, east brick wall of Exchange Bank of G. S. Smith & Co., about 4 feet above level of sidewalk and 3 feet south of east door of bank opening into Division street, aluminum tablet stamped "Prim. Trav. Sta. No. 32, 1906. Elev. 468".....	38 00 43.0	89 14 17.2
Duquoin, 0.6 mile southeast of; 5 corners.....	38 00 10.0	89 13 59.7
Ebenezer schoolhouse, opposite T road south, near center of sec. 12, T. 6 S., R. 1 W.....	38 00 09.5	89 11 46.5
Ebenezer, 0.8 mile northeast of; highway crossing Illinois Central Railroad, north rail.....	38 00 20.4	89 10 56.8
T. 6 S., R. 1 W., center sec. 11, T road north.....	38 01 01.9	89 10 39.6
T. 6 S., R. 1 W., near quarter corner between secs. 11 and 12, 4 corners.....	38 01 01.6	89 10 07.5
Three corners, road east to Benton, south to Mulkeytown, and west to Duquoin.....	38 01 01.0	89 09 34.4
Little Muddy River, center of iron bridge over.....	38 01 24.2	89 08 16.4
Little Muddy River, 1.2 miles east of; just south of Mr. Lindsay's house, 3 corners on line, between secs. 4 and 5, T. 6 S., R. 1 E.....	38 01 39.7	89 06 50.3
Kone Creek, schoolhouse, elbow corner.....	38 01 28.2	89 06 48.2
T. 6 S., R. 1 E., northeast corner sec. 8.....	38 01 28.3	89 06 48.4
T. 6 S., R. 1 E., 0.25 mile north of southeast corner sec. 8, crossroads.....	38 01 48.3	89 06 48.6

PINCKNEYVILLE QUADRANGLE.

Magnetic declination: South border, 5° 20' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Egyptian coal mine, just northeast of; L corner at about center of SE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 18, T. 6 S., R. 1 W., 20 feet northwest to honey locust tree.....	38 00 23.4	89 15 23.0
T. 6 S., R. 1 W., southwest corner NW. $\frac{1}{4}$ sec. 18.....	38 00 09.4	89 15 55.9
T road south, stone opposite in road.....	38 00 08.6	89 16 29.5
T. 6 S., R. 2 W., near quarter corner between secs. 14 and 15.....	38 00 09.1	89 17 52.7
T. 6 S., R. 2 W., center sec. 16, road south, private road north.....	38 00 10.6	89 19 32.5
T. 6 S., R. 2 W., quarter corner between secs. 17 and 18, T road south.....	38 00 12.1	89 21 12.3
T. 6 S., R. 2 W., center sec. 18, southwest corner of 4 corners; northeast fence corner bears N. 45° W. 6 feet; iron post stamped "Prim. Trav. Sta. No. 35, 1906".....	38 00 12.2	89 21 47.1
T. 6 S., Rs. 2 and 3 W., quarter corner on township line between secs. 13 and 18.....	38 00 12.7	89 22 20.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 6 S., R. 3 W., quarter corner between secs. 13 and 14, T road south.....	° ' " 38 00 15.2	° ' " 89 23 26.1
T. 6 S., R. 3 W., quarter corner between secs. 17 and 18.....	38 00 16.8	89 25 39.3
T. 6 S., R. 3 W., center of sec. 17, T road north.....	38 00 17.0	89 27 18.5
T. 6 S., R. 3 W., stone quarter corner between secs. 17 and 18, 18 feet to closing corner.....	38 00 17.5	89 27 51.4

CARBONDALE QUADRANGLE.

Geographic positions along Illinois Central Railroad.

Station.	Latitude.	Longitude.
T. 9 S., R. 1 W., northeast corner sec. 19, T road north.....	° ' " 37 43 51.3	° ' " 89 14 45.9
Carbondale, at northwest corner of Illinois Central Railroad park, 12 feet east of iron water stand, 2 feet east of iron fence, 6 feet south of iron fence, iron post stamped "Prim. Trav. Sta. No. 30, 1906".....	37 43 43.6	89 12 59.4
Carbondale, corner Spring and Oak streets, 30 feet north to north cross walk, 25 feet west to west sidewalk.....	37 43 45.3	89 13 28.0
Elbow corner, road south and west.....	37 43 45.5	89 11 58.8
Three corners, road south.....	37 43 39.1	89 11 04.5
T. 9 S., R. 1 W., near center of SW. $\frac{1}{4}$ sec. 13, 3 corners, road south.....	37 44 05.0	89 09 56.0
Jackson-Williamson county line at middle of south half of east line of sec. 13, T. 9 S., R. 1 W.....	37 44 05.1	89 09 05.5
Jackson-Williamson county line, road east to Cartersville, T. 9 S., R. 1 E., southwest corner sec. 7, stone post.....	37 44 47.5	89 09 05.0

ALTO PASS QUADRANGLE.

Magnetic declination: North border, 4° 48' east.

Geographic positions along Illinois Central Railroad.

Station.	Latitude.	Longitude.
North rail Illinois Central Railroad track, center of St. Louis, Iron Mountain and Southern Railway crossing ...	° ' " 37 42 40.2	° ' " 89 28 47.6
Sand Ridge junction, switch bar, on north rail of Illinois Central Railroad.....	37 44 02.4	89 27 03.9
Illinois Central Railroad bridge over Big Muddy River, center pier.....	37 44 55.8	89 26 09.5
Pleasant Grove Church, in front of; opposite Pleasant Grove schoolhouse, north side of road.....	37 44 08.4	89 17 09.9
T. 9 S., R. 2 W., at middle of west half of line between secs. 13 and 24, 35 feet southeast of mail box in front of Mr. Easterly's house, T road, east.....	37 43 53.9	89 16 53.1
T. 9 S., R. 2 W., northeast corner stone sec. 24, 33 feet north to road north on township line.....	37 43 51.2	89 16 00.2

MURPHYSBORO QUADRANGLE.

Magnetic declination: East border, 5° 21' east; north border, 5° 20' east; south border, 4° 48' east; west border, 5° 35' east.

Geographic positions.

ALONG ILLINOIS CENTRAL RAILROAD.

Station.	Latitude.	Longitude.
Private road crossing.....	37 45 32.9	89 25 58.3
Henson (J. G.), near house of; private road crossing.....	37 45 49.1	89 23 29.5
Murphysboro, 1 mile southwest of; 0.25 mile west of Mobile and Ohio Railroad crossing, 22 feet from east cattle guard, 34 feet from west cattle guard, south rail of Illinois Central Railroad at road crossing.....	37 45 02.0	89 21 04.9
Mobile and Ohio Railroad crossing.....	37 45 47.8	89 20 31.0
Murphysboro, in northwest corner of court-house yard, 1 foot south of north iron fence, 1.5 feet east of west iron fence, iron post stamped "Prim. Trav. Sta. No. 29, 1906".	37 45 50.9	89 20 06.1
T. 9 S., R. 2 W., quarter corner north side of sec. 9.....	37 45 41.5	89 19 59.6
Crossing Illinois Central Railroad.....	37 45 31.0	89 19 27.4
Corner Murphysboro-Jonesboro-Carbondale roads, west side of sec. 10, T. 9 S., R. 2 W.....	37 45 07.2	89 19 16.2

ALONG HIGHWAYS.

T. 6 S., R. 4 W., northeast corner sec. 24.....	37 59 52.7	89 28 59.3
Road south at Denmark.....	37 59 52.9	89 29 53.2
Denmark, 1 foot west of old brick church now owned by E. Anderson, 5 feet south of northwest corner; northeast corner of Free Baptist Church bears southwest 90 feet; iron post stamped "Prim. Trav. Sta. No. 36, 1906".....	37 59 52.6	89 29 53.0
T. 6 S., R. 4 W., quarter corner south side of sec. 23, T road east.....	37 59 01.3	89 30 40.3
T. 6 S., R. 4 W., quarter corner north side of sec. 35.....	37 58 08.8	89 30 40.7
T. 6 S., R. 4 W., northeast corner sec. 35.....	37 58 08.0	89 30 08.3
T. 6 S., R. 4 W., sec. 36, southeast corner L corner, road west and south.....	37 57 41.2	89 29 28.3
Ts. 6 and 7 S., Rs. 3 and 4 W., intersection of township line with Jackson-Perry county line, crossroads.....	37 57 14.6	89 29 03.0
T. 7 S., R. 3 W., quarter corner east side of sec. 6.....	37 56 47.3	89 27 58.3
Sugar Hill schoolhouse, northeast corner of; quarter corner north side of sec. 8, T. 7 S., R. 3 W.....	37 56 20.4	89 27 25.8
T. 7 S., R. 3 W., center sec. 8, T road east.....	37 55 54.2	89 27 26.5
T. 7 S., R. 3 W., northeast corner sec. 30.....	37 53 43.2	89 28 03.2
L corner, turn west at Mobile and Ohio Railroad crossing..	37 53 17.5	89 28 36.0
Ava, in southeast corner of Mobile and Ohio Railroad depot lot, 1 foot west of sidewalk, southeast corner of station, bears N. 76°, W. 82 feet; southeast corner of station platform is 30 feet north, northwest corner of cement sidewalk on south side of street is 47 feet south, iron post stamped "Prim. Trav. Sta. No. 37, 1906".....	37 53 18.9	89 29 40.0

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Ts. 7 and 8 S., Rs. 3 and 4 W., corner of townships, T road east.....	° ' " 37 51 59.3	° ' " 89 29 12.5
T. 8 S., R. 3 W., northeast corner NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 8, L corner.....	37 51 07.4	89 27 17.9
Sodom schoolhouse, T road east, at northeast corner of schoolhouse (church on southeast corner).....	37 49 48.4	89 27 20.2
T. 8 S., R. 3 W., northeast corner sec. 20.....	37 49 21.8	89 27 03.8
T road north, turn east.....	37 48 29.8	89 27 56.7
T road southeast across Kincaid Creek, turn southeast, ford creek.....	37 48 13.4	89 27 43.3
Waldbeiser schoolhouse (district 65), Jackson County, T road east.....	37 47 36.4	89 27 36.6
T. 8 S., R. 3 W., center sec. 32.....	37 47 10.2	89 27 43.2
East-west road crossing.....	37 45 27.4	89 26 51.7
Crossing of Illinois Central Railroad and St. Louis, Iron Mountain and Southern Railroad, station 9 (line from Fountain Bluff to bench mark 10).....	37 44 02.43	89 27 03.86
Fountain Bluff railroad station, 850 meters northeast of; 42 meters south of ruins of burnt house, 1,215 meters from river bank, in fence corner on inside of field, 16 meters northwest of railroad, flat stone (Mississippi River Commission bench mark 231, approximate United States standard).....	37 42 01.45	89 29 52.4

Eldorado, Galatia, and Harrisburg quadrangles.**FRANKLIN, HAMILTON, SALINE, AND WILLIAMSON COUNTIES.**

In cooperation with the State the following geographic positions on approximate United States standard datum were determined by L. E. Tucker in 1906. The line begins with adjusted position at Eldorado and follows southwest along the Big Four Railway to Harrisburg; thence west along highways to bench mark 3 at southwest corner of quadrangle; thence north to Akin; thence east to adjusted position at Dale.

ELDORADO QUADRANGLE.*Geographic positions along Big Four Railway.*

Station.	Latitude.	Longitude.
Eldorado, intersection of Louisville and Nashville Railroad and the Big Four Railway, center of track.....	° ' " 37 48 53.8	° ' " 88 26 04.1
Eldorado, 1 mile southwest of; road crossing.....	37 48 16.2	88 27 17.7
East-west road crossing.....	37 47 29.5	88 28 48.2

GALATIA QUADRANGLE.

Magnetic declination: South border, $5^{\circ} 36'$ east; west border, $3^{\circ} 48'$ east; north border, $4^{\circ} 11'$ east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Big Muddy Creek, east end of trestle No. 427 over.....	37 45 52.2	88 31 12.5
Three corners, road north to Akin.....	37 58 14.0	88 44 48.3
Akin, in sandstone block 4 by 8 inches and 3 feet long buried in ground, 15 feet northwest of northwest corner of Chas. Crisp's furniture store, 1.5 feet west of walk, 3 feet south of telephone pole; northeast corner of Chas. Crisp's main store is 85 feet west; southeast corner of McGuifer's store is 68.5 feet northwest, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1906".....	37 59 20.3	88 44 47.3
Franklin-Hamilton county line, northeast corner of sec. 25, T. 6 S., R. 4 E.....	37 58 53.6	88 42 18.7
Oak Grove Church, about 1 mile southeast of; 3 corners; road north, south, and east.....	37 58 27.6	88 41 12.8
Granville Hungate's residence, T road north.....	37 58 41.6	88 40 23.4
Little Spring Church, center of road opposite.....	37 58 27.1	88 38 34.9
T. 6 S., R. 5 E., center of west half of sec. 25, 5 feet south- east of corner stone, in sandstone post 8 by 6 inches by 3 feet, north of road at southeast corner of Perry S. Lee's orchard, southeast corner post of Lee's orchard is 6.4 feet southwest, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1906".....	37 58 27.3	88 36 28.7
T. 6 S., R. 5 E., center of east half, sec. 25, stone on north- south township line.....	37 58 27.3	88 35 39.6
T. 6 S., R. 6 E., southwest corner sec. 19, stone on township line, 30 feet northwest to black oak 8 inches in diameter, 30 feet southwest to telephone pole.....	37 58 54.6	88 35 39.4
T. 6 S., R. 6 E., northeast corner sec. 30, 20 feet northeast to large oak tree.....	37 58 54.5	88 34 33.2
T. 6 S., R. 6 E., northeast corner sec. 19.....	37 59 47.4	88 34 32.7
T. 6 S., R. 6 E., northeast corner sec. 20.....	37 59 47.3	88 33 27.1
T. 6 S., R. 6 E., northeast corner sec. 21.....	37 59 47.8	88 32 21.1
T. 6 S., R. 6 E., northeast corner sec. 22.....	37 59 48.3	88 31 13.8
Dale, about 1 mile southeast of; road crossing.....	37 59 06.70	88 29 10.50

HARRISBURG QUADRANGLE.

Magnetic declination: North border, $5^{\circ} 36'$ east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Harrisburg, in southwest corner of court-house yard, iron post stamped "Prim. Trav. Sta. No. 1, 1906".....	37 44 24.1	88 32 19.8
T. 9 S., R. 6 E., crossroads at center of sec. 17.....	37 44 24.9	88 34 00.2
T. 9 S., R. 6 E., quarter corner between secs. 17 and 18, T road south.....	37 44 24.4	88 34 33.5
T. 9 S., R. 5 E., northeast corner SE. $\frac{1}{4}$ sec. 13.....	37 44 25.6	88 35 44.2
T. 9 S., R. 5 E., middle of south line of NE. $\frac{1}{4}$ sec. 14.....	37 44 24.9	88 37 07.3
T. 9 S., R. 5 E., quarter corner east side of sec. 15.....	37 44 24.4	88 37 58.9
T. 9 S., R. 5 E., crossroads at middle of south line of NW. $\frac{1}{4}$ sec. 15, north of road, 1.5 feet south of fence corner post, 3 feet southeast of telephone pole, and 33.5 feet northeast of center of 4 corners, iron post stamped "Prim. Trav. Sta. No. 2, 1906".....	37 44 24.4	88 38 47.3
T. 9 S., R. 5 E., 4 corners at middle of south line NE. $\frac{1}{4}$ sec. 17.....	37 44 24.7	88 40 27.2
T. 9 S., R. 5 E., northwest corner SW. $\frac{1}{4}$ sec. 18, T road east on county line.....	37 44 24.0	88 42 21.7
T. 9 S., R. 4 E., quarter corner east side of sec. 15.....	37 44 23.8	88 44 33.4

Marion and West Frankfort quadrangles.

FRANKLIN AND WILLIAMSON COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1906 by L. E. Tucker.

The line for West Frankfort quadrangle starts from an adjusted position at the northeast corner of the quadrangle and follows public highways west to near northwest corner; thence south to southwest corner.

WEST FRANKFORT QUADRANGLE.

Magnetic declination: North border, $3^{\circ} 50'$ east; west border, $4^{\circ} 33'$ east; south border, $4^{\circ} 38'$ east; east border, $3^{\circ} 48'$ east.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 S., R. 4 E., center sec. 21, road corners.....	37 59 20.0	88 46 10.6
T. 6 S., R. 4 E., center sec. 20, 4 corners.....	37 59 20.0	88 47 17.5
T. 6 S., R. 3 E., quarter corner sec. 24.....	37 59 17.8	88 49 13.1
T. 6 S., R. 3 E., quarter corner east side of sec. 23, 4 corners.....	37 59 17.8	88 50 02.9
T. 6 S., R. 3 E., south half sec. 22, corner of the Benton, Thompsonville, and Akin roads bears northwest 63 feet, southwest corner of plank bridge on Akin road bears northeast 34 feet, sweet-gum tree blazed on north side and on east side of road, bears southeast 77 feet, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	37 59 06.0	88 51 38.7
T road, 3 corners.....	37 59 36.2	88 52 33.8
Benton, road crossing Chicago and Eastern Illinois Railroad.....	37 59 52.7	88 54 49.0
T. 6 S., R. 3 E., northwest corner sec. 19.....	37 59 43.4	88 55 41.8
T. 6 S., R. 2 E., near quarter corner north side of sec. 24, oak in yard bears northeast by north 66 feet, dead black-jack tree bears northwest 35 feet, quarter corner bears northwest by west 35 feet, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	37 59 41.6	88 56 14.7

NEAR WEST BORDER.

Four corners.....	37 58 49.4	88 56 29.9
T. 6 S., R. 2 E., stone at northeast corner sec. 35.....	37 57 56.6	88 56 46.6
T. 6 S., R. 2 E., quarter corner north side of sec. 35.....	37 57 56.2	88 57 19.9
T. 6 S., R. 2 E., southwest corner SE. $\frac{1}{4}$ sec. 35, 4 corners.....	37 57 03.5	88 57 20.5
Middle Branch, center of bridge over.....	37 55 52.0	88 57 36.2
T. 7 S., R. 2 E., northeast corner sec. 22, black locust post at road south.....	37 54 26.7	88 57 52.9
Public wells, road east.....	37 53 47.7	88 57 52.4
T. 7 S., R. 2 E., northeast corner sec. 34, 3 corners.....	37 52 39.4	88 57 52.6
T. 7 S., R. 2 E., center of S. $\frac{1}{2}$ sec. 33, at east-west road crossing of Chicago, Burlington and Quincy Railroad, iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	37 51 59.5	88 59 32.8

NEAR EAST BORDER.

South end of plank bridge at road corners.....	37 45 17.8	88 45 23.4
Four corners.....	37 45 56.6	88 45 22.6
T. 8 S., R. 4 E., northeast corner sec. 33, at Grant School, district No. 8.....	37 47 31.3	88 45 40.2
T. 8 S., R. 4 E., center of sec. 28.....	37 47 57.2	88 46 13.2
Corinth, one-half mile south of; center of 3 corners.....	37 48 49.1	88 46 37.5
Three corners, 25 feet northwest to large post.....	37 50 34.4	88 46 09.3

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Williamson-Franklin county line, middle of small bridge..	37 51 51.9	88 45 40.2
T. 7 S., R. 4 E., northeast corner sec. 33, T road east.....	37 52 44.5	88 45 39.1
T. 7 S., R. 4 E., northeast corner sec. 28.....	37 53 37.4	88 45 39.4
T. 7 S., R. 4 E., northeast corner sec. 21.....	37 54 29.8	88 45 39.6
Thompsonville, in school yard, 52.4 feet to southeast corner of schoolhouse, 79.6 feet to large elm tree in corner of yard, 82.9 feet northeast to elm tree in corner of yard across street, iron post stamped "Prim. Trav. Sta. No. 4, 1906"	37 54 57.3	88 45 40.2
Three corners, road east.....	37 56 45.4	88 45 07.0
T. 6 S., R. 4 E., center of S. $\frac{1}{2}$ sec. 27, 3 corners, 35 feet southeast to oak tree, 30 feet northeast to oak tree.....	37 57 43.8	88 45 05.1

MARION QUADRANGLE.

Magnetic declination: North border, 4° 38' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 9 S., R. 2 E., near northeast corner of sec. 16.....	37 44 44.8	88 59 00.0
T. 9 S., R. 2 E., northeast corner sec. 15.....	37 44 44.3	88 57 52.7
Marion, corner of road and North Court street, 25 feet southeast to maple tree at southwest corner of cemetery..	37 44 35.5	88 55 55.0
Marion court-house yard, center of north gate.....	37 43 55.2	88 55 35.3
T. 9 S., R. 3 E., northeast corner sec. 19.....	37 43 50.7	88 54 36.9
Crab Orchard Creek, center of steel bridge over.....	37 43 51.3	88 53 20.7
T. 9 S., R. 3 E., stone at northeast corner sec. 22.....	37 43 51.2	88 51 16.5
T. 9 S., R. 3 E., northeast corner sec. 22, at southwest corner of crossroads, stone at section corner bears northeast 47 feet, large dead oak on southeast corner bears east 58.5 feet, 2 feet north of fence line, iron post stamped "Prim. Trav. Sta. No. 11, 1906"	37 43 50.8	88 51 17.0
Road north.....	37 43 55.5	88 49 34.9
T road north.....	37 43 51.7	88 47 17.8
Crab Orchard, about 2.5 miles east of; 3 corners on Marion-Harrisburg road, in NW. $\frac{1}{4}$ sec. 21, T. 9 S., R. 4 E., southeast corner of red voting house bears northwest 75 feet, cherry tree bears east 20 feet.....	37 43 44.6	88 45 31.6
T. 9 S., R. 4 E., NW. $\frac{1}{4}$ sec. 15, south of 3 corners at T road north, 2 feet north of wire fence, 8.2 feet west to fence corner, 530 feet north to southeast corner of wagon shed, iron post stamped "Prim. Trav. Sta. No. 3, 1906"	37 44 17.8	88 45 24.7

Carlyle quadrangle.

BOND AND CLINTON COUNTIES.

In cooperation with the State, the following geographic positions were determined in July, 1907, by J. R. Ellis. The line starts from an adjusted position on the Breese quadrangle, 1.25 miles southwest of Bartelso, follows highways near south and east borders of Carlyle quadrangle to Boulder; thence northwest along highways to Keyesport; thence westward along highways near north border of quadrangle to primary traverse station No. 23, 1905, at Jamestown. A tie was also obtained at Geoffrey triangulation station of the Coast and Geodetic Survey.

Magnetic declination: South border, $4^{\circ} 06'$ east; east border, $4^{\circ} 54'$ east; north border, $4^{\circ} 28'$ east.

Geographic positions along highways near borders of quadrangle.

Stations.	Latitude.	Longitude.
Bartelso, 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. $76^{\circ} 45'$ E. 39.8 feet, iron post stamped "Prim. Trav. Sta. No. 25, 1905".....	$38^{\circ} 31' 44.8''$	$89^{\circ} 29' 02.8''$
Bartelso, 0.5 mile southeast of; crossroads, 33 feet southwest to corner fence post, 15 feet east to northwest corner small bridge.....	$38^{\circ} 31' 45.1''$	$89^{\circ} 28' 00.1''$
Stone quarter corner at crossroads.....	$38^{\circ} 31' 44.4''$	$89^{\circ} 26' 45.0''$
T. 1 N., R. 3 W., northeast corner sec. 17, T road south, 35 feet west to corner fence post.....	$38^{\circ} 32' 10.9''$	$89^{\circ} 26' 45.1''$
Geoffrey (Coast Survey) triangulation station, in Santa Fe Township, near center of NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 8, T. 1 N., R. 3 W., earthenware pyramid 6 by 6 inches placed 33 inches below surface marked "U. S. C. S." above which is a marble post 30 inches long, 6 inches square, its upper end even with ground, marked "U. S. C. & G. S." ^a	$38^{\circ} 32' 58.2''$	$89^{\circ} 26' 55.0''$
Stone quarter corner, crossroads.....	$38^{\circ} 31' 44.2''$	$89^{\circ} 26' 44.8''$
T. 1 N., R. 3 W., quarter corner east side of sec. 16, ditch north.....	$38^{\circ} 31' 43.9''$	$89^{\circ} 25' 38.1''$
T. 1 N., R. 3 W., stone quarter corner east side of sec. 15.....	$38^{\circ} 31' 45.2''$	$89^{\circ} 24' 30.0''$
Stable of Henry Waelz, southwest of; at point where road from Kaskaskia River ferry makes a turn at top of hill, iron post at corner stamped "Prim. Trav. Sta. No. 1, 1907, Illinois".....	$38^{\circ} 31' 09.6''$	$89^{\circ} 22' 53.6''$
Waelz, 1 mile east of; T road west.....	$38^{\circ} 30' 53.2''$	$89^{\circ} 21' 43.8''$
T road south at old frame house.....	$38^{\circ} 31' 45.8''$	$89^{\circ} 21' 26.3''$
Posey, 0.5 mile south of; crossroads, 40 feet northwest to Osage orange tree, 30 feet southeast to telephone pole....	$38^{\circ} 31' 46.1''$	$89^{\circ} 21' 09.5''$
Posey, 0.5 mile south and $\frac{1}{2}$ mile east of intersection of crossroads.....	$38^{\circ} 31' 46.6''$	$89^{\circ} 20' 19.2''$
T. 1 N., R. 2 W., northeast corner sec. 21, at turn of road....	$38^{\circ} 31' 21.4''$	$89^{\circ} 18' 37.5''$

^a Reference marks: Marble posts 32 inches long, 4 inches square, placed east and north of line of fence bordering the road, their upper surfaces 2 inches above level of ground, marked with arrows; to reference mark 474 feet; to east reference mark 714.7 feet; Parkinson, north reference mark, $50^{\circ} 24'$; Parkinson, east reference mark, $138^{\circ} 52''$. In 1882 the north reference mark was moved 9.4 feet west.

Geographic positions along highways near borders of quadrangle—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Crossroads at schoolhouse.....	38	31	35.2	89	16	57.0
Hoffman, 0.75 mile south of; east of T road west, 15 feet west and 6 feet south to stone at T road west, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Illinois".....	38	31	49.0	89	15	49.1
Hoffman, at southwest corner of L. Hussman's store, iron post stamped "Prim. Trav. Sta. No. 3, 1907, Illinois"....	38	32	29.1	89	15	48.0
T. 1 N., R. 2 W., quarter corner north side of sec. 12, center of intersection of crossroads.....	38	33	07.8	89	15	47.9
T. 1 N., R. 2 W., quarter corner north side of sec. 1, T road south, 24 feet north to corner fence post.....	38	34	00.1	89	15	47.4
Hoffman, 1.75 miles north of; T. 1 N., R. 2 W., quarter corner north side of sec. 1; iron post stamped "Prim. Trav. Sta. No. 4, 1907".....	38	34	00.3	89	15	47.2
T. 1 N., R. 2 W., northeast corner sec. 1, 20 feet south to center of small bridge, at crossroads.....	38	34	00.4	89	15	13.6
T. 2 N., R. 1 W., southeast corner sec. 31, T road north, 40 feet north to center of small bridge.....	38	33	56.9	89	14	03.9
T. 2 N., R. 1 W., northeast corner sec. 31, T road west, 44 feet south to center of small bridge.....	38	34	49.5	89	14	02.3
T. 2 N., R. 1 W., northeast corner sec. 30, crossroads.....	38	35	41.8	89	14	01.2
Ferren, Baltimore and Ohio Railroad crossing.....	38	36	25.1	89	13	59.8
T. 2 N., R. 1 W., northeast corner sec. 18, crossroads.....	38	37	26.7	89	13	58.2
Ferren, 2 miles north of; at northwest corner of crossroads, northeast corner sec. 7, T. 2 N., R. 1 W., iron post stamped "Prim. Trav. Sta. No. 5, 1907, Illinois".....	38	38	19.2	89	13	57.3
T. 3 N., R. 1 W., southeast corner sec. 31, T road north....	38	39	11.3	89	13	55.6
T. 2 N., R. 1 W., northeast corner sec. 6, T road south.....	38	39	11.3	89	13	56.5
T. 3 N., R. 1 W., northeast corner sec. 31, T road south, 10 feet east to center of bridge.....	38	40	04.0	89	13	54.8
T. 3 N., R. 1 W., quarter corner south side of sec. 20, crossroads.....	38	40	56.7	89	13	22.5
Boulder, in northeast part of; T road north.....	38	41	49.6	89	13	21.8
T. 3 N., R. 1 W., quarter corner north side of sec. 17, T road west.....	38	42	42.4	89	13	21.3
T. 3 N., R. 1 W., northeast corner sec. 7, 15 feet northeast to corner fence post.....	38	43	36.3	89	13	54.2
Keyesport, 0.5 mile south of; Chicago, Burlington and Quincy Railroad crossing.....	38	44	12.7	89	16	05.7
Clinton-Bond county line, Chicago, Burlington and Quincy Railroad crossing.....	38	44	31.6	89	16	28.4
Keyesport, 1.5 miles north of; north of wagon road, 56 feet west of west rail of Chicago, Burlington and Quincy Railroad at road crossing, iron post stamped "Prim. Trav. Sta. No. 6, 1907, Illinois".....	38	45	24.0	89	17	00.5
T. 4 N., R. 2 W., northeast corner sec. 34, 15 feet south to center of small bridge, crossroads.....	38	45	23.5	89	17	30.5
T. 4 N., R. 2 W., northeast corner sec. 33, T lane south....	38	45	23.0	89	18	37.2
Crossroads about 0.25 mile east of northeast corner sec. 32, T. 4 N., R. 2 W., 20 feet south to center of bridge.....	38	45	22.6	89	19	28.4

Geographic positions along highways near borders of quadrangle—Continued.

Station.	Latitude.	Longitude.
T. 4 N., R. 2 W., large stone at southeast corner sec. 32, T road west.....	38 44 29.8	89 19 38.3
T. 3 N., R. 2 W., northeast corner sec. 5, T road south, county line.....	38 44 29.8	89 19 45.5
Crossroads, 20 feet north to milk platform.....	38 44 29.2	89 20 34.8
T. 4 N., R. 3 W., southeast corner sec. 36, corner bears S. 30' E. 25 feet, iron post stamped "Prim. Trav. Sta. No. 7, 1907, Illinois".....	38 44 28.6	89 22 18.8
T. 3 N., R. 3 W., northeast corner sec. 2, T road south, 15 feet north to mulberry tree.....	38 44 27.8	89 23 25.4
T. 3 N., R. 3 W., northwest corner sec. 3, 40 feet west and 20 feet north to corner, at southeast corner of crossroads, 20 feet north and 10 feet west to southeast corner sec. 33, T. 4 N., R. 3 W., 21 feet west to corner fence post, iron post stamped "Prim. Trav. Sta. No. 8, 1907, Illinois".....	38 44 26.9	89 25 40.2
T. 4 N., R. 3 W., southeast corner sec. 33, T road north....	38 44 27.1	89 25 40.3
T. 3 N., R. 3 W., northeast corner sec. 4, T road south....	38 44 27.1	89 25 40.7
T. 4 N., R. 3 W., southeast corner sec. 32, 15 feet north to mail boxes.....	38 44 26.8	89 26 47.4
T. 3 N., R. 3 W., northeast corner sec. 4, T road south, 13 feet north to hedge tree.....	38 44 26.8	89 26 48.0
T. 4 N., R. 3 W., southeast corner sec. 31, north of county-line road, at T road south, 20 feet south to section corner, iron post stamped "Prim. Trav. Sta. No. 9, 1907, Illinois".....	38 44 26.7	89 27 54.9
T. 3 N., R. 3 W., northeast corner sec. 6.....	38 44 26.5	89 27 54.9
T. 3 N., R. 4 W., northeast corner sec. 1, T road E., 20 feet west to stone at corner of fence.....	38 44 25.9	89 28 54.9
Jamestown, near south line and 57 feet east of southwest corner of public school grounds; southwest corner of school building bears N: 5° E. 144 feet, in top of dressed limestone post 5 inches square and 2 feet high, aluminum tablet stamped "Prim. Trav. Sta. No. 23, 1905".....	38 43 59.7	89 31 06.9

Hardinville quadrangle.**CRAWFORD, JASPER, LAWRENCE, AND RICHLAND COUNTIES.**

In cooperation with the State, the following geographic positions were determined in July, 1907, by J. R. Ellis. The line starts from Claremont triangulation station, follows highways near south and east borders of quadrangle to Robinson; thence west along the Illinois Central Railroad via Oblong triangulation station to Willow Hill; thence southward along railroad and highways near west border of quadrangle to Claremont triangulation station.

Magnetic declination: South border 3° 42' east; east border 3° 36' east; west border 3° 36' east.

Geographic positions along highways and railroads near borders of quadrangle.

Station:	Latitude.	Longitude.
Claremont triangulation station of the Lake Survey and the Coast and Geodetic Survey, in sec. 29, T. 4 N., R. 14 W., German Township, 3 miles northwest of town of Claremont, on land of Brinkley heirs, two stone posts, one above the other in the usual manner ^a	38° 45' 28.55"	87° 59' 40.88"
T. 4 N., R. 14 W., northeast corner sec. 32, 20 feet south to corner fence post.....	38 44 49.1	87 59 03.2
T. 4 N., R. 14 W., northeast corner sec. 33, T road west at schoolhouse, 10 feet east to rail fence.....	38 44 48.8	87 57 55.1
T. 4 N., R. 14 W., quarter corner east side of sec. 27, crossroads, 15 feet north to center of bridge.....	38 45 15.1	87 56 47.2
T. 4 N., R. 14 W., quarter corner east side of sec. 26, center of crossroads.....	38 45 14.9	87 55 39.3
Richland-Lawrence county line, quarter corner east side of sec. 25, T. 4 N., R. 14 W., center of crossroads.....	38 45 14.7	87 54 31.4
Sumner, 2.25 miles north by 0.25 mile west of; west of road at T road east, 2 feet west to fence, 25 feet east to center of T road east, in top of concrete block 8 by 8 by 20 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1907, Illinois".....	38 44 47.8	87 51 58.4
T. 4 N., R. 13 W., northeast corner sec. 33, 25 feet south to corner fence post.....	38 44 47.7	87 51 06.9
T. 4 N., R. 13 W., northeast corner stone sec. 34, T road west at church.....	38 44 47.5	87 49 58.9
T. 4 N., R. 13 W., northeast corner sec. 35, center of T road south.....	38 44 44.0	87 48 55.7
T. 4 N., R. 13 W., northeast corner sec. 36, crossroads, 10 feet west to center of small bridge.....	38 44 43.8	87 47 48.1
T. 4 N., R. 12 W., stone corner sec. 31, T road south.....	38 44 44.8	87 46 42.8
Westport, 5.75 miles due south of; on east side of T road west at Fairview Church, in top of concrete block 8 by 8 by 20 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1907, Illinois".....	38 44 46.0	87 45 35.3
T. 4 N., R. 12 W., northeast corner sec. 32, center of T road west.....	38 44 45.9	87 45 35.5
T. 4 N., R. 12 W., northeast corner sec. 29, T road west....	38 45 39.2	87 45 35.4
T. 4 N., R. 12 W., northeast corner stone sec. 20, east-west fence.....	38 46 32.2	87 45 35.4
Center of T road east.....	38 46 44.2	87 46 38.5
T. 4 N., R. 12 W., northeast corner sec. 18, center of crossroads.....	38 47 23.4	87 46 41.8
Westport, 0.75 mile east of; intersection at T road west....	38 49 40.2	87 44 42.8
T. 5 N., R. 12 W., northeast corner sec. 28, center of county-line road at north-south fence.....	38 51 00.0	87 44 26.0
Crawford, 1 mile north of; Lawrence county line.....	38 51 54.8	87 43 52.1
T road east, southeast corner, 7 feet north and 4 feet west to maple tree, 35 feet north and 20 feet west to center of T road east, in concrete block, aluminum tablet stamped "Prim. Trav. Sta. No. 12, 1907, Illinois".....	38 52 57.9	87 43 52.7

^a Reference marks: One N. 67° 35' W., distant 23.1 meters; one N. 0° 39' W., distant 7.8 meters; one N. 71° 45' E., distant 24.6 meters from station mark; northwest corner of sec. 29 bears N. 60° 03' W., distant 847 meters.

Geographic positions along highways and railroads near borders of quadrangle—Cont'd.

Station.	Latitude.	Longitude.
Quarter corner at center of crossroads.....	38 53 40.5	87 43 53.1
T. 5 N., R. 12 W., 1,340 feet east of corner stone sec. 4, T road east on township line.....	38 54 41.6	87 44 10.4
T. 6 N., R. 12 W., northeast corner sec. 33, T road west, 25 feet due east to corner fence post.....	38 55 34.0	87 44 27.5
Road west at Indian boundary.....	38 56 19.8	87 44 51.8
New Hebron, T road just northeast of; 10 feet northeast to large black-oak tree.....	38 57 13.1	87 44 35.8
Lane east at turn of road.....	38 58 19.1	87 44 30.2
T. 6 N., R. 12 W., northeast corner sec. 9, T road west at schoolhouse, 12 feet east to corner of yard fence.....	38 58 59.3	87 44 19.2
T. 6 N., R. 12 W., northeast corner sec. 4, center of T road south, just east of entrance to Robinson fair grounds....	38 59 54.5	87 44 19.8
Robinson, in stone post at south entrance to court-house grounds, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1907, Illinois".....	39 00 18.2	87 44 21.6
Robinson, 2 miles west of; north-south road crossing on section line.....	39 00 05.5	87 46 37.2
Range-line road, crossing.....	39 00 08.7	87 47 47.0
T. 5 N., R. 13 W., northeast corner sec. 1, center of road at picket fence east, at corner of orchard.....	38 59 51.3	87 47 46.7
North-south road crossing at milepost 43.....	39 00 04.5	87 48 37.5
Stoy, road crossing at railroad station.....	38 59 45.9	87 49 59.7
Oblong triangulation station, in SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 32, T. 7 N., R. 13 W., stone post below surface with another over it as a surface mark "a".....	38 59 54.4	87 52 29.9
Oblong, range-line road crossing, 550 feet south of crossing is southeast corner sec. 36, T. 6 N., R. 14 W.....	38 59 56.7	87 54 31.5
Oblong, 1 mile west of; north-south road crossing.....	39 00 01.6	87 55 38.7
Oblong, 1.70 miles west of; Oblong-Willow Hill road crossing.....	39 00 04.2	87 56 20.3
Willow Hill, 3 miles east of; north-south road crossing.....	38 59 56.8	87 57 52.7
Willow Hill, 2 miles east of; road crossing.....	38 59 57.1	87 58 59.9
Willow Hill, 1 mile east of; north-south road crossing.....	38 59 57.5	88 00 06.9
Willow Hill, northwest corner of brick foundation of J. E. Jones's grain elevator, aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1907, Illinois".....	38 59 57.4	88 01 15.2
East-west street crossing.....	38 59 44.8	88 01 15.4
T. 6 N., R. 14 W., 11 E., northwest corner sec. 6, cross streets just west of township house.....	38 59 44.8	88 01 19.4
East-west road crossing, 770 feet south of milepost 17.....	38 58 00.2	88 01 13.0
Road crossing 500 feet north of milepost 16.....	38 57 20.6	88 01 13.2
Ste. Marie, road crossing 490 feet south of station.....	38 55 57.7	88 01 32.4
T. 5 N., fractional R. 11 E., northwest corner sec. 6, at corner of house.....	38 54 31.4	88 02 16.6

^a Reference marks: Three stone posts, one S. 44° 15' W., distant 125.7 meters; one S. 78° 32' W., distant 90 meters; and one N. 65° 13' W., distant 97.7 meters. Southeast corner sec. 32 is S. 73° 42' E., distant 325.6 meters.

Geographic positions along highways and railroads near borders of quadrangle—Cont'd.

Station.	Latitude.	Longitude.
T. 5 N., fractional Rs. 10 and 11 E., center of crossroads...	38 53 38.5	88 02 17.1
T. 5 N., fractional R. 11 E., northwest corner sec. 18, T road east.....	38 52 46.2	88 02 17.3
T. 5 N., fractional R. 11 E., northeast corner sec. 13, T road west.....	38 52 45.6	88 02 17.3
T. 5 N., fractional R. 11 E., northwest corner sec. 19, T road east.....	38 51 51.8	88 02 17.6
Olney, east base, T. 5 N., fractional R. 11 E., 3.5 miles east and 0.5 mile north of West Liberty Railroad station.....	38 51 44.1	88 01 35.1
T. 5 N., R. 14 W., northwest corner sec. 30, Richland- Jasper county line.....	38 50 59.5	88 01 23.8
T. 5 N., fractional R. 11 E., northeast corner sec. 30, at county line.....	38 50 59.0	88 01 23.8
T. 5 N., R. 14 W., northwest corner sec. 31, center T road east.....	38 50 06.6	88 01 24.2
T road south at Jos. Holmes's mail box.....	38 49 26.3	88 00 52.9
T. 4 N., R. 14 W., northeast stone corner sec. 7, crossroads at schoolhouse.....	38 48 21.1	88 00 10.7
T. 4 N., R. 14 W., southeast corner sec. 7, T road north...	38 47 28.3	88 00 10.9
T. 4 N., R. 14 W., northeast corner sec. 18, T road south...	38 47 28.3	88 00 09.8
Stone at T road north at schoolhouse.....	38 46 35.4	88 00 11.1

Baldwin, New Athens, and Okawville quadrangles.**ST. CLAIR AND WASHINGTON COUNTIES.**

In cooperation with the State, the following geographic positions were determined by J. R. Ellis in 1907. The line for Okawville quadrangle starts at a point located near the southwest corner of Carlyle quadrangle, follows highways near east, south, and west borders, and is tied to a point near southeast corner of Belleville quadrangle. The line for Baldwin and New Athens quadrangles starts from adjusted position of primary-traverse station No. 18, 1907, near Marissa, and follows highways west and north near borders of quadrangles to primary-traverse station No. 15, 1905, at Belleville.

OKAWVILLE QUADRANGLE.

Magnetic declination: East border, 4° 31' east; south border, 5° 13' east; west border, 5° 22' east.

Geographic positions along highways.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Center of T road east.....	38 31 18.2	89 26 44.7
T road west, corner sections, 20 feet west to center of small bridge.....	38 30 25.5	89 26 44.0
Kaskaskia River, center of bridge over.....	38 29 22.7	89 26 26.3
Stone, quarter corner between sections, at crossroads.....	38 28 41.0	89 26 10.2
Covington, southeast corner of NE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 9, T. 1 S., R. 3 W., T road west; 30 feet west to center of triangular grass plot.....	38 27 08.0	89 26 10.2
Covington, 1.75 miles west of; southeast corner NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 11, T. 1 S., R. 3 W.; stone at T road east.....	38 27 09.2	89 28 06.2
Pecan Grove Creamery, center sec. 18, T. 1 S., R. 3 W., T road north; 35 feet northwest to corner fence post, 35 feet northeast to hitch rock.....	38 26 29.8	89 28 06.5
T. 2 S., R. 4 W., northeast corner sec. 24; 10 feet south to northwest corner of bridge.....	38 26 04.2	89 28 39.6
T road west, northeast corner sec. 25, T. 2 S., R. 4 W.....	38 25 11.7	89 28 39.0
Addieville, 0.75 mile north of; northeast corner of SE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 36, T. 1 S., R. 4 W.; at southwest corner of T road west, iron post stamped "Prim. Trav. Sta. No. 15, 1907, Illinois".....	38 24 06.6	89 29 11.1
T. 2 S., R. 4 W., northeast corner sec. 13, center of T road south.....	38 21 42.2	89 28 36.1
T. 2 S., R. 4 W., northeast corner sec. 25, center of crossroads.....	38 19 57.7	89 28 36.9
T. 2 S., R. 4 W., southeast corner sec. 36.....	38 18 12.9	89 28 38.7
T. 3 S., R. 4 W., northeast corner sec. 12, T road north, 27 feet east to center of small bridge.....	38 17 20.7	89 28 39.6
T. 3 S., R. 4 W., 500 feet south of northwest corner of NE. $\frac{1}{4}$ sec. 13, north-south road crossing on Illinois Southern Railway, 0.75 mile south of water tank.....	38 16 24.2	89 29 13.5
Oakdale station, north of road and 21 feet west of road crossing Illinois Southern Railway, 10 feet northeast to warning post; iron post stamped "Prim. Trav. Sta. No. 16, 1907, Illinois".....	38 15 45.6	89 29 47.3

NEAR SOUTH BORDER.

Oakdale, 1.7 miles southwest of station, north-south road crossing.....	38 14 51.8	89 31 12.0
T road west, 15 feet east to corner fence post.....	38 15 02.7	89 31 45.4
Oakdale, 2.75 miles west of; northwest corner SW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 21, T. 3 S., R. 4 W., 0.75 mile south of T road east.....	38 15 04.6	89 33 09.0
T. 3 S., R. 4 W., northwest corner of SE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 20; turn of road, gas pipe.....	38 15 32.4	89 33 59.0
T. 3 S., R. 5 W., northeast corner sec. 25, center of T road west.....	38 14 54.0	89 35 33.3
T. 3 S., R. 5 W., northeast corner sec. 26; at crossroads, iron post stamped "Prim. Trav. Sta. No. 17, 1907, Illinois".....	38 14 53.0	89 36 38.4

Geographic positions along highways—Continued.

NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
T. 3 S., R. 5 W., northeast corner sec. 26; stone.....	38 14 53.1	89 36 38.8
T. 3 S., R. 5 W., northeast corner sec. 27, center of T road north.....	38 14 54.0	89 37 44.1
T. 3 S., R. 5 W., northeast corner sec. 28, center of T road at north-south fence.....	38 14 54.4	89 38 50.6
T. 3 S., R. 5 W., northeast corner sec. 29; crossroads, 15 feet south to center of bridge.....	38 14 54.9	89 39 56.4
T. 3 S., R. 5 W., northeast corner sec. 30, center of crossroads.....	38 14 54.6	89 41 03.3
Washington-St. Clair county line, northwest corner sec. 30, T. 3 S., R. 5 W.....	38 14 54.2	89 42 11.3
T. 3 S., R. 6 W., east corner secs. 24 and 25, center of T road west.....	38 14 55.9	89 42 11.3
T. 3 S., R. 6 W., southwest quarter sec. 24; 35 feet southwest to section corner, 7 feet northeast to corner of fence post, iron post stamped "Prim. Trav. Sta. No. 18, 1907, Illinois".....	38 14 57.1	89 43 16.6

NEAR WEST BORDER.

T. 3 S., R. 6 W., northwest corner of SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 13; at Oak Grove saloon, T road east, 13 feet east to center of bridge.....	38 16 30.4	89 43 18.1
T. 3 S., R. 6 W., northwest quarter of sec. 12, northwest-southeast road; at road south.....	38 17 34.4	89 43 18.2
T. 3 S., R. 6 W., northeast corner sec. 11.....	38 17 43.2	89 43 18.2
T. 3 S., R. 6 W., quarter corner north side of sec. 2.....	38 18 20.6	89 43 52.2
T. 2 S., R. 6 W., quarter corner south side of sec. 35.....	38 18 20.6	89 43 52.9
Darmstadt, quarter corner north side of sec. 35, T. 2 S., R. 6 W.; center of crossroads.....	38 19 14.4	89 43 53.3
T. 2 S., R. 6 W., northeast corner sec. 27, at turn of road..	38 20 08.8	89 44 26.7
T. 2 S., R. 6 W., northeast corner of NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 22; center of bridge over Little Mud Creek.....	38 21 02.6	89 44 43.2
Fayetteville, 2.5 miles east of; southeast corner NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec 10, T. 2 S., R. 6 W., in southeast corner of brick foundation of schoolhouse, aluminum tablet stamped "Prim. Trav. Sta. No. 19, 1907, Illinois.....	38 22 38.8	89.44 52.4
St. Libory, 1 mile northwest of; near southwest corner SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 12, T. 2 S., R. 6 W., T road north.....	38 22 26.7	89 43 20.6
T. 2 S., R. 6 W., northwest corner sec. 1.....	38 23 34.6	89 43 20.1
St. Clair-Washington county line, northeast corner sec. 1, T. 2 S., R. 6 W., T road west to corner of bridge.....	38 23 34.0	89 42 14.2
T. 2 S., R. 5 W., northeast corner sec. 6, center of T road north, at school.....	38 23 33.8	89 41 07.1
T. 2 S., R. 5 W., northeast corner sec. 32, T road north, 15 feet west to center of bridge.....	38 23 34.2	89 40 00.7

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
T. 2 S., R. 5 W., northeast corner sec. 4, crossroads.....	38° 23' 34".6	89° 38' 54".2
T. 2 S., R. 5 W., stone at northeast corner sec. 27, at turn of road just south of crossroads.....	38 25 20.4	89 37 48.4
T. 2 S., R. 5 W., southwest corner of NW. $\frac{1}{4}$ sec. 22, New Memphis-Nashville road, at road east to Walnut.....	38, 25 59.5	89. 38 34.4
Wittenburg, center of bridge over Kaskaskia River.....	38 26 42.9	89 39 49.4
New Memphis, Louisville and Nashville Railroad crossing, 640 feet west of station.....	38 27 29.0	89 40 36.6
North-south road crossing.....	38 27 36.0	89 41 09.3
Corner sections.....	38 27 30.3	89 41 09.3
Clinton-St. Clair county line; north-south road crossing...	38 27 50.0	89 42 15.8
T. 1 N., R. 6 W., quarter corner south side of sec. 35; stone at T road north.....	38° 28' 50.1	89 43 56.4
T. 1 N., R. 6 W., southwest corner of NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 35; center of crossroads.....	38 29 42.6	89 43 56.8
North-south road crossing of Southern Railway, 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

BALDWIN QUADRANGLE.

Magnetic declination: North border, 4° 56' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
T road north, stone.....	38° 14' 44.0	89° 44' 07.0
North Marissa, T road east.....	38 15 20.4	89 45 13.9
Marissa, 0.33 mile northwest of station, east-west road crossing Illinois Central Railroad.....	38 14 57.5	89 45 35.0
T. 3 S., R. 7 W., northeast corner sec. 29, center of east-west road at hedge fence north.....	38 14 57.8	89 46 37.3
T. 3 S., R. 7 W., northeast corner sec. 30, crossroads, 15 feet west to center of bridge.....	38 14 58.1	89 47 43.6
T. 3 S., R. 7 W., northwest corner sec. 30, 5 feet south to hedge tree.....	38 14 57.4	89 48 56.0
Doza Creek, center of iron bridge over.....	38 14 56.9	89 50 36.5
T. 3 S., R. 8 W., quarter corner east side of sec. 28, T road north.....	38 14 37.6	89 58 48.1
Red Bud, about 2 miles north of; 20 feet east and 27 feet south to quarter corner stone east side of sec. 27, T. 3 S., R. 8 W., in the northwest corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 21, 1907, Illinois".....	38 14 39.0	89 59 54.8

NEW ATHENS QUADRANGLE.

Magnetic declination: South border, $4^{\circ} 56'$ east; west border, $5^{\circ} 18'$ east.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
T. 3 S., R. 7 W., at center of sec. 22, 25 feet west and 6 feet north to center of crossroads, 6 feet southwest to nail in blaze on white-oak tree, iron post stamped "Prim. Trav. Sta. No. 20, 1907".....	38 15 24.3	89 51 42.2
T. 3 S., R. 7 W., quarter corner north side of sec. 22.....	38 15 50.6	89 51 42.7
Dutch Hill, 0.75 mile west and 0.5 mile south of; T road east, 22 feet due west to center of gate.....	38 16 29.6	89 51 42.8
T. 3 S., R. 7 W., quarter corner north side of sec. 10, center of crossroads.....	38 17 35.5	89 51 43.2
New Athens, 0.5 mile southeast of; forks of road, cross on telephone pole.....	38 19 02.4	89 52 16.8
New Athens, center of wagon bridge over Kaskaskia River.....	38 19 45.0	89 52 45.0
New Athens, 1.3 miles west of; stone at turn of road to south.....	38 19 42.0	89 54 13.1
St. Clair-Monroe county line, 0.75 mile north of; T road west at Charles Lindaur's mail box.....	38 19 06.0	89 55 35.6
St. Clair-Monroe county line, center of north-south road, 25 feet north to south side of straw stack.....	38 18 28.6	89 55 27.8
Hecker, about 3 miles east of; T road south at George Vogler's mail box.....	38 18 10.2	89 56 16.5
T. 3 S., R. 8 W., northeast corner stone sec. 14.....	38 16 45.2	89 56 37.8
T. 3 S., R. 8 W., corner northeast sec. 23, 20 feet due east to dead tree.....	38 15 53.5	89 56 37.4
T. 3 S., R. 8 W., 0.25 mile south of center sec. 23, crossroads, south end of small bridge.....	38 15 12.2	89 57 09.2

NEAR WEST BORDER.

Hecker, 1.75 miles south of; T road west, 15 feet south to west end of bridge.....	38 16 49.1	89 59 38.7
Hecker, crossroads.....	38 18 18.8	89 59 39.1
St. Clair-Monroe county line, stone at northeast corner sec. 5, T. 3 S., R. 8 W.....	38 18 30.8	89 59 55.6
Hecker, 1 mile north of; T road east, 25 feet due west to pole at fence corner.....	38 19 22.6	89 59 41.5
Schoolhouse, just east of; T road west.....	38 20 41.3	89 59 41.2
Schoolhouse, 0.8 mile north of; T road west.....	38 21 20.8	89 59 40.9
West Fork, center of bridge over.....	38 22 11.6	89 59 43.3
Smithton, 2 miles south of; northeast corner of T road east, 15 feet south and 5 feet west to quarter corner stone north side of sec. 9, T. 2 S., R. 8 W., iron post stamped "Prim. Trav. Sta. No. 22, 1907".....	38 22 52.7	89 59 23.9
Ts. 1 and 2 S., line between; center of road at fence east..	38 23 45.4	89 59 28.2

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
Smithton, in north part of; T street south, 30 feet west and 12 feet south to lamp-post.....	38 24 37.0	89 59 31.0
Douglas, T road east; 33 feet due west to small gate.....	38 25 29.0	89 58 56.1
T. 1 S., R. 8 W., northeast corner sec. 21, center of road at east-west fence.....	38 26 21.0	89 58 58.4
T. 1 S., R. 8 W., northeast corner sec. 9, center of road at east-west fence.....	38 28 05.0	89 58 59.1
T. 1 N., R. 8 W., stone at southeast corner sec. 33.....	38 28 59.6	89 59 00.5
T. 1 N., R. 8 W., northeast corner sec. 33.....	38 29 51.9	89 59 00.4

Baldwin, Chester, Renault, and Sparta quadrangles.

MONROE, RANDOLPH, AND ST. CLAIR COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1908 by J. R. Ellis. The line starts from primary traverse station mark No. 18, 1907, and follows highways near the east border of quadrangles to point 2 miles south of Blair; thence west to point near Missouri Junction, and north via Marigold, Ruma, and Red Bud, to primary traverse station mark No. 21, 1907.

BALDWIN QUADRANGLE.

Magnetic declination: South border, 4° 51' east; east border, 4° 57' east; west border, 5° 02' east.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Louis Krang's mail box, center of T road east at.....	38 00 43.1	89 45 52.3
Methodist Church, 0.2 mile west of; 20 feet north to center of bridge, T road north.....	38 00 30.5	89 46 59.8
T. 6 S., R. 6 W., quarter corner east side of sec. 18, T road south.....	38 00 30.9	89 47 33.2
T. 6 S., R. 7 W., northeast corner sec. 24.....	38 00 03.1	89 48 57.8
Ellis Grove, about 2 miles east of; near center of triangle formed by three large trees, forks of road at Joseph Labrie's farm, iron post stamped "Prim. Trav. Sta. No. 3, 1908, Illinois".....	38 00 19.2	89 52 50.0
Old Bluff Ferry, about 0.75 mile west of; at corner of Jeff Derouse's garden, at forks of road, iron post stamped "Prim. Trav. Sta. No. 4, 1908, Illinois".....	38 01 11.6	89 58 32.5
St. Louis road, at fork of road up bluff.....	38 01 41.3	89 59 19.6

Geographic positions along highways—Continued.

NEAR WEST BORDER.

Station.	Latitude.	Longitude.
Ruma, 1.5 miles south of; 20 feet east and 20 feet north to center of T road east; iron post stamped "Prim. Trav. Sta. No. 6, 1908, Illinois" (elev. 522).....	° ' " 38 07 00.6	° ' " 89 59 55.4
T. 5 S., R. 8 W., northeast corner sec. 5, center of T street south.....	38 08 06.4	89 59 54.4
Ruma, 25 feet north and 30 feet west to southeast corner sec. 32, T. 4 S., R. 8 W., iron post stamped "Prim. Trav. Sta. No. 7, 1908, Illinois" (elev. 442).....	38 08 06.2	89 59 51.9
Red Bud, 1.5 miles south of; 30 feet north and 30 feet west to center of crossroads; iron post stamped "Prim. Trav. Sta. No. 9, 1908, Illinois" (elev. 460).....	38 11 36.3	89 59 37.5
T. 4 S., R. 8 W., northeast corner sec. 17.....	38 11 36.7	89 59 54.4
Red Bud, just east of station, Main street crossing Mobile and Ohio Railroad.....	38 12 57.8	89 59 38.4
Red Bud, at west side of Main street and just north of Mobile and Ohio Railroad, iron post stamped "Prim. Trav. Sta. No. 10, 1907, Illinois" (elev. 444).....	38 12 58.8	89 59 38.8
Randolph-St. Clair county line, gate post supporting iron gate.....	38 13 20.6	89 59 33.3
T. 3 S., R. 8 W., stone at northeast corner sec. 32.....	38 14 12.8	89 59 54.6

CHESTER QUADRANGLE.

Magnetic declination: North border, 4° 51' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
New Palestine, 0.5 mile southwest of; center of T road west.....	° ' " 37 59 37.0	° ' " 89 49 14.2
New Palestine, 0.3 mile south and 0.8 mile west of; 7 feet northwest to stone corner, center of T road east.....	37 59 38.2	89 50 19.9
Guide board, "Ellis Grove 1½ miles, Preston 8," 20 feet east to white oak, T road west.....	37 59 32.0	89 53 23.8
T. 6 S., R. 7 W., quarter corner north side of sec. 29.....	37 59 13.4	89 53 57.4
Reily Lake schoolhouse, road opposite.....	37 58 43.6	89 54 53.4
Reily Lake, 0.5 mile northwest of station; road crossing Illinois Southern Railway.....	37 59 09.2	89 55 39.0
Reily Lake, 0.4 mile west of station, 21 feet northwest of blazed tree, about 200 feet south of St. Louis, Iron Mountain and Southern Railway, spike in top of elm post.....	37 58 59.4	89 55 35.3
St. Louis road, at center of T road east, Reily Lake Ferry over Kaskaskia River.....	37 59 07.4	89 57 19.8
St. Louis road, crossing under St. Louis, Iron Mountain and Southern Railway.....	37 59 51.1	89 57 36.8

RENAULT QUADRANGLE.

Magnetic declination: East border, $5^{\circ} 02'$ east.*Geographic positions along highways near east border.*

Station.	Latitude.	Longitude.
	[°] ['] ["]	[°] ['] ["]
Glasgow farm, 23 feet due south to well, T road northeast..	38 02 31.4	90 00 57.4
John A. Mudd's residence, center of T road southwest.....	38 02 59.0	90 00 17.2
T. 5 S., R. 8 W., quarter corner north side of sec. 29.....	38 04 34.3	90 00 29.6
Marigold, in southeast part of schoolhouse yard, iron post stamped "Prim. Trav. Sta. No. 5, 1908, Illinois" (elev. 565).....	38 04 47.9	90 00 23.3
Marigold, 1 mile north of, center of T road west.....	38 05 41.7	90 00 28.5
Camp Creek, center of bridge over.....	38 06 21.8	90 00 11.8
Ruma, 1.8 miles north of; 20 feet south and 20 feet east to center of T road west, iron post stamped "Prim. Trav. Sta. No. 8, 1908, Illinois" (elev. 419).....	38 09 25.8	90 00 07.3

SPARTA QUADRANGLE.

Magnetic declination: West border, $4^{\circ} 57'$ east.*Geographic positions along highways near west border.*

Station.	Latitude.	Longitude.
	[°] ['] ["]	[°] ['] ["]
Center of crossing of north-south and northwest-southeast roads.....	38 14 12.1	89 43 16.9
White Oak station, road crossing Illinois Central Railroad..	38 13 41.1	89 43 33.3
St. Clair-Randolph county line, northeast corner sec. 2, T. 4 S., R. 6 W.....	38 13 10.1	89 43 18.7
Scotland schoolhouse, 0.25 mile north of; center of crossroads.....	38 12 17.1	89 43 01.4
T. 4 S., R. 6 W., northeast corner sec. 14.....	38 11 24.8	89 43 18.6
T. 4 S., R. 6 W., quarter corner north side of sec. 14; T road south.....	38 11 25.0	89 43 52.4
T. 4 S., R. 6 W., stone at quarter corner north side of sec. 23, crossroads.....	38 10 32.9	89 43 52.1
T. 4 S., R. 6 W., quarter corner north side of sec. 26, 15 feet south to bridge, T road east.....	38 09 40.8	89 43 52.6
Sparta, 1 mile north of; at east side of T road west, 20 feet west to center of sec. 36, T. 4 S., R. 6 W., iron post stamped "Prim. Trav. Sta. No. 1, 1908, Illinois".....	38 08 20.6	89 42 44.7
Twps. 4 and 5 S., R. 6 W., quarter corner north side of sec. 1, T road east.....	38 07 56.0	89 42 44.9
Sparta, about 400 feet west of station, north-south road crossing Mobile and Ohio Railroad.....	38 07 14.2	89 42 45.0
T. 5 S., R. 6 W., northeast corner sec. 14.....	38 06 12.5	89 43 18.9
T. 5 S., R. 6 W., about 0.3 mile west of northeast corner sec. 23, center of crossroads.....	38 05 20.2	89 43 45.7

Geographic positions along highways near west border—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Blair, 2 miles north of; center of crossroads.....	38 04 27.3	89 44 17.6
T. 6 S., R. 6 W., northeast corner sec. 34.....	38 03 34.1	89 44 28.5
Blair, northeast corner sec. 3, T. 6 S., R. 6 W, center of crossroads.....	33 02 41.4	89 44 29.3
Blair, 2 miles south of; 25 feet west and 15 feet south to center of crossroads, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Illinois".....	38 00 59.1	89 44 28.1

Albion, Carmi, Enfield, and New Haven quadrangles.**EDWARDS, WAYNE, AND WHITE COUNTIES.**

In cooperation with the State, the following geographic positions were determined in 1908 by J. R. Ellis. The first line starts from an adjusted position at Grayville and follows public highways west to Burnt Prairie; thence south near borders of quadrangle to southwest corner of Carmi quadrangle and east to adjusted position 2 miles south of Maunie. The second line starts from an adjusted position at Maunie and follows public highways north to the original position at Grayville.

CARMI QUADRANGLE.

Magnetic declination: North border, 3° 35' east; south border, 3° 44' east; east border, 3° 41' east; west border, 3° 38' east.

*Geographic positions along highways.***NEAR SOUTH BORDER.**

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge, 600 feet east of center of; T road north.....	38 00 01.4	88 14 06.9
Little Wabash River, west bank of; at old ferry landing....	38 00 28.8	88 11 47.2
Storms, center of T road south.....	38 00 26.0	88 10 46.0
Storms, 1 mile east of; center of T road north.....	38 00 27.0	88 09 39.4
T. 6 S., R. 11 E., on east line sec. 14 T road north.....	38 00 11.2	88 03 36.4
T. 6 S., R. 10 E., quarter corner east side of sec. 13, center of bridge.....	38 00 10.6	88 02 30.2
Maunie, 2 miles south of; center of T road north.....	38 00 02.60	88 02 30.30

Geographic positions along highways—Continued.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Maunie, 1.5 miles north of; center of crossroads.....	38 03 26.5	88 02 44.7
T. 5 S., R. 10 E., northeast corner sec. 25, crossroads.....	38 04 05.5	88 02 27.8
T. 5 S., R. 10 E., stone at northeast corner sec. 24.....	38 04 57.4	88 02 27.2
Maunie, 3 miles north of; west side of T road east, iron post stamped "Prim. Trav. Sta. No. 28, 1908, Illinois".....	38 04 58.6	88 02 27.5
Wooden bridge, just north of T road northeast, 22 feet east to tree.....	38 04 57.0	88 01 12.5
T road east to ford on Wabash River, 15 feet east to honeylocust tree.....	38 05 40.3	88 01 00.2
T. 5 S., R. 14 W., stone at northeast corner sec. 7.....	38 06 54.2	88 00 45.3
Phillipstown, about 2 miles south of; in southwest part of Dick Pond School yard, iron post stamped "Prim. Trav. Sta. No. 29, 1908, Illinois" (elev. 378).....	38 07 07.7	88 00 44.8
T. 5 S., R. 14 W., northeast corner sec. 6, T road south.....	38 07 46.0	88 00 44.6
Phillipstown, center of T road east at store.....	38 08 35.6	88 01 15.8
Phillipstown, 1 mile north of; 35 feet west and 45 feet south to center of crossroads, iron post stamped "Prim. Trav. Sta. No. 30, 1908, Illinois".....	38 09 30.4	88 01 21.8
T. 4 S., R. 14 W., northeast corner sec. 19, sandstone.....	38 10 22.1	88 00 42.8
Calvin, 1 mile south and 0.3 mile west of station, 15 feet north and 15 feet east to center of T road, iron post stamped "Prim. Trav. Sta. No. 31, 1908, Illinois".....	38 11 40.2	88 01 20.0
Calvin, 140 feet northeast of station, north-south road crossing Big Four Railway.....	38 12 36.5	88 01 02.6
Joseph Bump's farm, road crossing Big Four Railway.....	38 13 52.4	88 00 09.0

ALBION QUADRANGLE.

Magnetic declination: South border, 3° 35' east.

Geographic positions along highways near south border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Grayville, in southeast corner of Williamson Hotel grounds, iron post stamped "Prim. Trav. Sta. No. 21, 1908, Illinois".....	38 15 35.1	87 59 29.1
Grayville, across the street from station on east side of Illinois Central Railroad, iron post stamped "Prim. Trav. Sta. No. 32, 1908, Illinois".....	38 15 30.7	87 59 26.5
Grayville, Big Four Railway station.....	38 15 36.9	87 59 29.4
T. 3 S., R. 14 W., northwest corner sec. 19, center of T road east.....	38 15 24.9	88 01 36.6
T. 3 S., R. 11 E., fraction, northeast corner sec. 19, center of T road west.....	38 15 23.5	88 01 36.6
Grayville, 3.5 miles west of; center of T road south.....	38 15 23.9	88 03 26.8

Geographic positions along highways near south border—Continued.

Station.	Latitude.	Longitude.
White-Edwards county line, northeast corner sec. 22, T. 3 S., R. 10 E., center of crossroads	° ' " 38 15 24.2	° ' " 88 04 32.5
White-Edwards county line, northeast corner sec. 21, T. 3 S., R. 10 E., center of T road north	38 15 24.3	88 05 38.9
T. 3 S., R. 10 E., northeast corner sec. 16, stone at center of crossroads	38 16 16.3	88 05 38.4
T. 3 S., R. 10 E., northeast corner sec. 17	38 16 16.5	88 06 44.5
T. 3 S., R. 10 E., northeast corner sec. 18, center of T road north	38 16 16.8	88 07 49.1
Wayne-Edwards county line, near; 1 mile south to line of White County, at northeast corner of T road east, 10 feet west and 20 feet south to corner sec. 7, T. 3 S., R. 10 E. on county line, iron post stamped "Prim. Trav. Sta. No. 22, 1908, Illinois"	38 16 17.7	88 08 58.2
T. 3 S., R. 9 E., northeast corner sec. 14	38 16 15.9	88 10 05.1
T. 3 S., R. 9 E., northeast corner sec. 15, center of cross- roads	38 16 19.3	88 11 10.6
T. 3 S., R. 9 E., northeast corner sec. 16	38 16 19.1	88 12 16.2
Gum store, center of crossroads at	38 16 19.7	88 12 48.8
T. 3 S., R. 9 E., stone at northeast corner sec. 17	38 16 20.2	88 13 21.9
T. 3 S., R. 9 E., quarter corner east side of sec. 18, 20 feet east to center of T road west	38 15 54.9	88 14 29.3
Burnt Prairie, 0.3 mile north of; on White-Wayne county line at turn of road, iron post stamped "Prim. Trav. Sta. No. 23, 1908, Illinois"	38 15 28.8	88 15 24.4

ENFIELD QUADRANGLE.

Magnetic declination: East border, 3° 38' east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
Burnt Prairie, 1 mile south of; center of T road east	° ' " 38 14 11.0	° ' " 88 15 15.3
Burnt Prairie, 2 miles south of; center of crossroads	38 13 31.7	88 15 05.0
T. 3 S., R. 9 E., southwest corner sec. 31, T road north	38 12 51.7	88 15 37.7
T. 4 S., R. 9 E., northwest corner sec. 6	38 12 51.7	88 15 38.2
Frasers, 0.8 mile north of store, center of T road east	38 12 37.6	88 17 01.4
Frasers store, center of T road east	38 11 45.3	88 17 02.2
Crossroads schoolhouse, center of T road west	38 10 40.6	88 17 03.7
Skillet Creek, United States Department of Agriculture drainage, 360 feet southwest of bridge at turn of road, iron post stamped "384" (elev. 383.6)	38 09 50.6	88 17 04.6
Ball, 0.5 mile north of store, T road west	38 09 02.0	88 16 49.1
T. 4 S., R. 8 E., northeast corner sec. 35, stone at turn of road	38 08 30.4	88 16 50.2

Geographic positions along highways near east border—Continued.

Station.	Latitude.	Longitude.
Ball, 1 mile south of store, at turn of road at township line, 6 feet north and 4 feet east to southeast corner sec. 35, T. 4 S., R. 8 E., iron post stamped "Prim. Trav. Sta. No. 24, 1908, Illinois".....	38 07 37.8	88 16 51.2
T. 5 S., R. 8 E., northeast corner sec. 2, T road south.....	38 07 37.8	88 16 50.2
T. 5 S., R. 8 E., northeast corner sec. 11, center of T road east.....	38 06 45.0	88 16 50.8
T. 5 S., R. 8 E., northeast corner sec. 14.....	38 05 53.1	88 16 51.6
Milepost 198, north-south road crossing Louisville and Nashville Railroad.....	38 05 23.2	88 16 51.7
T. 5 S., R. 8 E., northeast corner sec. 23, center of T road east at schoolhouse No. 6.....	38 05 01.6	88 16 51.6
T. 5 S., R. 8 E., northeast corner sec. 26, center of crossroads.....	38 04 09.5	88 16 52.6
T. 5 S., R. 8 E., northeast corner sec. 35, center of crossroads.....	38 03 17.7	88 16 53.6
T. 5 S., R. 8 E., southeast corner sec. 35, 10 feet east to crossroads.....	38 02 25.3	88 16 54.8
T. 6 S., R. 8 E., northeast corner sec. 2.....	38 02 25.3	88 16 54.5
T. 6 S., R. 8 E., northeast corner stone sec. 11.....	38 01 33.2	88 16 54.6
Ditney School, northeast corner stone sec. 26, T. 6 S., R. 8 E., center of crossroads.....	37 59 48.1	88 16 54.3
Ditney Church, southwest corner of yard, 30 feet west and 30 feet south to quarter corner west side of sec. 24, T. 6 S., R. 8 E., at crossroads, iron post stamped "Prim. Trav. Sta. No. 25, 1908, Illinois".....	37 59 22.0	88 16 53.9
Anna B. Poole, T road east, 21 feet southwest to mail box..	37 59 22.4	88 15 48.4

NEW HAVEN QUADRANGLE.

Magnetic declination: North border, 3° 44' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Anna B. Poole's, 1.3 miles east of; center of T road west..	37 59 21.6	88 14 23.8
T. 6 S., R. 9 E., northeast corner sec. 21.....	37 59 47.6	88 12 26.9
Storms, 2 miles east and 0.8 mile south of; 10 feet west and 15 feet north to center of T road north, iron post stamped "Prim. Trav. Sta. No. 26, 1908, Illinois".....	37 59 46.2	88 08 33.8
T. 6 S., R. 10 E., northeast corner stone sec. 19.....	37 59 46.0	88 08 01.0
T. 6 S., R. 10 E., northeast corner sec. 20.....	37 59 45.6	88 06 54.8
T. 6 S., R. 10 E., northeast corner stone sec. 21.....	37 59 45.5	88 05 49.0
T. 6 S., R. 10 E., northeast corner sec. 22, center of crossroads.....	37 59 45.2	88 04 42.9
Rising Sun, 0.33 mile southeast of village, under center of steel telephone tower west of Wabash River, iron post stamped "Prim. Trav. Sta. No. 27, 1908, Illinois".....	37 59 49.0	88 01 21.9

Bridgeport, Mount Carmel, Olney, and Vincennes quadrangles.

EDWARDS, LAWRENCE, RICHLAND, AND WABASH COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1908 by J. R. Ellis. The line starts from Claremont triangulation station of the United States Lake Survey and the Coast and Geodetic Survey and follows public highways south to Parkersburg triangulation station; thence to southwest corner of Bridgeport quadrangle; thence east to point near Patton and north near border of quadrangle to primary traverse station No. 11, 1907, Illinois.

BRIDGEPORT QUADRANGLE.

Magnetic declination: East border, $3^{\circ} 50'$ east; south border, $3^{\circ} 47'$ east; west border, $3^{\circ} 36'$ east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
St. James Church, center of crossroads.	38 44 49.2	87 59 54.4
T. 1 N., R. 14 W., quarter corner east side of sec. 20, center of crossroads.	38 30 15.3	87 59 05.2
Mills Prairie schoolhouse No. 13, 0.25 mile east of; at northeast corner of T road north, 25 feet south and 25 feet west to quarter corner east side of sec. 21, T. 1 N., R. 14 W., iron post stamped "Prim. Trav. Sta. No. 13, 1908, Illinois" (elev. 435).	38 30 15.2	87 57 57.8
Edwards-Wabash county line, center of bridge over Bompas Creek.	38 30 18.4	87 56 53.2
T. 1 N., R. 14 W., quarter corner east side of sec. 23, center of T road south.	38 30 14.6	87 55 48.1
T. 1 N., R. 14 W., quarter corner east side of sec. 24, center of T road west.	38 30 14.5	87 54 41.2
Barney Prairie Church, stone at T road west.	38 30 10.0	87 47 55.0
Harmony School, in southwest corner of yard, 35 feet south and 30 feet west to quarter corner east side of sec. 20, T. 2 N., R. 12 W., crossroads, iron post stamped "Prim. Trav. Sta. No. 17, 1908, Illinois" (elev. 445)	38 35 26.0	87 45 34.1
T. 2 N., R. 12 W., quarter corner east side of sec. 20, center of crossroads.	38 35 25.7	87 45 34.5
T. 2 N., R. 12 W., northeast corner sec. 20.	38 35 52.0	87 45 34.0
T. 2 N., R. 12 W., northeast corner sec. 17.	38 36 44.6	87 45 33.4
Grant School, in southeast corner of yard, iron post stamped "Prim. Trav. Sta. No. 18, 1908, Illinois" (elev. 446).	38 37 38.2	87 45 33.4
T. 2 N., R. 12 W., northeast corner sec. 8, center of crossroads.	38 37 37.5	87 45 33.1
T. 2 N., R. 12 W., northeast corner sec. 5, T road south.	38 38 34.6	87 45 33.0
T. 3 N., R. 12 W., southeast corner sec. 32, T road north.	38 38 34.6	87 45 34.6
Bridgeport, about 3 miles south of; at northeast corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 19, 1908, Illinois".	38 39 28.0	87 45 33.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 3 N., R. 12 W., northeast corner sec. 32, crossroads . . .	38 39 27.7	87 45 34.0
Bridgeport, 2 miles south of; at northwest corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 20, 1908, Illinois" (elev. 489)	38 40 20.7	87 45 34.3
T. 3 N., R. 12 W., northeast corner sec. 29, center of crossroads	38 40 20.4	87 45 33.9
T. 3 N., R. 12 W., northeast corner sec. 20, center of T road west	38 41 13.2	87 45 33.5
T. 3 N., R. 12 W., northeast corner sec. 17	38 42 06.2	87 45 33.3
Bridgeport, Main street crossing of Baltimore and Ohio Southwestern Railroad	38 42 19.2	87 45 35.3
T. 3 N., R. 12 W., northeast corner sec. 8, center of crossroads	38 42 59.3	87 45 33.1
T. 3 N., R. 12 W., northeast corner sec. 5, 20 feet north to T road south	38 43 52.6	87 45 33.0
Westport, 5.75 miles due south of; east of T road west at Fairview Church, in top of concrete block 8 by 8 by 20 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1907, Illinois"	38 44 46.0	87 45 35.3

OLNEY QUADRANGLE.

Magnetic declination: North border, 3° 47' east; east border, 3° 36' east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 3 N., R. 14 W., northeast corner sec. 6, center of T road south	38 43 56.4	88 00 10.4
T. 3 N., R. 14 W., northeast corner sec. 7, center of crossroads at schoolhouse	38 43 04.8	88 00 10.7
T. 3 N., R. 14 W., northeast corner sec. 18, center of crossroads	38 42 10.2	88 00 11.0
T. 3 N., R. 14 W., northeast corner sec. 19, center of crossroads	38 41 16.5	88 00 11.3
T. 3 N., R. 14 W., northeast corner sec. 30, center of crossroads	38 40 23.9	88 00 11.6
T. 3 N., R. 14 W., northeast corner stone, sec. 31	38 39 30.9	88 00 12.0
T. 2 N., R. 14 W., northeast corner sec 6, center of crossroads	38 38 37.9	88 00 12.2
Whittaker School and Methodist Church, 20 feet south and 20 feet west to center of crossroads, iron post stamped "Prim. Trav. Sta. No. 11, 1908, Illinois"	38 37 45.6	88 00 12.6
T. 2 N., R. 14 W., northeast corner stone sec. 7, center of crossroads	38 37 45.4	87 00 12.8
T. 2 N., R. 14 W., northeast corner sec. 18, crossroads . . .	38 36 52.5	88 00 13.1

Geographic positions along highways near east border—Continued.

Station.	Latitude.	Longitude.
T. 2 N., R. 14 W., northeast corner sec. 19, crossroads at Oak Grove School.....	° ' " 38 35 59.8	° ' " 88 00 13.3
T. 2 N., R. 14 W., quarter corner east side of sec. 30, center of crossroads.....	38 34 39.9	88 00 13.6
Harrison School, stone quarter corner west side of sec. 30, T. 2 N., R. 14 W., T road east.....	38 34 40.4	88 01 26.0
Parkersburg triangulation station, fractional sec. 30, T. 2 N., fractional R. 11 E., stone post.....	38 34 51.52	88 01 49.00
Richland-Edwards county line, southwest corner sec. 30, T. 2 N., R. 14 W., T road east.....	38 34 13.9	88 01 26.1
Fractional R. 11 E., northeast corner sec. 31.....	38 34 13.6	88 01 26.1
T. 1 N., R. 14 W., stone at northwest corner sec. 6, crossroads.....	38 33 20.6	88 01 26.2
Range-line road crossing Illinois Central Railroad.....	38 32 41.2	88 01 26.1
T. 1 N., R. 14 W., northwest corner sec. 18, crossroads.....	38 31 34.7	88 01 26.4
T. 1 N., R. 14 W., northwest corner sec. 19.....	38 30 41.6	88 01 26.4
Schwartzlow School, 1 mile south of West Salem, 20 feet east and 10 feet south to center of T road east, iron post stamped "Prim. Trav. Sta. No. 12, 1908, Illinois".....	38 30 15.3	88 00 29.3

MOUNT CARMEL QUADRANGLE.

Magnetic declination: North border, 3° 47' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
T. 1 N., R. 13 W., northeast corner sec. 30, center of crossroads.....	° ' " 38 29 48.1	° ' " 87 53 31.1
Friendsville, 3 miles west and 0.5 mile south of; southeast corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 14, 1908, Illinois".....	38 29 47.3	87 52 24.1
T. 1 N., R. 13 W., northeast corner sec. 29, crossroads.....	38 29 47.4	87 52 24.4
T. 1 N., R. 13 W., northeast corner sec. 28, center of crossroads.....	38 29 46.9	87 51 16.8
T. 1 N., R. 13 W., northeast corner stone sec. 27.....	38 29 46.0	87 50 09.9
T. 1 N., R. 13 W., northeast corner sec. 26, T road west ..	38 29 45.2	87 49 01.2
T. 1 N., R. 12 W., northeast corner sec. 30, center of T road east.....	38 29 43.2	87 46 45.3
Patton, 1 mile north and 0.5 mile west of; east of T road west, iron post stamped "Prim. Trav. Sta. No. 15, 1908, Illinois" (elev. 416).....	38 29 42.8	87 45 36.5
T. 1 N., R. 12 W., northeast corner sec. 29, center of T road west.....	38 29 42.8	87 45 36.8

VINCENNES QUADRANGLE.

Magnetic declination: West border, $3^{\circ} 50'$ east.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
Patton, 1.25 miles north and 0.5 mile east of; 15 feet north and 20 feet west to center of T road west, iron post stamped "Prim. Trav. Sta. No. 16, 1908, Illinois".....	° ' " 38 29 54.5	° ' " 87 44 29.8
T. 1 N., R. 12 W., northeast corner sec. 21.....	38 30 34.3	87 44 30.7
T. 1 N., R. 12 W., northeast corner sec. 16, center of cross-roads.....	38 31 27.3	87 44 31.8
T. 1 N., R. 12 W., northeast corner sec. 9, center of T road west at schoolhouse.....	38 32 20.0	87 44 32.6
T. 1 N., R. 12 W., northeast corner stone sec. 4.....	38 33 14.9	87 44 33.4
T. 2 N., R. 12 W., southwest corner stone sec. 34.....	38 33 14.9	87 44 29.3
Lawrence-Wabash county line, northeast corner sec. 33, T. 2 N., R. 12 W.....	38 34 06.8	87 44 28.5
Harmony schoolhouse, 1 mile east of; center of crossroads.	38 35 25.4	87 44 27.0

Hennepin, Lacon, LaSalle, Wenona, and Wyandot quadrangles.

BUREAU, LASALLE AND PUTNAM COUNTIES.

In cooperation with the State, the following geographic positions were determined by C. B. Kendall in 1908. The line begins with adjusted position of the Illinois River Survey triangulation station, Utica, and follows highways north to Triumph; thence west to northwest corner of the LaSalle quadrangle, 1.25 miles north of Arlington; thence south via Arlington to Marquette, where it is tied to All Fork Creek, U. S. Engineer Corps triangulation station, thence south along the Chicago, Indiana and Southern Railroad to a point about 1 mile north of Marks; thence along highways south via Marks to Granville; thence east via Ticona to Lowell, where it turns north and is tied to Utica triangulation station, the beginning.

For the control of the Hennepin quadrangle, the line begins 1.25 miles north of Arlington and follows highways west via Grader and Limerick to the northwest corner of the quadrangle; thence south via Tuskilwa to the southwest corner of the quadrangle; thence east to Hennepin, where it is tied to the Illinois River Survey triangulation station Ravine, continues east, and is tied to adjusted position at Granville.

LASALLE QUADRANGLE.

Magnetic declination: North border, $4^{\circ} 15'$ east; west border, $4^{\circ} 17'$ east; south border, $4^{\circ} 13'$ east; east border, $4^{\circ} 38'$ east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Utica triangulation station, U. S. Engineer Corps; marked by stone and pipe, on top of sandstone bluff 0.5 mile east of Utica, 1,800 feet east of large dwelling house of Mrs. William Clark, 150 feet north and 2,000 feet east of mile-post 94 on Chicago, Rock Island and Pacific Railway, in SW. $\frac{1}{4}$ sec. 9, T. 33 N., R. 2 E., Utica Township.....	° ' " 41 20 35.69	° ' " 89 00 06.7
Utica, at north edge of; T road west, 35 feet southeast to telegraph pole, 45 feet northwest to oak tree.....	41 20 47.1	89 00 43.4
T. 33 N., R. 2 E., quarter corner east side of sec. 5, center of crossroads.....	41 21 39.5	89 00 36.2
T. 33 N., R. 2 E., quarter corner east side of sec. 5, 40 feet northwest of center of crossroads, at corner of fence, in southeast corner of NE. $\frac{1}{4}$ sec. 5, iron post stamped "Prim. Trav. Sta. No. 8, 1908, Illinois".....	41 21 39.8	89 00 36.6
T. 33 N., R. 2 E., northeast corner sec. 5, T lane west, center of north-south road, east-west Utica-Waltham township line.....	41 22 05.6	89 00 35.9
T. 34 N., R. 2 E., northeast corner sec. 32, T road east, center of north-south road, 25 feet east to center of triangle.....	41 22 57.6	89 00 35.8
T. 34 N., R. 2 E., northeast corner sec. 29, east-west fence, center of north-south road.....	41 23 49.8	89 00 36.1
T. 34 N., R. 2 E., northeast corner sec. 20, center of crossroads.....	41 24 42.1	89 00 36.6
T. 34 N., R. 2 E., northeast corner sec. 17, east-west fence, center of north-south road.....	41 25 34.5	89 00 37.3
T. 34 N., R. 2 E., northeast corner sec. 8, second-class T road east, center of north-south road, 10 feet east to center of triangle.....	41 26 26.6	89 00 38.0
T. 34 N., R. 2 E., northeast corner sec. 5, T road south, center of north edge of triangle, east-west Ophir-Waltham township line.....	41 27 18.7	89 00 39.2
T. 35 N., R. 2 E., southeast corner sec. 32, T road north, center of east-west road, east-west Ophir-Waltham township line.....	41 27 18.7	89 00 41.0
T. 35 N., R. 2 E., northeast corner sec. 32, stone in center of crossroads.....	41 28 10.8	89 00 41.8
T. 35 N., R. 2 E., northeast corner sec. 29, center of crossroads.....	41 29 03.0	89 00 42.7
Triumph, northeast corner sec. 20, 0.5 mile east of; T. 35 N., R. 2 E., center of crossroads, 50 feet northeast to large boulder at farm gate, 45 feet northwest to willow tree at corner of fence.....	41 29 54.8	89 00 44.0
Triumph, in concrete porch 1 foot from west wall at north-west corner of First National Bank, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1908, Illinois".....	41 30 00.4	89 01 17.5
Triumph, at west edge of; T road south, center of east-west road, 20 feet south to center of triangle.....	41 29 55.6	89 01 48.5
T. 35 N., R. 2 E., northeast corner sec. 19, at bend of road to north.....	41 29 55.6	89 01 52.7
Vermilion River, center of iron bridge over.....	41 29 28.6	89 02 39.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 35 N., R. 1 E., quarter corner east side of sec. 23, T road north, 270 feet west of bridge over stream, center of east-west road, 25 feet northwest of center of triangle....	41° 29' 30.7"	89° 03' 32.6"
T. 35 N., R. 1 E., 0.25 mile east of quarter corner east side of sec. 22, at schoolhouse and church, center of crossroads.....	41° 29' 30.1"	89° 04' 59.7"
T. 35 N., R. 1 E., northeast corner sec. 22, second-class T road south, fence north, center of east-west road.....	41° 29' 56.2"	89° 05' 17.3"
T. 35 N., R. 1 E., northeast corner sec. 21, center of crossroads.....	41° 29' 55.4"	89° 06' 27.8"
T. 35 N., R. 1 E., northeast corner sec. 20, center of crossroads.....	41° 29' 54.1"	89° 07' 37.8"
T. 35 N., R. 1 E., 30 feet northwest of northeast corner sec. 20, at corner of hedge fence in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, 1908, Illinois".....	41° 29' 54.3"	89° 07' 38.0"
T. 35 N., R. 1 E., northeast corner sec. 19, center of crossroads.....	41° 29' 53.2"	89° 08' 46.4"
T. 35 N., R. 1 E., northwest corner sec. 19, T road east, center of north-south road, 10 feet east to center of triangle, north-south LaSalle-Bureau county line and 3d principal meridian.....	41° 29' 52.3"	89° 09' 58.6"
T. 17 N., R. 11 E., northeast corner sec. 1, T road west, center of north-south road, 15 feet west to center of triangle, north-south LaSalle-Bureau county line and 3d principal meridian.....	41° 29' 45.1"	89° 09' 58.6"
T. 17 N., R. 11 E., northeast corner sec. 2, T road south, center of east-west road, 15 feet south to center of triangle.....	41° 29' 44.5"	89° 11' 10.1"
T. 17 N., R. 11 E., northeast corner sec. 3, T road, center of east-west road, 40 feet southeast to telephone pole, 35 feet north to yard fence.....	41° 29' 43.7"	89° 12' 37.5"
T. 18 N., R. 11 E., southeast corner sec. 32, T road north, center of east-west road, 15 feet north to center of triangle.....	41° 29' 43.2"	89° 14' 19.5"
T. 17 N., R. 11 E., northeast corner sec. 5, T road south, center of east-west road, 15 feet south to center of triangle.....	41° 29' 43.2"	89° 14' 20.9"
T. 17 N., R. 11 E., 76 feet southeast of northeast corner sec. 5, in center of school yard; iron post stamped "Prim. Trav. Sta. No. 3, 1908, Illinois".....	41° 29' 42.8"	89° 14' 20.1"
T. 17 N., R. 11 E., northeast corner sec. 8, center of crossroads.....	41° 28' 51.9"	89° 14' 21.2"
Arlington, Main street crossing of Chicago, Burlington and Quincy Railroad, center between main tracks.....	41° 28' 24.2"	89° 14' 54.3"
T. 17 N., R. 11 E., quarter corner east side of sec. 17, center of crossroads.....	41° 27' 33.0"	89° 14' 21.1"
T. 17 N., R. 11 E., quarter corner east side of sec. 20, center of crossroads.....	41° 26' 40.3"	89° 14' 20.5"
T. 17 N., R. 11 E., northeast corner sec. 32.....	41° 25' 21.3"	89° 14' 19.0"
Ottville, 0.8 mile southeast of; T road south, center of east-west road, 5 feet south to center of triangle.....	41° 20' 39.1"	89° 14' 53.0"
T. 16 N., R. 11 E., quarter corner north side of sec. 32, T road west, center of north-south road, 10 feet east to end of wire fence.....	41° 20' 06.5"	89° 14' 52.5"

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Granville, 0.5 mile southwest of; T road north, quarter corner east side of sec. 29, T. 15 N., R. 11 E., 10 feet north to center of east-west road	41 15 27.0	89 14 25.6
Granville, at southeast edge of; crossroads 250 feet north of elevator and 500 feet south of T. M. & N. R. R. track, quarter corner east side of sec. 28, T. 15 N., R. 11 E.	41 15 27.3	89 13 16.6
Granville, 1.5 miles east of; quarter corner east side of sec. 27, T. 15 N., R. 11 E., 500 feet east of T road north, center of east-west road, 15 feet south to center of triangle.	41 15 28.0	89 12 07.1
T. 15 N., R. 11 E., quarter corner east side of sec. 26, center of crossroads, 35 feet southeast to corner of brick store, 50 feet north to railroad	41 15 28.3	89 10 56.6
T. 15 N., R. 11 E., quarter corner east side of sec. 25 T road east, 3d principal meridian and Lasalle-Putnam county line, 15 feet west to center of triangle, 40 feet north to center of track	41 15 31.6	89 09 46.4
T. 32 N., R. 11 E., northwest corner sec. 18, T road east, 3d principal meridian and Lasalle-Putnam county line, center of north-south road, 15 feet east to center of triangle	41 15 01.9	89 09 46.2
T. 32 N., R. 1 E., northeast corner sec. 18, center of crossroads	41 15 01.9	89 08 42.6
T. 32 N., R. 1 E., northeast corner sec. 17, center of crossroads	41 15 02.4	89 07 32.6
T. 32 N., R. 1 E., northeast corner sec. 17, 50 feet southeast of center of crossroads, by telephone pole at fence; iron post stamped "Prim. Trav. Sta. No. 6, 1908, Illinois" ..	41 15 01.9	89 07 32.2
T. 32 N., R. 1 E., northeast corner sec. 16, T road south, center of east-west road, 15 feet south to center of triangle ..	41 15 02.1	89 06 22.7
T. 32 N., R. 1 E., northeast corner sec. 15, center of crossroads	41 15 01.8	89 05 12.4
T. 32 N., R. 1 E., 700 feet west of northeast corner sec. 14, center of Illinois Central Railroad crossing	41 15 01.6	89 04 13.4
T. 32 N., R. 1 E., 2,200 feet east of northeast corner sec. 14, T road west, center of north-south road, 50 feet west to center of triangle	41 15 02.3	89 03 35.2
Lowell, 0.8 mile north of; T road east, center of north-south road, 10 feet east to center of triangle	41 15 35.2	89 00 44.8
T. 32 N., R. 2 E., quarter corner east side of sec. 4, T road east, bend of north-south road to north, hickory tree in triangle	41 16 21.4	89 00 37.5
T. 32 N., R. 2 E., northeast corner sec. 4, stone at bend of road east, east-west Deer Park-Vermilion township line ..	41 16 48.2	89 00 37.4
T. 33 N., R. 2 E., southeast corner sec. 32, stone at T road north, 25 feet north to center of triangle, east-west Deer Park-Vermilion township line	41 16 48.2	89 00 36.1
T. 33 N., R. 2 E., northeast corner sec. 32, T road east, center of north-south road, 25 feet southeast to center of triangle, 25 feet west to gate	41 17 40.6	89 00 36.0
T. 33 N., R. 2 E., northeast corner sec. 29, center of crossroads	41 18 33.1	89 00 36.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Utica, northeast corner sec. 20, T. 33 N., R. 2 E., T road east at south end of approach to bridge over Illinois River, center of north-south road.....	° ' " 41 19 34.7	° ' " 89 00 35.6
Utica, south of; center of draw span of highway bridge over Illinois River.....	41 19 40.1	89 00 36.5
Utica, 30 feet east of station, center of track of Illinois Valley Electric Railroad at street crossing.....	41 20 20.8	89 00 36.4
Utica, 50 feet west of; main street crossing Chicago, Rock Island and Pacific Railroad, north rail of main track...	41 20 34.4	89 00 32.7
Utica, Illinois River survey station (duplicate).....	41 20 35.69	89 00 06.7

WENONA QUADRANGLE.

Magnetic declination: North border, 4° 13' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Tonica, 1 mile northwest of; quarter corner north side of sec. 24, T. 32 N., R. 1 E., T road west, center of north-south road, 35 feet northwest to corner of fence, 25 feet east to gate.....	° ' " 41 14 10.5	° ' " 89 03 20.5
Tonica, 300 feet southeast of station, T road northwest, 25 feet northwest to center of triangle, 25 feet east to telephone pole, 140 feet northeast to Chicago, Burlington and Quincy Railroad crossing.....	41 13 25.7	89 03 07.8
Tonica, 1.25 miles northeast of station, near northeast corner sec. 20, T. 32 N., R. 2 E., center of intersection, 25 feet west to telephone pole, 60 feet east to oak.....	41 14 07.4	89 02 10.8
Lowell, at south edge of; southeast corner NE. $\frac{1}{4}$ sec. 17, T. 32 N., R. 2 E., center of crossroads.....	41 14 49.7	89 00 37.7
Lowell, at south edge of; southeast corner NE. $\frac{1}{4}$ sec. 17, T. 32 N., R. 2 E., in northwest corner crossroads, at corner of fence, iron post stamped "Prim. Trav. Sta. No. 7, 1908, Illinois".....	41 14 49.9	89 00 38.0

HENNEPIN QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 17'$ east; south border, $4^{\circ} 37'$ east; north border, $4^{\circ} 50'$ east; west border, $4^{\circ} 30'$ east.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
T. 17 N., R. 11 E., about 300 feet east of northeast corner sec. 31, T road south, center of east-west road.....	41 25 20.9	89 15 24.3
T. 17 N., R. 11 E., southeast corner sec. 31, T road north, center of east-west road, east-west Westfield-Hall township line.....	41 24 28.2	89 15 28.7
T. 16 N., R. 11 E., northeast corner sec. 6, T road south, center of east-west road, east-west Westfield-Hall township line.....	41 24 28.2	89 15 29.0
T. 16 N., R. 11 E., northeast corner sec. 7, center of crossroads.....	41 23 36.8	89 15 29.0
T. 16 N., R. 11 E., northeast corner sec. 18, center of crossroads.....	41 22 44.1	89 15 28.6
T. 16 N., R. 11 E., northeast corner sec. 18, 35 feet southwest of center of crossroads, in northeast corner of yard of Kline School, iron post stamped "Prim. Trav. Sta. No. 4, 1908, Illinois".....	41 22 43.9	89 15 28.9
T. 16 N., R. 11 E., northeast corner sec. 19, center of crossroads.....	41 21 51.5	89 15 28.4
Ottville, forks of roads southwest and southeast, center of triangle.....	41 20 53.2	89 15 32.6
T. 16 N., R. 11 E., northeast corner sec. 31, stone in center of east-west road.....	41 20 06.3	89 15 27.9
Marquette, just west of station, road crossing Chicago, Rock Island and Pacific Railroad, center between main tracks.....	41 19 31.6	89 15 53.9

ALONG CHICAGO, INDIANA AND SOUTHERN RAILROAD.

Howe, just south of station, crossing of Chicago, Indiana and Southern Railroad over the Chicago, Rock Island and Pacific Railroad, center of girder bridge.....	41 19 33.1	89 16 59.4
All Fork Creek triangulation station, U. S. Engineer Corps, marked by stone and pipe, on south bluff of Illinois River 1 mile south of Marquette coal mine, 300 feet east of dwelling house owned by Joseph Maheux, 125 feet north and 5 feet east of intersection of east-west highway with east line fence of NW. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 30, T. 33 N., R. 1 W., Granville Township, tower 26 feet high.....	41 18 24.06	89 15 52.4
Chicago, Indiana and Southern Railroad Bridge over Illinois River, center of draw span.....	41 18 50.9	89 16 48.7
Moronto, 1.5 miles northeast of station, road crossing, center of track.....	41 18 03.4	89 16 53.3
Moronto, 1,000 feet north of station, 150 feet north of Elevator No. 14, road crossing, center of main track.....	41 17 09.9	89 17 39.8
Mark, 0.8 mile north of; near center sec. 20, T. 15 N., R. 11 E., north rail at road crossing.....	41 16 29.3	89 15 09.3

Geographic positions—Continued.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Mark, at east edge of; 30 feet northeast to large stump, 30 feet southwest to corner of; burnt store.....	° ' " 41 15 52.8	° ' " 89 15 00.6
T. 18 N., R. 11 E., southeast corner sec. 31, T road north, center of east-west road, 25 feet north to center of triangle.....	41 29 43.0	89 15 26.2
T. 17 N., R. 11 E., northeast corner sec. 6, wire fence south, center of east-west road.....	41 29 43.0	89 15 27.9
Arlington, 1.8 miles northwest of; crossroads, 35 feet southwest to John Manning's mail box, 60 feet northeast to forked willow tree.....	41 29 43.0	89 15 49.4
T. 17 N., R. 10 E., stone corner of sec. 1, at slight bend of road to northwest, 150 feet west of Bureau Creek, corner of Clarion, Westfield, Lamoille, and Berlin townships...	41 29 43.2	89 16 33.8
T. 17 N., R. 10 E., quarter corner north side of sec. 1, T road west, center of north-south road, 30 feet west to mail box in center of triangle.....	41 29 43.1	89 17 09.6
T. 18 N., R. 10 E., southeast corner sec. 34, second-class T road north, center of east-west road.....	41 29 43.6	89 18 54.1
T. 18 N., R. 10 E., quarter corner south side of sec. 34, T road north, 15 feet west to crossroads.....	41 29 43.6	89 19 29.3
T. 17 N., R. 10 E., quarter corner north side of sec. 3, T road south, 15 feet east to crossroads.....	41 29 43.6	89 19 29.7
T. 17 N., R. 10 E., quarter corner north side of sec. 4, stone at crossroads, 100 feet southwest to schoolhouse.....	41 29 44.0	89 20 39.5
T. 17 N., R. 10 E., northeast corner sec. 6, center of crossroads.....	41 29 43.4	89 22 23.7
T. 17, R. 10 E., in northwest corner sec. 5, 50 feet southeast of center of crossroads, in corner of wire fence, iron post stamped "Prim. Trav. Sta. No. 9, 1908, Illinois".....	41 29 43.0	89 22 23.2
T. 17 N., R. 9 E., northeast corner sec. 1, T road east, center of west edge of triangle, 10 feet east to center of triangle, corner of Lamoille, Ohio, Dover and Berlin townships.....	41 29 42.0	89 23 36.5
Grover, 0.5 mile northwest of station, road crossing the Illinois Valley and Northern Railroad track, center of track.....	41 29 03.7	89 24 28.5
T. 17 N., R. 9 E., northeast corner sec. 3, T road, 30 feet north to forked maple, 10 feet south to center of triangle.....	41 29 41.8	89 25 56.1
T. 18 N., R. 9 E., southeast corner sec. 34, T road north, center of east-west road, 12 feet north to center of triangle.....	41 29 41.8	89 25 55.7
T. 18 N., R. 9 E., southeast corner sec. 33, T road north, center of east-west road, 30 feet north to center of triangle.....	41 29 41.7	89 27 06.0
T. 17 N., R. 9 E., northeast corner sec. 4, T road south, center of east-west road, 20 feet southeast to two mail boxes.....	41 29 41.7	89 27 06.5
Limerick, T. 18 N., R. 9 E., 0.25 mile east of southeast corner sec. 33, T road north, 20 feet west to center of crossroads.....	41 29 41.8	89 27 57.8

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Limerick, 0.25 mile east of; northwest corner sec. 4, T. 17 N., R. 9 E., T road south, 20 feet east to center of crossroads.....	41° 29' 41.8"	89° 27' 58.3"
T. 18 N., R. 9 E., quarter corner south side of sec. 32, T road north, center of east-west road, 25 feet north to center of triangle.....	41° 29' 41.8"	89° 28' 50.1"
T. 17 N., R. 9 E., quarter corner north side of sec. 5, T road south, center of east-west road, 20 feet south to center of triangle.....	41° 29' 41.8"	89° 28' 51.0"
T. 17 N., R. 9 E., 1,180 feet north of quarter corner south side of sec. 30, T road west, center of north-south road...	41° 25' 31.9"	89° 29' 59.5"
Princeton, about 2 miles southwest of; near southeast corner sec. 18, T. 16 N., R. 9 E., about 1,500 feet east of T road south, 25 feet southeast to bridge over Bureau Creek, 45 feet west to old log, 5 feet north to center of east-west road.....	41° 21' 57.3"	89° 29' 37.4"
T. 16 N., R. 9 E., near south line of sec. 30, large oak tree in corner of fence at bend of main road to east, second-class road to west.....	41° 20' 11.7"	89° 29' 53.7"
T. 16 N., R. 9 E., line between secs. 29 and 30, center of east-west road at fence north.....	41° 20' 11.1"	89° 29' 19.3"
T. 16 N., R. 9 E., southeast corner sec. 29, T road west at red brick schoolhouse, center of north-south road, 25 feet west to center of triangle, 35 feet east to corner of school yard.....	41° 20' 21.2"	89° 28' 17.7"
T. 16 N., R. 9 E., near east line of sec. 32, T road north, center of east-west road, 20 feet north to center of triangle.....	41° 19' 42.0"	89° 28' 17.4"
T. 16 N., R. 9 E., line between secs. 31 and 32, center of road at crossing.....	41° 19' 37.9"	89° 29' 19.2"
T. 15 N., R. 9 E., northeast corner sec. 30, stone in center of road at east-west fence.....	41° 15' 47.4"	89° 29' 24.9"
T. 15 N., R. 9 E., SE. $\frac{1}{4}$ sec. 24, T road southwest, 60 feet south to walnut trees, 15 feet southwest to center of triangle.....	41° 16' 01.5"	89° 23' 52.3"
Bureau Junction, 1.25 miles southwest of; NW. $\frac{1}{4}$ sec. 19, T. 15 N., R. 10 E., in northeast corner of Carl Hosier's front yard, 75 feet west of Chicago, Rock Island and Pacific Railroad crossing of the Hennepin Ferry road and 35 feet west of junction of ferry road with roads northwest and southwest, Illinois River survey bench mark post stamped "469.75 Ft. Memphis datum".....	41° 16' 39.7"	89° 23' 01.5"
Hennepin, 1.5 miles northwest of; center of iron bridge...	41° 15' 57.4"	89° 22' 23.1"
Hennepin, Illinois River Survey triangulation station, 10-foot tower over point ^a	41° 15' 24.54"	89° 20' 44.08"
Hennepin, at southeast corner of Putnam County courthouse yard, 50 feet northwest of intersection of High and Fifth streets, iron post stamped "Prim. Trav. Sta. No. 13, 1908, Illinois".....	41° 15' 09.8"	89° 20' 30.4"
Hennepin, 2 miles east of; center of crossroads.....	41° 15' 24.9"	89° 18' 14.6"

^a U. S. Engineer Corps permanent tertiary station on high left bank of Illinois River, 166 feet north and 20 feet west of northeast corner of First and Mulberry streets, Hennepin, marked by stone and pipe.

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Hennepin, 3 miles east of; T road south, center of north-east-southwest road, 10 feet north to fence, 60 feet south-east to elm, 50 feet south to center of triangle.....	° ' " 41 15 32.1	° ' " 89 17 06.8
Granville, 1.8 miles west of; 1,100 feet west of quarter corner east side of sec. 30, T. 15 N., R. 11 E., T road south, center of east-west road, 25 feet south to center of triangle.....	41 15 26.0	89 15 43.2
Granville, 1.8 miles west of; 1,100 feet west of quarter corner east side of sec. 29, T. 15 N., R. 11 E., 40 feet southeast of T road south, corner of fence, iron post stamped "Prim. Trav. Sta. No. 5, 1908, Illinois".....	41 15 25.8	89 15 42.9
Granville, 0.5 mile southwest of; T road north.....	41 15 27.02	89 14 25.58

WYANET QUADRANGLE.

Magnetic declination: East border, 4° 30' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 17 N., R. 9 E., quarter corner north side of sec. 6, T road south, center east-west road, 20 feet south to center of triangle.....	° ' " 41 29 41.4	° ' " 89 30 01.4
T. 17 N., R. 9 E., 40 feet southeast of quarter corner, north side of sec. 6, T road south, at corner of wire fence, iron post stamped "Prim. Trav. Sta. No. 10, 1908, Illinois".....	41 29 41.3	89 30 01.0
T. 17 N., R. 9 E., quarter corner north of sec. 7, center of crossroads.....	41 28 49.9	89 30 01.7
T. 17 N., R. 9 E., quarter corner north side of sec. 18, T road north, center of east-west road, 25 feet north to center of triangle, 180 feet west to T road south.....	41 27 57.5	89 30 01.3
T. 17 N., R. 9 E., line between secs. 18 and 19, T road west, center of triangle, 150 feet south to church.....	41 27 05.1	89 30 09.8
T. 17 N., R. 9 E., quarter corner north side of sec. 30, center of crossroads.....	41 26 12.8	89 30 00.3
T. 17 N., R. 8 E., northeast corner sec. 36, north-south line between Dover and Bureau townships.....	41 25 19.9	89 30 38.2
T. 17 N., R. 8 E., northeast corner sec. 35, T road south, center of east-west road, 20 feet south to center of triangle.....	41 25 23.2	89 31 47.6
T. 16 N., R. 8 E., northeast corner sec. 2, T road north, stone in center of east-west road.....	41 24 31.1	89 31 47.3
T. 16 N., R. 8 E., quarter corner north side of sec. 12, T road west, center of north-south road, 20 feet west to center of triangle, 30 feet east to line fence.....	41 23 38.3	89 31 12.3
T. 16 N., R. 8 E., quarter corner north side of sec. 13, T road north, center of east-west road, 15 feet north to center of triangle, 40 feet south to maple tree.....	41 22 46.0	89 31 11.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 16 N., R. 8 E., northeast corner sec. 13, second-class road north, bend in main road south.....	° ' " 41 22 44.7	° ' " 89 30 37.1
T. 16 N., R. 9 E., northwest corner sec. 18, T road east, center of north-south road, 20 feet east to center of triangle.....	41 22 43.5	89 30 37.1
T. 16 N., R. 9 E., northwest corner sec. 18, 35 feet southeast of T road east, at corner of fence, iron post stamped "Prim. Trav. Sta. No. 11, 1908, Illinois".....	41 22 43.3	89 30 36.7
Ts. 15 and 16 N., R. 9 E., north line sec. 6, east-west line between Princeton and Arispie townships, center of road at crossing.....	41 19 16.3	89 30 15.2
Illinois and Mississippi Canal, at west end of; center of triangle.....	41 18 50.3	89 30 39.8
Tiskilwa, 1 mile north of; center of bridge over Bureau Creek.....	41 18 24.1	89 30 33.4
Tiskilwa, 0.5 mile north of; road crossing Chicago, Rock Island and Pacific Railroad, center between main track.....	41 17 54.6	89 30 35.2
Tiskilwa, northeast corner sec. 13, T. 15 N., R. 8 E., stone in center of intersection of Main and Princeton streets...	41 17 32.7	89 30 35.4
Tiskilwa, 1.25 miles southeast of; second-class road to southwest, 150 feet south of top of hill, center of main road, 15 feet west to telephone pole, 35 feet southwest to center of triangle.....	41 16 43.1	89 30 01.1

LACON QUADRANGLE.

Magnetic declination: North border, 4° 37' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 15 N., R. 9 E., northeast corner sec. 31, center of crossroads.....	° ' " 41 14 54.8	° ' " 89 29 24.9
T. 15 N., R. 9 E., northwest corner sec. 32, 40 feet southeast of, center of crossroads, at corner of hedge fence, iron post stamped "Prim. Trav. Sta. No. 12, 1908, Illinois".....	41 14 54.5	89 29 24.5
T. 15 N., R. 9 E., northeast corner sec. 32, T road south, center of east-west road, 5 feet south to center of triangle.	41 14 54.7	89 28 15.0
T. 15 N., R. 9 E., northeast corner sec. 33, farm road north, center of east-west road.....	41 14 54.5	89 27 05.1
T. 15 N., R. 9 E., northeast corner sec. 34, T road north, center of east-west road, 20 feet north to center of triangle, 20 feet south to end of north-south wire fence....	41 14 54.1	89 25 56.4
T. 15 N., R. 9 E., quarter corner north side of sec. 35, T road west, center of north-south road, 25 feet west to center of triangle, 20 feet east to end of wire fence, 225 feet southeast to schoolhouse (No. 174).....	41 14 54.0	89 25 21.6
Hennepin, 1 mile southeast of; center of crossroads.....	41 14 58.0	89 19 40.8
Hennepin, 2.25 miles southeast of; center of stone-arch bridge at north-south road.....	41 14 31.1	89 18 14.2

Apple River, Galena, Lena, Mineral Point, and Savanna quadrangles.

JO DAVIESS COUNTY.

In cooperation with the State, the following geographic positions were determined by L. E. Tucker in 1906. For the control of Apple River quadrangle the line begins with Coast and Geodetic Survey position of White Steeple at Warren and follows the Illinois Central Railroad west to Scales Mound; thence along highways south to a point 3 miles west of Derinder; thence east along highways to 3 miles south of Moresville; thence north to Warren.

For control of Galena quadrangle the line begins with adjusted position at Scales Mound and follows highways to a point about 6 miles northwest of Galena; thence south to Galena, where it is tied to a position of Galena Spire and Horseshoe Mound triangulation stations; thence south along the Chicago, Burlington and Quincy Railroad to Blanding station where it turns east along highways to adjusted position 3 miles west of Derinder.

APPLE RIVER QUADRANGLE

Magnetic declination: West border, $6^{\circ} 07'$ east; east border, $4^{\circ} 57'$ east; south border, $5^{\circ} 15'$ east.

Geographic positions.

ALONG THE ILLINOIS CENTRAL RAILROAD NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Warren, white steeple, Coast and Geodetic Survey triangulation station.....	$42^{\circ} 29' 35.95''$	$89^{\circ} 59' 20.27''$
Law station, center of track opposite operator's window...	$42^{\circ} 29' 35.6''$	$90^{\circ} 10' 54.2''$
Law station, 0.6 mile west of; north-south highway crossing.....	$42^{\circ} 29' 21.4''$	$90^{\circ} 11' 33.9''$
Scales Mound, 1.5 miles northeast of; center of track over public road crossing.....	$42^{\circ} 28' 46.6''$	$90^{\circ} 13' 22.9''$

ALONG HIGHWAYS NEAR WEST BORDER.

Mount Morley, schoolhouse No. 4, in southeast part of sec. 26, T. 28 N., R. 2 E., in angle of junction of ridge road and Elizabeth-Scales Mound road, schoolhouse bears N. 41° E. 119 feet, a blazed oak is 12.4 feet west, iron post stamped "Prim. Trav. Sta. No. 18, 1906, Illinois".....	$42^{\circ} 23' 29.0''$	$90^{\circ} 14' 48.2''$
Hickory Grove, 1.8 miles north of schoolhouse, T road east, 35 feet east to Will Brockner's mail box.....	$42^{\circ} 22' 51.2''$	$90^{\circ} 13' 40.6''$
Hickory Grove, Elizabeth Township, center of road opposite schoolhouse.....	$42^{\circ} 21' 17.7''$	$90^{\circ} 13' 53.8''$
Hickory Grove, 0.4 mile south of schoolhouse, 4 corners, mail box of H. Rees is on southeast corner.....	$42^{\circ} 20' 58.0''$	$90^{\circ} 13' 58.0''$
Apple River, 1.25 miles northwest of, junction of Elizabeth-Galena and Scales Mound ridge roads.....	$42^{\circ} 20' 07.5''$	$90^{\circ} 14' 53.3''$

Geographic positions—Continued.

ALONG HIGHWAYS NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
Apple River, north end of iron bridge over.....	° ' " 42 19 20.4	° ' " 90 14 04.6
Elizabeth, corner of Main and Myrtle streets, corner of Black Hawk Building bears S. 89° 30' W. 35 feet, corner of Illinois Building bears N. 12° E. 45 feet.....	42 19 04.5	90 13 17.0
Elizabeth, at southwest edge of, public road crossing Chicago Great Western Railway.....	42 18 42.0	90 13 41.1
T. 27 N., R. 2 E., approximate quarter corner north side of sec. 36.....	42 17 54.0	90 13 38.8
T. 26 N., R. 2 E., quarter corner north side of sec. 1.....	42 17 02.0	90 13 35.4
Pleasant Hill School, Hanover Township, 43 feet south of northeast corner of fence, 126.6 feet north of white-oak tree at southeast corner of yard and 11 feet northwest of large white oak, iron post stamped "Prim. Trav. Sta. No. 19, 1906".....	42 15 54.3	90 14 07.9
T. 26 N., R. 3 E., approximate northeast corner sec. 18, T road south.....	42 15 15.0	90 11 43.7
Derinda Center, approximate northeast corner sec. 17, T. 26 N., R. 3 E., 4 corners.....	42 15 16.9	90 10 31.8
Big Rush Creek, west end of iron bridge over, approximate northeast corner sec. 16, T. 26 N., R. 3 E.....	42 15 17.4	90 09 20.5

GALENA QUADRANGLE.

Magnetic declination: East border, 6° 07' east; west border, 6° 52' east; north border, 6° 25' east; south border, 5° 26' east.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Scales Mound, in the southwest corner of schoolhouse yard at two churches, 93.2 feet southeast to corner of Presbyterian Church porch, 51 feet west to southeast corner of Catholic Church, 70 feet northeast to southeast corner of schoolhouse porch, iron post stamped "Prim. Trav. Sta. No. 17, 1906".....	° ' " 42 28 31.6	° ' " 90 15 07.9
Hesselbacher cheese factory, at T road east, northwest corner of factory.....	42 27 08.7	90 15 07.1
Flint Rock Hill, T road west at summit.....	42 26 34.3	90 15 26.3
Lutheran Church, gate in front of.....	42 25 53.6	90 15 37.5
Lutheran Church, 0.7 mile southeast of; junction ridge road and Shappville road, 50 feet east to Robert Gill's mail box.....	42 25 20.4	90 15 17.8
Lutheran Church, 1.25 miles southeast of; junction of Scales Mound-Elizabeth ridge road and Thompsonville-Galena roads.....	42 24 34.8	90 15 22.0
Schoolhouse No. 4, 0.7 mile northwest of; T road east, mail box of H. J. Ehredt by gate on west side of road.....	42 24 02.3	90 15 02.9

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Scales Mound, 0.7 mile west of; wagon bridge over Illinois Central Railroad, center of bridge.....	42 28 58.6	90 15 44.7
T. 29 N., R. 2 E., approximately northeast corner sec. 27.....	42 29 20.8	90 15 44.6
Schoolhouse No. 92, Council Hill Township, center of road opposite.....	42 29 58.3	90 18 59.4
T. 29 N., R. 2 E., quarter corner west side of sec. 19.....	42 29 49.8	90 20 34.1
T. 29 N., R. 1 E., quarter corner east side of sec. 24.....	42 29 49.5	90 20 34.1
Stone blacksmith shop, 3 corners.....	42 29 26.2	90 20 59.5
T. 29 N., R. 1 E., E. $\frac{1}{4}$ sec. 27, 0.5 mile east of Millbrick, just east of ruins of old stone church, at northeast corner of T road, corner of fence bears S. 50° W. 8 feet, mail box of Travarthen bears S. 45° W. 75 feet, iron post stamped "Prim. Trav. Sta. No. 23, 1906".....	42 28 55.0	90 23 27.2
Highway crossing railroad.....	42 29 39.0	90 23 42.1
Intersection of 4th principal meridian and Illinois-Wisconsin state line, 1 mile southwest of; 4 corners, center of turnpike.....	42 29 48.6	90 26 33.6
T. 29 N., R. 1 W., approximate center sec. 23.....	42 29 49.1	90 27 24.8
T. 29 N., R. 1 W., in east part of SE. $\frac{1}{4}$ sec. 28, 0.25 mile south of schoolhouse No. 3, south of Bodell's, 4 corners (Menominee Township), southeast corner of Bodell's front-yard fence bears N. 1° W. 104 feet, mail box of Gehard Bussen bears N. 30° 30' E. 87 feet, iron post stamped "Prim. Trav. Sta. No. 25, 1906".....	42 28 50.2	90 29 16.3
T. 28 N., R. 1 W., near center of NE. $\frac{1}{4}$ sec. 2, 3 corners, Galena-Hazel Green road and road to Excelsior, 18 feet east to east fence of turnpike.....	42 27 29.9	90 27 23.6
T. 28 N., R. 1 W., north line sec. 11, intersection of Galena turnpike.....	42 26 47.6	90 27 17.0
T. 28 N., R. 1 W., northeast corner sec. 14.....	42 25 54.2	90 26 48.6
Galena, in most easterly corner of court-house yard, east corner of court-house bears S. 89° W. 24.5 feet, square stone on northwest corner of Bench and Meeker streets bears S. 80° E. 14.7 feet, iron post stamped "Prim. Trav. Sta. No. 26, 1906".....	42 25 06.3	90 25 31.0
Galena, German Lutheran Church spire.....	42 25 02.64	90 25 53.06
Horseshoe Mound triangulation station, ^a about 1.25 miles southeast of Galena, on northwest end of Horseshoe Mound, on top of rock ledge.....	42 24 29.14	90 24 03.61

ALONG THE CHICAGO, BURLINGTON AND QUINCY RAILROAD, GALENA TO BLANDING.

Illinois Central and Chicago, Burlington and Quincy Railroad crossing at southwest edge of Galena.....	42 24 33.1	90 25 46.6
Galena Junction, center of south end of station.....	42 22 29.4	90 26 38.0
Galena Junction, about 3 miles southeast of, east-west road crossing near culvert No. 168112.....	42 20 05.8	90 23 59.0

^a The Mississippi River Commission bench-mark post had been broken off and thrown on ground, so exact location of station could not be identified.

Geographic positions—Continued.

ALONG THE CHICAGO, BURLINGTON AND QUINCY RAILROAD, GALENA TO BLANDING—continued.

Station.	Latitude.	Longitude.
Blanding, 1 mile northwest of station, highway road crossing.....	° ' " 42 17 10.3	° ' " 90 24 07.8
Blanding, west of Chicago, Burlington and Quincy Railroad, corner in front of post-office, 74 feet southwest to northeast corner of post-office, 44 feet west to east corner Mrs. Botin's house, 44 feet east to northwest corner of railroad station, iron post stamped "Prim. Trav. Sta. No. 27, 1906".....	42 16 27.6	90 23 11.0
T. 26 N., R. 1 E., northeast corner sec. 10.....	42 16 09.2	90 22 27.1
T. 26 N., R. 1 E., east line sec. 11, north-south road crossing.....	42 15 38.3	90 21 16.1
T. 26 N., R. 1 E., quarter corner east side of sec. 11.....	42 15 42.2	90 21 16.1
T. 26 N., R. 1 E., SW. $\frac{1}{4}$ sec. 2, east-west road crossing...	42 15 29.3	90 20 57.3

ALONG HIGHWAYS.

T. 26 N., R. 1 E., SE. $\frac{1}{4}$ sec. 12, 3 corners.....	42 15 29.7	90 20 25.4
Hanover, 3 miles west of; 3 corners, roads south, east, and west.....	42 15 04.8	90 18 52.2
Hanover, 2.5 miles west of; oak tree on north side of road at 3 corners.....	42 14 58.0	90 18 14.0
Hanover, at southwest corner of Hanover Hotel piazza wall, northeast corner of Hanover Manufacturing Company's brick block bears southwest 87.4 feet, northwest corner of Miller & White's brick store bears south 61.6 feet, iron post stamped "Prim. Trav. Sta. No. 28, 1906".....	42 15 24.7	90 17 06.8
Holy Face Catholic Church, corner Jefferson street, Savanna road, and Pleasant Hill road.....	42 15 21.3	90 16 33.4
Holy Face Catholic Church, 0.5 mile east of; 3 corners, roads west to Hanover and east to Pleasant Hill.....	42 15 29.2	90 16 08.1

MINERAL POINT QUADRANGLE.

Magnetic declination: Southwest border, 6° 25' east.

Geographic positions.

ALONG THE ILLINOIS CENTRAL RAILROAD NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Warren, white steeple, Coast and Geodetic Survey triangulation.....	° ' " 42 29 35.95	° ' " 89 59 20.27
Warren, 1.5 miles northwest of; highway road crossing.....	42 30 24.6	90 00 54.0
Apple River, in yard of W. H. Smith, southwest corner of lot 10, block 16, 64.5 feet east to southwest corner of Henry Smith's store, 42.2 feet north to southwest corner of Henry Smith's house, iron post stamped "Prim. Trav. Sta. No. 16, 1906".....	42 30 12.4	90 05 53.2
T. 29 N., R. 3 E., northeast corner sec. 1.....	42 30 10.6	90 06 14.2
Law station, 2 miles east of, highway crossing.....	42 30 08.8	90 08 34.2

Geographic positions—Continued.

ALONG HIGHWAYS NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Veda Grand, Illinois-Wisconsin state line, at elbow in road, 30 feet northwest to William Haskin's mail box, 20 feet east to corner of state line fence	° ' " 42 30 27.4	° ' " 90 16 20.5
T. 29 N., R. 2 E., approximately northeast corner sec. 16, at state line	42 30 27.0	90 16 56.0
T. 29 N., R. 1 E., on west half north line of sec. 15, north-south road on the Illinois-Wisconsin state line	42 30 25.8	90 23 44.1
Intersection of 4th principal meridian and Illinois-Wisconsin state line	42 30 26.1	90 25 36.2
Intersection of 4th principal meridian and Illinois-Wisconsin state line, 0.5 mile west of, south of state line road, at corner of Galena-Hazel Green turnpike, 1 foot north of fence and 10 feet east of fence corner, 77.7 feet northwest to blazed soft-maple tree west of turnpike and on state line, cottonwood tree on northeast corner bears north 53°, iron post stamped "Prim. Trav. Sta. No. 24, 1906"	42 30 26.2	90 26 12.9

SAVANNA QUADRANGLE.

Magnetic declination: North border, 5° 15' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Massbach, 0.5 mile south of post-office, south line of sec. 14, T. 26 N., R. 3 E., 3 corners	° ' " 42 14 25.9	° ' " 90 07 25.3
Camp Creek School (No. 14), Derinda Township, in southeast corner of school yard, southeast corner of school-house bears N. 33° W. 81 feet, oak tree 16 inches in diameter bears N. 42° E. 52 feet, iron post stamped "Prim. Trav. Sta. No. 20, 1906"	42 14 27.2	90 05 48.9
T. 26 N., R. 3 E., approximate northeast corner sec. 24.	42 14 26.9	90 05 48.0
T. 26 N., R. 4 E., northeast corner sec. 19	42 14 23.9	90 04 54.7
T. 26 N., R. 4 E., NE. $\frac{1}{4}$ sec. 20, 4 corners, Galena-Dixon road	42 14 11.2	90 03 37.3
Carrott School (No. 21), Pleasant Valley Township, T road.	42 14 37.7	90 02 13.5
Pleasant Valley Township, center of road in front of town hall	42 14 24.1	90 02 02.4

LENA QUADRANGLE.

Magnetic declination: West border, $4^{\circ} 57'$ east.*Geographic positions along highways near west border of quadrangle.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
White School, just west of; T road south.....	42 15 07.6	89 59 25.1
T. 26 N., R. 5 E., NW. $\frac{1}{4}$ sec. 7, south of Savanna-Freeport road, about 150 feet northeast of Union Church road, corner, wild-cherry tree 22 inches in diameter bears S. 16° W. 9.6 feet, northeast corner of iron bridge over Muddy Plumb River bears S. $38^{\circ} 30'$ E. 366 feet, iron post stamped "Prim. Trav. Sta. No. 21, 1906".....	42 15 42.0	89 58 29.7
T. 26 N., R. 4 E., northeast corner sec. 1, corner of Pleasant Valley, Stockton, Ward Grove, and Berriman townships, T road east.....	42 17 01.4	89 58 43.4
T. 27 N., R. 4 E., northeast corner sec. 36, at road east....	42 17 54.0	89 58 45.0
T. 27 N., R. 4 E., approximately northeast corner sec. 25, T road west.....	42 18 46.9	89 58 47.0
T. 27 N., R. 5 E., northwest corner sec. 19, at road east....	42 19 38.8	89 58 48.5
T. 27 N., R. 4 E., northeast corner sec. 24, at road west....	42 19 39.3	89 58 48.5
T. 27 N., R. 5 E., northwest corner sec. 18.....	42 20 31.5	89 58 50.2
T. 27 N., R. 4 E., northeast corner sec. 13.....	42 20 32.3	89 58 50.2
T. 27 N., R. 4 E., northeast corner sec. 12, highway.....	42 21 24.9	89 58 52.4
T. 27 N., R. 5 E., northwest corner sec. 7, road east.....	42 21 23.9	89 58 52.4
School No. 82, Rush Township, in yard just south of plank walk leading from gate to schoolhouse, 1 foot west of fence, 4 feet south of center of gate, southeast corner of schoolhouse bears S. 73° W. 25.3 feet, iron post stamped "Prim. Trav. Sta. No. 22, 1906".....	42 22 43.3	89 58 56.0
Chelsea Church, northeast corner sec. 24, T. 28 N., R. 4 E., corner of public crossroads.....	42 24 55.6	89 59 00.7
Nora, northwest corner sec. 19, T. 28 N., R. 5 E., road east.....	42 25 47.7	89 59 02.9
Rush, northeast sec. 13, T. 28 N., R. 4 E., road west.....	42 25 48.4	89 59 02.9
Nora, Puckett's School, northwest corner sec. 7, T. 28 N., R. 5 E., crossroads.....	42 26 39.8	89 59 05.9
Rush, T. 28 N., R. 4 E., secs. 1 and 2, corner.....	42 26 40.5	89 59 05.9
T. 28 N., R. 4 E., northeast corner sec. 1, crossroads.....	42 27 33.2	89 59 07.2
Warren, 0.5 mile south of; T road west.....	42 28 22.0	89 59 08.6
Warren, White Steeple Coast and Geodetic Survey triangulation station.....	42 29 35.95	89 59 20.27

ILLINOIS-KENTUCKY.

PRIMARY TRAVERSE.

Equality, Marion, Morganfield, and Shawneetown quadrangles.

GALLATIN AND HARDIN COUNTIES, ILL.; CRITTENDEN AND UNION COUNTIES, KY.

In cooperation with the States, the following geographic positions were determined in 1908 by J. R. Ellis. The line starts from an adjusted position near Cypress Junction, Ill., and follows public highways south near borders of quadrangles to Peters Creek, Ill.; thence proceeding east the line crosses the Ohio River at Weston, Ky., and connects with an adjusted position at Sturgis, Ky.

EQUALITY QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 12'$ east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Saline River, just east of steel bridge; T road north.....	37 41 55.4	88 15 41.6
Township line, center of T road east.....	37 41 20.7	88 16 11.1
T. 9 S., R. 8 E., quarter corner south side of sec. 36.....	37 41 20.7	88 16 16.4
Center of crossroads.....	37 40 41.0	88 16 28.4
J. C. Baldwin's residence, just north of; center of T road west.....	37 39 34.8	88 16 11.6
Gibsonia, center of steel bridge over Eagle Fork.....	37 38 59.1	88 15 39.8
Gibsonia, 1 mile southeast of; stone at T road west.....	37 38 16.3	88 15 07.3
T. 10 S., R. 9 E., northeast corner sec. 36, in northeast corner of orchard.....	37 36 56.4	88 15 37.6
Center of T lane east.....	37 36 15.9	88 16 16.6
T. 11 S., R. 8 E., northeast corner sec. 2.....	37 36 02.3	88 16 51.5
T. 11 S., R. 8 E., quarter corner east side of sec. 2, stone..	37 35 37.3	88 16 52.0
Philadelphia Church and School, about 0.2 mile north of; center of T road west at house on hill.....	37 34 43.2	88 17 05.9
Sparks Hill post-office, T road south, 40 feet southeast to corner of store porch, 35 feet east to telephone pole.....	37 34 29.7	88 15 55.1
T. 11 S., R. 8 E., northeast corner sec. 13, stone.....	37 34 16.2	88 15 45.3
Old log house, center of T road west at corner of fence.....	37 33 07.3	88 15 02.4

SHAWNEETOWN QUADRANGLE.

Magnetic declination: West border, $4^{\circ} 12'$ east; south border, $4^{\circ} 27'$ east.

Geographic positions along highways.

NEAR WEST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Cypress Junction station, track opposite semaphore.....	37 43 33.8	88 14 10.7
Center of T road south, 10 feet south to stone quarter corner east side of sec. 30, T. 9 S., R. 9 E.....	37 42 40.0	88 14 48.4
T. 9 S., R. 9 E., northeast corner sec. 31.....	37 42 13.6	88 14 49.2
C. B. Swogirt's residence, 0.3 mile northwest of; at cross-roads, 40 feet north and 30 feet east to center of cross-roads, iron post stamped "Prim. Trav. Sta. No. 33, 1908, Illinois".....	37 37 44.8	88 14 26.3
T. 11 S., R. 9 E., corner at turn of road (no numbers).....	37 32 58.1	88 14 40.2
Rock Creek, 0.5 mile west of store and post-office; center of T road east.....	37 32 36.8	88 14 23.5
Rock Creek, about 0.5 mile south of store and post-office; forks just east of schoolhouse.....	37 32 18.9	88 13 50.0
Baptist Church and schoolhouse, 0.8 mile south of; center of T lane east.....	37 31 37.0	88 13 50.4
Baptist Church and schoolhouse, 1.5 miles south of; forks of road at south end of lane, 20 feet north to corner of fence.....	37 31 01.0	88 13 51.6

NEAR SOUTHEAST CORNER.

Coal mine, just north of; center of forks.....	37 30 00.2	88 00 37.3
Charles Travis's mail box, just south of; forks of road, 25 feet south and 10 feet east to corner of fence.....	37 30 37.9	88 00 40.8
Mill just north of schoolhouse, T road east, 20 feet southwest to corner fence post.....	37 31 33.1	88 00 30.9

MARION QUADRANGLE.

Magnetic declination: North border, 4° 27' east.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
ILLINOIS.		
Peters Creek, 200 feet east of turn of road at store, on north side of road, iron post stamped "Prim. Trav. Sta. No. 34, 1908, Illinois".....	37 29 37.8	88 14 05.6
T. 12 S., R. 9 E., northeast corner sec. 7.....	37 29 50.8	88 13 35.1
Richard Frailey's mail box, center of road.....	37 29 43.7	88 12 44.9
T. 12 S., R. 9 E., northeast corner sec. 9.....	37 29 50.1	88 11 21.1
Love School (No. 1), just east of; T road west, 35 feet north and 10 feet west to corner telephone post.....	37 29 50.0	88 10 08.1
Cave in Rock, in north part of; center of T road east, 30 feet west to advertising board.....	37 28 30.6	88 09 53.7

Geographic positions along highways—Continued.

NEAR NORTH BORDER—continued.

Station.	Latitude.	Longitude.
ILLINOIS—continued.		
T. 12 S., R. 8 E., northeast corner sec. 13	37 28 56.2	88 09 07.8
T. 12 S., R. 8 E., northeast corner sec. 18	37 28 56.9	88 07 59.9
Cave in Rock, 2 miles east of; south side of Cave in Rock-Fords Ferry road, 10 feet northeast to center of T road northeast; iron post stamped "Prim. Trav. Sta. No. 35, 1908, Illinois"	37 28 50.3	88 07 47.9
T road south to Fords Ferry, at barn, 20 feet southwest to corner fence post	37 28 46.0	88 06 30.6
Three mail boxes, forks of road	37 29 02.0	88 05 56.6
Old ferry landing opposite Weston, Ky., large cross cut on southwest face of honey-locust tree, with two nails driven in center	37 29 04.7	88 04 39.3
KENTUCKY.		
Weston, elm tree at center of cross streets	37 28 27.7	88 04 18.9
Weston, 0.8 mile east of; T road south, 15 feet north to corner fence post	37 28 05.0	88 03 40.5
David Crowell's residence, just north of; T road south, 15 feet northeast to center of small bridge	37 28 19.3	88 02 28.1
Weston, 4 miles east of; 30 feet west to center of T road west at Rodney's store, cross in sandstone with "U. S. G. S." cut on top	37 28 27.7	88 01 03.3
Mr. Munn's residence, 0.5 mile north of; crossroads, 12 feet southwest to elevation "504.3" painted on corner fence post	37 29 09.1	88 00 51.7

MORGANFIELD QUADRANGLE.

Geographic positions near southwest corner.

Station.	Latitude.	Longitude.
Tradewater River, 0.5 mile northeast of ferry, T lane east ..	37 31 52.1	87 59 41.7
Sturgis-Adams street crossing Illinois Central Railroad	37 32 48.5	87 59 03.6

INDIANA.

PRIMARY TRAVERSE.

Bloomington, Brazil, Clay City, Jasonville, and Spencer quadrangles.

CLAY, GREENE, LAWRENCE, MONROE, AND OWEN COUNTIES.

The following geographic positions were determined in 1906 by J. R. Ellis. The line starts at Beard triangulation station, Coast and Geodetic Survey, follows highways near the borders of quadrangles, and is tied to Leonard and Wright triangulation stations.

BLOOMINGTON QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Beard triangulation station, Coast and Geodetic Survey, in SE. $\frac{1}{4}$ sec. 10, T. 6 N., R. 2 W., on land of J. T. Beard, about 7 miles from Harrodsburg, and 2.5 miles from Springville ^a	38 58 03.86	86 36 43.06
Forks of road, 24 feet east to walnut tree.....	38 58 33.9	86 36 12.5
T. 6 N., R. 2 W., northeast corner sec. 2.....	38 59 33.4	86 35 32.5
T road east, 20 feet west to tree used as telephone pole, 20 feet west to corner fence.....	39 00 10.1	86 35 23.4
Harrodsburg, 0.75 mile west of T road north, 24 feet northwest to north end of culvert, 38 feet northeast to corner fence.....	39 00 42.0	86 33 32.0
Harrodsburg, T street west at hotel.....	39 00 43.3	86 32 42.2
Harrodsburg, 0.5 mile east of; in southeast corner of Wm. Dickard's field, T road north, nail in west face of elm tree bears S. 78° E., 14 feet, nail in west face of white-oak tree bears N. 58° E. 79 feet, iron post stamped "Prim. Trav. Sta. No. 1, 1906".....	39 00 48.1	86 31 24.2
T. 7 N., R. 1 W., northeast corner sec. 21.....	39 02 31.8	86 31 01.0
Smithville, road crossing Monon Route, 200 feet north of station.....	39 04 10.4	86 30 27.8
T. 7 N., R. 1 W., northeast corner sec. 3.....	39 04 42.0	86 29 54.8
Church, forks of road just west of; 38 feet southeast to cherry tree, 18 feet northeast to cherry tree.....	39 05 45.1	86 29 37.6
T. 8 N., R. 1 W., northeast corner of sec. 27, T road west.....	39 06 25.2	86 29 54.4
T. 8 N., R. 1 W., near northeast corner sec. 22, nail in blaze on walnut tree bears N. 58° W. 14 feet, nail in blaze on ash tree bears N. 10° W. 14 feet, iron post stamped "Prim. Trav. Sta. No. 2, 1906".....	39 07 17.6	86 29 55.0
T. 8 N., R. 1 W., northeast corner sec. 21.....	39 07 17.2	86 31 02.0
T. 8 N., R. 1 W., northeast corner sec. 20.....	39 07 17.5	86 32 09.2
T. 8 N., R. 1 W., northeast corner sec. 19.....	39 07 19.4	86 33 14.8
T. 8 N., R. 2 W., northeast corner sec. 19.....	39 07 20.3	86 34 24.0
Leonard triangulation station, Coast and Geodetic Survey, NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 26, T. 8 N., R. 2 W., 7 miles southwest of Bloomington ^b	39 06 28.2	86 36 17.1
T road south, 20 feet northeast to corner of fence 34 feet northwest to cross on sycamore tree.....	39 08 09.7	86 30 45.6
T. 8 N., R. 1 W., quarter corner north side of sec 10, T road east at cemetery.....	39 09 01.9	86 30 30.0

^a Station mark: A 4 by 6-inch earthenware pyramid lettered "U. S. C. S.," buried 4.5 feet and a marble post 3 feet long and 6 inches square marked on top "U. S. + C. & G. S." There are also 3 marble reference posts 3 feet long and 4 inches square with arrows pointing to station in following distances and directions: Post A, 124.6 feet, magnetic bearing N. 17° 00' E.; post B, 167.9 feet, magnetic bearing S. 42° 28' E.; post C, 233.4 feet, magnetic bearing S. 66° 28' W. Post B is in range with mulberry tree 400 feet from station.

^b Station is near Stamford road on west of a hill planted with young fruit trees and occupied by Thos. Regan. A 4 by 6 inch earthenware pyramid lettered "U. S. C. S." buried 4.25 feet and a marble post 3 feet long and 6 inches square marked "U. S. C. & G. S." are the underground and surface marks. There are also 3 marble posts 3 feet long and 4 inches square, each with an arrow pointing toward station in following directions and distances; Post A, N. 8° 10' W., 70.3 feet; post B, N. (meridian) 56.1 feet; post C, N. 78° 25' E., 108.7 feet.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 8 N., R. 1 W., quarter corner north side of sec. 3, T road south.....	39 09 51.5	86 30 30.2
T. 9 N., R. 1 W., quarter corner east side of sec. 33, T road north.....	39 10 18.1	86 31 07.5
T. 9 N., R. 1 W., quarter corner east side of sec. 28, T road south.....	39 11 10.7	86 31 08.4
Bloomington, 1.5 miles north of; forks of road, 24 feet east to end of culvert, 30 feet north to pile of stone.....	39 11 09.5	86 32 04.1
Griffith's Creek, center of bridge over.....	39 12 28.9	86 31 57.6
T road southwest, 30 feet northwest to cross on fence post, 30 feet south to J. A. Bell's mail box.....	39 13 53.8	86 32 34.3
Dolan, 2.5 miles southwest of; at southwest corner of T pike, cross cut on south end of stone culvert bears N. 46° E., 133 feet, nail in blaze on white oak bears S. 70° W., 8 feet, iron post stamped "Prim. Trav. Sta. No. 3, 1906".....	39 14 50.3	86 32 52.3
Township line, T road south, 10 feet east to corner of wire fence.....	39 14 40.2	86 34 25.9
T. 9 N., R. 2 W., quarter corner east side of sec. 2, cross roads.....	39 14 41.0	86 35 34.2
T. 9 N., R. 2 W., northeast corner sec. 11, T road west....	39 14 14.8	86 35 34.0
Ellettsville, 0.5 mile north of; Pike crossing Monon Route.	39 14 34.9	86 37 16.9
T. 9 N., R. 2 W., sec. 9, center of crossroads at cemetery...	39 13 52.7	86 38 23.9
School grounds, north side of; northeast corner of foundation of schoolhouse bears S. 11° W., 86.6 feet; nail in blaze on ash tree bears S. 59° W., 101.6 feet, iron post stamped "Prim. Trav. Sta. No. 4, 1906".....	39 13 53.4	86 39 32.7
T. 9 N., R. 3 W., northeast corner sec. 12.....	39 14 20.6	86 41 02.8
T road north, 24 feet south to corner fence post, 16 feet northwest to apple tree.....	39 14 33.0	86 42 27.3
Hardscrabble School, in southwest corner of grounds, southeast corner of schoolhouse bears N. 78° W., 99 feet, nail in blaze on beech tree bears N. 42° W. 94.6 feet, iron post stamped "Prim. Trav. Sta. No. 5, 1906".....	39 14 46.0	86 43 34.4
Owens County Infirmary, 700 feet south of; road southeast.....	39 13 57.5	86 43 44.9
Old store, T road, 33 feet west to walnut tree.....	39 12 53.0	86 44 12.7
Freeman, just north of; road northeast, 33 feet northeast to telephone pole, 18 feet northwest to sycamore tree...	39 11 44.7	86 43 59.3
Blacksmith shop, T road east.....	39 10 50.9	86 43 47.8
T. 8 N., R. 3 W., northeast corner sec. 3.....	39 09 57.0	86 43 30.8
McVille, northeast corner sec. 9, T. 8 N., R. 3 W., crossroads.....	39 09 11.9	86 44 19.3
T. 8 N., R. 3 W., northeast corner sec. 8.....	39 09 13.5	86 45 27.4
T. 8 N., R. 3 W., northeast corner sec. 17.....	39 08 22.7	86 45 27.2
T. 8 N., R. 3 W., northeast corner sec. 20, T road west....	39 07 28.3	86 45 26.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Solsberry, 3 miles north of; at T road east, in southwest corner of David Cox's field, nail in blaze on cherry tree bears N. 6° W. 46 feet, nail in blaze on cherry tree bears S. 83° E. 105 feet, iron post stamped "Prim. Trav. Sta. No. 6, 1906".....	39 07 11.4	86 45 25.9
Crossroads, 30 feet north west to corner fence, 32 feet north-east to corner of fence.....	39 06 09.1	86 45 26.0
Solsberry, crossroads, 19 feet northeast to north end of culvert, 18 feet southeast to culvert.....	39 05 00.2	86 45 22.6
Solsberry, 0.75 mile south of; 30 feet southeast to gatepost, 15 feet north to cross on tree, road forks.....	39 04 27.6	86 45 30.3
Buck Creek, center of bridge over.....	39 03 32.6	86 44 48.6
Cincinnati Junction, 1.75 miles northwest of; crossroads, 15 feet southwest to blaze on black oak.....	39 02 35.6	86 44 48.6
T. 7 N., R. 3 W., northeast corner sec. 21.....	39 02 11.3	86 44 15.8
Cincinnati, T road east, 27 feet southwest to store, 34 feet northeast to stone steps.....	39 01 12.9	86 43 44.3
Cincinnati, 0.5 mile southeast of; in Jacon H. Neal's front yard, stone chimney bears S. 48° W. 63 feet, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	39 00 53.2	86 43 26.7
Hobbsville, crossroads.....	39 00 01.6	86 42 37.0
T road south.....	39 00 00.1	86 41 29.8
T. 7 N., R. 3 W., northeast corner sec. 25.....	39 00 26.2	86 40 56.4
T. 7 N., R. 2 W., northeast corner sec. 31.....	39 00 25.3	86 39 58.1
T. 7 N., R. 2 W., northeast corner sec. 32.....	39 00 25.1	86 38 51.5
Lampscomb Church, 500 feet south of; south of road at elbow, 160 feet west of forks, nail in blaze of maple tree bears N. 54° W. 23 feet, nail in blaze of white oak bears S. 39° E. 31 feet, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	38 59 53.9	86 37 29.1
Monroe-Lawrence county line, east-west fence, at road....	38 59 31.7	86 37 07.6

SPENCER QUADRANGLE.

Magnetic declination: South border, 2° 40' east; west border, 2° 52' east.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
T. 9 N., R. 3 W., center of pike at north township line...	39 15 10.4	86 43 51.3
Spencer, 0.5 mile south of; forks of pike, 30 feet northwest to H. C. K. mail box, 21 feet southwest to mail box.....	39 16 31.8	86 45 43.0
Spencer, Washington street crossing Vandalia Railroad....	39 17 09.9	86 45 40.8
Crossroads.....	39 16 56.9	86 46 37.6

Geographic positions along highways—Continued.

NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
Bridge over Rattlesnake-Creek, just west of; T road east, 27 feet southeast to arrow on telephone pole, 36 feet east to northwest corner of bridge.....	39° 15' 36.4"	86° 48' 21.2"
Bridge over Rattlesnake Creek, 1 mile southwest of; T road south, 15 feet northwest to D. Burket's mail box, 27 feet northeast to Chas. McCauley's mail box.....	39 14 46.3	86 48 53.5
T. 9 N., R. 4 W., northeast corner sec. 3.....	39 15 13.4	86 49 57.2
T. 9 N., R. 4 W., northeast corner sec. 4, T road south, 30 feet southeast to arrow on corner of fence.....	39 15 13.8	86 51 01.2
Wilk Strouse's field, southeast corner of; 2 feet north of township line at elbow of road, nail in blaze on small sycamore bears S. 17° 15' E. 7.4 feet, nail in blaze on tree bears N. 85° 50' W. 83.4 feet, iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	39 15 14.3	86 52 16.6
Crossroads in south part of sec. 32, T. 10 N., R. 3 W., 20 feet west of center of small bridge.....	39 15 27.3	86 53 17.3
Township line, 0.25 mile north of; stone at T road east....	39 15 28.2	86 54 21.7
T road north, 20 feet due south to east end of gate.....	39 15 41.6	86 54 55.3
Schoolhouse, 0.33 mile west of; T road north.....	39 15 42.0	86 56 01.5
Schoolhouse, just west of; center of bridge at T road north..	39 16 15.0	86 57 42.3
T. 10 N., R. 5 W., northeast cornerstone sec. 32.....	39 16 08.3	86 58 50.8
Denmark, 1.5 miles east of; in southeast corner of field at crossroads, nail in blaze on large oak bears N. 85° 10' E. 40.4 feet, nail in blaze on black oak bears N. 55° 45' W. 11.2 feet, iron post stamped "Prim. Trav. Sta. No. 10, 1906".....	39 16 09.2	86 59 55.4

NEAR WEST BORDER.

School No. 10, cross cut on southwest corner of schoolhouse foundation bears N. 56° 50' E. 46.2 feet, nail in blaze on ash tree bears S. 1° 50' E. 25.3 feet, iron post stamped "Prim. Trav. Sta. No. 16, 1906".....	39 30 10.0	86 59 30.3
Stone at crossroads 0.5 mile north of Croy Creek.....	39 29 17.3	86 59 31.5
Putnam-Clay county line, stone at T road west.....	39 28 24.5	86 59 32.3
Putnam-Clay county line, 1 mile south of; road west, 28 feet northwest to east end of gate, 33 feet southeast to corner yard fence.....	39 27 37.7	86 59 42.6
T. 10 N., R. 5 W., northeast corner sec. 6, Clay-Owen county line, T road south.....	39 20 32.2	86 59 54.5
T. 10 N., R. 5 W., northeast corner sec. 7, T road east at schoolhouse.....	39 19 37.7	86 59 55.4
T. 10 N., R. 5 W., northeast corner sec. 18, center of road at rail fence east.....	39 18 45.2	86 59 56.1
T. 10 N., R. 5 W., northeast corner sec. 19, center of road at board fence.....	39 17 52.4	86 59 56.4
T. 10 N., R. 5 W., northeast corner sec. 30, center of road at east-west rail fence.....	39 17 00.2	86 59 57.3

CLAY CITY QUADRANGLE.

Magnetic declination: South border, $3^{\circ} 00'$ east; east border, $2^{\circ} 52'$ east; west border, $3^{\circ} 15'$ east; north border, $3^{\circ} 00'$ east.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
T. 10 N., R. 5 W., northwest corner sec. 31 (road jogs north 160 feet, thence west again).....	$39^{\circ} 16' 09.4''$	$87^{\circ} 01' 03.6''$
T. 10 N., R. 6 W., northeast corner sec. 35, center of road at wire fence south at schoolhouse.....	$39^{\circ} 16' 11.4''$	$87^{\circ} 02' 10.4''$
T. 10 N., R. 6 W., northeast corner sec. 34, Owen-Clay county line, crossroads.....	$39^{\circ} 16' 11.8''$	$87^{\circ} 03' 17.8''$
T. 10 N., R. 6 W., northeast corner sec. 33, crossroads, 24 feet southwest to corner of board fence, 34 feet northeast to arrow on telephone pole.....	$39^{\circ} 16' 12.6''$	$87^{\circ} 04' 24.3''$
T. 10 N., R. 6 W., northeast corner sec. 32, crossroads, 15 feet northwest to west end of culvert, 30 feet northeast to mail box.....	$39^{\circ} 16' 13.1''$	$87^{\circ} 05' 31.7''$
T. 10 N., R. 6 W., northeast corner sec. 31, crossroads, 24 feet northeast to corner yard fence, 24 feet southeast to arrow on telephone pole.....	$39^{\circ} 16' 13.6''$	$87^{\circ} 06' 38.7''$
Martz, in northwest corner of lot owned by Philips Brown, nail in blaze on maple bears S. 12° W. 22.2 feet, northeast corner of store bears S. $88^{\circ} 45'$ W. 53.4 feet, iron post stamped "Prim. Trav. Sta. No. 11, 1906".....	$39^{\circ} 15' 48.6''$	$87^{\circ} 07' 15.0''$
Crossroads at schoolhouse, 27 feet northeast to corner fence post, 31 feet northwest to corner fence post.....	$39^{\circ} 15' 49.7''$	$87^{\circ} 08' 33.6''$
T. 10 N., R. 7 W., quarter corner east side of sec. 34, center of crossroads.....	$39^{\circ} 15' 51.2''$	$87^{\circ} 09' 57.6''$
Neal's mill, center of steel bridge over Eel River.....	$39^{\circ} 16' 16.4''$	$87^{\circ} 11' 41.6''$
Briley Chapel, crossroads, 22 feet due west to center of small bridge.....	$39^{\circ} 15' 55.6''$	$87^{\circ} 12' 39.0''$
T. 9 N., north line of; T road west, 18 feet due west to center of small bridge.....	$39^{\circ} 15' 29.2''$	$87^{\circ} 12' 25.5''$
Lewis, 0.75 mile east and 0.5 mile north of; Clay-Vigo county line, T road west, in southeast corner of Robt. J. Skannerhorn's farm, iron post stamped "Prim. Trav. Sta. No. 12, 1906".....	$39^{\circ} 15' 59.2''$	$87^{\circ} 14' 25.3''$

NEAR WEST BORDER.

T. 10 N., R. 7 W., northwest corner sec. 31, T road east, Clay-Vigo county line.....	$39^{\circ} 16' 24.6''$	$87^{\circ} 14' 24.8''$
T. 10 N., R. 8 W., northeast corner sec. 36, road west, Clay-Vigo county line.....	$39^{\circ} 16' 25.0''$	$87^{\circ} 14' 24.8''$
T. 10 N., R. 8 W., northeast corner sec. 25, T road west, county line.....	$39^{\circ} 17' 17.5''$	$87^{\circ} 14' 24.9''$
T. 10 N., R. 7 W., northwest corner sec. 19, T road east, county line.....	$39^{\circ} 18' 09.5''$	$87^{\circ} 14' 24.5''$
T. 10 N., R. 8 W., northeast corner sec. 13, county line.....	$39^{\circ} 19' 02.3''$	$87^{\circ} 14' 24.1''$

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
T. 10 N., R. 8 W., northeast corner sec. 12, T road west, county line.....	° ' " 39 19 54.7	° ' " 87 14 23.5
T. 10 N., R. 7 W., northwest corner sec. 6, crossroads, county line.....	39 20 47.8	87 14 23.4
Center of bridge at crossroads, county line.....	39 21 39.8	87 14 23.3
T. 11 N., R. 7 W., 18 feet east of northwest corner sec. 30, crossroads, southwest corner of foundation to David Swank's residence bears N. 65° 20' W. 110.4 feet, southwest corner of stable bears N. 30° 15' E. 18.9 feet, iron post stamped "Prim. Trav. Sta. No. 13, 1906".....	39 22 32.2	87 14 22.9
T. 11 N., R. 8 W., northeast corner sec. 24, crossroads, 16 feet southwest to south end of small bridge, 15 feet southwest to south end of culvert, county line.....	39 23 24.4	87 14 22.8
T. 11 N., R. 8 W., northeast corner sec. 13, T road west, county line.....	39 24 16.4	87 14 22.5
T. 11 N., Rs. 7 and 8 W., northeast corner sec. 12, crossroads, 13 feet northwest to north corner of small bridge, 21 feet northeast to north end of culvert, county line....	39 25 08.6	87 14 22.3
T. 11 N., R. 8 W., northeast corner sec. 1, center of road at east-west fence, county line.....	39 26 00.8	87 14 21.9
T. 12 N., R. 8 W., northeast corner sec. 36, T road west, 18 feet east to arrow on fence, county line.....	39 26 53.0	87 14 21.5
T. 12 N., R. 7 W., northwest corner sec. 30, at turn of road to east, county line.....	39 27 47.4	87 14 21.1
T. 12 N., R. 7 W., quarter corner north side of sec. 19, T road south.....	39 28 39.5	87 13 44.8
Cloverland, 0.5 mile south of; road crossing under Vandalia Railroad.....	39 29 33.3	87 14 02.9

NEAR EAST BORDER.

T road east, 28 feet due west to junction of fences.....	39 26 39.8	87 00 01.7
T. 12 N., R. 5 W., northeast corner sec. 31.....	39 26 39.8	86 59 50.5
T. 11 N., center of road at north line of; east-west rail fence.....	39 25 47.8	87 00 25.6
T. 11 N., R. 6 W., northeast corner sec. 12, stone in center of east-west road.....	39 24 54.1	87 00 57.0
James Campbell's residence, center of large stone culvert.....	39 23 41.7	87 01 26.2
Covered bridge, 0.33 mile northwest of; T road north, 33 feet southwest to south end of stone culvert, 33 feet southeast to cross on telephone pole.....	39 23 09.7	87 01 33.9
Bowling Green, in southeast part of; on east side of T road, 1.5 feet west of fence, iron post stamped "Prim. Trav. Sta. No. 17, 1906".....	39 22 41.0	87 00 27.6
T. 11 N., R. 5 W., quarter corner north side of sec. 31, center of road at east-west fence.....	39 21 24.6	87 00 27.7

BRAZIL QUADRANGLE.

Magnetic declination: South border, 3° east.

Geographic positions along highways near south border.

Station.	Latitude.	Longitude.
Cloverland, in west part of; north side of National road at T road south, nail in blaze on large catalpa tree bears N. 57° 45' E. 71.4 feet, northwest corner of residence bears S. 25° 45' E. 92.4 feet, iron post stamped "Prim. Trav. Sta. No. 14, 1906".....	39 30 05.5	87 14 02.9
Bowles School, crossroads, 25 feet south to road crossing electric railroad, 32 feet northeast to guidepost.....	39 30 20.9	87 12 35.6
School No. 6, road crossing Terre Haute-Brazil electric railroad.....	39 30 36.0	87 11 17.3
Williamstown, crossroads 0.75 mile south of School No. 6, 33 feet northeast to arrow on tree, 18 feet southeast to guidepost.....	39 29 54.4	87 11 11.9
Turner station, road crossing Vandalia Railroad.....	39 29 59.6	87 09 37.8
T. 12 N., R. 7 W., northeast corner sec. 11, crossroads, 16 feet northeast to telephone pole, 22 feet northwest to west end of culvert.....	39 30 16.1	87 08 40.0
Brazil, 1 mile south of; at crossroads, in southeast corner of Thomas Kellar's orchard, 20 feet east and 15 feet north to northwest corner sec. 7, T. 12 N., R. 6 W., iron post stamped "Prim. Trav. Sta. No. 15, 1906".....	39 30 14.5	87 07 32.6
T. 12 N., R. 6 W., northeast corner sec. 7, 24 feet due north to center of bridge.....	39 30 13.9	87 06 28.0
T. 12 N., R. 6 W., northeast corner sec. 8, crossroads, 23 feet northwest to west end of culvert, 21 feet northeast to east end of culvert.....	39 30 12.0	87 05 22.0
T. 12 N., R. 6 W., northeast corner sec. 9, crossroads, 30 feet northwest to guidepost, 24 feet northwest to telephone pole.....	39 30 12.2	87 04 16.0
T. 12 N., R. 6 W., northeast corner sec. 10, crossroads, 26 feet northeast to corner fence post, 21 feet northwest to arrow on telephone pole.....	39 30 12.0	87 03 08.9
T. 12 N., R. 6 W., northeast corner sec. 11, crossroads at church and schoolhouse.....	39 30 11.9	87 02 01.5
Clay-Putnam county line, T road east, 18 feet northeast to dead walnut tree, 22 feet west to rail fence.....	39 30 23.7	87 00 52.1

JASONVILLE QUADRANGLE.

Magnetic declination: North border, 3° east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 9 N., R. 7 W., northeast corner sec. 8.....	39 14 35.1	87 12 12.0
T. 9 N., R. 7 W., northeast corner sec. 17, crossroads.	39 13 42.9	87 12 11.8
T. 9 N., R. 7 W., northeast corner sec. 20, crossroads.	39 12 51.0	87 12 11.4
T. 9 N., R. 7 W., northeast corner sec. 29, crossroads, 25 feet northwest to corner fence post, 27 feet southwest to corner fence post.....	39 11 59.1	87 12 11.3
School No. 4, crossroads.....	39 11 33.1	87 12 11.4
T. 9 N., R. 7 W., northeast corner sec. 32.....	39 11 07.0	87 12 11.8
Center of road opposite stone at Clay-Greene county line..	39 10 14.7	87 11 55.8
Jasonville, crossing of Main and Meridian streets.....	39 09 47.0	87 11 55.9
Jasonville, 1.5 miles south of; road crossing Southern Indiana Railway.....	39 08 32.2	87 11 56.0
Wright triangulation station, in Wright Township, near center sec. 21, T. 8 N., R. 7 W., on James Wright's farm in meadow on crest of highest ground in neighborhood <i>a</i> .	39 07 13.6	87 11 42.41

a Station mark: A 4-sided earthenware pyramid 3 feet below surface; pyramid is 6 inches high, and 4 sides are inscribed "U. S. C. S." Surface mark is a marble post 2 feet long and 6 inches square marked on its upper surface with a cross and letters "U. S. C. & G. S." Three reference posts, 2.5 feet long and 5 inches square, are placed near fence line of main road east (magnetic) of station; one bears N. 47° 30' E. 323.8 feet, one N. 88° 30' E. 255.0 feet, one S. 38° 30' E. 451.4 feet.

INDIANA-ILLINOIS.

PRIMARY TRAVERSE.

Marshall, Rosedale, and Terre Haute quadrangles.

VIGO COUNTY, IND.; CLARK COUNTY, ILL.

The following geographic positions were determined in 1906 by J. R. Ellis. The line starts from an adjusted position near Lewis, Ind., and follows highways to Prairie Creek post-office; thence north to Wabash River; thence north near state line to near northwest corner of Terre Haute quadrangle; thence east along highways and railroads to Cloverdale, Ind., where line is tied to an adjusted position.

TERRE HAUTE QUADRANGLE.

Magnetic declination: North border, 2° 33' east; west border, 3° 05' east; east border, 3° 15' east; south border, 2° 52' east.

Geographic positions.

ALONG HIGHWAYS NEAR BORDERS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10 N., R. 8 W., quarter corner stone east side of sec. 35.	39 15 59.9	87 15 32.5
East-west road crossing Southern Indiana Railway	39 15 58.2	87 17 41.4
T. 10 N., R. 8 W., northeast corner stone sec. 33, crossroads at church and schoolhouse	39 16 25.8	87 17 46.9
T. 10 N., R. 8 W., northeast corner sec. 32, crossroads, 9 feet south to center of small bridge	39 16 25.6	87 18 54.1
T. 10 N., R. 8 W., northeast corner sec. 31, crossroads, 24 feet northwest to corner fence post, 21 feet northeast to mail box	39 16 25.4	87 20 01.4
T. 10 N., R. 8 W., northwest corner sec. 31, just north of crossroads, 25 feet due east to north end of small bridge	39 16 25.2	87 21 04.7
T. 10 N., R. 9 W., northwest corner sec. 36, south of road, nail in root of large white oak bears S. 89° 55' W. 48.8 feet, cross cut on northeast corner of stone culvert bears N. 35° W. 27 feet, iron post stamped "Prim. Trav. Sta. No. 18, 1906"	39 16 24.8	87 22 11.0
T. 10 N., R. 9 W., northeast corner sec. 34, crossroads, 24 feet northeast to large corner fence post, 27 feet northwest to large corner fence post	39 16 25.2	87 23 18.9
T. 10 N., R. 9 W., northeast corner sec. 33, crossroads, 36 feet northwest to guidepost, 27 feet northeast to corner fence post	39 16 25.2	87 24 26.3
T. 10 N., R. 9 W., northeast corner stone sec. 32, crossroads	39 16 25.4	87 25 33.6
T. 10 N., R. 9 W., northeast corner stake sec. 31, crossroads at schoolhouse	39 16 25.5	87 26 40.8
T. 10 N., R. 10 W., northeast corner sec. 36, crossroads, 27 feet northeast to corner fence post, 22 feet northwest to corner fence post	39 16 25.6	87 27 37.8
T road north	39 16 25.6	87 28 53.5
Prairie Creek post-office (Middletown), in southeast corner of public school grounds, southwest corner of school building bears N. 34° 05' W. 152.3 feet, nail in blaze on walnut tree bears S. 16° 15' W. 9.9 feet, iron post stamped "Prim. Trav. Sta. No. 19, 1906"	39 16 28.3	87 29 56.7
T. 10 N., R. 10 W., northeast corner sec. 27, crossroads, 33 feet southeast to J. E. Yeager's mail box, 28 feet northeast to corner of garden	39 17 17.6	87 29 53.3
T. 10 N., R. 10 W., northeast corner sec. 22, crossroads, 28 feet northeast to corner fence post, 27 feet southeast to corner fence post	39 18 10.2	87 29 52.5
T. 10 N., R. 10 W., northeast corner sec. 15, center of east-west road at rail fence north	39 19 02.1	87 29 52.5
T road west in bottom, 27 feet southwest to stump, 30 feet northwest to large corner fence post	39 20 21.2	87 29 51.4

Geographic positions—Continued.

ALONG BIG FOUR RAILWAY NEAR TERRE HAUTE.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Culvert No. 192, road crossing under	39 29 32.1	87 26 53.1
Terre Haute, Fifth street-Lafayette avenue crossing	39 28 32.0	87 24 41.2
Terre Haute, Maple avenue crossing of Chicago and Eastern Illinois Railroad.....	39 29 31.7	87 23 29.1

MARSHALL QUADRANGLE.

Magnetic declination: East border, 3° 05' east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10 N., R. 10 W., northeast corner sec. 4, T road, 30 feet southeast to junction of fences, 28 feet southwest to cross on fence post.....	39 20 47.6	87 30 59.0
Illinois-Indiana state-line monument, large stone post set on right bank of Wabash River at large sycamore tree opposite William Stout's farm.....	39 20 57.6	87 31 52.9
J. R. Lee's residence, 0.5 mile east of; T road south, 30 feet southwest to elm tree, 20 feet southeast to cross on fence post.....	39 22 05.8	87 32 06.5
J. L. Ingram's residence, crossroads just north of; 42 feet west to corner of fence, 36 feet northeast to large elm tree.....	39 22 52.6	87 32 30.2
Illinois-Indiana state line, 15 feet east of; north of Terre Haute-Darwin pike, nail in blaze on large walnut tree bears S. 82° 10' W. 178 feet, nail in blaze south of pike bears S. 53° 40' W. 68 feet, iron post stamped "Prim. Trav. Sta. No. 20, 1906".....	39 23 07.2	87 31 54.0
T. 11 N., R. 10 W., northeast corner sec. 16, T road east, 22 feet southeast to mail box 94, 39 feet southeast to sycamore tree.....	39 24 16.8	87 30 58.6
T. 11 N., R. 10 W., northeast corner sec. 9, center of road at wire east-west fence.....	39 25 08.8	87 30 58.7
T. 12 N., R. 10 W., southeast corner sec. 33, 18 feet west to end of wire fence.....	39 26 00.3	87 30 59.9
Illinois-Indiana state line, national road at road north, 34 feet northeast to telegraph pole, 33 feet northwest to corner fence post.....	39 26 10.9	87 31 53.2
Center of steel bridge over creek east.....	39 26 58.1	87 31 53.4
Vandalia Railroad, 0.25 mile south of; stone at crossroads..	39 27 57.9	87 31 53.4
Vandalia Railroad, 0.5 mile north of; stone at T road west..	39 28 37.5	87 31 54.1
Bloomtown, 0.33 mile west of; gravel road crossing Illinois-Indiana state line.....	39 29 10.9	87 31 54.6
Sanford, 2.5 miles south of; in northeast corner of Harry Fuqua's field at T road west, iron post stamped "Prim. Trav. Sta. No. 21, 1906".....	39 30 09.5	87 31 36.7
T. 12 N., R. 10 W., northeast corner sec. 9, center of road at rail fence south.....	39 30 21.6	87 31 02.9

ROSEDALE QUADRANGLE. •

Magnetic declination: South border, $2^{\circ} 33'$ east.*Geographic positions along highways near south border.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 12 N., R. 10 W., northeast corner sec. 10	39 30 22.0	87 29 55.6
St. Marys, 0.5 mile northwest of station, road crossing under Big Four Railway	39 30 33.9	87 28 16.6
St. Marys, 0.5 mile southeast of station, Big Four Railway at crossing of electric railroad overhead	39 30 06.6	87 27 30.9
Chicago and Eastern Illinois Railroad, north of Fort Harrison pike crossing; nail in blaze on elm tree bears S. $19^{\circ} 15'$ E. 43 feet, 26.6 feet west to east rail of railroad, iron post stamped "Prim. Trav. Sta. No. 22, 1906"	39 30 24.4	87 22 47.8
T. 12 N., R. 9 W., northeast corner stone sec. 12	39 30 22.8	87 21 03.3
T. 12 N., R. 8 W., northeast corner stone sec. 7, T road north	39 30 22.2	87 19 58.7
T. 12 N., R. 8 W., northeast corner sec. 8, crossroads, 27 feet northwest to corner fence post, 24 feet northeast to corner fence post	39 30 22.4	87 18 51.4
T. 12 N., R. 8 W., northeast corner stone sec. 9, T road south	39 30 22.6	87 17 43.7
T. 12 N., R. 8 W., northeast corner sec. 10, center of road at rail fence south	39 30 22.4	87 16 36.1
Seeleyville, north-south road crossing electric railroad . . .	39 29 39.8	87 16 02.4

IOWA.

PRIMARY TRAVERSE.

Albia, Belinda, Knoxville, Lynnville, Milo, Newton, and Pella quadrangles.

MAHASKA, MARION, POLK, AND WARREN COUNTIES.

In cooperation with the State, the following geographic positions, determined by J. R. Ellis in 1907 and 1908, are based on the Des Moines astronomic datum. The line for Milo quadrangle was tied to the iron post located at Levey in 1904. The line for the other quadrangles starts from adjusted position near the southwest corner of Knoxville quadrangle, follows highways east, north, and west near borders of quadrangle and is tied to adjusted position near the northwest corner of Knoxville quadrangle. Starting again from a position on above line near the northeast corner of Knoxville quadrangle, the line follows highways east, south, and west and is tied to adjusted position near the southeast corner of Knoxville quadrangle.

MILO QUADRANGLE.

Magnetic declination: North border, $8^{\circ} 21'$ east; east border, $8^{\circ} 22'$ east; south border, $7^{\circ} 49'$ east; west border, $8^{\circ} 16'$ east.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Levey, west of north-south road, on property of E. S. Erwin, northeast corner of brick foundation to Irwin's residence bears N. 21° 50' W. 174.5 feet, five nails in large telephone pole bear S. 54° 15' E. 54 feet, iron post stamped "Prim. Trav. Sta. No. 7".....	41 32 50.9	93 31 23.2
Levey, 1 mile southeast of; north-south road crossing.....	41 32 04.1	93 30 30.8
Avon station, north-south road crossing.....	41 31 37.6	93 29 56.1
Avon station, northeast corner sec. 33, T. 78 N., R. 23 W.; center of T road north, 25 feet south to corner fence post.....	41 31 25.8	93 29 56.2
Chicago, Burlington and Quincy Railroad at Polk-Warren county line post.....	41 30 29.5	93 27 55.6
Clarkson, north-south road crossing.....	41 30 00.6	93 27 02.7
Milepost 56, 0.5 mile southeast of; north-south road crossing.....	41 29 35.8	93 25 39.0
Ford station, just west of; road crossing.....	41 29 05.1	93 23 09.7
Ford station, 0.5 mile north of; in top of concrete pile at southeast corner of south span of bridge over Des Moines River, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907, Iowa".....	41 29 36.0	93 22 55.9
T. 37 N., R. 22 W., quarter corner north side of sec. 3, center T road south.....	41 30 26.0	93 22 30.1
Runnells station.....	41 30 32.2	93 21 19.6
Milepost 17, north-south road crossing.....	41 30 23.1	93 20 17.9
Runnells, 1.5 miles east of; northeast corner sec. 1, T. 77 N., R. 22 W., corner of Jasper, Warren, Marion, and Polk counties, large fence post on north-south fence line at fence west.....	41 30 27.4	93 19 36.8
Milepost 19, 0.33 mile east of; private road crossing.....	41 29 15.6	93 18 02.8
Percy, 1.5 miles west of; in south part of W. C. Wilson's yard, 1 foot north of Wabash Railroad fence at road crossing wagon bridge over Des Moines River, in top of sandstone post 5 by 20 by 26 inches, set 22 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1907, Iowa".....	41 29 15.6	93 16 21.1
T. 77 N., R. 21 W., northeast corner sec. 16, 10 feet west to center of turn in road.....	41 28 46.5	93 16 13.5
T. 77 N., R. 21 W., northeast corner sec. 28, center of T road west.....	41 27 02.2	93 16 12.8
T. 77 N., R. 21 W., northeast corner sec. 33, center of T road at schoolhouse.....	41 26 09.8	93 16 12.4
T. 76 N., R. 21 W., northeast corner sec. 4, center of cross-roads.....	41 25 17.6	93 16 11.8
T. 76 N., R. 21 W., northeast corner sec. 3, center of cross-roads.....	41 25 17.9	93 15 02.4
T. 76 N., R. 21 W., northeast corner sec. 10, center of T road west.....	41 24 26.0	93 15 01.7

Geographic positions along highways—Continued.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Pleasantville, 0.75 mile southeast of; 230 feet northwest of section-line road crossing, in top of east end of railroad culvert, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1907, Iowa".....	41 22 55.8	93 15 03.6
T. 76 N., R. 21 W., northeast corner sec. 22, center of road at hedge fence east.....	41 22 42.1	93 15 01.5
T. 76 N., R. 21 W., northeast corner sec. 27, center of culvert.....	41 21 50.1	93 15 00.7
T. 76 N., R. 21 W., quarter corner north side of sec. 34, center of crossroads.....	41 20 57.8	93 15 35.8
T. 75 N., R. 21 W., quarter corner north side of sec. 3, center of crossroads.....	41 20 05.3	93 15 36.0
T. 75 N., R. 21 W., quarter corner north side of sec. 10, center of crossroads.....	41 19 13.8	93 15 35.6
T. 75 N., R. 21 W., quarter corner north side of sec. 15, center of T road west.....	41 18 21.6	93 15 35.3
T. 75 N., R. 21 W., northeast corner sec. 22, center of road at fence west.....	41 17 29.4	93 15 00.8
Dallas, 1 mile north of; at northwest corner of William Clark's lot, 25 feet northwest to T road east, in top of sandstone 26 by 10 by 8 inches, 24 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1907, Iowa".....	41 14 52.6	93 14 07.2
T. 74 N., R. 21 W., northeast corner sec. 3, T road west, 25 feet south to corner fence post.....	41 14 52.8	93 14 59.2

NEAR SOUTH BORDER.

T. 74 N., R. 21 W., northeast corner sec. 5, center of T road north.....	41 14 53.0	93 17 17.2
T. 75 N., R. 21 W., northeast corner sec. 32, center of road at hedge fence east.....	41 15 45.2	93 17 17.7
Marion-Warren county line, center of T road east, cut through fields.....	41 15 57.9	93 19 34.8
T. 75 N., R. 22 W., northeast corner sec. 35, center of T road east of schoolhouse, 20 feet west to cross on fence post.....	41 15 45.1	93 20 44.1
T. 74 N., R. 22 W., northeast corner stone sec. 2, crossroads.....	41 14 52.8	93 20 44.3
St. Mary's Catholic Church, at crossroads, 40 feet west, 20 feet south of stone corner at southwest corner sec. 35, T. 74 N., R. 22 W., 6 feet east of cottonwood tree, in top of sandstone 28 by 6 by 12 inches, 24 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1907, Iowa".....	41 14 52.6	93 21 52.9
T. 74 N., R. 22 W., northeast corner sec. 4.....	41 14 52.1	93 23 03.0
T. 74 N., R. 22 W., northeast corner sec. 5, corner of crossroads.....	41 14 51.9	93 24 07.6
T. 74 N., R. 22 W., northeast corner sec. 6, center of crossroads.....	41 14 51.8	93 25 17.3

Geographic positions along highways—Continued.

NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
T. 74 N., R. 22 W., northeast corner sec. 1, center of crossroads.....	41 14 51.8	93 26 26.2
T. 74 N., R. 22 W., northeast corner sec. 2, center of road..	41 14 52.0	93 27 35.9
T. 74 N., R. 23 W., northeast corner sec. 4, 30 feet north and 60 feet west to crossroads, limestone 26 by 9 by 9 inches, set 24 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1907, Iowa".....	41 14 52.5	93 29 54.8

NEAR WEST BORDER.

Center of T road east, at section corner.....	41 15 45.2	93 29 55.1
Center of T road east, at section corner.....	41 16 36.8	93 29 54.8
Otter Creek, center of bridge over.....	41 18 50.5	93 30 10.2
Crossroads, corner of sections.....	41 21 01.4	93 31 07.1
T. 76 N., R. 23 W., 30 feet west and 20 feet south to northeast corner sec. 16, crossroads, at corner of fence, in top of limestone 28 by 8 by 6 inches, 24 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907, Iowa".....	41 22 44.7	93 31 06.8
T. 76 N., R. 23 W., northeast corner sec. 17, T road east, at schoolhouse, 10 feet north to stone.....	41 23 36.8	93 31 07.2
T. 76 N., R. 23 W., corner sec. 5, T road east, 25 feet west to Robert McElroy's mail box.....	41 25 21.4	93 31 06.9
T. 77 N., R. 23 W., quarter corner north side of sec. 33, 20 feet west to mail box, T road east.....	41 26 12.9	93 30 31.5
T. 77 N., R. 23 W., northeast corner sec. 33, at turn of road, 23 feet east to south end of gate.....	41 26 12.3	93 29 57.0
T. 77 N., R. 23 W., northeast corner sec. 28, T road east, 12 feet northwest to D. Luther's mail box.....	41 27 04.4	93 29 56.2
Carlyle station.....	41 29 54.4	93 28 55.3
Chicago, Rock Island and Pacific Railway at Warren-Polk County line, 90 feet west to section corner.....	41 30 31.4	93 28 45.3

KNOXVILLE QUADRANGLE.

Magnetic declination: North border, 7° 31' east; east border, 8° 19' east; south border, 8° 02' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 75 N., R. 19 W., northeast corner stone sec. 34, center of crossroads.....	41 15 45.7	93 01 17.4
T. 75 N., R. 19 W., quarter corner east side of sec. 22, center of T road south.....	41 17 04.3	93 01 18.4
T. 75 N., R. 19 W., center of sec. 15, center of crossroads..	41 17 56.7	93 01 53.1
Flagler Chapel, center of T road south.....	41 19 09.6	93 01 53.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 75 N., R. 19 W., northeast corner sec. 10.....	° ' " 41 19 15.3	° ' " 93 01 18.9
T. 75 N., R. 19 W., quarter corner east side of sec. 3, center of crossroads.....	41 19 41.5	93 01 19.0
T. 75 N., R. 19 W., northeast corner stone sec. 3, T road west.....	41 20 05.9	93 01 19.1
T. 76 N., R. 19 W., northeast corner sec. 34.....	41 20 58.2	93 01 19.6
T. 76 N., R. 19 W., northeast corner sec. 27, center of T road east.....	41 21 50.3	93 01 19.3
T. 76 N., R. 19 W., northwest corner sec. 23, church yard, iron post stamped "Prim. Trav. Sta. No. 3, 1908, Iowa".....	41 22 42.5	93 01 18.7
T. 76 N., R. 19 W., northeast corner sec. 22, center of crossroads.....	41 22 42.8	93 01 19.0
T. 76 N., R. 19 W., northeast corner sec. 15, turn of road..	41 23 35.0	93 01 19.7
Pella, 4.5 miles due west of; unused bridge at T road north.....	41 24 28.5	93 00 10.5
T. 76 N., R. 19 W., northeast corner stone sec. 2.....	41 25 18.5	93 00 10.8
T. 77 N., R. 19 W., northeast corner sec. 35, center of crossroads.....	41 26 11.0	93 00 11.0
T. 77 N., R. 19 W., northeast corner sec. 26, center of T road east.....	41 27 03.1	93 00 11.2
T. 77 N., R. 19 W., northeast corner sec. 23, center of crossroads.....	41 27 55.3	93 00 11.8
T. 77 N., R. 19 W., northeast corner sec. 14.....	41 28 47.6	93 00 12.7
T. 77 N., R. 19 W., northeast corner sec. 11, T road east..	41 29 39.8	93 00 13.2
Section corner.....	41 29 38.3	93 13 56.2
Section corner, center of T road east.....	41 28 46.3	93 13 55.9
Percy station, just east of road crossing.....	41 28 40.6	93 14 09.4

LYNNVILLE QUADRANGLE.

Magnetic declination: South border, 7° 42' east.

Geographic positions along highways near border.

Station.	Latitude.	Longitude.
T. 77 N., R. 19 W., northeast corner sec. 1, center of T road north.....	° ' " 41 30 30.0	° ' " 92 59 03.2
Skunk River, center of steel bridge over.....	41 30 46.4	92 57 48.8
T road north, center of.....	41 30 43.5	92 56 46.0
T. 78 N., R. 18 W., southeast corner sec. 33.....	41 30 30.5	92 55 36.7
T. 78 N., R. 18 W., northeast corner sec. 4, crossroads.....	41 30 30.5	92 55 36.5
T. 78 N., R. 18 W., center sec. 34, center of T road east...	41 30 56.7	92 55 02.6
Skunk River, just west of Middle Fork of; county line, center of T road north.....	41 30 57.0	92 53 01.0
Corner of Marion and Mahaska counties at Jasper county line, at southeast corner of T road east, in sandstone, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1908, Iowa".....	41 30 30.3	92 52 08.3

Geographic positions along highways near border—Continued.

Station.	Latitude.	Longitude.
T. 77 N., R. 18 W., northeast corner sec. 1, corner of Marion and Mahaska counties at Jasper county line	° ' " 41 30 30.9	° ' " 92 52 08.7
T. 77 N., R. 17 W., northeast corner sec. 6, county line . . .	41 30 31.2	92 51 03.0
T. 78 N., R. 17 W., southeast corner sec 31, county line . . .	41 30 31.2	92 51 02.1
County line, 1 mile east of Middle Fork of Skunk River, center of T road north	41 30 31.2	92 50 44.7
T. 77 N., R. 18 W., northeast corner sec. 5	41 30 31.4	92 49 53.8
T. 78 N., R. 18 W., southeast corner sec. 32, stone	41 30 31.4	92 49 52.7
T. 77 N., R. 17 W., northeast corner sec. 3, T road south, county line	41 30 31.9	92 47 36.6
T. 78 N., R. 17 W., southeast corner sec. 34	41 30 31.9	92 47 35.4
T. 77 N., R. 17 W., quarter corner north side of sec. 2, T road south, Mahaska-Jasper county line	41 30 31.8	92 46 59.7

ALBIA QUADRANGLE.

Magnetic declination: North border, 8° 03' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Riverside Church, at forks of road just north of Eveland bridge, in northeast corner of yard, iron post stamped "Prim. Trav. Sta. No. 9, 1908, Iowa"	° ' " 41 14 39.3	° ' " 92 45 13.7
T. 77 N., R. 18 W., northeast corner sec. 3	41 14 55.0	92 47 28.4
T. 75 N., R. 18 W., southeast corner sec. 34	41 14 55.0	92 47 29.4
T. 74 N., R. 18 W., northeast corner sec. 4	41 14 54.5	92 48 37.9
T. 74 N., R. 18 W., northeast corner sec. 5	41 14 54.4	92 49 47.2
T. 75 N., R. 18 W., southeast corner sec. 32	41 14 54.4	92 49 47.8
T. 74 N., R. 18 W., northeast corner sec. 6, 30 feet north to north corner fence post, T road south	41 14 54.2	92 50 56.6
T. 75 N., R. 18 W., southeast corner sec. 31, T road north . . .	41 14 54.2	92 50 56.9
T. 74 N., R. 19 W., quarter corner east side of sec. 1, Mahaska-Marion county line	41 14 26.3	92 52 05.5
Wabash Railroad, east-west road crossing, just north of milepost 289	41 14 26.2	92 53 05.3
Bussey, 2.5 miles north by 0.5 mile west of; west of T road east at bridge over Cedar Creek, 30 feet due east to west end of bridge, iron post stamped "Prim. Trav. Sta. No. 10, 1908, Iowa"	41 14 28.8	92 53 44.7
T. 74 N., R. 18 W., northeast corner sec. 9	41 13 59.9	92 55 33.6
T road east, 30 feet north to corner fence post	41 13 46.8	92 56 42.1
T. 74 N., R. 18 W., quarter corner east side of sec. 7, center of crossroads at schoolhouse	41 13 33.7	92 57 50.6
T. 74 N., R. 18 W., quarter corner west side of sec. 7	41 13 32.7	92 58 58.2

PELLA QUADRANGLE.

Magnetic declination: North border, $7^{\circ} 42'$ east; east border, $7^{\circ} 45'$ east; south border, $8^{\circ} 03'$ east; west border, $8^{\circ} 19'$ east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
T. 77 N., R. 17 W., northeast corner sec. 11, T road south, 60 feet due east to center of bridge.....	$41^{\circ} 29' 40.8''$	$92^{\circ} 46' 24.7''$
Taintor, 1.25 miles west by 0.5 mile south of; 20 feet north of T road south at G. L. Hall's residence, iron post stamped "Prim. Trav. Sta. No. 7, 1908, Iowa".....	$41^{\circ} 29' 41.0''$	$92^{\circ} 45' 32.9''$
Taintor, 1.25 miles west by 1.5 miles south of; near J. W. Strangham's residence, center of crossroads.....	$41^{\circ} 28' 48.7''$	$92^{\circ} 45' 32.3''$
Center of T road west.....	$41^{\circ} 27' 43.5''$	$92^{\circ} 45' 32.1''$
T. 77 N., R. 18 W., northeast corner sec. 25, center of crossroads.....	$41^{\circ} 27' 04.3''$	$92^{\circ} 45' 14.5''$
T. 77 N., R. 18 W., northeast corner sec. 36, turn of road..	$41^{\circ} 26' 12.1''$	$92^{\circ} 45' 14.2''$
T. 76 N., R. 18 W., northeast corner sec. 1.....	$41^{\circ} 25' 19.9''$	$92^{\circ} 45' 14.1''$
River Hill, forks of road at top of.....	$41^{\circ} 24' 28.1''$	$92^{\circ} 45' 19.6''$
T. 76 N., R. 18 W., southeast corner stone sec. 1.....	$41^{\circ} 24' 28.1''$	$92^{\circ} 45' 13.8''$
Center of T road west.....	$41^{\circ} 22' 44.07''$	$92^{\circ} 45' 31.1''$
Leighton, 2.25 miles north by 1.5 miles east of; 30 feet north by 20 feet east of center of T road east, iron post stamped "Prim. Trav. Sta. No. 8, 1908, Iowa".....	$41^{\circ} 22' 05.2''$	$92^{\circ} 45' 13.2''$
T. 76 N., R. 18 W., northeast corner stone sec. 36, road north from state road.....	$41^{\circ} 20' 60.0''$	$92^{\circ} 45' 13.2''$
T. 75 N., R. 18 W., northeast corner stone sec. 1, T road south.....	$41^{\circ} 20' 07.3''$	$92^{\circ} 45' 13.0''$
T. 76 N., R. 18 W., northeast corner sec. 13.....	$41^{\circ} 19' 16.6''$	$92^{\circ} 45' 12.6''$
T. 76 N., R. 18 W., northeast corner sec. 24.....	$41^{\circ} 18' 24.5''$	$92^{\circ} 45' 12.3''$
Ramsen coal shaft No. 4, center of T road south.....	$41^{\circ} 17' 58.8''$	$92^{\circ} 45' 46.5''$
Mahaska county farm, southeast of and near; center of steel bridge over creek.....	$41^{\circ} 16' 55.5''$	$92^{\circ} 45' 49.2''$
Foster station, road crossing Chicago, Burlington and Quincy Railroad.....	$41^{\circ} 15' 49.7''$	$92^{\circ} 46' 10.6''$

BELINDA QUADRANGLE.

Magnetic declination: North border, $8^{\circ} 02'$ east.

Geographic positions along highways near border.

Station.	Latitude.	Longitude..
Iron post stamped "Prim. Trav. Sta. No. 4, 1907, Iowa".....	$41^{\circ} 14' 52.6''$	$93^{\circ} 14' 07.2''$
T. 74 N., R. 21 W., northeast corner sec. 1.....	$41^{\circ} 14' 52.8''$	$93^{\circ} 12' 41.6''$
T. 74 N., R. 20 W., northeast corner sec. 6, center of crossroads.....	$41^{\circ} 14' 52.8''$	$93^{\circ} 11' 33.7''$
T. 74 N., R. 20 W., northeast corner sec. 5.....	$41^{\circ} 14' 53.0''$	$93^{\circ} 10' 25.5''$
English Creek, center of bridge over.....	$41^{\circ} 14' 53.3''$	$93^{\circ} 09' 18.0''$

Geographic positions along highways near border—Continued.

Station.	Latitude.	Longitude.
T. 74 N., R. 20 W., northeast corner sec. 2, iron post stamped "Prim. Trav. Sta. No. 1, 1908, Iowa".....	° ' " 41 14 53.5	° ' " 93 06 59.1
T. 74 N., R. 20 W., northeast corner sec. 2, center of crossroads.....	41 14 53.7	93 06 58.9
T. 74 N., R. 20 W., northeast corner stone sec. 1.....	41 14 53.7	93 05 50.3
T. 74 N., R. 19 W., northeast corner sec. 6.....	41 14 53.6	93 04 45.0
T. 74 N., R. 19 W., northeast corner sec. 5, 10 feet west of center of crossroads.....	41 14 53.5	93 03 35.5
T. 74 N., R. 19 W., northeast corner stone sec. 4.....	41 14 53.4	93 02 26.4
Attica, 1.25 miles north of; east side of T road west, iron post stamped "Prim. Trav. Sta. No. 2, 1908, Iowa"....	41 14 53.3	93 01 16.9
T road south, quarter corner east side of sec. 11.....	41 13 33.2	93 00 07.4
Attica, 0.25 mile northwest of; northeast corner sec. 10, T. 74 N., R. 18 W., 550 feet due east to T road west.....	41 13 59.8	93 01 16.7

NEWTON QUADRANGLE.

Magnetic declination: South border, 7° 31' east.

Geographic positions along highways near border.

Station.	Latitude.	Longitude.
T road south, north of; iron post stamped "Prim. Trav. Sta. No. 4, 1908, Iowa".....	° ' " 41 30 30.4	° ' " 93 00 12.7
T. 77 N., R. 19 W., northeast corner sec. 2, Marion-Jasper county line.....	41 30 30.2	93 00 12.8
T. 77 N., R. 19 W., northeast corner sec. 3, Marion-Jasper county line, center of crossroads.....	41 30 30.5	93 01 22.5
T. 77 N., R. 19 W., northeast corner sec. 4, Marion-Jasper county line, center of T road south.....	41 30 30.4	93 02 32.2
T. 77, R. 19 W., northeast corner sec. 5, Marion-Jasper county line, center of crossroads.....	41 30 29.9	93 03 41.7
T. 78 N., R. 19 W., southeast corner of sec. 31.....	41 30 30.0	93 04 51.3
T. 77 N., R. 19 W., northeast corner sec. 6, T road east....	41 30 29.9	93 04 51.7
T. 77 N., R. 20 W., northeast corner sec. 1, center of T road south.....	41 30 29.9	93 05 56.5
T. 77 N., R. 20 W., northeast corner sec. 2.....	41 30 29.7	93 07 06.0
T. 78 N., R. 20 W., southeast corner sec. 35.....	41 30 29.7	93 07 06.2
T. 77 N., R. 20 W., 0.25 mile north of; northeast corner sec. 3, at northeast corner of T road west, iron post stamped "Prim. Trav. Sta. No. 5, 1908, Iowa".....	41 30 42.7	93 08 15.7
T. 77 N., R. 20 W., northeast corner sec. 4.....	41 30 29.1	93 09 25.7
T. 77 N., R. 20 W., northeast corner sec. 5.....	41 30 29.1	93 10 35.2
Prairie Creek, center of bridge over.....	41 30 28.7	93 12 06.4
T road west, center of; at quarter corner between sections.	41 30 05.2	93 12 36.4
Center of crossroads, at church.....	41 30 04.5	93 13 56.3

KANSAS-MISSOURI

PRIMARY TRAVERSE.

Easton and Leavenworth quadrangles.

ATCHISON, JEFFERSON, AND LEAVENWORTH COUNTIES, KANS.; PLATTE COUNTY, MO.

The following geographic positions were determined in 1906 by George T. Hawkins. The line for Leavenworth quadrangle starts from Missouri River Commission triangulation station Iatan, follows highways east and south near borders of quadrangle and connects with Missouri River Commission triangulation station Waldron. West of the river the line starts from Missouri River Commission triangulation station Kickapoo, follows highways south and east near borders of quadrangle and connects with Missouri River Commission triangulation station Delaware. The line for Easton quadrangle starts from iron post "No. 1, 1906," at southeast corner of quadrangle, and follows highways west, north, and east, near borders of quadrangle, and connects with Missouri River Commission triangulation station Snyder.

LEAVENWORTH QUADRANGLE.

Magnetic declination: North border, $9^{\circ} 35'$ east; east border, $9^{\circ} 20'$ east; west border, $9^{\circ} 29'$ east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
MISSOURI.		
Iatan triangulation station, on left bank on a high wooded spur from a knob $1\frac{1}{4}$ miles south of Iatan, Mo., in SE. $\frac{1}{4}$ sec. 29, T. 54 N., R. 36 W.....	$39^{\circ} 27' 42.8''$	$94^{\circ} 57' 58.6''$
T. 54 N., R. 36 W., quarter corner north side of sec. 22, T road east.....	$39^{\circ} 28' 58.0''$	$94^{\circ} 55' 41.1''$
T. 54 N., R. 36 W., northeast corner sec. 23 crossroads.....	$39^{\circ} 28' 58.6''$	$94^{\circ} 54' 00.6''$
T. 54 N., R. 36 W., northeast corner sec. 24, crossroads....	$39^{\circ} 28' 59.9''$	$94^{\circ} 52' 52.5''$
T. 54 N., R. 36 W., northeast corner sec. 13, T road east....	$39^{\circ} 29' 52.2''$	$94^{\circ} 52' 51.9''$
T. 54 N., R. 35 W., 60 feet southeast of northwest corner sec. 18, iron post stamped "Prim. Trav. Sta. No. 1, 1906"....	$39^{\circ} 29' 51.7''$	$94^{\circ} 52' 51.2''$
T. 54 N., R. 35 W., northeast corner sec. 17, crossroads....	$39^{\circ} 29' 52.6''$	$94^{\circ} 50' 40.2''$
T. 54 N., R. 35 W., quarter corner north side of sec. 15, T road south.....	$39^{\circ} 29' 54.3''$	$94^{\circ} 49' 00.3''$
T. 54 N., R. 35 W., quarter corner north side of sec. 14, T road east.....	$39^{\circ} 29' 55.2''$	$94^{\circ} 47' 54.5''$
T. 54 N., R. 35 W., northeast corner sec. 13.....	$39^{\circ} 29' 57.2''$	$94^{\circ} 46' 12.7''$
T. 54 N., R. 34 W., northeast corner sec. 18, T road north..	$39^{\circ} 29' 57.1''$	$94^{\circ} 45' 03.3''$
T. 54 N., R. 34 W., 35 feet northwest of quarter corner north side of sec. 17, iron post stamped "Prim. Trav. Sta. No. 2, 1906".....	$39^{\circ} 29' 57.4''$	$94^{\circ} 44' 29.2''$

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
MISSOURI—continued.		
T. 54 N., R. 34 W., quarter corner north side of sec 20, crossroads.....	° ' " 39 29 04.8	° ' " 94 44 28.8
T. 54 N., R. 34 W., center sec. 29, crossroads.....	39 27 46.3	94 44 29.1
T. 54 N., R. 34 W., quarter corner south side of sec. 32, T road north.....	39 26 27.7	94 44 33.0
T. 53 N., R. 34 W., northeast corner sec. 7.....	39 25 36.7	94 45 02.6
Settles, quarter corner east side of; sec. 18, T. 53 N., R. 34 W., crossroads.....	39 24 18.5	94 45 02.8
Tracy, 0.5 mile north of; 4 corners.....	39 24 04.2	94 46 45.9
Tracy, railway crossing south of station.....	39 22 31.3	94 47 32.2
Platte City, 5 corners at southeast corner court-house grounds.....	39 22 13.4	94 46 47.2
Platte City, 1.5 miles southeast of; junction of roads near brick house.....	39 21 14.6	94 45 50.0
T. 52 N., R. 34 W., quarter corner north side of sec. 8, 20 feet north and 16 feet west of tracks, iron post stamped "Prim. Trav. Sta. No. 3, 1906".....	39 20 23.9	94 44 32.3
T. 52 N., R. 34 W., quarter corner north side of sec. 17.....	39 19 31.3	94 44 32.2
T. 52 N., R. 34 W., quarter corner north side of sec. 20.....	39 18 39.2	94 44 32.4
T. 52 N., R. 34 W., northeast corner sec. 20, T road south..	39 18 39.5	94 43 58.5
T. 52 N., R. 34 W., northeast corner sec. 29 (no road).....	39 17 46.1	94 43 58.4
Hampton, northeast corner sec. 32, T. 52 N., R. 34 W., crossroads.....	39 16 54.2	94 43 58.2
Hampton, 2.5 miles south of; 3 corners.....	39 14 48.6	94 43 57.5
T. 51 N., R. 34 W., quarter corner east side of sec. 17, T road west.....	39 13 57.3	94 43 58.7
T. 51 N., R. 34 W., quarter corner east side of sec. 20, T road west.....	39 13 05.4	94 43 58.5
T. 51 N., R. 34 W., 35 feet southwest of quarter corner east side of sec. 20, iron post stamped "Prim. Trav. Sta. No. 4, 1906".....	39 13 05.2	94 43 59.2
Waldron triangulation station, about 1 mile southeast of Waldron, Mo., on land of Mr. Havelow, on highest point of a cultivated field, about one-eighth mile southwest of Mr. Havelow's house.....	39 12 49.36	94 46 31.05
KANSAS.		
Kickapoo triangulation station, on first high hill above Kickapoo railroad station, in northwest corner of apple orchard, 15 feet east of west line of sec. 29, T. 7 S., R. 22 E.....	39 24 23.87	94 58 23.55
T. 7 S., R. 22 E., northeast corner sec. 32, elbow in road..	39 24 16.0	94 58 24.1
T. 8 S., R. 22 E., northeast corner sec. 5.....	39 23 23.7	94 58 24.0
T. 8 S., R. 22 E., northeast corner sec. 8, T road north....	39 22 30.9	94 58 23.4
T. 8 S., R. 22 E., quarter corner east side of sec. 8, T road west.....	39 22 31.0	94 57 50.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
KANSAS—continued.		
Junction of roads, 100 feet southeast of saloon.....	39° 21' 18.4"	94° 57' 50.9"
T. 8 S., R. 22 E., quarter corner east side of sec. 18, T road west.....	39 21 12.7	94 59 31.7
T. 8 S., R. 22 E., northeast corner sec. 31, T road north...	39 19 02.6	94 59 33.1
T. 8 S., R. 21 E., northeast corner sec. 36, crossroads.....	39 19 02.7	95 00 41.7
T. 9 S., R. 21 E., northeast corner sec. 1, crossroads.....	39 18 09.9	95 00 42.3
T. 9 S., R. 21 E., northeast corner sec. 13, crossroads.....	39 16 25.7	95 00 42.5
T. 9 S., R. 21 E., northeast corner sec. 24, crossroads.....	39 15 33.2	95 00 43.3
T. 9 S., R. 21 E., 15 feet south of northeast corner sec. 24, iron post stamped "Prim. Trav. Sta. No. 1, 1906".....	39 15 33.1	95 00 43.3
T. 9 S., R. 22 E., railway crossing between secs. 20 and 29.	39 15 59.9	94 58 00.4
T. 9 S., R. 22 E., quarter corner east side of sec. 15, T road south.....	39 16 00.1	94 56 12.0
T. 9 S., R. 22 E., quarter corner east side of sec. 14, crossroads.....	39 16 00.2	94 55 06.0
T. 9 S., R. 22 E., quarter corner east side of sec. 13, crossroads.....	39 16 00.9	94 53 58.8
T. 9 S., R. 22 E., northeast corner sec. 24, crossroads.....	39 15 34.9	94 53 59.2
Delaware triangulation station, about 1.5 miles east of Lansing, Kans., on bluff just below Delaware railroad station, on land of John Veneman, 4 feet east of corner post of barbed-wire fence.....	39 14 38.41	94 51 55.21

EASTON QUADRANGLE.

Magnetic declination: South border, 9° 39' east; west border, 9° 48' east; north border, 9° 30' east; east border, 9° 29' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 9 S., R. 21 E., northeast corner sec. 23, T road south...	39° 15' 33.6"	95° 01' 50.8"
Valley School, crossroads.....	39 15 07.8	95 03 31.7
Valley School, 1 mile west of; crossroads.....	39 15 08.0	95 04 38.8
Big Stranger Creek, center of bridge over.....	39 15 29.6	95 05 12.5
Bridge, 4 corners on.....	39 16 01.0	95 05 46.1
Springdale, 400 feet west of Catholic Church, 180 feet southeast of Mehuellan's house, 5 feet south of corner post to barnyard fence, north of east-west road, iron post stamped "Prim. Trav. Sta. No. 6, 1906".....	39 15 34.8	95 07 12.8
Springdale, northeast corner sec. 24, T. 9 S., R. 20 E.....	39 15 34.5	95 07 26.3
T. 9 S., R. 20 E., northeast corner sec. 23, crossroads.....	39 15 34.7	95 08 33.2
T. 9 S., R. 20 E., northeast corner sec. 22, crossroads.....	39 15 35.3	95 09 40.8
T. 9 S., R. 20 E., northeast corner sec. 21, crossroads.....	39 15 35.5	95 10 48.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 9 S., R. 20 E., quarter corner north side of sec. 20, crossroads.....	° ' " 39 15 36.2	° ' " 95 12 29.4
T. 9 S., R. 20 E., 45 feet north and 15 feet east of quarter corner north side of sec. 19, east of north-south road, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	39 15 36.5	95 13 36.7
T. 9 S., R. 20 E., quarter corner north side of sec. 18, crossroads.....	39 16 28.6	95 13 37.1
T. 9 S., R. 20 E., quarter corner north side of sec. 7, crossroads.....	39 17 20.8	95 13 37.0
T. 9 S., R. 20 E., quarter corner north side of sec. 6, T road west.....	39 18 12.2	95 13 35.4
T. 9 S., R. 19 E., northeast corner sec. 1, crossroads.....	39 18 12.3	95 14 09.0
T. 8 S., R. 19 E., northeast corner sec. 36, T road west....	39 19 04.7	95 14 08.8
T. 8 S., R. 20 E., center sec. 30, crossroads.....	39 19 30.6	95 13 35.9
T. 8 S., R. 20 E., quarter corner north side of sec. 30, T road west.....	39 19 56.5	95 13 36.0
T. 8 S., R. 20 E., quarter corner north side of sec. 19, crossroads.....	39 20 49.0	95 13 36.2
T. 8 S., R. 20 E., quarter corner north side of sec. 7, crossroads.....	39 22 32.3	95 13 36.2
T. 8 S., R. 19 E., northeast corner sec. 12, T road north....	39 22 32.4	95 14 08.3
T. 8 S., R. 19 E., northeast corner sec. 1.....	39 23 24.6	95 14 08.4
Township corner, 30 feet north and 16 feet east of; in southwest part of B. H. Meyers's yard, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	39 23 24.9	95 14 08.6
T. 7 S., R. 19 E., northeast corner sec. 36.....	39 24 17.1	95 14 08.2
T. 7 S., R. 19 E., northeast corner sec. 25.....	39 25 09.0	95 14 08.1
T. 7 S., R. 19 E., quarter corner north side of sec. 13, crossroad.....	39 26 53.6	95 14 41.5
Cummins, 3 corners at Kaufman's store.....	39 27 45.6	95 14 41.5
T. 7 S., R. 19 E., northeast corner sec. 1, crossroads.....	39 28 37.2	95 14 08.8
T. 7 S., R. 20 E., northeast corner sec. 6.....	39 28 37.2	95 13 01.3
T. 6 S., R. 20 E., northeast corner sec. 31, T road east....	39 29 30.0	95 13 02.0
T. 6 S., R. 20 E., 15 feet south and 30 feet west of northeast corner sec. 30, iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	39 30 22.2	95 13 02.9
T. 6 S., R. 20 E., quarter corner north side of sec. 28, crossroads.....	39 30 22.5	95 11 21.0
T. 6 S., R. 20 E., quarter corner north side of sec. 21....	39 31 15.1	95 11 21.2
T. 6 S., R. 20 E., northeast corner sec. 21, crossroads.....	39 31 15.1	95 10 47.3
T. 6 S., R. 20 E., northeast corner sec. 22, crossroads....	39 31 15.3	95 09 39.6
T. 6 S., R. 20 E., northeast corner sec. 23 crossroads.....	39 31 14.8	95 08 32.3
T. 6 S., R. 20 E., quarter corner north side of sec. 24....	39 31 14.3	95 07 59.0
Snyder triangulation station, on right bank Missouri River, 3 miles below Atchison, in cultivated field of E. Snyder, SW. $\frac{1}{4}$ sec. 17, T. 6 S., R. 21 E.....	39 31 35.97	95 06 00.00

KENTUCKY.

TRIANGULATION STATIONS.

Grundy, Hazard, and Whitesburg quadrangles.

FLOYD, HARLAN, KNOTT, LESLIE, LETCHER, PERRY, AND PIKE COUNTIES.

In cooperation with the State, the following positions were determined by primary triangulation during the summer of 1906 by E. L. McNair. The work is based upon the old United States Geological Survey stations Harlan and Long Spur, and connections were made with other old stations—Quicksand, Frazier, Waseoto, and Willard—where the old positions could be identified. Besides these, seven new stations were established, furnishing primary control for three 30-minute quadrangles.

To reduce to approximate United States standard datum subtract 0.6 second from all latitudes and add 1 second to all longitudes in this list.

FRAZIER, FLOYD COUNTY, KY.

On a prominent knob between Mud and Frazier creeks near the head of Mud Creek the timber was cleared, except on north side. Old signal tree at station has fallen and nearly rotted; position of tree is apparently indicated by a depression, all of the stump having rotted away.

Station mark: Iron bench-mark post 48 inches long set 24 inches in the ground on bed rock. Apparent position of former station mark: Distance 27.7 feet, true azimuth 234° .

[Latitude $37^{\circ} 24' 04.12''$. Longitude $82^{\circ} 40' 03.58''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Waseoto.....	9 59 15.02	189 56 56.78	4.5119696
Beaver.....	21 39 41.17	201 37 20.79	4.1888769
Walnut.....	61 15 08.97	241 07 01.27	4.3537137
Quicksand.....	111 58 11.60	291 48 39.70	4.3965473
Stratton.....	243 41 01.83	63 48 44.41	4.3191994
Dick.....	253 57 36.69	74 13 41.93	4.6081929
Willard.....	301 42 49.39	121 53 11.49	4.4729899

QUICKSAND, FLOYD COUNTY, KY.

On a high ridge separating the headwaters of Quicksand Creek from Salt Lick Creek, 3 miles northwest of Hippo post-office.

Station mark: A boulder in ground, in top of which is cemented a bronze triangulation tablet.

Reference mark: Chestnut-oak tree 2 feet in diameter; distance 6.6 feet, true azimuth $165^{\circ} 04'$. Position of former signal tree and station mark (recently blown down): Distance 13 feet, azimuth 16° .

[Latitude $37^{\circ} 29' 05.50''$. Longitude $82^{\circ} 55' 44.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lost.....	50 38 23.48	230 29 06.44	4.4654749
Frazier.....	291 48 39.70	111 58 11.60	4.3965473
Beaver.....	323 31 14.17	143 38 24.71	4.4682050
Walnut.....	350 31 01.51	170 32 24.60	4.3107538

HARLAN, HARLAN COUNTY, KY.

On a spur of Pine Mountain about 4 miles north of Harlan. Timber is mostly cleared around summit. It is best reached by driving to foot of incline (cable log railway) on Poor Fork of Cumberland River about 4 miles from Harlan; thence walk or ride up incline to summit, turn west, and follow mountain ridge about 1 mile to station.

Station mark: A piece of $\frac{3}{4}$ -inch iron gas pipe, 40 inches long, set 22 inches in the ground. A T is fastened to bottom end.

Reference marks: A drill hole $1\frac{1}{4}$ inches in diameter and 2 inches deep in small projecting ledge of sandstone; distance 8 feet, true azimuth $243^{\circ} 03'$. Position of old signal tree and former station mark: Distance 8 feet, true azimuth $87^{\circ} 02'$.

[Latitude $36^{\circ} 53' 54.70''$. Longitude $83^{\circ} 19' 03.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Thousand Stick.....	165 04 43.41	345 01 30.05	4.4880178
Brashear.....	214 02 55.82	34 09 11.50	4.4397907
Longspur.....	259 24 41.16	79 34 37.35	4.3976914

LONGSPUR, HARLAN COUNTY, KY.

On a high point of Black Mountain, between Clover Fork and Poor Fork of Cumberland River. It is best reached from Poor Fork post-office by trail (4 miles) leading over mountain to head of Clover Fork. At summit of divide turn north and follow ridge about 1 mile. Timber partly cleared; heavy timber from north to northeast.

Station mark: Bronze triangulation tablet cemented in top of a flat sandstone 15 by 12 by 6 inches set 3 inches below surface and covered with a pile of stone 2 feet high.

Reference marks: A drill hole 1.5 inches deep in sandstone boulder embedded in ground; distance 80.8 feet, true azimuth $212^{\circ} 50'$. Former station mark is a tall dead tree 30 inches in diameter; distance 9.7 feet, true azimuth 16° .

[Latitude $36^{\circ} 56' 22.49''$. Longitude $83^{\circ} 02' 30.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Harlan.....	79 34 37.35	259 24 41.16	4.3976914
Thousand Stick.....	127 53 53.75	307 40 42.26	4.6135227
Brashear.....	153 30 21.86	333 26 40.11	4.3093191
Waseoto.....	235 07 06.47	55 18 20.06	4.5271926

WALNUT, KNOTT COUNTY, KY.

On the north end of a knob about 7 miles southeast of Hindman, at the head of Caney Fork of Beaver Creek, and near the head of Troublesome Creek; south end of knob is not cleared.

Station mark: Bronze triangulation tablet cemented in solid rock on top of a huge boulder or part of ledge 25 feet above ground.

[Latitude $37^{\circ} 18' 11.10''$. Longitude $82^{\circ} 53' 27.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Brashear.....	45 33 25.96	225 24 14.89	4.4986000
Lost.....	93 39 47.09	273 29 08.27	4.4150334
Quicksand.....	170 32 24.60	350 31 01.51	4.3107538
Frazier.....	241 07 01.27	61 15 08.97	4.3537137
Beaver.....	283 48 05.55	103 53 52.31	4.1620185
Waseoto.....	326 04 11.59	146 09 59.59	4.4057774

BEAVER, AT LINE OF KNOTT, LETCHER, AND PIKE COUNTIES, KY.

On a high knob at the head of Long Fork of Shelby Creek, Beaver Creek, and Rockhouse Creek, at the corner of Pike and Letcher counties on Knott County line. It is best reached from head of Beaver Creek. Follow trail to gap between Beaver Creek and Long Fork; thence south along ridge about 1 mile to station. The summit is only partially cleared.

Station mark: Iron post set 30 inches in ground.

Reference marks: Chestnut-oak tree 24 inches in diameter; distance 11.70 feet, azimuth $73^{\circ} 44'$.

[Latitude 37° 16' 18.34". Longitude 82° 43' 55.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brashear.....	63 09 09.98	242 54 13.14	4. 6134633
Walnut.....	103 53 52.31	283 48 05.55	4. 1620185
Quicksand.....	143 38 24.71	323 31 14.17	4. 4682050
Frazier.....	201 37 20.79	21 39 41.17	4. 1888769
Willard.....	272 17 49.15	92 30 30.47	4. 4914586
Waseoto.....	359 45 05.89	179 45 07.76	4. 2469099

THOUSAND STICK, LESLIE COUNTY, KY.

About 1.5 miles northwest of Hyden. The knob is not as high as some surrounding ones west and north, but gives a good view from north to east and south.

Station mark: A $\frac{3}{4}$ -inch iron bolt 30 inches long set 18 inches in ground down to bed rock. Flat strips fastened to foot of rod to prevent pulling up.

Reference marks: Chestnut-oak tree about 15 inches in diameter; distance 16 feet, true azimuth 225° 24'.

[Latitude 37° 09' 58.84". Longitude 83° 24' 24.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tenmile.....	200 46 30	20 50 15	4. 41145
Cockerill.....	207 26 46	27 32 33	4. 48568
Lost.....	229 36 13.98	49 44 19.78	4. 4141955
Brashear.....	286 27 14.30	106 36 44.96	4. 3862778
Longspur.....	307 40 42.26	127 53 53.75	4. 6135227
Harlan.....	345 01 30.05	165 04 43.41	4. 4880178

WASEOTO, LETCHER COUNTY, KY.

On a spur of Pine Mountain, near the Kentucky-Virginia state line, at the head of Poor Fork of Cumberland River, 7 miles by road east of Whitesburg, at the head of Pine Creek.

Station mark: Bronze triangulation tablet cemented in sandstone outcrop. Apparent location of former signal tree and station mark: Distance 5 feet, azimuth 286°.

[Latitude $37^{\circ} 06' 45.59''$. Longitude $82^{\circ} 43' 51.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Longspur.....	55 18 20.06	235 07 06.47	4. 5271926
Brashear.....	88 36 49.64	268 21 52.58	4. 5649652
Walnut.....	146 09 59.59	326 04 11.59	4. 4057774
Beaver.....	179 45 07.76	359 45 05.89	4. 2469099
Frazier.....	189 56 56.78	9 59 15.02	4. 5119696
Willard.....	242 01 41.12	62 14 19.18	4. 5439898

BRASHEAR, PERRY COUNTY, KY.

On a high knob at the head of Middle and Left forks of Macies Creek and Owens Branch of Leatherwood Creek. It is 15 miles by road south of Hazard. The knob is rather flat, three ridges meeting on top—one from west, one from south, and one from northeast. These ridges were not all cleared of timber.

Station mark: A $\frac{3}{4}$ -inch iron pipe 30 inches long, set 20 inches in the ground. Flat strips of iron are fastened at right angles to foot of rod to prevent pulling up.

Reference marks: No. 1, large oak tree on top of knob; distance 26.7 feet, azimuth $58^{\circ} 06'$. No. 2, large oak tree on ridge northeast; distance 27.6 feet, azimuth $189^{\circ} 15'$. No. 3, large oak tree on ridge south; distance 45.0 feet, azimuth $347^{\circ} 36'$.

[Latitude $37^{\circ} 06' 14.18''$. Longitude $83^{\circ} 08' 38.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harlan.....	34 09 11.50	214 02 55.82	4. 4397907
Thousand Stick.....	106 36 44.96	286 27 14.30	4. 3862778
Tenmile.....	155 33 45	335 28 00	4. 53276
Cockerill.....	164 58 38	344 54 54	4. 54750
Lost.....	171 35 05.40	351 33 39.20	4. 3798687
Walnut.....	225 24 14.89	45 33 25.96	4. 4986000
Beaver.....	242 54 13.14	63 09 09.98	4. 6134633
Waseoto.....	268 21 52.58	88 36 49.64	4. 5649652
Longspur.....	333 26 40.11	153 30 21.86	4. 3093191

COCKERILL, PERRY COUNTY, KY.

(Not occupied.)

Lone tree on high knob near head of Cockerill Branch of Lost Creek.

[Latitude 37° 24' 39.2". Longitude 83° 14' 50.7".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Thousand Stick.....	27 32 33	207 26 46	4. 48568
Lost.....	331 22 05	151 24 24	4. 07126
Brashear.....	344 54 54	164 58 38	4. 54750

LOST, PERRY COUNTY, KY.

On prominent knob at head of Lost Creek, 7 miles by road north of Hazard, one-half mile west of gap through which passes main road to Jackson. Hill entirely cleared; excellent view in all directions.

Station mark: Bronze triangulation tablet cemented in solid rock.

Reference marks: No. 1, drill hole in solid rock 3 inches deep; distance 9.0 feet; true azimuth, 31° 56'. No. 2, drill hole in solid rock 3 inches deep; distance 16.7 feet, true azimuth 136° 12'. No. 3, lone pine signal tree; distance 30 feet, azimuth 184° 40'.

[Latitude 37° 19' 03.69". Longitude 83° 11' 01.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Thousand Stick.....	49 44 19.78	229 36 13.98	4. 4141955
Tenmile.....	124 37 16	304 32 55	4. 10998
Cockerill.....	151 24 24	331 22 05	4. 07126
Quicksand.....	230 29 06.44	50 38 23.48	4. 4654749
Walnut.....	273 29 08.27	93 39 47.09	4. 4150334
Brashear.....	351 33 39.20	171 35 05.40	4. 3798687

TENMILE, PERRY COUNTY, KY.

(Not occupied.)

Lone chestnut-oak tree on high knob at the head of Tenmile Creek, a branch of Lost Creek.

[Latitude 37° 23' 00.9". Longitude 83° 18' 12.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Thousand Stick.....	20 50 15	200 46 30	4. 41145
Lost.....	304 32 55	124 37 16	4. 10998
Brashear.....	335 28 00	155 33 45	4. 53276

DICK, PIKE COUNTY, KY.

On a very high knob at the head of Johns and Blackberry creeks; 1 mile north of gap between Johns and Peter creeks, through which main road passes.

Station mark: Bronze triangulation tablet cemented in solid rock.

Reference marks: No. 1, an 8-inch oak tree; distance 4.4 feet, azimuth $322^{\circ} 10'$. No. 2, cross chiseled in rock; distance 4.7 feet, azimuth $3^{\circ} 42'$. No. 3, cross chiseled in rock; distance 7.3 feet, azimuth 111° . No. 4, cross chiseled in rock; distance 7.8 feet, azimuth 166° .

[Latitude $37^{\circ} 30' 04.77''$. Longitude $82^{\circ} 13' 36.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willard.....	27 20 07.48	207 14 26.60	4. 4790048
Frazier.....	74 13 41.93	253 57 36.69	4. 6081929
Stratton.....	84 44 26.83	264 36 03.78	4. 3094423

STRATTON, PIKE COUNTY, KY.

On a high knob between Frazier Creek and Burning Fork, about 4 miles in an air line northeast of Pikeville. Henry Stratton lives at foot of mountain at head of Burning Fork.

Station mark: Bronze triangulation tablet cemented in boulder well embedded in ground.

Reference mark: Dead oak signal tree 2.5 feet in diameter; distance 30.4 feet, azimuth $200^{\circ} 18'$.

[Latitude $37^{\circ} 29' 03.34''$. Longitude $82^{\circ} 27' 22.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Frazier.....	63 48 44.41	243 41 01.83	4. 3191994
Dick.....	264 36 03.78	84 44 26.83	4. 3094423
Willard.....	345 17 38.99	165 20 19.84	4. 4103307

WILLARD, AT LINE OF PIKE COUNTY, KY., AND DICKENSON COUNTY, VA.

On a high knob of Pine Mountain on the state line about 3 miles southwest of Elkhorn City. The mountain is best reached from the Kentucky side from John Sloan's, on Elkhorn Creek, by a trail which crosses Pine Mountain about 0.25 mile northeast of station.

Station mark: Bronze triangulation tablet cemented in small sandstone outcrop. This stone was partially split in drilling, so that tablet may not be permanently secure.

Reference marks: No. 1, cross well chiseled in sandstone near edge of bluff and the letters "J. B." chiseled about 18 inches south of cross; distance 10.75 feet, azimuth 135°. No. 2, another cross chiseled in flat sandstone partially embedded on edge in ground and leaning against two chestnut stumps about 6 inches in diameter, one of which has partially grown around sandstone; distance 6.3 feet, azimuth 255° 30'.

[Latitude 37° 15' 36.18''. Longitude 82° 22' 57.72'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Waseoto.....	62 14 19.18	242 01 41.12	4. 5439898
Beaver.....	92 30 30.47	272 17 49.15	4. 4914586
Frazier.....	121 53 11.49	301 42 49.39	4. 4729899
Stratton.....	165 20 19.84	345 17 38.99	4. 3103307
Dick.....	207 14 26.60	27 20 07.48	4. 4790048

Olive Hill, Quincy, Soldier, and Vanceburg quadrangles.

CARTER, LEWIS, AND ROWAN COUNTIES.

In cooperation with the State, triangulation was extended south from Coast and Geodetic Survey stations Cherry Ridge and Roundtop during August and September, 1908, by E. L. McNair. Seven new stations were established giving control for two 15-minute quadrangles and partial control on a third. Three other stations were selected and signals erected, one each on two other quadrangles, but these were not located.

GEARHART, AT LINE OF CARTER AND ELLIOTT COUNTIES, KY.

On Carter-Elliott county line about 3 miles south of Olive Hill, on a cleared ridge. From Olive Hill follow tar kiln road to point where it begins to descend divide into Elliott County; thence follow a secondary road southwest along ridge to station, about 0.25 mile.

Signal and station mark: Tetrapod of poles centered under iron post set about 40 inches in ground.

[Latitude 38° 15' 36.5''. Longitude 83° 10' 49.6'']

To station—	Azimuth.	Back azimuth.	Log. distance
	° ' "	° ' "	Meters.
Enix.....	121 50 21	301 43 47	4. 25935
Hilger.....	168 11 49	348 10 07	4. 29188

HILGER, AT LINE OF CARTER AND LEWIS COUNTIES, KY.

On Lewis-Carter county line about 12 miles north of Olive Hill, at the head of a branch of Buffalo Creek and Scotts Branch of Laurel Creek, on land owned by Peter Hilger. It is on a knob of the ridge slightly higher than surrounding knobs. The land where signal stands is bare, but fringes of timber around the edges and on near-by knobs considerably obstruct the view. From an elevation of about 35 feet above the ground a very fine view can be had in nearly every direction.

Signal and station mark: Tetrapod of chestnut poles 37 feet long, having top of center pole 45 feet above ground over iron post set 3.5 feet in ground.

Reference marks: Two glass bottles buried with tops about 8 inches below surface and each covered with a flat stone—distance of one 8.06 feet, true azimuth $14^{\circ} 10'$; distance of the other, 7.99 feet, true azimuth $115^{\circ} 58'$.

[Latitude $38^{\circ} 25' 58.13''$. Longitude $83^{\circ} 13' 34.786''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Enix.....	49 59 36	229 54 44	4. 17366
Gulley.....	83 02 14. 5	262 55 14. 5	4. 21789
Elk Lick.....	107 48 04. 55	287 39 21. 94	4. 3301371
Hamilton.....	144 56 49. 65	324 53 11. 00	4. 1706814
Roundtop.....	184 00 51. 36	4 01 26. 86	4. 2944105
Gearhart.....	348 10 07	168 11 49	4. 29188

CHERRY RIDGE, LEWIS COUNTY, KY.

A Coast and Geodetic Survey (1886) station situated on summit of south end of Cherry Ridge, about 2 miles south of Concord. Is about 50 minutes' walk via Parker School from Concord. Follow ridge south from schoolhouse less than 0.5 mile. A good view can be obtained in nearly every direction. The north and southwest slopes have some timber.

Station mark: Pottery pyramid 3 feet below surface under 6-inch tile pipe filled with cement, flush with surface, having a nail in center of top.

Reference marks: Four 4-inch drain-tile pipes filled with concrete, about level with surface of ground and having distances and directions from station mark as follows: North, 7.54 feet; south, 7.87 feet; east, 8.10 feet; west, 8.37 feet.

[Latitude 38° 39' 38.337". Longitude 83° 28' 58.825'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peach Mount.....	201 55 26.06	21 59 58.74	4.4487263
Twin Creek.....	255 07 09.25	75 14 42.46	4.2584072
Roundtop.....	283 17 23.46	103 27 35.99	4.3871984
Hamilton.....	313 29 12.47	133 35 09.79	4.2814164
Elk Lick.....	353 49 32.71	173 50 24.98	4.2761801

ELK LICK, LEWIS COUNTY, KY.

About 4 miles north of Petersville and 2 miles south of Glen Springs on a cleared round knob at the head of Elk Lick and Black Lick, both being branches of Kinniconick Creek. George Washburn lives at base of hill on north side, and his place can be reached by road up Elk Lick. An excellent view in every direction.

Signal: Chestnut-oak tree about 14 inches in diameter; distance 8.3 feet, true azimuth from station mark, 58° 11'.

Station mark: Iron post set 30 inches in ground and resting on bed rock.

[Latitude 38° 29' 29.335". Longitude 83° 27' 35.002'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stacey.....	12 55 54	192 55 00	3.97407
Cherry Ridge.....	173 50 24.98	353 49 32.71	4.2761801
Hamilton.....	244 36 40.01	64 41 44.47	4.1174591
Hilger.....	287 39 21.94	107 48 04.55	4.3301371
Gulley.....	334 55 46	154 57 28	3.97393

ENIX, LEWIS COUNTY, KY.

Hill near the headwaters of Laurel Creek, at the head of Schoolhouse Branch and Left Fork of Bedford Branch. Schoolhouse Branch is about 2 miles above Harris post-office, and a rough road follows up branch to summit. The hill was timbered on west side, but has been partly cleared. There is a good view east, south, and southwest. Land belongs to W. A. Enix.

Signal: Tetrapod of poles 18 feet long.

Station mark: Aluminum tablet set in surface of boulder about 4 inches below the surface of ground and covered with a pile of stones.

[Latitude 38° 20' 46.9". Longitude 83° 21' 25.3'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Gulley.....	146 42 06	326 39 59	3. 95757
Hilger.....	229 54 44	49 59 36	4. 17366
Gearhart.....	301 43 47	121 50 21	4. 25935

GULLEY, LEWIS COUNTY, KY.

On a low knob on the divide between waters of Briary and Indian creeks and at the head of Buck Lick. The hill is partly cleared to afford a view of other signals, but the general view is poor. The site can be reached from the Briary Creek side by driving up Buck Lick to its head and climbing ridge. It can also be reached from the Indian Creek side by driving to Alonzo Pitt's place and walking to top of ridge; thence proceed southeast along ridge for half a mile.

Signal: Tetrapod of poles of the usual form.

Station mark: Iron post set 30 inches in ground on bed rock.

[Latitude 38° 24' 52.7". Longitude 83° 24' 50.5'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stacey.....	83 55 54	263 53 18	3. 78769
Elk Lick.....	154 57 28	334 55 46	3. 97393
Hilger.....	262 55 14. 5	83 02 14. 5	4. 21789
Enix.....	326 39 59	146 42 06	3. 95757

HAMILTON, LEWIS COUNTY, KY.

About 4 miles south of Vanceburg, on a round knob at the headwaters of Hamilton Creek and the right branch of Little Grassy Creek. An old road (now impassable for wagons) follows up branch and across divide to Hamilton Creek. At the summit leave road and follow main ridge south less than 0.25 mile to station. The site can easily be reached from the main Vanceburg-Kinniconick road in half an hour.

Signal: A tall signal tree about 12 inches in diameter; distance 12.95 feet, azimuth from station mark 226°.

Station mark: Iron post set 3 feet in ground; marked by a pile of stones which surrounds and covers it.

[Latitude 38° 32' 31.29". Longitude 83° 19' 26.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elk Lick.....	64 41 44.47	244 36 40.01	4.1174591
Cherry Ridge.....	133 35 09.79	313 29 12.47	4.2814164
Roundtop.....	232 40 36.37	52 44 50.97	4.0942326
Hilger.....	324 53 11.00	144 56 49.65	4.1706814

ROUNDTOP, LEWIS COUNTY, KY.

Coast and Geodetic Survey (1885) station about 1.5 miles west of Garrison, on the Chesapeake and Ohio Railway, at summit of a hill locally known as Roundtop and as being the highest point along the Ohio River between Pittsburg and Cincinnati. Top of hill is now cleared, with the exception of a lone black-oak signal tree. The site can be reached by following up ridge from east, by ascending hill from river road at Lewis Catton's house.

Signal: Lone black-oak tree, 8 inches in diameter; distance 32.7 feet, true azimuth from station mark 89° 47'.

Station mark: Earthen pyramid buried 3 feet in ground, above which, and coming to within 8 inches of the surface, is a drain-tile pipe 6 inches in diameter filled with cement. The pipe was originally 2 feet long, coming to surface with nail in center of top, marking center of station; but the upper part seems to have been broken off and destroyed. Center of tiling now left was taken for center of station. Station mark is about 4 feet west of a north-south wire fence running over hill and is covered with several flat stones concealed by earth, making a smooth surface on top.

Reference marks: There were originally 4 drain pipes, 2 feet long and 4 inches in diameter, filled with concrete with nail in top, and flush with surface, set, respectively, north, east, south, and west, and about 6 feet distant from station mark. Only one of these references remains—the one to the east, at a distance of 6.22 feet—the others having been destroyed. In place of the one south is now a hole which was excavated in search for the pipe; in place of the one west is a stone about 2 feet long set on end and rising about 4 inches above the surface; and in place of the one north is a similar stone rising about 6 inches above the surface.

274 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $38^{\circ} 36' 35.371''$. Longitude $83^{\circ} 12' 37.795''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hilger.....	4 01 26.86	184 00 51.36	4.2944105
Hamilton.....	52 44 50.97	232 40 36.37	4.0942326
Cherry Ridge.....	103 27 35.99	283 17 23.46	4.3871984
Twin Creek.....	148 58 34.20	328 55 54.36	4.0790769
Scioto.....	219 07 22.42	39 13 21.31	4.3418228
Howland.....	263 23 19.14	83 31 36.82	4.2881697

STACEY, LEWIS COUNTY, KY.

About 3 miles south of Petersville on a round knob at head of Indian Creek and Sargeant Branch of Kinniconick Creek. It is about 0.25 mile south of the Lewis-Fleming county line. A road crosses the divide from Indian Creek to Sargeant Branch a few hundred feet north of station. The land is owned by William Stacey. Knob is entirely cleared and has a splendid view north-west and south.

Station mark: Iron post set 24 inches in ground and resting on bed rock.

Reference marks: Two glass bottles set with top about 8 inches below the surface and each covered with a flat stone and earth. One bottle is distant 8.12 feet, true azimuth $110^{\circ} 43'$; the other is 8.02 feet distant, true azimuth $198^{\circ} 12'$.

[Latitude $38^{\circ} 24' 31.55''$. Longitude $83^{\circ} 29' 01.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elk Lick.....	192 55 00	12 55 54	3.97407
Gulley.....	263 53 18	83 55 54	3.78769

PRIMARY TRAVERSE.

Burnside and Williamsburg quadrangles.

PULASKI AND WAYNE COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1906 by J. R. Ellis. The line starts from an adjusted position near Coopersville, and runs east along highways to Marsh siding; thence along Cincinnati, New Orleans and Texas Pacific Railway to Burnside; thence along Burnside-Monticello pike to tie point at Mill Springs.

BURNSIDE QUADRANGLE.

Magnetic declination: North border, 3° 07' east; south border, 2° 49' east.

Geographic positions.

ALONG HIGHWAYS NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jim Barrier's grist mill, just east of; center of forks of road.	36 44 54.5	84 43 29.9
Forks of road, 33 feet northeast to blaze on white-oak tree, 24 feet east to stump.....	36 44 58.5	84 42 30.6
Slavans post-office, road north just west of old site, 12 feet northeast to arrow on tree, 42 feet southwest to forks of road.....	36 45 23.7	84 40 48.1
Slavans, center of road opposite front gate at new site post-office.....	36 45 04.6	84 39 54.9
Slavans, 1 mile southeast of post-office (new site); 30 feet south to east-west road, 160 feet east of forks at log cabin, in ledge of stone, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1906, Ky.".....	36 44 16.4	84 39 21.9
T road east on ridge, 27 feet east to blaze on tree, 9 feet west to arrow on tree.....	36 44 07.1	84 38 25.2
Road west, 10 feet north to blaze on black oak tree, 24 feet southwest to arrow on dead tree.....	36 45 04.2	84 37 32.9
New Concord School, forks of road, 15 feet west to hollow tree, 51 feet southeast to west corner of schoolhouse....	36 45 16.0	84 36 33.3
Point where road forks in creek bed, near west end of old tramway.....	36 45 37.5	84 35 28.8
Mr. Cook's residence, about 400 feet southeast of; northeast corner of oil derrick.....	36 46 07.6	84 33 43.2
Junction of Big South Fork and Alum Creek; cross cut on hollow sycamore tree on east side of ford.....	36 46 06.4	84 32 36.8
Junction of Big South Fork and Alum Creek, 1 mile east of; road southwest, 15 feet northeast to stump, 22 feet southeast to cross on pine tree.....	36 45 42.0	84 31 48.8
Blacksmith shop, just east of; cross cut on black oak at T road south.....	36 45 28.0	84 31 01.9
Forks of road, 30 feet northeast, to old blaze on black oak; 34 feet northwest to hollow dead black oak.....	36 45 23.5	84 30 10.1

ALONG CINCINNATI, NEW ORLEANS AND TEXAS PACIFIC RAILWAY NEAR SLOAN VALLEY.

Road crossing under large steel trestle.....	36 54 40.5	84 31 09.7
Milepost 171, road crossing under trestle.....	36 55 49.6	84 32 12.3
Sloan Valley station, road crossing.....	36 56 30.7	84 33 09.5
Alcorn station.....	36 57 14.7	84 34 38.6
Tateville, road crossing.....	36 57 55.0	84 34 51.2

Geographic positions—Continued.

ALONG HIGHWAYS NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Burnside, in north corner of property of Dick & Denny, north corner of porch to Dick & Denny Hotel bears S. 47° 30' W. 41.2 feet, southwest corner of Lewis Hotel bears S. 78° E. 52 feet, iron post stamped "Prim. Trav. Sta. No. 13, 1906, Ky.".....	36 59 09.1	84 36 09.8
Bronston, T road south, 16 feet northeast to southwest corner of log house, 31 feet southeast to corner of post-office porch.....	36 59 10.2	84 37 07.2
Bronston, 0.75 mile west of post-office, center of junction of T road south.....	36 59 12.3	84 37 54.4
Bronston, 1.5 miles west of; T road northeast, 30 feet northeast to cross on fence post, 18 feet west to telegraph pole.....	36 59 10.5	84 38 44.9
Sloan, 520 feet east of former post-office, north of Burnside-Monticello pike, in top of blue limestone boulder, aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1906, Ky.".....	36 58 39.7	84 39 59.3
Pulaski-Wayne county line, center of Burnside-Monticello pike, 10 feet northwest to cross on fence.....	36 58 34.1	84 40 27.4
T road northwest at barn, 20 feet south to corner of barn, 27 feet west to telephone pole.....	36 57 55.4	84 41 32.8
North Frazer, crossroads, 16 feet northwest to corner fence post, 30 feet southwest to old white oak.....	36 57 24.1	84 42 16.9
Frazer, 0.25 mile southwest of post-office, crossroads, 18 feet southwest to corner yard fence, 27 feet southeast to corner garden fence.....	36 56 50.6	84 42 59.8
Tollgate No. 3.....	36 55 48.2	84 45 13.8
Mill Springs, T road west, 12 feet due east to northwest corner of Lanier's store.....	36 55 59.85	84 46 43.75

WILLIAMSBURG QUADRANGLE.

Geographic positions along Cincinnati, New Orleans and Texas Pacific Railway, Marsh to Greenwood.

Station.	Latitude.	Longitude.
Marsh siding, in G. W. Stephens's front yard, iron post stamped "Prim. Trav. Sta. No. 11, 1906, Ky.".....	36 44 37.4	84 28 49.9
Milepost 185, 930 feet south of; road crossing.....	36 45 18.9	84 28 55.5
Barren Fork, station board.....	36 46 47.1	84 28 56.2
Flatrock station.....	36 47 40.4	84 29 04.0
Wilborg station, road crossing.....	36 48 45.8	84 29 13.6
Williams siding, just north of; road crossing.....	36 49 27.5	84 29 20.3
Cumberland Falls station.....	36 50 29.1	84 28 55.9
Road crossing under south end of large steel trestle.....	36 51 04.4	84 29 26.0
Milepost 177, road crossing.....	36 51 49.9	84 29 15.8
Greenwood, on line between railroad right of way and S. A. Adams's property, southeast corner of Adams residence bears N. 61° 15' W. 59.2 feet, nail in blaze on black oak bears N. 23° 30' W., 19.7 feet, iron post stamped "Prim. Trav. Sta. No. 12, 1906, Ky.".....	36 52 50.5	84 29 46.2

Central City, Earlington, Hartford, and Madisonville quadrangles.

BUTLER, HOPKINS, M'LEAN, MUHLENBERG, AND OHIO COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1907 by C. B. Kendall. The line for Central City quadrangle starts from adjusted position near Bethel Church and follows highways near south border of quadrangle to Paradise; thence north near east border of quadrangle to Noe post-office, tying to adjusted position at that place. The line for Earlington and Madisonville quadrangles starts at Slaughterville and follows the Louisville and Nashville Railroad south to Earlington; thence west along highways to Dalton. The adjusted position at Slaughterville was determined in 1904 by J. R. Ellis. The line for Hartford quadrangle starts from adjusted position near Jingo and follows highways along the east and south borders of the quadrangle, tying to adjusted position near Paradise in the Central City quadrangle.

CENTRAL CITY QUADRANGLE.

Magnetic declination: South border, $3^{\circ} 37'$ east; east border, $3^{\circ} 30'$ east.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Bethel Church, 1.80 miles south of; 4 corners, second-class road, 35 feet west to large oak, 15 feet northeast to oak.	$37^{\circ} 15' 39.8''$	$87^{\circ} 11' 59.5''$
Devault Chapel, forks of road 300 feet northwest of; second-class road east to Hillside, 15 feet north to 3 oaks (line turns east)	$37^{\circ} 14' 38.0''$	$87^{\circ} 11' 20.4''$
Second-class road at edge of bottom, 10 feet north to oak, 30 feet southwest to beech, 25 feet east to oak.	$37^{\circ} 14' 53.8''$	$87^{\circ} 10' 37.1''$
Hillside station, 5 feet east of main track of Illinois Central Railroad, 40 feet east of brick store, road crossing.	$37^{\circ} 14' 57.6''$	$87^{\circ} 09' 43.6''$
Hillside, 0.5 mile south of; center of main track at public road crossing.	$37^{\circ} 14' 36.7''$	$87^{\circ} 09' 52.2''$
Powderly, 0.5 mile east of station, 3 corners at junction of the Greenville-Central City road with T road to Cleaton, 35 feet to elm, 25 feet east to front-yard fence.	$37^{\circ} 14' 14.8''$	$87^{\circ} 09' 25.3''$
Forks of road, 125 feet southwest of coal bank, roads northeast and east, 20 feet southeast to corner picket fence, 100 feet east to coal bank, T road northwest.	$37^{\circ} 14' 25.5''$	$87^{\circ} 08' 22.9''$
Forks of road, 250 feet south of white church, road east and northeast, 15 feet south to rail fence, 10 feet northwest to oak.	$37^{\circ} 14' 54.7''$	$87^{\circ} 07' 55.8''$
Cleaton, 1 mile northwest of; junction of Greenville-Central City and Greenville-Paradise roads, 1,500 feet west of Richardson Chapel, at southwest corner of Major Brown's store, iron post stamped "Prim. Trav. Sta. No. 10, 1907, Kentucky"	$37^{\circ} 15' 09.4''$	$87^{\circ} 06' 48.4''$

Geographic positions along highways—Continued.

NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
Cleaton station, 500 feet northwest and 15 feet north of center of track at crossing of Louisville and Nashville Railroad.....	37 15 22.6	87 05 46.2
Cleaton, 1 mile east of; 4 corners, second-class crossroads, 15 feet west to persimmon, 25 feet southwest to maple..	37 15 47.8	87 04 42.4
Cleaton, 2 miles east of; T road north, 15 feet northeast to corner post in picket fence, 10 feet west to corner post in fence.....	37 16 03.7	87 03 46.9
Oak stump at second-class road to north and bend of main road to east.....	37 16 02.8	87 03 21.4
Pond Creek, center of bridge over.....	37 16 04.6	87 02 35.9
Paradise, 3 miles south of; 4 corners, 50 feet southeast to hickory, 10 feet northeast to corner picket fence.....	37 15 41.0	87 01 32.4
Second-class road, fork to south at bend of main road to northeast, 15 feet east to fence, 25 feet southwest to oak, 10 feet north to oak.....	37 15 52.1	87 00 39.2
Paradise, 1 mile southwest of; road forks to southwest and northwest, 300 feet northwest of cemetery, 35 feet northwest to oak, 15 feet northeast to oak.....	37 16 07.5	86 59 38.4
Paradise, 0.5 mile southwest of; oak tree in angle at road forks to south and west.....	37 15 57.0	86 59 18.6

NEAR EAST BORDER.

Paradise, in 6 by 6 by 36 inches sandstone post, in northeast corner of E. C. Shull's front yard, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1907, Kentucky".....	37 16 06.2	86 58 56.3
Paradise, 0.25 mile southeast of; center of triangle at road forks east and northwest (line turns northwest).....	37 16 20.6	86 58 31.6
Paradise, 2 miles northeast of; 4 corners, at center of second-class road, center of north-south road, 20 feet southwest to corner post, in picket fence, 30 feet south to corner post.....	37 17 28.1	86 58 03.3
Second-class road forks to northwest, 15 feet to large post at corner picket fence.....	37 17 59.8	86 57 31.2
Pond River Church, 1 mile south of; road forks to south and southeast, at top of hill, 15 feet southeast to oak, 25 feet east to maple in yard.....	37 18 36.0	86 57 08.6
Pond River Church, 2,000 feet north of; center of triangle at T road south, 20 feet west to walnut, 35 feet west to picket fence.....	37 19 13.3	86 57 03.6
Road forks south and southeast, 15 feet northeast to double oak, 40 feet northwest to double oak.....	37 19 56.1	86 57 50.7
Echols, center of main track Illinois Central Railroad opposite old freight car used as station.....	37 19 56.4	86 58 23.5
Rockport, 500 feet west of railroad station, 30 feet north of north end of bridge over Illinois Central Railroad....	37 20 02.0	86 59 39.2
Rockport, at north edge of; road forks east and west, T street to south (line turns east).....	37 20 13.0	86 59 42.7

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
Rockport, 1 mile northeast of; 3 corners, T road north, 45 feet southwest to oak, 10 feet east to corner of yard fence, turn north.....	37° 20' 36.8"	86° 58' 52.6"
Three corners at T road south, 15 feet south to center of bridge.....	37° 21' 58.6"	86° 58' 36.2"
Rockport, 4 miles north of; at northeast corner of West Providence Church, on the Rockport-Centertown road, iron post stamped "Prim. Trav. Sta. No. 12, 1907, Kentucky".....	37° 22' 36.6"	86° 58' 54.2"
Center of triangle at T road south, junction of Ceralvo-Hartford and Hartford-Rockport roads, 15 feet southeast to oaks (line turns west).....	37° 23' 52.1"	86° 59' 14.1"
Centertown, 1.6 miles south of; center of bridge over stream at T road north.....	37° 23' 44.6"	86° 59' 44.9"
Centertown, intersection of Main and Church streets, 40 feet northwest to car livery stable, 25 feet southwest to telephone pole (line turns west).....	37° 25' 06.0"	86° 59' 51.4"
Centertown, 0.7 mile northwest of; center of east-west road at T road north, 15 feet north to center of bridge...	37° 25' 31.7"	87° 00' 25.3"
Mulberry tree in triangle at forks of road northeast and second-class road west.....	37° 26' 06.4"	87° 00' 16.7"
Carters Ferry, 1.8 miles south of; 4 corners, 25 feet west to oak, 25 feet east to oak, 15 feet south to corner picket fence.....	37° 26' 47.8"	87° 00' 11.8"
Carters Ferry, elm on north bank of Rough Creek, 30 feet north of edge of water at mean level.....	37° 27' 42.2"	86° 59' 21.3"
Carters Ferry, 0.6 mile north of; second-class T road west, 10 feet west to field gate.....	37° 28' 15.3"	86° 59' 12.9"
Noe, 0.25 mile south of post-office; second-class road east at bend in main road northeast, 10 feet southeast to gatepost.....	37° 28' 31.8"	86° 58' 27.7"
Noe post-office, T road south, in northeast corner of J. R. Foster's farm, 25 feet west of large mulberry tree at fence corner, southwest corner of porch of post-office bears N. 16° 35' E. 85 feet, corner stone at T road north bears N. 50° 45' W. 50.8 feet, in sandstone 6 by 6 by 36 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1907, Kentucky".....	37° 28' 58.0"	86° 58' 10.4"

EARLINGTON AND MADISONVILLE QUADRANGLES.

Magnetic declination of Earlington quadrangle: South border, 4° 43' east; east border, 4° east.

Geographic positions.

ALONG LOUISVILLE AND NASHVILLE RAILROAD, SLAUGHTERVILLE TO BARNSELEY.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Slaughterville, primary-traverse station No. 4, 1904.	37	29	26.4	87	30	00.9
Slaughterville, front entrance of court-house, west end of door sill, aluminum tablet stamped "Elev. 403, 1903" ..	37	29	24.1	87	29	56.0
Slaughterville, 1.5 miles south of; road crossing.	37	28	33.8	87	30	01.5
Slaughterville, 3 miles south of; 70 feet north of milepost 116, at road crossing.	37	27	08.2	87	29	17.0
Hanson, 1.7 miles north of; road crossing.	37	26	41.8	87	29	06.7
Hanson, 50 feet north of station, road crossing.	37	25	08.2	87	28	54.1
Hanson, 150 feet northeast of station; in south face of brick hotel, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907, Ky." ..	37	25	08.6	87	28	52.2
Hanson, 2 miles south of; road crossing.	37	23	22.7	87	29	51.8
Milepost 110, 800 feet south of road crossing.	37	22	07.2	87	29	43.2
Madisonville, 1 mile north of; road crossing at new railroad grade.	37	20	40.0	87	29	42.0
Madisonville, 20 feet north of station, 40 feet from center of street crossing.	37	19	48.1	87	29	55.7
Madisonville, at northwest corner of iron fence around Hopkins County court-house, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Ky." ..	37	19	47.3	87	29	51.3
Victoria station, road crossing.	37	18	41.4	87	30	28.3
Earlington, street crossing 50 feet northeast of station, 30 feet southwest to telegraph pole and 15 feet northeast to telegraph pole.	37	16	32.8	87	30	40.3
Earlington, 0.75 mile south of; road crossing.	37	15	50.8	87	29	58.1
Barnsley, road crossing opposite company's store.	37	15	34.5	87	29	17.9
Barnsley, in corner at south end of front steps to St. Bernard Mining Company's store, 98 feet west of center of Louisville and Nashville Railroad, iron post stamped "Prim. Trav. Sta. No. 3, 1907, Ky." ..	37	15	33.5	87	29	18.0

ALONG HIGHWAYS, BARNSELEY TO DALTON.

Barnsley, 2 miles southwest of; 3 corners, T road east, 60 feet west to dead oak in field, 40 feet southeast to 3 small locust trees.	37	14	07.0	87	29	44.3
Barnsley, 2.8 miles southwest of; 60 feet west of three corners, 20 feet east to oak, T road west.	37	13	50.0	87	29	59.8
Road forks south and southwest, small oak in triangle.	37	14	09.6	87	30	24.0
Road fork southeast at three corners, 20 feet east to picket fence, 15 feet west to garden fence.	37	14	01.3	87	30	50.4

Geographic positions—Continued.

ALONG HIGHWAYS, BARNESLEY TO DALTON—continued.

Station.	Latitude.	Longitude.
T road west, 10 feet east of clump of 4 small trees in triangle (line turns west).....	° ' " 37 14 40.1	° ' " 87 31 36.1
Earlington, 3.75 miles southwest of; second-class T road southeast, 10 feet west from Earlington-St. Charles road, 30 feet northwest to walnut.....	37 14 50.6	87 32 27.2
Saiders School, 500 feet south of road forks, 10 feet east of center of triangle.....	37 14 37.0	87 33 14.4
Second-class road northwest, center of triangle.....	37 14 29.1	87 34 10.3
Second-class T road south, 40 feet southeast to chestnut oak, 10 feet north to picket fence.....	37 14 14.7	87 34 43.4
Earlington, 7 miles southwest of; in southeast corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 4, 1907, Ky." (line turns north on new Earlington-Charleston road).....	37 14 33.2	87 35 44.9
Road forks north and west, 400 feet west of creek crossing, 10 feet northeast to oak at corner of picket fence.....	37 15 20.3	87 36 12.5
Madisonville-Princeton road, second-class T road east, 30 feet south to elm tree on edge of road.....	37 15 27.5	87 37 22.1
Center of bridge at T road west.....	37 15 51.0	87 37 22.3
Center of bridge over creek at T road south.....	37 16 13.7	87 38 26.5
Three corners T road north, 400 feet east of schoolhouse, 10 feet northwest to dead tree at corner of garden fence, 15 feet northeast to elm tree at corner wire fence.....	37 16 25.8	87 39 21.8
Second-class north-south road crossing, 15 feet north to oak stump in northeast corner of crossroads.....	37 16 30.8	87 40 00.0
Beulah, 150 feet east of store, T road north to Silent Run, 10 feet north to oak tree.....	37 16 21.8	87 41 04.2
Beulah, at northwest corner of store of B. D. Franklin, on Wilson Warehouse road, 2 miles south of Silent Run post-office, iron post stamped "Prim. Trav. Sta. No. 5, 1907, Ky.".....	37 16 21.0	87 41 06.0
Lick Creek, center of covered bridge over, at sawmill.....	37 15 49.9	87 42 02.4
Crossroads, 0.7 mile west of; 30 feet north to center of triangle.....	37 15 40.6	87 42 45.6
Second-class crossroads, center of bridge.....	37 15 42.0	87 43 35.6
Three corners, T road north, 10 feet south to picket fence, 40 feet northeast to oak, 35 feet west to oak.....	37 16 07.9	87 44 53.8
T road south, 25 feet south of east-west road crossing, 60 feet west to walnut, 80 feet south to oak.....	37 16 11.4	87 45 03.6
Prospect Church, 100 feet north of; road fork 10 feet south to oak tree on which is bench mark "Elev. 478.370" (line turns north to Dalton).....	37 16 47.3	87 46 50.1
Dalton, 0.5 mile south of; T road west; 80 feet south to large oak, 80 feet west to large oak.....	37 17 43.5	87 46 10.0
Dalton, in front of public school, 3 feet from building, iron post stamped "Prim. Trav. Sta. No. 18, 1906".....	37 17 49.70	87 45 55.6

MADISONVILLE QUADRANGLE.

Magnetic declination: South border, $4^{\circ} 41'$ east; east border, $3^{\circ} 45'$ east.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Barnsley, 1 mile northeast of; 4 corners, 60 feet north to small persimmon, 50 feet south to clump of low woods.	$37^{\circ} 16' 15.4''$	$87^{\circ} 28' 75.6''$
Four corners, 700 feet north of white house, 30 feet northeast to two mail boxes, 20 feet southwest to plank bridge (line turns east).	$37^{\circ} 16' 33.2''$	$87^{\circ} 27' 41.8''$
Three corners, 10 feet west of center of plank bridge, T road east to Free Henry Ford, 25 feet south to oak, 30 feet northwest to walnut.	$37^{\circ} 16' 06.7''$	$87^{\circ} 26' 46.2''$
Flat Creek, center of bridge over.	$37^{\circ} 16' 05.5''$	$89^{\circ} 25' 51.5''$
Flat Creek, 0.5 mile east of; at second-class road fork up hill to northeast, large oak stump.	$37^{\circ} 16' 09.4''$	$87^{\circ} 25' 05.4''$
Free Henry Ford, 0.75 mile west of; center of bridge over creek, 50 feet west of second-class road southwest.	$37^{\circ} 15' 58.7''$	$87^{\circ} 23' 52.1''$
Free Henry Ford, center of Pond River at Hopkins-Muhlenberg county line.	$37^{\circ} 15' 47.6''$	$87^{\circ} 23' 14.2''$
Horseshoe bend in creek, south edge of road, at oak tree.	$37^{\circ} 15' 19.1''$	$87^{\circ} 22' 31.3''$
Center of horseshoe bend in river, north edge of road, oak tree.	$37^{\circ} 15' 13.6''$	$87^{\circ} 22' 19.9''$
Beech tree at old gate place at edge of swamp, roads north, south, northwest, and west.	$37^{\circ} 15' 24.2''$	$87^{\circ} 21' 52.5''$
McMary, 3 miles north of; 4 miles southwest of Earles, 1.2 miles east of Free Henry Ford, about 1,500 feet east of Nick Oats's dwelling, in triangle at junction of west branch of the Madisonville-Greenville road and road west to Free Henry Ford, iron post stamped "Prim. Trav. Sta. No. 6, 1907, Kentucky".	$37^{\circ} 15' 15.5''$	$87^{\circ} 20' 33.4''$
Four corners, road to northeast, second-class road southwest, 25 feet north to corner of picket fence, 25 feet north to corner of wire fence.	$37^{\circ} 14' 43.0''$	$87^{\circ} 19' 51.5''$
Road forks at top of hill, junction of Madisonville-Greenville road and Clarks Ferry road, 20 feet west to oak, 40 feet north to oak (line turns east).	$37^{\circ} 13' 56.5''$	$87^{\circ} 19' 19.0''$
Center of road at forks northwest and southwest, 125 feet west of bridge over small stream, 40 feet north to broken sycamore, 10 feet south to picket fence.	$37^{\circ} 13' 29.2''$	$87^{\circ} 18' 06.0''$
T road north, center of east-west road, 250 feet west of spur track crossing.	$37^{\circ} 13' 43.2''$	$87^{\circ} 16' 27.1''$
Graham, 0.75 mile south of; center of north-south road at second-class T road to east, 25 feet northeast to pecan tree (line turns east).	$37^{\circ} 14' 04.2''$	$87^{\circ} 16' 30.8''$
Job-Carrollton-Oaks road and T road west to Graham (line turns north).	$37^{\circ} 14' 03.6''$	$87^{\circ} 15' 49.5''$
Intersection of crossroads, corner of picket fence at.	$37^{\circ} 14' 35.3''$	$87^{\circ} 15' 04.5''$
Graham, 2 miles northeast of; junction of Madisonville-Greenville road with T road to Graham, 6 miles northwest of Greenville, 12 feet west to mail box at corner of fence, 20 feet south to corner post of wire fence (line turns northwest).	$37^{\circ} 15' 10.0''$	$87^{\circ} 14' 21.0''$

Geographic positions along highways—Continued.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Center of triangle at junction of Madisonville-Greenville road with T road northeast to Bethel Church.....	37 15 30.2	87 14 34.0
Center of grass plat at center of crossroads, 35 feet north to oak, 20 feet south to oak snag.....	37 15 53.2	87 14 13.8
Three corners at second-class road east, 10 feet west to sycamore, 40 feet northeast to small stream.....	37 16 03.1	87 13 35.2
Triangle at road forks south and west.....	37 16 32.3	87 12 57.8
Bethel Church, in wall at southwest corner, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907, Ky."..	37 16 57.7	87 12 25.8
Center of bridge over old run, 200 feet north of coal house, second-class road forks southwest and northwest.....	37 17 30.9	87 12 37.1
Railroad crossing of Kentucky Midland Railroad.....	37 17 45.7	87 12 36.2
West edge of north-south road at T road east, 25 feet southwest to oak, 25 feet northeast to sweet gum at fence corner.	37 18 30.1	87 12 44.5
Gishton, 4 corners, 25 feet southwest to corner of store, 25 feet northeast to corner of store.....	37 19 33.7	87 12 59.2
Stone in main road at second-class T road east, 0.5 mile north of church.....	37 20 52.4	87 13 19.9
Bremen, 0.5 mile southwest of; center of triangle at T road south, 80 feet east of T road north.....	37 21 25.6	87 13 42.4
Cemetery, 3 corners, T road southwest, 25 feet west to corner of cemetery fence, 15 feet south to oak.....	37 22 09.0	87 14 09.0
Greenville-Rumsey road crossing, Madison, Hartford and Eastern Railroad.....	37 22 24.0	87 14 18.5
Four corners, large oak stump in north-south road.....	37 22 38.8	87 14 28.6
Plain Creek, center of bridge over, at Muhlenburg-McLean county line.....	37 23 14.0	87 15 02.8
Sacramento, 1.25 miles south of; stone in center of north-south road at public T road east.....	37 23 51.2	87 15 22.5
Sacramento, intersection of Main and Third streets.....	37 24 57.0	87 15 53.1
Sacramento, at southeast corner of public-school building, on Third street, between Poplar and Oak streets, iron post stamped "Prim. Trav. Sta. No. 8, 1907, Kentucky".....	37 24 59.5	87 15 59.6
Sacramento, road forks at north edge of public road to Hartford and Rumsey, 40 feet east to stump.....	37 25 16.9	87 15 48.8
Road fork opposite schoolhouse, 200 feet south of white church, 30 feet to dead oak, 35 feet south to oak in fork..	37 25 59.0	87 14 54.4
Second-class road fork to southeast, 15 feet east to stump, 15 feet northwest to sweet gum at fence corner.....	37 27 07.8	87 14 05.3
Triangle at public road east, 20 feet east to southerly of two oak trees.....	37 27 56.3	87 13 52.4
Four corners, second-class road, 30 feet west to oak, 20 feet south to corner picket fence.....	37 28 43.4	87 14 39.4
Four corners at second-class road, center of north-south road.....	37 29 09.6	87 14 47.1
Rumsey, 1.70 miles south of; center of north-south road at public T road west.....	37 30 00.9	87 14 48.4

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
Rumsey, intersection of east-west street and Rumsey road at imitation brick store.....	° ' " 37 31 50.5	° ' " 87 15 37.1
Rumsey, at northwest corner of public school building, iron post stamped "Prim. Trav. Sta. No. 9, 1907, Kentucky".....	37 31 53.0	87 15 30.0

HARTFORD QUADRANGLE.

Magnetic declination: North border, 3° 35' east; east border, 3° 46' east; south border, 3° 33' east.

Geographic positions along highways.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Jingo, 0.5 mile northeast of; public roads southeast and south, 10 feet southeast to forked oak, 70 feet southwest to elm.....	° ' " 37 30 10.4	° ' " 86 48 00.8
Halls Creek, 0.5 mile southwest of; 3 corners, T road northwest, 15 feet south to beech on bank, 20 feet east to walnut.....	37 30 36.4	86 47 13.8
Halls Creek, 600 feet northeast of bridge over, center of large triangle at road forks northeast and east (line turns east).....	37 30 45.8	86 46 54.8
Mount Vernon Church, 0.5 mile west of; road forks east and northeast, 20 feet south to large sycamore, 70 feet east to dead oak.....	37 30 48.7	86 46 15.4
Mount Vernon Church, at southeast corner of; near intersection of the Dundee-Rosine and Hartford-Sulphur Springs roads, 2.5 miles east of Jingo, 3 miles south of Sulphur Springs, iron post stamped "Prim. Trav. Sta. No. 14, 1907, Kentucky".....	37 30 58.5	86 45 48.1
Mount Vernon Church, 200 feet southeast of; oak tree in triangle at crossroads (line turns south).....	37 30 59.2	86 45 45.9
Mount Vernon Church, 1.25 miles southeast of; road forks to south and west.....	37 30 01.5	86 45 16.2
Road forks to north and west at small stream.....	37 29 35.7	86 45 03.0
Stump in triangle at T road west.....	37 28 55.4	86 44 03.6
Rosine, 1 mile north of; 15 feet west of public crossroads at top of hill, 45 feet southwest to oak, 30 feet southeast to corner fence post.....	37 28 03.9	86 44 12.1
Rosine, 90 feet north of T street to north, 125 feet north of Illinois Central Railroad and 35 feet east to corner of store.....	37 26 58.5	86 44 26.3
Rosine, 1.20 miles south of; second-class T road northwest near top of hill, 20 feet northwest to oak, 60 feet south to oak.....	37 26 10.6	86 44 51.7
Mount Pleasant Church, 0.70 mile north of; 100 feet west of road forks to south and east, 20 feet northeast to small oak, 40 feet north to small oak.....	37 25 18.2	86 44 55.5

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
Manda, oak stump on top of hill, northeast corner of 4 corners, 150 feet north of Mount Pleasant Church.....	37° 24' 43.0"	86° 44' 58.9"
Manda, 1 mile south of; northwest-southeast crossroads, 30 feet southeast to bridge, 20 feet northwest to bridge..	37° 23' 57.2"	86° 45' 26.3"
Oak in triangle at second-class road east.....	37° 23' 32.5"	86° 45' 48.1"
Cromwell, 3 miles north of; at southwest corner of Bald Knob Church on the Cromwell-Rosine road, iron post stamped "Prim. Trav. Sta. No. 15, 1907, Kentucky"....	37° 22' 44.0"	86° 46' 42.3"
Bald Knob Church, 0.5 mile west of; center of triangle at 3 corners of public T road east, 150 feet south of public T road south.....	37° 22' 32.2"	86° 47' 12.7"
Bald Knob Church, 0.5 mile west of; T road south.....	37° 22' 33.6"	86° 47' 12.7"
Cromwell, 2.5 miles northeast of; center of north-south road at fork leading southeast to Oak Grove School, 40 feet southeast to stump, 15 feet west to picket fence (line turns southeast).....	37° 21' 57.6"	86° 46' 55.5"
Second-class T road north, 40 feet north to oak, 15 feet south to corner post in picket fence, 15 feet east to oak..	37° 21' 27.8"	86° 45' 50.5"
Oak Grove School, 4 corners, 700 feet north of crossing of The Cromwell-Falls of Rough and the Hartford-Brownsville roads, 10 feet southwest to stump, 50 feet north to oak tree in triangle.....	37° 20' 50.7"	86° 45' 04.6"
Cromwell, 1.5 miles southeast of; center of triangle at forks to east and northeast 1 mile west of Green River Church and 1,000 feet south of Indian Camp Creek.....	37° 19' 54.5"	86° 46' 03.8"
Green River Church, 300 feet west of; public road forks to southeast and east, 15 feet east to oak, 15 feet north to oak.....	37° 19' 39.8"	86° 45' 38.0"
Second-class road fork to south, 40 feet southeast to mail box, 45 feet east to pear tree.....	37° 18' 41.7"	86° 44' 55.8"
Ennis Ferry, 1 mile north of; road forks to south and southeast, 5 feet west to beech tree.....	37° 18' 05.9"	86° 44' 23.8"
Ennis Ferry (old Noka post-office), center of road in front of store.....	37° 17' 40.1"	86° 45' 04.0"
Salem Church, center of southeast-northwest road, 35 feet south to front of church, 25 feet southeast to oak, 35 feet north to oak.....	37° 17' 08.2"	86° 46' 01.6"
Lebanon Church, at northwest corner of; 120 feet east of three corners, at north edge of Logansport, iron post stamped "Prim. Trav. Sta. No. 16, 1907, Kentucky" (line turns west).....	37° 16' 10.3"	86° 44' 55.1"
Logansport, north edge of; 3 corners, 120 feet west of Lebanon Church.....	37° 16' 10.3"	86° 44' 56.6"
Reeds Ferry, 0.75 mile east of; road forks to east and north, 45 feet west to maple, 20 feet south to picket fence.....	37° 15' 45.6"	86° 45' 53.7"
Reeds Ferry, 50 feet south of elm tree at west landing (Green River).....	37° 15' 37.1"	86° 46' 29.6"
Reeds Ferry, 0.25 mile west of; center of triangle at 3 corners, T road south to Mining City, 25 feet west to corner post in picket fence.....	37° 15' 25.8"	86° 46' 45.7"

Geographic positions along highways—Continued.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Mining City, 3 corners, 400 feet east of ferry T road south, 10 feet south to gate.....	37 13 51.5	86 46 33.5
Mining City, center of bridge over Mud Creek.....	37 13 44.3	86 46 40.9
Mining City, 0.75 mile west of; second-class crossroads, 10 feet southeast to telephone pole, 15 feet north to oak..	37 13 47.6	86 47 28.3
Provo, 1.4 miles east of; center of triangle at junction of the Morgantown-Rochester and the Reeds Ferry roads.....	37 13 46.7	86 48 29.4
Monticello Church, 150 feet east of; oak stump at south edge of main road at road fork to north.....	37 13 58.6	86 48 48.1
Provo post-office, oak tree at road fork opposite store....	37 13 57.2	86 49 51.4
Provo, 0.9 mile southwest of; second-class road at foot of hill, 40 feet south to sycamore, 40 feet northeast to post..	37 13 31.9	86 50 40.0
Rochester, 2 miles east of; 3 corners, second-class T road west, 10 feet west to tall dead tree, 10 feet southeast to telephone pole.....	37 13 09.1	86 52 02.2
Rochester, 0.9 mile east of; oak tree in angle at road forks to northeast and southeast.....	37 12 29.7	86 52 51.5
Rochester, southeast edge of; in northwest corner of yard in front of James A. Marion's residence, on the Morgantown-Rochester road, at 4 corners, iron post stamped "Prim. Trav. Sta. No. 17, 1907, Kentucky".....	37 12 32.0	86 53 22.5
Rochester, ferry-bell post on south bank of Green River....	37 12 54.2	86 53 33.0
Rochester, 1.6 miles north of; ferry road forks to northeast and northwest, 45 feet southeast to walnut, 70 feet north to signpost.....	37 14 24.1	86 53 15.7
Taylorville School No. 22, 10 feet east of front door, second-class road west.....	37 15 13.9	86 53 45.7
Wysox, 4 corners, public crossroads, 25 feet northwest to corner of store porch, 40 feet southeast to maple, 25 feet northeast to telephone pole (line turns west).....	37 16 25.2	86 54 23.5
Wysox, 1 mile west of; second-class road west at bend of main road north, 20 feet north to wild-cherry tree, 35 feet northwest to forked oak.....	37 15 57.0	86 55 00.2
Large ash tree at edge of swamp, second-class road southwest.....	37 15 53.4	86 56 26.3
Three corners, beech tree at; second-class T road north....	37 16 05.3	86 57 13.5
Paradise, 1.25 miles northeast of; center of triangle at 3 corners, T road west.....	37 16 26.8	86 57 40.3
Paradise, 0.25 mile east of; center of triangle at road forks east and northwest.....	37 16 20.6	86 58 31.6

Cadiz, Cerulean, Dalton, Dawson Springs, Earlington, Elkton, Greenville, Princeton, Rochester, and White Plains quadrangles.

CALDWELL, CHRISTIAN, HOPKINS, LOGAN, LYON, MUHLENBERG, AND TODD COUNTIES.

In cooperation with the State, the following geographic positions for the control of the above-named quadrangles were determined by F. J. McMaugh in December, 1907, and January, 1908. The lines were run as follows:

Line No. 1 begins with position of primary traverse station No. 16 and follows highways south via Crider to Knome; thence east to Cobb station and along the Illinois Central Railroad to Cerulean station, where it turns north along public roads to Claxton station; thence north along the Illinois Central Railroad to Dawson Springs and along highways to adjusted position at Prospect Church, 2 miles south of Dalton.

Line No. 2 begins at Cerulean station and follows highways east to Crofton; thence north along the Louisville and Nashville Railroad to Barnsley station, and is tied to primary traverse station No. 3, 1907.

Line No. 3 begins with adjusted position at T road north 1.5 miles south of Graham and follows highways south via Weir to Kirkmansville; thence west via Fruithill to Crofton, and is tied to line No. 2.

Line No. 4 begins with position of Kirkmansville and follows highways east via Clifty to Deerlick; thence north to Dunmor station and along the Louisville and Nashville Railroad to Drakesboro; thence north along highways to primary traverse station No. 11, 1907, at Paradise.

PRINCETON QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 06'$ east; west border, $4^{\circ} 10'$ east; south border, $3^{\circ} 57'$ east.

PRINCETON QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Enon, 0.75 mile southwest of; T road south.....	37 15 10.4	87 59 14.7
Enon, 2 miles southwest of; T road to east, mail box on white oak	37 14 11.1	87 59 30.5
T road south, center of grass plat, 15 feet northeast to two persimmon trees, 40 feet west to mail box, 60 feet south to large red oak.....	37 12 55.8	87 59 28.1
Bridge over small creek, T road west, 10 feet west to center of bridge.....	37 12 19.6	87 59 17.2
Crider, 2.5 miles northwest of; road forks south, 38 feet north to corner post of picket fence.....	37 11 37.0	87 58 50.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Crider, 1.75 miles northeast of; 1,500 feet north of Bethlehem schoolhouse, T road, center of grass plot, 26 feet south to corner post of wire fence, 10 feet north to hickory tree at edge of plot, 65 feet northeast to large walnut tree in corner of wire fence.....	° ' " 37 10 36.1	° ' " 87 58 04.8
Crider, Illinois Central Railroad crossing, center of track...	37 09 37.3	87 58 17.1
Crider, 0.5 mile south of station, in front face of northeast corner of Crider's residence, aluminum tablet stamped "Prim. Trav. Sta. No. 18, 1907, Kentucky".....	37 09 16.5	87 58 42.2
Crider, 1.25 miles southeast of; T road south, 27 feet to fence post, 27 feet north to tree.....	37 08 58.8	87 58 07.1
T road southeast, 30 feet southeast to corner post of wire fence, 47 feet southwest to middle of gate.....	37 08 13.8	87 59 07.8
T road south, grass plot, 20 feet northeast to small locust tree in corner of fence, 60 feet north to small house.....	37 06 47.2	87 58 48.7
Dulaney, 0.6 mile northeast of; T road north, 60 feet east to small tree, 7 feet south to mail box on large hickory.....	37 06 20.6	87 58 53.4
Dulaney, Illinois Central Railroad crossing, center of track, 20 feet north to large telegraph pole, 35 feet east to switch stand.....	37 05 47.5	87 59 04.6
Dulaney, 2.75 miles southeast of; T road north, 18 feet north to mail box on fence, 73 feet east to center of bridge over creek.....	37 04 08.1	87 58 29.0
Dulaney, 2.75 miles southeast of; center of bridge over creek, Caldwell-Lyon County line.....	37 04 08.3	87 58 28.1
Saratoga, T road south, 105 feet northeast to schoolhouse door, 105 feet northwest to church door.....	37 03 40.5	87 59 44.4
Eddy Creek, center of bridge over.....	37 02 13.5	87 58 18.7
Knome, 1 mile northwest of; T road east, 40 feet south to mail box, 37 feet north to small tree.....	37 01 19.9	87 57 19.4
Knome, front door of store.....	37 00 44.0	87 56 50.1
Knome, 1.5 miles southeast of; T road west, 40 feet west to small oak tree, 65 feet northwest to corner of fence, 73 feet north to L. A. Lester's mail box.....	37 00 17.3	87 55 19.7
Friendship, crossroads, 32 feet north to post at fence corner, 29 feet southwest to corner of barn, 68 feet northwest to mail box 50.....	37 03 30.6	87 45 53.4
Friendship, in sandstone post planted in southeast fence corner at Gunn's crossroads; aluminum tablet stamped "Prim. Trav. Sta. No. 21, 1907, Kentucky".....	37 03 30.1	87 45 53.2

WHITE PLAINS QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 37'$ east; west border, $4^{\circ} 04'$ east; south border, $3^{\circ} 57'$ east.

Geographic positions.

ALONG HIGHWAYS AT AND NEAR CROFTON.

Station.	Latitude.	Longitude.
Crofton, 0.75 mile southwest of station, center of iron bridge over creek.....	37 02 31.2	87 29 28.7
Crofton, center of station.....	37 02 56.2	87 29 03.3
Crofton, in northeast corner of brick wall of hotel on Main street, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1908, Kentucky".....	37 02 57.2	87 29 05.1

ALONG LOUISVILLE AND NASHVILLE RAILROAD, CROFTON TO BARNESLEY.

Milepost N 86.....	37 03 51.3	87 29 18.7
Milepost N 87.....	37 04 33.5	87 29 44.0
Empire, road crossing, center of track at station.....	37 05 23.7	87 29 43.4
Empire, 1 mile north of station, road crossing, center of track.....	37 05 43.2	87 29 39.6
New Empire, 0.5 mile north of, road crossing, center of track.....	37 06 37.2	87 29 02.9
Mannington, 700 feet north of block tower, road crossing, center of track.....	37 07 41.8	87 28 55.6
Mannington block tower.....	37 07 48.6	87 28 50.4
Milepost N 92.....	37 08 33.5	87 28 14.8
Milepost N 93.....	37 09 19.9	87 27 49.6
Milepost N 94.....	37 10 12.7	87 27 50.9
Nortonville, 1.25 miles southwest of; road crossing, center of track.....	37 10 41.3	87 27 42.9
Nortonville, 0.5 mile southwest of; road crossing, center of track.....	37 11 22.9	87 27 19.1
Nortonville, in north face at west end of State Bank Building, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1908, Kentucky".....	37 11 34.6	87 27 09.1
Nortonville, 1.25 miles northwest of; road crossing, center of track.....	37 11 50.0	87 27 14.5
Cabhill, 240 feet north to road crossing, mail crane.....	37 12 42.3	87 27 44.5
Milepost N 99.....	37 14 06.8	87 28 21.7
Mortons Gap, center of front door of station.....	37 14 21.3	87 28 23.4
Bridge No. 237, center of.....	37 14 56.2	87 28 33.5
Barnesley, in corner at south end of front steps to St. Bernard Mining Company's store, 98 feet west of center of Louisville and Nashville Railroad, iron post stamped "Prim. Trav. Sta. No. 3, 1907, Kentucky".....	37 15 33.5	87 29 18.0

Geographic positions—Continued.

ALONG HIGHWAYS, GRAHAM TO CROFTON.

Station.	Latitude.	Longitude.
Graham, 1.5 miles south of post-office, 0.5 mile northwest of Graham station, at northwest corner of split rail fence, 3 feet south of gate at junction of T road north with east-west road 300 feet west of Graham mines spur track, in sandstone post, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1908, Kentucky".....	37 13 43.4	87 16 27.3
Graham, 0.5 mile east of station, road crossing the Illinois Central Railroad, center of track.....	37 13 35.1	87 15 38.5
Kirkmansville, 1 mile southwest of; road forks southwest and west.....	40 00 34.6	87 15 23.0
Christian-Todd county line, stone boundary post.....	37 00 11.8	87 16 11.9
Christian-Todd county line, 0.25 mile west of; road forks southwest, west, and northwest, 38 feet southeast to large oak, 24 feet northeast to corner of fence, 18 feet south to fence.....	37 00 09.9	87 16 28.5
Bluff Spring School, 1 mile northeast of; T road east, center of grass plot, 20 feet west to stump, 40 feet southeast to large tree.....	37 01 12.9	87 18 13.0
Bluff Spring School, front door of schoolhouse.....	37 00 32.4	87 18 29.0
Bluff Spring School, 1.5 miles southwest of; T lane south, center of east-west road.....	36 59 49.3	87 20 09.1
Fruithill, 1.5 miles southeast of; T road north, center of east-west road.....	36 59 34.6	87 20 45.5
Fruithill, in north face of chimney on north side of dwelling of Mr. Wells, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1908, Kentucky".....	37 00 18.1	87 21 59.7
Fruithill, 1 mile northwest of; center of wooden bridge over creek.....	37 00 52.5	87 22 49.0
Wooden bridge over creek, 1.25 miles northwest of; forks of road.....	37 01 34.6	87 23 48.8
Wooden bridge over creek, 2 miles northwest of; T road south, 10 feet north to fence, 28 feet southeast to fence corner, 30 feet southwest to fence corner.....	37 01 59.1	87 24 18.5
Crofton, 3.5 miles east of; road forks west and northwest...	37 03 00.5	87 25 15.3
Crofton, 1.9 miles east of; road forks northeast, center of east-west road.....	37 02 59.6	87 27 06.7
Crofton station, No. 356 (tie).....	37 02 58.60	87 29 04.52

CADIZ QUADRANGLE.

Magnetic declination: North border, $3^{\circ} 57'$ east.*Geographic positions.*

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Lamasco, 1 mile northeast of; in west face of foundation of brick chimney to residence of Joe Prescott, aluminum tablet stamped "Prim. Trav. Sta. No. 19, 1907, Kentucky"	$36^{\circ} 59' 35.9''$	$87^{\circ} 54' 31.2''$
Caldwell-Lyon county line, center of road at crossing.....	$36^{\circ} 59' 16.2''$	$87^{\circ} 53' 58.4''$
Hopson, T road south, 80 feet northwest to store door, 36 feet southeast to north corner of wire fence, 145 feet west to old oak tree.....	$36^{\circ} 59' 28.2''$	$87^{\circ} 50' 42.4''$
Hopson, 1.75 miles southeast of store, 3 miles southwest of Cobb station, 4 corners, 25 feet west to Keeney mail box, 30 feet northeast to large oak.....	$36^{\circ} 58' 33.9''$	$87^{\circ} 49' 21.1''$

ALONG ILLINOIS CENTRAL RAILROAD NEAR COBB STATION.

Cobb, center of track opposite station, 25 feet southwest to front door of station, 37 feet southeast to mail crane.....	$36^{\circ} 59' 31.7''$	$87^{\circ} 46' 41.1''$
Cobb station, 1.5 miles southeast of; road crossing, center of track.....	$36^{\circ} 59' 10.4''$	$87^{\circ} 45' 22.3''$

ELKTON QUADRANGLE.

Magnetic declination: North border, $4^{\circ} 31'$ east.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
Pond River, center of iron bridge over.....	$36^{\circ} 59' 53.3''$	$87^{\circ} 12' 40.2''$
Bridge over Pond River, 1 mile southeast of; road forks south and east.....	$36^{\circ} 59' 23.3''$	$87^{\circ} 12' 02.3''$
Clifty, 1.25 miles southwest of; T lane north, center of east-west road.....	$36^{\circ} 59' 11.3''$	$87^{\circ} 10' 23.2''$
Clifty, T road east, 19 feet west to fence, 32 feet southeast to corner of store, 22 feet northwest to corner of store....	$36^{\circ} 59' 29.5''$	$87^{\circ} 09' 00.4''$
Clifty, 1 mile northeast of; T lane southeast at cemetery..	$36^{\circ} 59' 52.1''$	$87^{\circ} 08' 08.1''$

CERULEAN QUADRANGLE.

Magnetic declination: North border, $3^{\circ} 37'$ east.*Geographic positions.*

ALONG ILLINOIS CENTRAL RAILROAD NEAR CERULEAN.

Station.	Latitude.	Longitude.
Milepost E 112, 1,000 feet northeast of; 800 feet northeast of bridge No. 5 J E 111-95, road crossing, center of track.....	36 58 45.0	87 44 38.2
Cerulean, 0.75 mile northwest of station, road crossing, center of track.....	36 58 14.4	87 43 18.4
Cerulean station, in west end of north pier of Illinois Central Railroad bridge over Muddy Fork Creek; aluminum tablet stamped "Prim. Trav. Sta. No. 20, 1907, Kentucky".....	36 58 06.1	87 42 31.4
Cerulean, 100 feet northwest of station, road crossing, center of track, 12 feet north to road crossing sign, 104 feet southeast to front door of station.....	36 58 01.0	87 42 25.4

ALONG HIGHWAYS.

Cerulean, 0.5 mile northeast of station, T lane to northwest, corner stone.....	36 58 20.6	87 42 02.2
Muddy Fork Creek, 0.7 mile southeast of bridge over; T road to north, 28 feet northwest to post in fence corner, 29 feet northeast to post in fence corner.....	36 59 00.6	87 41 58.1
Muddy Fork Creek, center of iron bridge over.....	36 59 32.1	87 42 00.5
Muddy Fork Creek, 0.6 mile northeast of bridge, T road east.....	36 59 58.0	87 41 51.4
Cerulean, 1 mile southeast of; road forks northeast and southeast.....	36 57 39.0	87 41 33.6
Cerulean, 1.75 miles east of; at sharp bend in road, 7 feet southeast to large chestnut tree, 20 feet northwest to fence corner, 15 feet east to large fence post.....	36 58 01.0	87 40 45.8
Cerulean, 3 miles east of; road forks southeast and northeast, 3 feet southwest to oak, 4 feet northwest to mail box, 35 feet west to road fork.....	36 57 52.1	87 39 25.3
T road northeast, 14 feet north to small oak tree blazed and painted "U.S.P.T.," 27 feet south to tree in fence corner, 20 feet west to mail box.....	36 58 00.1	87 39 11.1
T lane north, center of east-west road.....	36 57 26.9	87 38 06.3
Road forks north and east.....	36 57 45.9	87 36 44.4
Intersection of the "Bark" road with the "Buttermilk" road, 31 feet southwest to J. C. East's mail box, 40 feet east to 2 trees at fence corner.....	36 58 36.0	87 36 13.6
"Bark" and "Buttermilk" roads, 1.6 miles east of; T road southwest, 18 feet to telephone pole painted "U.S.P.T.," 18 feet southwest to clump of small trees....	36 58 43.7	87 34 32.5
Iron bridge over creek, 3 miles southwest of; in south chimney to residence facing highway of K. A. Martin, on road leading from "Buttermilk" road to Crofton, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1908, Kentucky".....	36 58 53.4	87 33 59.8
Iron bridge over creek, 2.25 miles southwest of; T road west.....	36 59 44.3	87 32 24.6

ROCHESTER QUADRANGLE.

Magnetic declination: West border, $4^{\circ} 02'$ east.

Geographic positions along Louisville and Nashville Railroad near Dunmor.

Station.	Latitude.	Longitude.
Dunmor, 0.5 mile southwest of; T road east, center of north-south road.....	° ' " 37 04 03.3	° ' " 86 59 49.6
Dunmor, in east face at northeast corner of Farmers Bank Building, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1908, Kentucky".....	37 04 25.2	86 59 41.1
Dunmor, 1.25 miles north of; 400 feet south of milepost "52," second-class road crossing, center of track.....	37 05 32.0	86 59 35.4
Penrod, 1,500 feet south of station, 900 feet north of milepost "51," road crossing, center of track.....	37 06 34.4	86 59 53.9

EARLINGTON QUADRANGLE.

Magnetic declination: South border, $4^{\circ} 43'$ east; east border, 4° east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Bridge over creek, 3 miles northwest of; road forks north and northeast.....	° ' " 37 15 29.5	° ' " 87 42 28.9
Dalton, 5.5 miles southeast of; in chimney at northeast end of residence of J. J. Hicks, aluminum tablet stamped "Prim. Trav. Sta. No. 23, 1907, Kentucky"....	37 15 44.5	87 43 17.3
T lane southwest.....	37 16 02.2	87 44 31.0

DALTON QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Prospect Church, 2.5 miles southeast of, T road south.....	° ' " 37 16 11.4	° ' " 87 45 03.3
Prospect Church, forks of road.....	37 16 47.3	87 46 50.1

GREENVILLE QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 02'$ east; west border, $4^{\circ} 37'$ east; south border, $4^{\circ} 31'$ east.

Geographic positions.

ALONG HIGHWAYS, GRAHAM TO DUNMOR.

Station.	Latitude.	Longitude.
Graham, 2 miles southeast of station, T road south at store, 28 feet northwest to telephone pole, 35 feet northeast to corner of store	° ' " 37 12 59.8	° ' " 87 14 21.6
Store, 1 mile southwest of; T lane west, highest point on rock protruding from ground, 15 feet southwest to gate, 8 feet east to fence.....	37 12 17.3	87 14 38.1
T road east, center of north-south road, 26 feet southeast to fence corner, 6 feet west to fence, 35 feet northeast to fence corner.....	37 11 46.9	87 14 35.2
Schoolhouse, 0.75 mile northwest of; road forks south and southeast, 25 feet east to fence, 30 feet southeast to black oak.	37 11 08.1	87 14 36.7
Schoolhouse, near junction of T road north with Greenville-Hopkinsville road.....	37 10 42.0	87 14 19.6
Bancroft, grass plot in front of church, 55 feet west of intersection of roads, 34 feet south to telephone pole, 41 feet west to southeast corner of church.....	37 09 50.6	87 14 54.3
Bancroft, 1 mile southeast of; road forks southwest and southeast.....	37 09 15.1	87 14 27.1
Center of wooden bridge over small creek.....	37 08 24.6	87 13 47.3
Weir, 0.75 mile west of; road forks northwest, 200 feet west of house, 30 feet south to fence, 34 feet northeast to large black oak	37 07 23.0	87 13 24.6
Weir, in front yard of residence of F. K. Jameson, 45 feet from southeast corner of dwelling, 78 feet from southeast corner of general store and post-office, in sandstone, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1908, Kentucky".....	37 07 21.3	87 12 38.5
Lead Hill Methodist Church, front of.....	37 06 16.8	87 11 33.8
Lead Hill Methodist Church, 1 mile southwest of; road forks southwest and west.....	37 05 41.0	87 12 14.1
Second-class T road east, center of north-south road.....	37 03 58.1	87 12 13.5
Mhlenburg-Todd county line, 0.75 mile north of; T lane, center of north-south road.....	37 03 18.7	87 12 18.4
Muhlenburg-Todd county line, center of road crossing (approximate).....	37 02 42.4	87 12 22.0
Emby Church, 400 feet northeast of; 4 corners.....	37 01 59.3	87 13 00.8
Kirkmansville, 900 feet north of center of town, on west side of Greenville-Kirkmansville road, 200 feet from crest of hill; in sandstone ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1908, Kentucky".....	37 00 52.9	87 14 32.5
Kirkmansville, 1.25 miles southeast of; T lane northeast, 10 feet north to corner of fence, 40 feet east to corner of fence, 17 feet south to edge of road.....	37 00 37.8	87 13 28.0
Clifty, 2.5 miles northeast of; 15 feet east of intersection of road forks to northeast and southeast, 700 feet east of large barn of Munroe McElvin, in stone post, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1908, Kentucky".....	37 00 19.3	87 07 01.8

Geographic positions—Continued.

ALONG HIGHWAYS, GRAHAM TO DUNMOR—continued.

Station.	Latitude.	Longitude.
Clifty, 4 miles northeast of; T lane south, 30 feet south to oak, 10 feet north to fence corner, 35 feet southeast to black oak.	37 00 25.2	87 05 28.1
McPherson Chapel, 0.75 mile west of; T road west, center of north-south road.	37 00 53.2	87 03 50.7
McPherson Chapel, 1,500 feet east of; road forks east and northeast.	37 00 54.8	87 02 46.3
Deerlick, road forks north and northeast, 15 feet south to picket fence, 25 feet northwest to fence corner, 8 feet north to intersection of roads.	37 00 59.9	87 02 00.3
Deerlick, 1.5 miles east of; forks of roads north and northeast.	37 02 20.7	87 02 05.7
Dunmor, 1.5 miles southwest of; T road east, 6 feet east to picket fence, 8 feet southwest to tree.	37 03 06.2	87 00 40.8

ALONG LOUISVILLE AND NASHVILLE RAILROAD, PENROD TO DRAKESBORO.

Penrod, 2 miles northwest of station, center of track at south end of tunnel.	37 08 07.7	87 00 46.3
Yost, 350 feet south of station, road crossing, center of track.	37 09 32.2	87 01 42.0
Yost, 1.25 miles north of station, second-class road crossing.	37 10 39.9	87 01 42.9
Browder station, road crossing, center of track.	37 11 53.6	87 02 02.3
Browder, 1 mile northwest of; road crossing, center of track.	37 12 36.2	87 02 24.1
Drakesboro, Greenville-Paradise road crossing, center of track, 8 feet north to signpost, 10 feet west to center of track, 12 feet south to center of road crossing.	37 13 10.1	87 02 37.8
Drakesboro, inside of picket fence, 3 feet north of northwest corner of police station, at cross streets, 50 feet east of railroad crossing, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1908, Kentucky".	37 13 10.8	87 02 37.4

ALONG HIGHWAYS, NEAR DRAKESBORO TO PARADISE.

Drakesboro, 1.25 miles northeast of; T lane north at top of hill, center of gate.	37 13 52.4	87 01 39.5
Drakesboro, 2.5 miles northeast of; road fork south, center of northeast-southwest road.	37 14 46.9	87 00 53.7
Paradise, 0.5 mile southwest of; 4 corners, elevation painted on telephone pole, "434 feet".	37 15 55.2	86 59 20.5
Paradise, in northeast corner of E. C. Shull's front yard, in top of sandstone post 6 by 6 by 36 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1907 Kentucky".	37 16 06.2	86 58 56.3

DAWSON SPRINGS QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 04'$ east; west border, $4^{\circ} 06'$ east; south border, $3^{\circ} 37'$ east.

Geographic positions.

ALONG HIGHWAYS, COUNTY LINE TO NEW CHURCH.

Station.	Latitude.	Longitude.
Caldwell-Christian county line, 1.5 miles southeast of; 4-corner intersection of north-south road with the Princeton-Hopkinsville pike, 47 feet northwest to north end of culvert, 39 feet west to small tree in grass plot, 40 feet south to clump of trees, 8 feet northwest to center of intersection.	37 00 48.9	87 41 22.9
Caldwell-Christian county line, stone boundary post.	37 01 22.8	87 42 32.8
Pleasant Grove Church, front door of.	37 02 04.3	87 43 32.6
Pleasant Grove Church, 1.5 miles northwest of; 4 corners, crossroads.	37 02 38.4	87 44 46.0
Friendship, 2 miles northeast of; center of front of new church.	37 04 41.3	87 44 49.5
New church, 2 miles northeast of; 4 corners, crossing of east-west road with Friendship-Dawson Springs road, 70 feet northeast to red-oak tree, 40 feet southeast to two small red-oak trees blazed and marked "U. S. P. T.".	37 05 55.8	87 43 55.8

ALONG ILLINOIS CENTRAL RAILROAD, RUTH TO DAWSON.

Ruth, center of track, opposite station.	37 06 27.8	87 44 52.4
Ruth, 1 mile northeast of station, center of iron bridge J-170-20.	37 07 01.0	87 44 01.8
Milepost L 169—No. 630, 2,000 feet southwest of; second-class road crossing, center of track.	37 07 23.1	87 43 29.7
Milepost L 168 No. 621.	37 08 25.6	87 42 53.5
Bridge J 167, center of.	37 08 54.7	87 42 16.5
Bridge over Tradewater River, road crossing.	37 09 43.3	87 42 10.0
Dawson Springs, in east face of Dawson Springs Salts and Water Company's building on Main street, 278 feet south of Illinois Central Railroad, in sandstone pier, aluminum tablet stamped "Prim. Trav. Sta. No. 22, 1907, Kentucky".	37 10 05.8	87 41 25.9
Dawson, front door of station.	37 10 08.9	87 41 26.9

Geographic positions—Continued.

ALONG HIGHWAYS, DAWSON TO CROFTON.

Station.	Latitude.	Longitude.
Dawson Springs, 1 mile north of station, T road south, 90 feet northeast to cemetery gate, 67 feet east to fence corner, 28 feet west to fence corner.....	37 10 51.1	87 41 18.9
Cemetery, T road north, 90 feet northeast to cemetery gate, 67 feet east to fence corner, 28 feet west to fence corner..	37 11 00.4	87 41 00.8
Charleston, 2.75 miles southwest of; T road north, 25 feet southeast to fence corner, 47 feet southwest to fence corner, 27 feet north to small oak tree.....	37 12 02.7	87 41 21.2
Charleston, 0.7 mile southwest of; road fork west.....	37 13 09.6	87 40 30.9
Charleston, center of front door of store.....	37 13 38.2	87 40 15.4
Charleston, 0.6 mile northwest of; center of bridge over creek.....	37 14 04.0	87 40 34.8
Bridge over creek, 1.25 miles northwest of; sharp bend in road, 17 feet south to post in fence corner painted "Elev. 400," 42 feet east to oak.....	37 14 48.4	87 41 20.3
Iron bridge over creek, 0.7 mile southwest of; T road east..	37 00 17.8	87 32 19.0
Iron bridge over creek, center of.....	37 00 34.1	87 31 28.9
Iron bridge over creek, 1.5 miles northeast of; T lane northwest.....	37 01 16.7	87 30 25.6
Crofton, 1.5 miles southwest of station, T road southwest, 25 feet west to fence corner.....	37 01 43.9	87 30 09.6

LOUISIANA.

PRIMARY TRAVERSE.

Abbeville, Calumet, Crowley, Delcambre, Grand Lake, Jeanerette, Jennings, Lafayette, and New Iberia quadrangles.

ACADIA, IBERIA, LAFAYETTE, ST. MARTIN, ST. MARY, AND VERMILION PARISHES.

The following geographic positions were determined by L. E. Tucker in the fall of 1906. The line begins with the position of the Pilgrim Baptist Church at Morgan City, as given by the Coast and Geodetic Survey, and follows the Southern Pacific Railroad to New Iberia and via Lafayette and Crowley to Midland; thence along the Louisiana Western Railroad and the Iberia-Vermilion branch of the Southern Pacific Railroad south and east, via Gueydan and Abbeville, checking at New Iberia. A line was also run along the Southern Pacific Railroad from Midland to Jennings, checking back at Midland.

This work was done by the United States Geological Survey in cooperation with the State of Louisiana, the latter being represented by G. D. Harris, state geologist.

CALUMET QUADRANGLE.

Geographic positions along Southern Pacific Railroad, Morgan City to Lafayette.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Morgan City, Pilgrim Baptist Church.....	29 41 34.53	91 12 26.18
Morgan City, in northwest corner of the Catholic church- yard, 88 feet north of northwest corner of church, iron post stamped "Prim. Trav. Sta. No. 23, 1906, La."...	29 41 42.31	91 12 19.83
Lagonda station, road crossing.....	29 40 50.93	91 16 23.64
Patterson, 1 mile east of station, road crossing.....	29 40 46.61	91 17 34.85
Patterson, road crossing at station.....	29 41 19.29	91 18 26.63
Calumet, rail opposite ticket office window at station....	29 41 52.59	91 21 57.82
Calumet, 76 feet east of station platform, 27 feet north of track, iron post stamped "Prim. Trav. Sta. No. 24, 1906, La.".....	29 41 52.76	91 21 56.29
Recohoc, point on rail opposite water tank.....	29 42 33.85	91 23 31.62
Recohoc, 2.4 miles northwest of; road crossing.....	29 43 52.22	91 25 27.12
Bayou Sale, point on rail opposite ticket office at station.	29 44 28.23	91 26 20.30

GRAND LAKE QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bayou Sale, 1.2 miles northwest of station, road crossing.	29 45 05.73	91 27 15.62
Garden City, point on rail opposite ticket office at station.	29 45 38.20	91 28 03.56
Garden City, 0.9 mile northwest of station, road crossing.	29 46 06.72	91 28 45.65
Garden City, 2 miles northwest of; road crossing.....	29 46 40.00	91 29 34.80

JEANERETTE QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Franklin, west of Southern Pacific Railroad, in section- house yard 80.5 feet southwest of station, 60 feet west of track, standard bench-mark post stamped "Prim. Trav. Sta. No. 25, 1906, La.".....	29 47 26.24	91 30 25.23
Franklin, crossing of railroad and New Iberia street.....	29 47 51.50	91 30 50.15
Franklin, 2 miles northwest of; railroad crossing.....	29 49 10.40	91 32 09.53
Baldwin, point on rail opposite ticket office at station...	29 50 08.62	91 33 07.75
Baldwin, 100 feet northwest of station; 25 feet west of center of highway, 15 feet south of switch, iron post stamped "Prim. Trav. Sta. No. 26, 1906, La.".....	29 50 08.87	91 33 09.38
Baldwin, 2.6 miles northwest of; road crossing.....	29 51 50.22	91 34 49.32

Geographic positions—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Adeline, point on tract opposite ticket office at station...	29 52 32.08	91 35 31.99
Adeline, 220 feet west of station, 20 feet north of track, iron post stamped "Prim. Trav. Sta. No. 27, 1906, La.".....	29 52 33.83	91 35 34.03
Adeline, 1.7 miles northwest of; road crossing.....	29 53 09.69	91 36 43.56
Abania plantation refinery, road crossing opposite.....	29 54 15.00	91 39 11.17
Jeanerette, crossing of railroad and St. Peters street, St. Mary-Iberia parish line at city limits.....	29 54 23.49	91 39 31.12
Jeanerette, 0.8 mile east of station; at city limits, 45 feet north of north track and 30 feet east of center of highway on St. Mary-Iberia parish line, iron post stamped "Prim. Trav. Sta. No. 28, 1906, La.".....	29 54 23.78	91 39 30.64
Jeanerette, point on rail opposite ticket office at station..	29 54 51.00	91 40 11.78
Jeanerette, 1 mile northwest of station; road crossing....	29 55 26.35	91 41 00.21
Loisel sugar plantation, tramroad crossing.....	29 56 06.16	91 41 54.75

DELCAMBRE QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Olivier, 54 feet west of station, 25 feet north of track, iron post stamped "Prim. Trav. Sta. No. 29, 1906, La."...	29 58 33.80	91 45 18.40
Olivier, point on rail opposite ticket office at station....	29 58 32.84	91 45 17.94
Olivier, 1.8 miles northwest of; road crossing.....	29 59 13.22	91 46 52.31
New Iberia, at south edge of; road crossing at city limits.	29 59 42.95	91 48 03.03
Delcambre, west of road crossing on Iberia-Vermilion parish line, 33 feet north of track, 25 feet west of highway, iron post stamped "Prim. Trav. Sta. No. 48, 1906, La.".....	29 57 08.68	91 59 17.67
Delcambre, road crossing on Iberia-Vermilion parish line..	29 57 08.32	91 59 17.54
Bob Acres, just west of; road crossing.....	29 56 57.77	91 58 00.51
Lee, 1.3 miles west of station; road crossing.....	29 56 39.71	91 55 48.86
Lee station, road crossing.....	29 56 29.20	91 54 32.21
Rynella station, road crossing.....	29 56 38.26	91 53 02.48
Veria, point on rail opposite station sign.....	29 56 57.92	91 52 30.80
Veria, opposite station sign, 35 feet south of track, iron post stamped "Prim. Trav. Sta. No. 49, 1906, La.".....	29 56 57.81	91 52 30.54
Milepost 4, road crossing.....	29 57 51.04	91 51 57.21
Veria station, 3 miles east of; road crossing.....	29 59 10.63	91 50 46.83

CROWLEY QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
Rayne, in southeast corner of section-house yard, 50 feet north of track, 8 feet inside of fence corner, just back of red toolhouse, iron post stamped "Prim. Trav. Sta. No. 37, 1906, La.".....	30 14 11.80	92 16 10.36
Rayne, 2 miles west of; private road crossing.....	30 14 11.79	92 18 11.82
Milepost 164, road crossing.....	30 13 39.13	92 19 42.66
Hunter rice mill, road crossing east of.....	30 12 47.44	92 21 45.75
T. 10 S., R. 1 E., northeast corner of sec. 4.....	30 12 51.70	92 21 45.75
Crowley, about 125 feet southwest of station, 40 feet west of center of Parkerson avenue, 24.5 feet south of center of main track, iron post stamped "Prim. Trav. Sta. No. 38, 1906, La.".....	30 12 35.45	92 22 13.83
Milepost 168, road crossing.....	30 12 09.18	92 23 16.79
Crowley, 3.4 miles west of; road crossing.....	30 11 18.42	92 25 17.54
Estherwood, 1 mile east of; road crossing.....	30 10 53.52	92 26 48.55
Estherwood, 35 feet north of track, iron post stamped "Prim. Trav. Sta. No. 39, 1906, La.".....	30 10 53.12	92 27 52.07
Midland, 485 feet east of station, 35 feet south of track at crossing, iron post stamped "Prim. Trav. Sta. No. 40, 1906, La.".....	30 10 51.00	92 29 52.96
Midland, road crossing at Southern Pacific station.....	30 10 51.28	92 29 58.43
Morse, point on rail opposite semaphore at station.....	30 07 23.61	92 29 51.27
T. 11 S., R. 1 W., northeast corner sec. 7, crossroads.....	30 06 39.64	92 29 51.77
Wright post-office, road crossing.....	30 00 28.79	92 25 42.40
T. 12 S., R. 1 W., northeast corner sec. 14, crossroads.....	30 00 29.29	92 25 42.40
T. 12 S., R. 1 W., northeast corner sec. 13, crossroads....	30 00 29.61	92 24 42.23
Mulvey, 48 feet south of station, east of railroad, 50 feet west of road crossing, iron post stamped "Prim. Trav. Sta. No. 45, 1906, La.".....	30 00 25.08	92 24 11.28
Mulvey, 1 mile east of station, road crossing (37 C D)....	30 00 22.33	92 23 09.40
Mulvey, 2.2 miles east of; irrigation canal (36 B).....	30 00 23.40	92 22 09.65
Kaplan, 3.5 miles west of; road crossing.....	30 00 25.08	92 20 36.47
Kaplan, 1.5 miles west of; road crossing.....	30 00 19.13	92 18 32.46
Kaplan, point on rail opposite semaphore at station.....	29 59 54.17	92 17 08.49
Kaplan, opposite semaphore, 45 feet south of track and 18 feet east of telegraph pole, iron post stamped "Prim. Trav. Sta. No. 46, 1906, La.".....	29 59 53.75	92 17 08.66
Kaplan, 1.6 miles east of station; irrigation canal.....	29 59 27.37	92 15 38.31

JENNINGS QUADRANGLE.

Geographic positions along Southern Pacific Railroad.

MIDLAND TO JENNINGS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Midland, 2.5 miles west of; road crossing.....	30 10 49.42	92 32 31.44
Mermentau, 1.8 miles east of station; road crossing (179 C).....	30 10 49.84	92 33 34.09
Mermentau, 190 feet west of station, 35 feet south of north rail, iron post stamped "Prim. Trav. Sta. No. 41, 1906, La.".....	30 11 20.60	92 35 16.10
Mermentau, east end of drawbridge at Acadia-Calcasieu parish line.....	30 11 23.04	92 35 22.70
Jennings, south of Southern Pacific Railroad, west of first crossing west of old passenger station, 10 feet west of sidewalk, 55 feet south of main line of railroad, iron poststamped "Prim. Trav. Sta. No. 42, 1906, La.".....	30 13 17.72	92 39 31.72

BAYOU QUEUE DE TORTAE TO GUEYDAN.

Bayou de Tortae, east end of bridge over; Acadia-Vermilion parish line.....	30 04 56.71	92 30 19.83
Bayou de Tortae, 1.7 miles south of; irrigation canal.....	30 03 41.96	92 30 50.74
Gueydan, point on rail opposite semaphore at station....	30 01 36.34	92 30 50.56
Gueydan, opposite station semaphore, 35 feet west of south rail of main track, iron post stamped "Prim. Trav. Sta. No. 44, 1906, La.".....	30 01 36.34	92 30 50.96
Gueydan, 0.9 mile south of station; road crossing (45 B C).....	30 00 49.78	92 30 49.51

ABBEVILLE QUADRANGLE.

Geographic positions along Southern Pacific Railroad, Nunez to Erath.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Nunez, road crossing at station.....	29 59 05.92	92 13 37.55
Lastie station, point on rail opposite section house 405....	29 58 55.18	92 12 18.12
Lastie, 0.9 mile east of station, road crossing (25 B C)....	29 58 48.32	92 11 27.40
Abbeville, 58 feet west of station, 29 feet north of track, iron post stamped "Prim. Trav. Sta. No. 47, 1906, La.".....	29 58 19.98	92 08 25.08
Cotton gin, road crossing.....	29 58 16.61	92 08 02.00
Youngs station, road crossing.....	29 58 07.88	92 06 58.12
Gross Isle station, road crossing.....	29 57 58.00	92 05 26.65
Aristide switch, road crossing.....	29 57 41.82	92 03 22.28
Erath, 3,770 feet east of station, road crossing.....	29 57 25.24	92 01 21.13

NEW IBERIA QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
New Iberia, point on rail opposite ticket office at station.	30 00 33.49	91 49 25.41
New Iberia, 105 feet west of water standpipe, 55 feet south of railroad water tank, iron post stamped "Prim. Trav. Sta. No. 30, 1906, La.".....	30 00 31.49	91 49 25.40
Segura, point on rail opposite station signpost.....	30 02 14.20	91 51 18.12
Burke, 1 mile south of; road crossing.....	30 03 03.72	91 52 14.31
Burke, 100 feet southeast of station, 28 feet east of railroad, south of highway, at corner of road and railroad right-of-way fences, iron post stamped "Prim. Trav. Sta. No. 31, 1906, La.".....	30 03 44.82	91 52 53.34
Burke, 880 feet northwest of station, crossing of Iberia-St. Martin Parish line.....	30 03 52.39	91 53 00.59
Cades, point on rail opposite ticket office at station.....	30 05 04.87	91 54 06.21
Duchamp, southwest corner of road, 35 feet south of track, iron post stamped "Prim. Trav. Sta. No. 32, 1906, La.".....	30 06 10.41	91 55 05.23
T. 11 S., R. 5 E. (southwestern district Louisiana), corner secs. 41, 12, and 42.....	30 06 05.60	91 55 21.27
Duchamp, 1.6 miles northwest of station, Lafayette-St. Martin Parish line, road crossing.....	30 07 14.27	91 56 03.49
Billeaud switch, road crossing.....	30 08 06.28	91 56 50.66
Broussard station, northeast corner of section-house yard, iron post stamped "Prim. Trav. Sta. No. 33, 1906, La.".....	30 09 03.24	91 57 42.73
Landrys switch, point on rail opposite station sign.....	30 10 36.09	91 59 03.55

LAFAYETTE QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Landrys switch, 2.3 miles northwest of; road crossing...	30 12 21.66	92 00 07.71
Lafayette, northwest corner of freight-house yard, about 240 feet north of passenger station, about 30 feet south of track, iron post stamped "Prim. Trav. Sta. No. 34, 1906, La.".....	30 13 43.14	92 00 50.98
Lafayette, 1 mile west of station, road crossing.....	30 14 08.29	92 01 28.85
Scott, 2.9 miles east of; road crossing.....	30 14 08.62	92 02 57.94
Scott, 1 mile east of station, road crossing.....	30 14 09.03	92 04 48.13
Scott, southeast corner of section-house yard opposite station, 30 feet north of track, 2 feet inside fence corner, iron post stamped "No. 35, 1906, La.".....	30 14 09.50	92 05 41.98
Duson, 2 miles east of; road crossing (154 C).....	30 14 09.87	92 09 00.44
Duson, 25 feet west of northwest corner of station, 50 feet north of track, in southwest corner of field, iron post stamped "36, 1906, La.".....	30 14 10.66	92 10 57.85
Duson, 1.6 miles west of; Lafayette-Acadia parish line, road crossing.....	30 14 10.51	92 12 35.37
Rayne, 1.2 miles east of station, road crossing.....	30 14 10.94	92 14 53.19

Colfax, Derry, and Winnfield quadrangles.

GRANT, NATCHITOCHES, AND WINN PARISHES.

The following geographic positions were determined in 1906 by L. E. Tucker and E. L. McNair. The line starts from triangulation station No. 248 of the U. S. Engineer Corps, 4 miles west of Colfax, the position of which was computed from a Geological Survey primary-traverse station at Shreveport, through triangulation of the U. S. Engineer Corps along the Red River. From triangulation station 248 lines were run in duplicate or in circuits to Colfax and to several points in Winnfield quadrangle and later extended so as to fix the boundaries of Winn Parish. Positions are given on approximate United States standard datum.

DERRY QUADRANGLE.

Geographic positions along Louisiana Railway and Navigation Line, Phillips to Lofton.

Station.	Latitude.	Longitude.
Triangulation station 248, on bank of Red River, 260 meters below mouth of small bayou, 4 miles west of Colfax, on right bank, opposite house of Isaac McMills.....	° ' " 31 32 30.76	° ' " 92 45 10.70
Phillips station, road crossing.....	31 33 50.3	92 45 08.4
Aloha, at southeast corner of station, 8 inches north of corner and 8 inches east of station, iron post stamped "Prim. Trav. Sta. No. 1, 1906".....	31 35 01.9	92 46 18.9
Road crossing.....	31 36 40.6	92 45 13.8
Milepost 4, 2,690 feet north of; road crossing.....	31 38 36.3	92 45 08.5
Milepost 6, 1,745 feet south of; road crossing.....	31 39 30.9	92 45 42.1
Verda, at northeast corner of projecting ticket office, 12 feet from west rail of Louisiana Railway and Navigation track, in front of station, iron post stamped "Prim. Trav. Sta. No. 2, 1906".....	31 41 30.2	92 45 40.5
T. 8 N., R. 4 W., quarter corner north side of sec. 10.....	31 41 42.2	92 45 34.3
Lofton, road crossing 1,150 feet south of station.....	31 42 54.0	92 45 30.1

WINNFIELD QUADRANGLE.

Magnetic declination = $6^{\circ} 42'$ east (mean of 15 distributed observations).

Geographic positions.

ALONG LOUISIANA RAILWAY AND NAVIGATION LINE.

Station.	Latitude.	Longitude.
Overhead road crossing.....	° ' " 31 45 50.5	° ' " 92 45 14.9
Milepost 15, 1,070 feet north of; road crossing.....	31 47 29.2	92 45 02.5
Atlanta, west side of station, 1.5 feet west of ticket office projection, 12 feet east of track, iron post stamped "Prim. Trav. Sta. No. 3, 1906".....	31 48 24.0	92 44 41.2

Geographic positions—Continued.

ALONG LOUISIANA RAILWAY AND NAVIGATION LINE—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 18, 420 feet south of; road crossing.....	31 49 30.0	92 44 12.4
Milepost 20, 573 feet south of; road crossing.....	31 50 45.7	92 43 04.0
Berton's store, veranda of; 55 feet northwest of south side of freight platform, west rail is 10 feet east, north side of railroad water tank is 50 feet southwest, iron post stamped "Prim. Trav. Sta. No. 4, 1906".....	31 51 52.9	92 42 15.6
Alonzo sawmill, road crossing north of.....	31 51 55.1	92 42 11.6
Milepost 23, 1,840 feet northeast of; road crossing.....	31 53 08.8	92 41 11.8
Milepost 25, 760 feet northeast of; road crossing.....	31 54 14.8	92 39 27.9
Winnfield, just south of crossing of Louisiana Railway and Navigation line and Chicago, Rock Island and Pacific Railroad.....	31 55 09.7	92 38 07.6

ALONG LOUISIANA AND ARKANSAS RAILWAY, WINNFIELD TO CALVIN.

Brick kiln, road crossing.....	31 55 27.1	92 38 55.2
Siding, bill box.....	31 56 30.4	92 41 09.0
Fays spur, road crossing.....	31 57 22.8	92 42 12.8
Milepost 142, 0.5 mile northwest of; road crossing.....	31 57 34.9	92 43 51.5
T. 11 N., R. 4 W., center of sec. 4.....	31 57 54.1	92 46 51.7
Calvin, at west end of station, iron post stamped "Prim. Trav. Sta. No. 6, 1906".....	31 57 54.8	92 46 32.6
Fays spur, southwest corner of lumber and freight yard, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	31 57 22.8	92 42 10.9

ALONG ARKANSAS AND SOUTHERN RAILROAD, WINNFIELD TO TANNEHILL.

Winnfield, northwest corner of court-house yard, 1.5 feet south of north fence, 1.5 feet east of west fence, 6 feet north of 18-inch oak tree, iron post stamped "Prim. Trav. Sta. No. 5, 1906".....	31 55 36.4	92 38 19.9
Winnfield, T. 11 N., R. 3 W., northeast corner sec. 23, corner Laurel and Boundary streets.....	31 55 43.1	92 38 09.7
Milepost 97, 1,083 feet south of; road crossing.....	31 57 15.1	92 38 30.2
Milepost 95, 1,170 feet south of; road crossing.....	31 58 51.6	92 39 08.6
Tannehill, east of track just south of freight platform, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	31 59 52.7	92 39 13.9
T. 12 N., R. 3 W., quarter corner east side of sec. 22.....	32 00 31.8	92 39 10.0

Geographic positions—Continued.

ALONG LOUISIANA AND ARKANSAS RAILWAY, WINNFELD TO ZION.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 151, 2,195 feet north of; road crossing.....	31 53 35.8	92 36 49.4
Moore, east of track, north of wagon road crossing, 10 feet north of wagon road, 22 feet east of track, 2 feet west of telegraph pole, 25 feet west of southwest corner of Mac-Melton's warehouse, iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	31 50 22.8	92 34 57.5
T. 10 N., R. 2 W., northeast corner sec. 20.....	31 50 27.4	92 35 04.4
Milepost 157, just west of; road crossing.....	31 48 29.6	92 34 45.7
T. 9 N., R. 2 W., quarter corner north side of sec. 4, Grant-Winn parish line.....	31 48 01.4	92 34 42.1
Packton, 10 feet south of water tank, 14 feet east of Alexandria branch of Louisiana and Arkansas Railway, iron post stamped "Prim. Trav. Sta. No. 12, 1906".....	31 47 56.1	92 34 36.7
Packton, road crossing, 965 feet south of station.....	31 47 49.0	92 34 30.7
Sardonias, 20 feet east of road crossing just east of station, 25 feet north of railroad, 5 feet west of telegraph pole, iron post stamped "Prim. Trav. Sta. No. 10, 1906".....	31 47 24.7	92 32 21.3
Milepost 161, 2,065 feet south of; road crossing.....	31 47 12.7	92 30 55.6
Crossing of Louisiana and Arkansas Railway and the Louisiana Railway and Navigation line.....	31 47 03.6	92 29 49.3
Zion, 1 foot west of station, 13 feet south of track, iron post stamped "Prim. Trav. Sta. No. 11, 1906".....	31 46 58.5	92 29 13.9
T. 9 N., R. 1 W., northeast corner sec. 8.....	31 46 57.5	92 29 00.2

ALONG HIGHWAYS, WINNFELD TO SILLS.

T. 11 N., R. 3 W., northeast corner sec. 24.....	31 55 43.6	92 37 08.3
Dugdemonia Creek, first forks in road east of; south of road, 900 feet east of Mr. Graham's house and store, across road and just east of Mr. R. Custom's house, 1 foot outside of fence line and just at bend of fence, iron post stamped "Prim. Trav. Sta. No. 13, 1906".....	31 56 21.3	92 35 54.1
T. 11 N., R. 2 W., northeast corner sec. 17.....	31 56 32.8	92 35 06.9
Winnfield, center of grade at crossing of Tremont and Gulf Railroad, about 4 miles east of.....	31 56 42.2	92 34 56.0
Road crossing.....	31 57 06.0	92 34 05.3
Blazed pine tree marked 164.17 (white paint) on north side of road.....	31 57 58.8	92 33 39.7
Old road crosses north and south, a blazed pine tree marked 128.49, white paint.....	31 58 27.2	92 32 25.4
Crossroads.....	31 58 49.0	92 31 39.6
T. 12 N., R. 2 W., sec. 36, northeast portion of; on southeast corner of crossing of public road and Tremont and Gulf Railway, 40 feet south of wagon road, 30 feet east of track, iron post stamped "Prim. Trav. Sta. No. 14, 1906".....	31 59 04.5	92 31 18.1
T. 12 N., R. 2 W., northeast corner sec. 36.....	31 59 11.0	92 31 00.8

Geographic positions—Continued.

ALONG HIGHWAYS, ATLANTA TO PACKTON.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Forks of road.....	31 48 27.1	92 43 46.0
T. 10 N., R. 3 W., quarter corner, north side of sec. 31....	31 48 42.8	92 42 45.3
T. 10 N., R. 3 W., northeast corner sec. 31.....	31 48 42.8	92 42 15.0
T. 10 N., R. 3 W., northeast corner sec. 32.....	31 48 42.8	92 41 13.7
Bridge across stream.....	31 48 50.1	92 40 29.7
T. 10 N., R. 3 W., about center sec. 35, 10 feet west of north-south road, 15 feet north of east-west road, iron post stamped "Prim. Trav. Sta. No. 15, 1906".....	31 48 19.5	92 38 39.5
T. 10 N., R. 3 W., northeast corner sec. 36 (approximate)..	31 48 43.8	92 37 08.4
Crossing of Arkansas Southern Railroad.....	31 50 00.9	92 35 53.5

ALONG HIGHWAYS, CALVIN TO ALONZO.

Bench mark 152.217, at road fork.....	31 57 25.8	92 45 53.5
Union Hill Church, road in front of.....	31 56 38.2	92 44 31.1
Road fork.....	31 56 01.2	92 44 49.6
Road fork; pine tree marked 259.056.....	31 55 17.8	92 45 27.0
Road opposite house of H. Jones.....	31 54 29.3	92 44 46.9
Road fork.....	31 53 53.0	92 44 07.7
Cross roads.....	31 52 34.3	92 42 29.7

COLFAX QUADRANGLE.

Geographic positions along Louisiana Railway and Navigation line, Phillips to Colfax.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	31 32 50.2	92 43 46.1
Road crossing.....	31 31 57.7	92 42 57.8
Colfax, in northwest corner of court-house yard, at south- east corner of Second and Main streets, 8.4 meters north of north wall and 16.2 meters west of west wall of court- house, bench mark 69.....	31 31 01.2	92 42 42.4

Unnamed quadrangles.

GRANT AND WINN PARISHES.

The following geographic positions were determined in December, 1906, and January, 1907, by L. E. Tucker. Lines were run from various positions previously established on the Winnfield quadrangle to points on the boundary line of Winn Parish.

Magnetic declination of Winn Parish: South and west boundaries, 6° 40' east; north boundary, 6° east.

Geographic positions.

SOUTH BOUNDARY OF WINN PARISH.

Station.	Latitude.	Longitude.
Atlanta, about 6 miles east of; northeast corner sec. 2, T. 9 N., R. 3 W.....	31 47 50.0	92 37 07.6
Sardonia, 0.7 mile west of; T. 9 N., R. 2 W., northeast corner sec. 2.....	31 47 49.0	92 32 02.2
Packton, Grant-Winn parish line, northeast corner sec. 5, T. 9 N., R. 2 W.....	31 47 50.2	92 35 09.8
T. 8, N., R. 4 W., northeast corner sec. 3, Grant-Winn parish line (corner in dispute, another location of same corner of 45 feet north).....	31 42 36.4	92 45 18.2

ALONG LOUISIANA RAILWAY AND NAVIGATION LINE, ALOHA TO ST. MAURICE.

Aloha, at southeast corner of station, iron post No. 1.....	31 35 01.9	92 46 18.9
Redemption, road crossing.....	31 35 47.8	92 47 11.0
Road crossing.....	31 36 30.8	92 48 44.7
Road crossing at milepost 88.....	31 37 10.1	92 49 58.8
Milepost 86, 0.25 mile north of; road crossing.....	31 38 35.4	92 51 17.4
Road crossing.....	31 39 06.2	92 51 45.3
Montgomery, at southeast corner of station, iron post No. 55.	31 40 03.2	92 53 18.7
Montgomery, 0.25 mile southwest of; northeast corner sec. 20, T. 8 N., R. 5 W.....	31 39 55.6	92 53 29.7
Road crossing.....	31 41 12.3	92 53 53.7
Kadesh, road crossing near.....	31 42 14.4	92 54 34.4
Kadesh, 0.33 mile north of station, northeast corner sec. 6, T. 8 N., R. 5 W., parish line.....	31 42 33.2	92 54 31.4
Crews station.....	31 43 19.8	92 55 56.4
Road crossing.....	31 43 49.9	92 56 33.1
St. Maurice, Winn-Natchitoches parish line, center of bridge over Saline River, 1,100 feet northwest of station.	31 45 29.0	92 58 08.2

ALONG LOUISIANA AND ARKANSAS RAILWAY, CALVIN TO GOLDONNA.

Grace flag station.....	31 58 12.1	92 48 28.5
Coldwater station.....	31 59 02.4	92 51 51.3
Saline River, center of bridge over, Winn-Natchitoches parish line.....	32 00 01.7	92 53 34.2
Goldonna, 80 feet west of station, 20 feet north of track, iron post No. 50.....	32 01 01.1	92 54 32.2

Geographic positions—Continued.

ALONG HIGHWAY, GOLDONNA TO PINE RIDGE.

Station.	Latitude.	Longitude.
Goldonna, road in front of schoolhouse.....	° 32 01 44.9	° 92 54 18.7
T. 12 N., R. 5 W., quarter corner east side of sec. 7.....	32 02 18.9	92 54 32.7
T. 12 N., R. 6 W., northeast corner sec. 1.....	32 03 37.7	92 55 38.0
Saline River bridge, center of; Winn-Natchitoches parish line.....	32 05 01.5	92 54 17.2
Road fork at northeast corner of field.....	32 05 07.3	92 53 33.8
Pine Ridge, in northwest corner of field on east side of highway, south side of lane to post-office, iron post No. 51.....	32 07 17.26	92 53 41.25
Pine Ridge, 2 miles north of, quarter corner north side of T. 13 N., R. 5 W., sec. 5, Bienville-Winn parish line....	32 08 52.9	92 54 08.5

ALONG ARKANSAS SOUTHERN RAILROAD, TANNEHILL TO WYATT.

Tannehill, 2 miles north of; road crossing.....	32 01 38.3	92 39 16.2
Winona, front of commissary of Pine Tree Lumber Company.....	32 03 34.5	92 39 34.3
Pyburn station.....	32 04 05.7	92 39 42.9
Dodson, front of ticket office at station.....	32 04 45.5	92 39 42.9
T. 13 N., R. 3 W., center sec. 27.....	32 04 51.0	92 39 44.9
Big Creek, bridge over.....	32 06 11.1	92 40 42.5
Wyatt, 1.5 miles south of; road crossing.....	32 08 01.8	92 41 35.5
Wyatt, 30 feet east of railroad track, north of main road crossing of Monroe-Natchitoches road and just north of station platform, iron post No. 54.....	32 09 20.0	92 42 11.2

ALONG HIGHWAYS, WYATT TO PINE RIDGE.

T. 13 N., R. 4 W., northeast corner sec. 1, Winn-Jackson parish line.....	32 08 49.3	92 43 22.4
Road fork.....	32 08 40.3	92 44 42.1
Crossroads.....	32 08 31.0	92 45 16.3
Crossroads.....	32 08 31.3	92 46 10.4
Crossroads.....	32 08 22.8	92 47 37.0
Dugdemona Creek, bridge over.....	32 08 19.8	92 48 48.2
Mill in northeast corner of E. A. Golden's dooryard opposite post-office, 20 feet west of highway and 6 inches north of yard fence, iron post No. 52.....	32 07 33.4	92 50 25.0
Mill, front of Union Church.....	32 07 02.6	92 51 13.8
T. 13 N., R. 5 W., northeast corner sec. 17.....	32 07 09.0	92 53 35.8

*Geographic positions—Continued.*ALONG TREMONT AND GULF RAILWAY, NEAR SILLS.^a

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	32 02 00.2	92 30 23.8
Road crossing.....	32 03 28.5	92 29 24.7
Sykes road crossing.....	32 04 52.9	92 29 09.3
Monroe-Winnfield road, crossing of.....	32 06 21.6	92 29 21.2
Columbia-Gansville road, 35 feet south of; 30 feet east of Tremont and Gulf railway, iron post stamped "Prim. Trav. Sta. No. 57, 1906".....	32 07 20.5	92 29 17.4

ALONG HIGHWAYS, TO NEWPORT.^a

Road forks.....	32 07 17.5	92 28 48.6
Road forks.....	32 07 34.1	92 28 02.8
Bridge over Spring Creek by Fotharee's mill.....	32 07 17.1	92 27 07.4
Thompson, T road south near schoolhouse.....	32 07 07.3	92 26 32.3
Milepost, Columbia 27 miles, road fork.....	32 07 02.3	92 26 17.0
Road north.....	32 06 55.3	92 25 05.1
Oak Ridge schoolhouse.....	32 06 58.0	92 24 07.9
Milepost, Columbia 23 miles.....	32 06 31.9	92 22 35.9
Road forks, east of stream north.....	32 06 16.4	92 21 57.5
Hebron Church, road in front of.....	32 05 56.3	92 21 29.4
Forks of old and new roads.....	32 06 27.3	92 20 05.3
Newport, 100 feet west of residence of B. Q. May, 20 feet south of log tool house, in northeast corner of field, iron post stamped "Prim. Trav. Sta. No. 1, 1907".....	32 06 27.0	92 19 51.2

ALONG HIGHWAYS, NEWPORT TO NORTHEAST CORNER OF WINN PARISH.^a

Newport, 1 mile northeast of; road forks.....	32 07 13.8	92 19 36.2
Road forks.....	32 07 13.4	92 19 10.3
Tom Fluitt's residence, front yard gate.....	32 07 35.9	92 19 17.2
Road forks.....	32 07 53.0	92 19 11.9
Road forks.....	32 08 17.6	92 18 52.1
Corner Winn and Jackson parishes at Caldwell parish line, also northeast corner sec. 1, T. 13 N., R. 1 E.....	32 08 50.5	92 18 43.8

^a An excessive error was distributed in part of circuit from Sills via Newport to Zion.

*Geographic positions—Continued.*ALONG HIGHWAYS, NEWPORT TO URANIA.^a

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Newport, 0.33 mile southeast of; road forks.....	32	06	13.1	92	19	45.9
Willis schoolhouse, forks in road opposite.....	32	05	42.9	92	19	47.5
May's mill, 5 corners south of.....	32	04	36.4	92	20	12.2
Crossroads.....	32	03	25.5	92	20	49.4
J. Thornton's house, road in front of.....	32	02	09.9	92	20	45.5
Road forks.....	32	01	24.0	92	20	38.9
Edge of clearing.....	32	00	45.4	92	20	40.8
Road fork.....	32	00	06.6	92	19	26.0
Road crossing.....	31	59	53.9	92	18	38.0
Road crossing, top of big hill.....	31	57	31.6	92	17	25.6
Road crossing.....	31	56	48.3	92	17	20.2
Bridge over Flat Creek.....	31	55	26.8	92	17	33.9
Crossroads.....	31	54	25.1	92	17	46.7
Crossroads.....	31	53	10.9	92	17	48.5
Urania Lumber Co.'s store, in front of.....	31	51	52.9	92	17	41.6

ALONG ST. LOUIS, IRON MOUNTAIN AND SOUTHERN RAILWAY, URANIA TO GEORGETOWN.^a

Urania, at northeast corner of foundation of St. Louis, Iron Mountain and Southern Railroad water tank near station, 45 feet north of railroad track, iron post stamped "Prim. Trav. Sta. No. 2, 1907".....	31	51	36.0	92	17	47.4
Overhead road crossing.....	31	50	40.5	92	18	51.0
Tullos station.....	31	49	16.3	92	19	47.5
T. 10 N., R. 1 E., quarter corner north side of sec. 35.....	31	48	41.9	92	20	16.4
Grant-Catahoula parish line south side of railway.....	31	47	37.4	92	21	50.6
T. 9 N., R. 1 E., northeast corner sec. 4, Winn-Grant parish line.....	31	47	49.8	92	21	49.3
Corner of Winn and Grant parishes at Catahoula parish line (approximate).....	31	47	48.9	92	21	43.8
Georgetown, crossing of the Louisiana and Arkansas and the St. Louis, Iron Mountain and Southern railways....	31	45	57.8	92	22	58.1
Georgetown, 51 feet northeast of railroad crossing, iron post stamped "Prim. Trav. Sta. No. 3, 1907".....	31	45	58.2	92	22	58.5
Zion station, Louisiana and Arkansas Railway, 7 miles northeast of Georgetown (line closed, adopted value)....	31	46	58.50	92	29	13.94

^a An excessive error was distributed in part of circuit from Sills via Newport to Zion.

MAINE.

TRIANGULATION STATIONS.

Ellsworth quadrangle.

HANCOCK COUNTY.

In cooperation with the State, during August and September, 1907, S. S. Gannett extended triangulation control over the Ellsworth quadrangle by occupying 5 stations and locating 2 points by intersections. Positions are based on Coast and Geodetic Survey stations Mount Desert and Saunders.

BEECHLAND SCHOOL, HANCOCK COUNTY, ME.

(Not occupied; no check on this position.)

Center of cupola of white schoolhouse on Beechland Ridge about 3 miles north of Franklin and 0.5 mile north of store of Chas. Murch.

[Latitude $44^{\circ} 37' 00.54''$. Longitude $68^{\circ} 16' 21.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mills Ridge.....	3. 64218

HOPKINS, HANCOCK COUNTY, ME.

On a flat cultivated ridge 2.5 miles north of Lakewood post-office on land owned by E. G. Hopkins, who lives 100 yards east of station.

Signal: A pole 35 feet high; black top, white flag and targets; 31.3 feet northeast of station mark.

Station mark: Aluminum tablet cemented in rock in place.

[Latitude $44^{\circ} 39' 28.40''$. Longitude $68^{\circ} 26' 03.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saunders.....	90 13 24. 15	270 06 10. 31	4. 13353
Waltham.....	226 50 33. 94	46 54 49. 41	4. 03974
Robertson.....	.....	.....	4. 14798
Mount Desert.....	334 05 56. 89	154 14 39. 89	4. 57784

MILLS RIDGE, HANCOCK COUNTY, ME.

On a flat ridge in Eastbrook Township, 5 miles north of Franklin, on land owned by L. W. Bunker, whose house is 200 feet south of station. The station is not on highest point of ridge, but was selected north of house so that Waltham triangulation station could be seen.

Signal: Tall pole with white flag and targets.

Station mark: Aluminum tablet cemented in solid rock 22.3 feet south-southwest of signal pole.

[Latitude $44^{\circ} 39' 20.53''$. Longitude $68^{\circ} 15' 46.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hopkins.....	91 05 02.92	270 57 49.40	4.13327
Waltham.....	144 11 55.56	324 08 57.26	3.97946

MOUNT DESERT, HANCOCK COUNTY, ME.

A Coast and Geodetic Survey station on Mount Desert or Greenmount in town of Mount Desert, on Mount Desert Island, on the summit and near the center of the mountain. This, the highest elevation on island, occupies a commanding position.

Station mark: Copper bolt sunk in rock; two cross lines cut on head. In 1902 the copper bolt had disappeared, but the drill hole was intact. The position of station was verified by distances and directions as follows: 22.25 inches east from southeast corner of a crevice; from drill hole in rock toward Peaked 17.52 feet; from another hole in rock toward Peaked 21.33 feet. The building referred to in description has been destroyed by fire; few trees remain on mountain and view is generally unobstructed. August 27, 1907: Signal of 1902 having disappeared, pine signal was erected over center of Coast and Geodetic Survey bolt hole.

[Latitude $44^{\circ} 21' 05.234''$. Longitude $68^{\circ} 13' 37.648''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Humpback.....	189 11 26.68	9 16 21.53	4.7612680
Cooper.....	220 12 01.03	40 44 04.08	4.9677442
Howard.....	244 39 13.91	65 14 10.90	4.8632290
Hopkins.....	154 14 39.89	334 05 56.89	4.57784
Waltham.....	168 32 09.29	348 27 40.76	4.62729
Robertson.....	172 54 48.99	352 52 56.51	4.45780

ROBERTSON, HANCOCK COUNTY, ME.

In a field on a flat ridge in Franklin Township, 3 miles northwest of village of Franklin, on line between property of Charles Murch and Arthur Robertson, 74 feet north of corner of fence along a narrow lane.

Signal: Small pine tree trimmed, with white target facing west. Tree is 82 feet north of corner of lane and 8 feet northwest of station mark.

Station mark: Aluminum tablet cemented in granite boulder 74 feet north of corner of lane fence.

[Latitude $44^{\circ} 36' 27.72''$. Longitude $68^{\circ} 16' 18.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saunders.....	102 04 35.52	281 50 30.45	4.43298
Hopkins.....			4.14798
Mount Desert.....	352 52 56.51	172 54 48.99	4.45780

SAUNDERS, HANCOCK COUNTY, ME.

A Coast and Geodetic Survey station in town of Dedham, 14 miles southeast of Bangor and 14 miles northwest of Ellsworth. It is best ascended from the north side from a schoolhouse near residence of J. H. Whaarf. The northeast part of summit is heavily timbered, but a fine view can be had in all directions except northeast.

Signal: Fir pole erected in 1907, with black top and white flag.

Station mark: A hole drilled in solid rock by Coast and Geodetic Survey party under center of signal pole and a cairn 5 feet in diameter and 5 feet high.

[Latitude $44^{\circ} 39' 29.652''$. Longitude $68^{\circ} 36' 21.001''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ragged Mountain.....	41 27 10.76	221 04 15.51	4.8187158
Harris.....	91 13 37.14	270 50 43.86	4.6339557
Mount Blue.....	93 50 30.24	272 37 12.86	5.1395125
Humpback.....	239 34 21.16	59 55 16.82	4.6570772
Tunk.....	272 42 42.03	93 04 15.78	4.6087205
Hopkins.....	270 06 10.31	90 13 24.15	4.13353
Pigeon.....	291 23 00.14	111 53 08.05	4.7866177
Mount Desert.....	318 24 28.92	138 40 24.59	4.6578961
Mills Ridge.....			4.43443
Robertson.....	281 50 30.45	102 04 35.52	4.43298

WALTHAM, HANCOCK COUNTY, ME.

In a field on a flat ridge 0.7 mile north of Waltham post-office and 100 yards north of cemetery, on land owned by the Haslem estate.

Signal: Tall pole with black top and white flag and target 4.1 feet northeast of station mark.

Station mark: Aluminum tablet cemented in rock 30 by 30 by 24 inches set 24 inches in ground on north side of ruins of an old cellar.

[Latitude $44^{\circ} 43' 31.06''$. Longitude $68^{\circ} 20' 00.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hopkins.....	46 54 49.41	226 50 33.94	4. 03974
Mills Ridge.....	324 08 57.26	144 11 55.56	3. 97946
Mount Desert.....	348 27 40.76	168 32 09.29	4. 62729

WALTHAM CHURCH, HANCOCK COUNTY, ME.

(Not occupied; no check on this position.)

Center of church spire on white church 0.5 mile north of Waltham post-office.

[Latitude $44^{\circ} 43' 05.09''$. Longitude $68^{\circ} 20' 13.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hopkins.....			4. 00923
Waltham.....			2. 92871

Lewiston and Poland quadrangles.

ANDROSCOGGIN, CUMBERLAND, KENNEBEC, AND OXFORD COUNTIES.

In cooperation with the State, in the fall of 1905 George T. Hawkins extended triangulation over Lewiston and Poland quadrangles from stations Pike and Tenney. A check in position was obtained by connecting with the Coast and Geodetic Survey triangulation station Sabattus.

HIGH, ANDROSCOGGIN COUNTY, ME.

On a bald knob locally known as High Knob, near the center of town of Minot, 3.5 miles northeast of Mechanic Falls and 2 miles southeast of West Minot.

Station mark: Bronze tablet cemented in solid rock.

Reference mark: Signal tree 6 feet distant, azimuth $113^{\circ} 38'$.

[Latitude 44° 08' 51.8''. Longitude 70° 21' 27.0''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Poland Springs.....	1 38 37	.....	4. 12060
Summit Spring.....	18 42 49	.....	4. 09870
Tenney.....	21 06 51	201 03 29	4. 25489
Pike.....	112 05 46	291 57 35	4. 22787
Merrill Hill.....	248 45 05	68 52 55	4. 20610
Sabattus.....	271 00 10	91 11 49	4. 34834
Lewiston Catholic Hospital.....	292 28 35	.....	4. 13369
Shiloh.....	306 38 35	.....	4. 49162
Woodbury.....	324 39 34	144 44 14	4. 18951

LEWISTON CATHOLIC HOSPITAL, ANDROSCOGGIN COUNTY, ME.

(Not occupied.)

Center of cupola.

[Latitude 44° 06' 02.9''. Longitude 70° 12' 01.8''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
High.....	292 28 35	4. 13369
Merrill Hill.....	12 27 17	4. 05255

MERRILL HILL, ANDROSCOGGIN COUNTY, ME.

On bald knob of Clark Mountain, in town of Greene, about 1 mile north of Greene Center, on land of F. E. Merrill and 200 yards north of his residence.

Station mark: Bronze tablet in solid rock.

Signal: A tripod erected over tablet.

[Latitude 44° 12' 00.0''. Longitude 70° 10' 12.4''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lewiston Catholic Hospital.....	12 27 17	.....	4. 05255
Woodbury.....	18 14 12	198 11 02	4. 28790
Tenney.....	43 38 45	223 27 29	4. 49366
High.....	68 52 55	248 45 05	4. 20610
Lone Elm.....	274 05 07	.....	4. 07505
Sabattus.....	310 28 11	130 31 59	3. 98233

POLAND SPRINGS, ANDROSCOGGIN COUNTY, ME.

(Not occupied.)

Golden dome of Poland Springs Hotel.

[Latitude $44^{\circ} 01' 44.2''$. Longitude $70^{\circ} 21' 44.0''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
High.....	1 38 37	4. 12060
Woodbury.....	86 32 41	3. 97059

SABATTUS, ANDROSCOGGIN COUNTY, ME.

On a bare knob in the town of Wales, about 4 miles south of Leeds Junction. Station established by Coast and Geodetic Survey.

Station mark: Copper bolt sunk in solid rock.

Signal: Pole tetrapod erected over station mark.

[Latitude $44^{\circ} 08' 37.8''$. Longitude $70^{\circ} 04' 43.7''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Woodbury.....	47 42 01	227 35 03	4. 25777
High.....	91 11 49	271 00 10	4. 34834
Merrill Hill.....	130 31 59	310 28 11	3. 98233
Lone Elm.....	220 16 51	.....	3. 84834
Shiloh.....	352 03 41	.....	4. 26260
Blue.....	162 10 18. 59	341 59 13. 68	4. 8340499
Moose Hill.....	173 26 06. 70	353 23 49. 26	4. 5801167
York.....	189 22 31. 33	9 26 54. 88	4. 7077893
Quaker.....	216 39 30. 16	36 52 13. 48	4. 6073824

SHILOH, ANDROSCOGGIN COUNTY, ME.

(Not occupied.)

Northwest tower on building of Shiloh (religious) Community, near Lisbon Falls village.

[Latitude $43^{\circ} 58' 50.5''$. Longitude $70^{\circ} 02' 50.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
High.....	306 38 35	4. 49162
Sabattus.....	352 03 41	4. 26260

SUMMIT SPRINGS, ANDROSCOGGIN COUNTY, ME.

(Not occupied.)

North cupola on Summit Springs Hotel, about 1.5 miles southeast of Poland.

[Latitude $44^{\circ} 02' 26.6''$. Longitude $70^{\circ} 24' 27.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
High.....	18 42, 49	4. 09870
Woodbury.....	93 18 29	4. 11381

WOODBURY, ANDROSCOGGIN COUNTY, ME.

On north end of Woodbury hill, about 1.5 miles northeast of Danville Junction on land owned by Joseph Moore. The hill is wooded on southeast side.

Station mark: Bronze tablet cemented in solid rock 10 feet north of east-west stone wall running over hill.

Reference mark: Lone tree used as signal; distance 10.5 feet, azimuth $184^{\circ} 00'$.

[Latitude $44^{\circ} 02' 02.7''$. Longitude $70^{\circ} 14' 45.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tenney.....	74 59 50	254 51 49	4. 20351
Poland Springs.....	86 32 41	.....	3. 97059
Summit Springs.....	93 18 29	.....	4. 11381
High.....	144 44 14	324 39 34	4. 18951
Merrill Hill.....	198 11 02	18 14 12	4. 28790
Sabattus.....	227 35 03	47 42 01	4. 25777

TENNEY, CUMBERLAND COUNTY, ME.

On a bald hill 3 miles south of West Poland and about 4 miles southwest of Poland Springs Hotel. A lone pine tree is used as a signal.

Station mark: Bronze triangulation tablet cemented in solid rock.

Reference mark: Lone pine signal tree; distance 107.5 feet, azimuth $320^{\circ} 36'$.

[Latitude $43^{\circ} 59' 48.1''$. Longitude $70^{\circ} 26' 18.0''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pike.....	158 18 00	338 13 12	4. 39600
High.....	201 03 29	21 06 51	4. 25489
Summit Springs.....	206 34 40	.....	3. 73793
Merrill Hill.....	223 27 29	43 38 45	4. 49366
Woodbury.....	254 51 49	74 59 50	4. 20351

LONE ELM, KENNEBEC COUNTY, ME.

(Not occupied.)

On a bald knob hill about 4 miles east of Leeds Junction on Monmouth Ridge.

Station mark: Lone elm tree near house.

[Latitude $44^{\circ} 11' 32.1''$. Longitude $70^{\circ} 01' 18.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sabattus.....	220 16 51	3. 84834
Merrill Hill.....	274 05 07	4. 07505

PIKE, OXFORD COUNTY, ME.

On a hill covered with small scattering pines 1 mile south of Norway, 400 feet east of a road.

Station mark: Bronze tablet in solid rock.

[Latitude $44^{\circ} 12' 17.2''$. Longitude $70^{\circ} 33' 12.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
High.....	291 57 35	112 05 46	4. 22787
Tenney.....	338 13 12	158 18 00	4. 39600

MARYLAND-PENNSYLVANIA.

PRIMARY TRAVERSE.

Emmitsburg and Taneytown quadrangles.

CARROLL AND FREDERICK COUNTIES, MD.; ADAMS COUNTY, PA.

In cooperation with the States, the following geographic positions were determined by F. J. McMaugh in 1907. The line for Taneytown quadrangle starts from adjusted position near the northwest corner of the Mount Airy quadrangle and follows highways north along the west border of the quadrangle to the state line; thence east along highways near Pennsylvania-Maryland state line to an adjusted position near Raubenstein, Pa. The line for Emmitsburg quadrangle starts from adjusted position near the northwest corner of Taneytown quadrangle and follows highways west to Blue Ridge Summit; thence south along highways and railroad to Thurmont; thence south along pike to Hansonville.

EMMITSBURG QUADRANGLE.

Magnetic declination: East border, 5° 18' west; west border, 5° 16' west; north border, 4° 45' west.

Geographic positions.

ALONG HIGHWAYS NEAR EAST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ladiesburg railroad station, road crossing.	39 34 36.0	77 15 51.8
Mount Zion Lutheran Church, northwest corner of.....	39 35 16.5	77 15 49.9
Four corners at tollgate, 19 feet northeast to southwest corner of tollhouse, 22 feet to gatepost, 29 feet south to corner post of wire fence.....	39 35 26.4	77 16 39.0
Double Pipe Creek, center of bridge over; at county line..	39 36 14.0	77 16 12.2
Detour, railroad crossing.....	39 36 22.4	77 16 12.9
Detour, 0.35 mile north of; railroad crossing, in east face, 6 feet from southeast corner in stone foundation of E. D. Diller's house, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907".....	39 36 39.4	77 16 15.9
Detour, 1.0 mile northwest of; crossroads.....	39 37 06.9	77 16 07.2
T road north.....	39 38 04.5	77 15 27.3

Geographic positions—Continued.

ALONG HIGHWAYS NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Bollinger schoolhouse, 0.25 mile northeast of; on west side of foundation at southwest corner of large barn belonging to R. G. Showmaker, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1907, Pennsylvania".....	39 42 19.0	77 15 11.2
Road forks to south and southeast.....	39 42 43.4	77 15 39.4
Pennsylvania-Maryland state line; boundary stone.....	39 43 12.7	77 15 31.5
T road south.....	39 42 44.8	77 16 30.0
T road south.....	39 42 25.5	77 17 46.8
Intersection of Taneytown road with north-south road....	39 42 06.2	77 18 43.9
Emmitsburg, Fountain square.....	39 42 20.4	77 19 49.6
Emmitsburg, 0.7 mile northwest of; T road north.....	39 42 38.7	77 20 20.7
Pennsylvania-Maryland state line; boundary stone.....	39 43 12.8	77 21 11.3
Road forks to northwest and west.....	39 43 33.1	77 21 43.4
Railroad crossing, near forks east of track.....	39 39 29.4	77 26 41.3
Center of trestle over small stream and road.....	39 38 56.8	77 25 40.4
Road crossing.....	39 38 03.9	77 24 55.3
Thurmont, east face at northeast corner of Thurmont National Bank Building, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1907".....	39 37 24.9	77 24 42.9
Crossroads, center of.....	39 37 07.5	77 24 55.6
Thurmont, 1.0 mile south of; center of pike at tollgate, 42 feet north to tollgate, 17 feet east to mail box.....	39 36 25.5	77 25 17.0
Second-class T road east.....	39 35 04.3	77 26 03.6
Cross lane at white stone gatepost.....	39 33 28.8	77 25 52.3
Four corners, 38 feet southwest to telegraph pole, 71 feet northwest to telegraph pole, 33 feet northeast to fence post in corner of roads.....	39 32 33.7	77 25 02.9
Thurmont-Frederick pike, center of tollgate.....	39 31 23.4	77 24 43.2
Road forks northwest and southeast.....	39 30 54.8	77 24 42.4
Hansonville, road fork.....	39 29 51.6	77 24 07.3
Hansonville, in stone pier under ell at southwest corner of store near road forks, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907".....	39 29 51.0	77 24 06.9
T road east to Fairfield.....	39 44 07.2	77 22 18.0
Miney Branch schoolhouse, front door of.....	39 44 19.8	77 23 10.9
T road north.....	39 44 24.9	77 24 14.0
Blue Ridge summit, south of road 80 feet southwest of Charles McIntire's boarding house, in large stone, aluminum tablet stamped "Prim. Trav. Sta. No. 5, Pennsylvania".....	39 44 32.2	77 25 27.5
Road forks to northwest and northeast.....	39 44 42.6	77 27 13.3
Charmion road crossing at station.....	39 44 31.3	77 27 57.0

Geographic positions—Continued.

ALONG WESTERN MARYLAND RAILROAD AND HIGHWAYS NEAR WEST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road east.	39 43 59.6	77 28 16.3
Blue Ridge summit, railroad crossing.	39 43 15.5	77 28 19.5
Pennsylvania-Maryland state line, boundary stone.	39 43 12.9	77 29 05.6
Blue Ridge summit, T road south at railroad crossing east of.	39 43 10.6	77 28 05.3
Railroad crossing of Western Maryland Railroad.	39 42 26.8	77 27 42.0
T road east, west edge of grass plot at intersection with north-south road.	39 42 01.0	77 27 23.9
T road east.	39 41 00.4	77 27 11.3
Deerfield railroad crossing.	39 40 26.2	77 27 18.8

TANEYTOWN QUADRANGLE.

Magnetic declination: North border, 5° 19' west; west border, 5° 18' west.

Geographic positions along highways.

NEAR WEST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Libertytown, in center of south face near entrance of school building No. 8, aluminum tablet stamped "Prim. Trav. Sta. No. 123".	39 29 05.9	77 14 40.7
East-west crossroad, 16 feet northeast to corner picket fence.	39 30 56.8	77 14 16.4
Johnsville post-office, center of road.	39 32 01.7	77 13 52.8
Johnsville, road forks to northwest and northeast.	39 32 14.0	77 13 55.4
Road forks to northwest and northeast.	39 33 02.2	77 14 24.1
Four corners, crossing of north-south and east-west roads.	39 34 09.3	77 14 55.2
Piney Creek, center of wooden bridge over.	39 39 10.9	77 14 39.7
T road northeast.	39 39 33.7	77 14 55.4
Four corners, north-south and east-west roads, 38 feet southeast to gatepost, 33 feet northwest to corner picket fence, 44 feet southwest to corner blacksmith shop.	39 40 42.7	77 13 32.7
T road west.	39 41 31.9	77 14 05.2
Four corners, east-west crossroads.	39 42 19.0	77 14 31.7
Frederick-Carroll county line.	39 42 51.3	77 12 58.9
Harney, four corners, 31 feet southeast to corner yellow house, 68.5 feet southwest to yellow house, 45.8 feet west to southeast corner of Snider's store.	39 42 50.8	77 12 28.6
Pennsylvania-Maryland state line, northeast corner of cemetery.	39 43 12.6	77 12 37.6
Pennsylvania-Maryland state line, boundary stone.	39 43 12.6	77 12 08.8

Geographic positions along highways—Continued.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
North-south and east-west crossroads at signboard "Taneytown, 5 miles; Two Taverns, 3 miles".....	° ' " 39 43 45.6	° ' " 77 11 02.0
St. James Church, front door of.....	39 43 54.1	77 09 32.1
North-south crossroads, at signboard "Littlestown, 3 miles; Maryland line, 1 mile; Emmitsburg, 11 miles".....	39 43 46.2	77 08 46.6
Mount Vernon School, front door of.....	39 43 42.0	77 08 17.1
Crossroads, 22 feet southwest to post in wire fence, 16 feet southeast to post in fence, 33 feet south to signpost.....	39 43 33.4	77 07 09.3
Kingsdale, in top stone near east end of south abutment of culvert near railroad station, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1907, Pennsylvania".....	39 43 24.3	77 06 45.2
Pennsylvania-Maryland state line, boundary stone.....	39 43 12.6	77 06 37.0
Creek, center of iron bridge over, 21 feet northwest to south end of west abutment, 18 feet northeast to south end east abutment, 45.6 feet to northwest corner mill foundation.....	39 43 26.4	77 06 15.3
T road north.....	39 43 25.7	77 04 52.3
Baltimore pike intersection T road north, 62 feet southwest to center of small bridge, 43 feet west to tree on edge of road, 42 feet to center of small bridge south of road.....	39 43 16.8	77 04 02.6
T road south.....	39 43 21.7	77 02 22.4
Pennsylvania-Maryland state line, boundary stone 55 feet east of T lane north.....	39 43 13.0	77 00 50.2
Intersection of east-west road on state line with Westminster-Hanover road.....	39 43 13.0	77 00 20.6
Pennsylvania-Maryland state line, boundary stone in J. R. Brumgard's field, at corner of Adams and York counties, Pa.....	39 43 13.1	77 59 58.5
Pennsylvania-Maryland state line, boundary stone.....	39 43 13.0	76 59 42.3
Raubenstine, 1 mile southwest of, in west face of foundation stone at southwest corner of J. A. Brumgard's house, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1907, Pennsylvania".....	39 43 15.8	76 59 59.2
Raubenstine, on west edge of triangular plot of grass near former post-office, 18 feet south to corner of fence, 14 feet west to fence post, 18 feet northeast to corner fence post, 90 feet west of Raubenstine's store, iron bolt 8 inches long, driven in ground.....	39 44 07.0	76 59 51.2
Adams-York county line, near Raubenstine, boundary stone.....	39 44 12.1	76 59 58.6

MARYLAND-VIRGINIA.

PRIMARY TRAVERSE.

Seneca quadrangle.

MONTGOMERY COUNTY, MD.; FAIRFAX AND LOUDOUN COUNTIES, VA.

The following geographic positions were established in 1907, by F. J. McMaugh, for the control of the southern half of Seneca quadrangle. Positions are based on points located at Edwards Ferry and Grimes, in 1904. The work in Maryland was done in cooperation with that State.

Magnetic declination: Horizontal half-sheet line, $4^{\circ} 44'$ west; south half of vertical half-sheet line, $4^{\circ} 05'$ west; west border, $4^{\circ} 50'$ west; south border, $3^{\circ} 51'$ west.

Geographic positions along highways.

EDWARDS FERRY EAST TO DAWSONVILLE; THENCE SOUTH TO SENECA, MD.

Station.	Latitude.	Longitude.
Edwards Ferry, cemented in top coping stone of west wing wall to south gate of Lock No. 25, aluminum tablet stamped "Prim. Trav. Sta. No. 88".....	39 06 11.2	77 28 20.3
Edwards Ferry, T road east and road north.....	39 06 15.2	77 28 17.8
T road east.....	39 06 57.9	77 27 32.5
Small stream crossing road.....	39 07 35.9	77 27 09.5
Road forks northwest and northeast (line turns northeast).....	39 07 56.2	77 26 52.6
Crossroads east and west, 100 feet southeast of church.....	39 08 00.6	77 26 29.3
T road southwest and north-south crossroads (line turns north).....	39 08 16.7	77 25 19.0
Poolesville, in south face of stone foundation of new bank building, aluminum tablet stamped "Prim. Trav. Sta. No. 1".....	39 08 43.5	77 24 56.9
Poolesville, approximate location of front of old town hall (now destroyed).....	39 08 37.9	77 24 59.8
Road forks to south and east (line turns east).....	39 08 17.3	77 24 25.4
Intersection of Dawsonville and Seneca aqueduct roads (line turns east).....	39 07 39.6	77 23 01.5
Dawsonville, intersection of road south to Seneca aqueduct with roads to northeast and west, S. $22^{\circ} 30'$ E. 27 feet to northwest corner of blacksmith shop, S. 58° W. 66 feet to northeast corner of store, N. $19^{\circ} 30'$ E. 60 feet to southwest corner of store.....	39 07 40.5	77 20 47.9
Road forks (line turns east).....	39 06 25.3	77 21 09.2
Dry Seneca Creek, center of wooden bridge over.....	39 05 35.2	77 20 49.5
Seneca Creek, center of bridge over.....	39 04 43.5	77 20 23.2
Seneca Creek, cemented in south wing wall of west abutment of aqueduct, aluminum tablet stamped "Prim. Trav. Sta. No. 127".....	39 04 05.3	77 20 28.5

*Geographic positions along highways—Continued.*EDWARDS FERRY, MD., SOUTH NEAR WEST BORDER, TO RYAN, VA.; THENCE EAST NEAR SOUTH BORDER
TO GRIMES LOCK.

Station.	Latitude.	Longitude.
Edwards Ferry, cemented in top of coping stone to west wing wall to south gate of Lock No. 25, aluminum tablet stamped "Prim. Trav. Sta. No. 88".....	° ' " 39 06 11.2	° ' " 77 28 20.3
Low-water mark, Virginia-Maryland state line.....	39 06 01.3	77 28 38.0
Gateway of lane to southeast (line turns west).....	39 05 05.7	77 29 02.3
Second-class road intersection, 10 feet east to two mail boxes on south side of road (line turns east).....	39 04 26.6	77 29 15.8
Intersection of T road southwest to Ashburn with Georgetown pike (line turns southwest).....	39 04 14.4	77 28 50.4
Ashburn station, road crossing.....	39 02 38.6	77 29 17.4
Beaverdam Creek, center of iron bridge over.....	39 02 09.3	77 29 08.5
Road forks to south and southwest (line turns southwest)..	39 01 46.8	77 29 07.4
Ryan, crossroads (line turns east).....	39 00 54.1	77 29 36.2
Ryan, 1.8 miles east of; crossroads.....	39 00 47.3	77 27 47.2
Broad Run, center of bridge over.....	39 00 34.6	77 27 09.5
Sterling, crossroads 0.5 mile west of.....	39 00 15.0	77 26 04.0
Sterling, 460 feet southeast of; road crossing.....	39 00 22.8	77 25 44.1
Sterling, 35 feet north of road, 48.6 feet to southwest corner of schoolhouse, 47.9 feet to southeast corner of schoolhouse, S. 25° 30' W. 137.1 feet to northeast corner of Baptist Church, cemented in stone, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907".....	39 00 23.8	77 25 37.5
Second-class T road south.....	39 00 23.9	77 23 20.0
Loudoun-Fairfax county line, stone.....	39 00 30.5	77 22 52.2
Road forks southeast and east (line turns east).....	39 00 06.7	77 21 14.1
Dranesville, road forks to west and northwest.....	39 00 13.4	77 21 04.6
Bench-mark tablet (elevation 305).....	39 00 12.9	77 21 04.4
T road north.....	39 00 00.0	77 19 47.7
Second-class T road south.....	38 59 55.5	77 17 45.7
Front of church.....	38 59 55.9	77 17 35.4
Great Falls, 4 corners, 10 feet northeast to oak tree and fence corner, N. 33° W. to corner of post-office building (line turns north).....	38 59 54.3	77 17 19.5
Great Falls, in southeast corner east face of concrete underpinning of store and post-office, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1907".....	38 59 54.8	77 17 20.0
Great Falls, 0.6 mile north of; road forks to north and northeast; S. 15° E. about 160 feet to front of Methodist Episcopal Church (line turns northeast).....	39 00 21.2	77 17 39.4
T road north.....	39 00 41.4	77 16 36.1
North-south road (line turns north).....	39 00 46.2	77 16 06.2
T road west.....	39 01 12.5	77 15 20.4
Grimes, cemented in coping stone of west wing wall to south end of Lock No. 21, aluminum tablet stamped "Prim. Trav. Sta. No. 179".....	39 01 53.2	77 14 36.7

MICHIGAN.

PRIMARY TRAVERSE.

Calumet special quadrangle.

HOUGHTON AND KEWEENAW COUNTIES.

In cooperation with the State the following geographic positions were determined in 1907 by J. R. Ellis. The line starts at Franklin triangulation station and follows highways to Calumet; thence along Keweenaw Central Railroad to Kearsarge; thence along highway to Eagle River; thence along the lake shore to Ship Canal; thence along highways to original point.

Approximate magnetic declination: North half of area, $3^{\circ} 53'$ east.

Geographic positions.

ALONG HIGHWAYS, FRANKLIN STATION TO EAGLE RIVER.

Station.	Latitude.	Longitude.
Franklin triangulation station, center of stone and wood foundation at old mine shaft No. 2.....	47 08 33.72	88 34 09.22
Arcadia station, south end of culvert at road northeast....	47 09 21.3	88 33 21.3
Boston or Franklin Jr., mine, 0.5 mile west of; north end of road crossing "South Shore" Railway.....	47 10 23.4	88 32 11.2
Highway station, 0.25 mile southwest of; in top of boulder 3 feet in diameter, 25 feet south of highway near wagon bridge, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907, Michigan".....	47 11 22.8	88 30 19.5
Oneco mine, crossroads, 20 feet west to north end of culvert, 20 feet southwest to south end of culvert.....	47 11 19.3	88 28 43.7
T. 55 N., R. 33 W., northeast corner sec. 3, at west corner of triangular field, iron pin.....	47 11 58.8	88 28 02.4
Osceola, in northeast corner of lot 165 feet north of the electric railroad at road crossing, 263 feet southwest of "South Shore" Railway cattle guard, in top of concrete post, 36 inches long by 6 inches square, set 32 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1907, Michigan".....	47 13 21.7	88 27 25.4
Calumet "South Shore" Railway and Keweenaw Central Railroad station, center of track nearest station, opposite semaphore.....	47 14 47.8	88 27 26.6
Calumet electric plant, large smokestack to, on south side of small lake.....	47 15 11.0	88 26 46.5
Kearsarge, 1.25 miles southwest of station, road crossing Keweenaw Central Railroad in swamp.....	47 15 36.6	88 26 19.9
Kearsarge, 0.25 mile southwest of station, road crossing Keweenaw Railroad.....	47 16 03.4	88 25 19.2
Allouez, 0.3 mile southwest of general store at; on north side of public highway and about 200 feet southwest of blacksmith shop, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1907, Michigan".....	47 16 58.9	88 24 35.1
T. 56 N., R. 32 W., corner sec. 6, iron pin in boulder.....	47 17 09.9	88 24 16.5

Geographic positions—Continued.

ALONG HIGHWAYS, FRANKLIN STATION TO EAGLE RIVER—continued.

Station.	Latitude.	Longitude.
Ahmeek, east part of; T road east to Mohawk, 20 feet northwest to telephone pole, 40 feet northeast to telephone pole.....	° ' " 47 17 59.8	° ' " 88 23 27.3
Frank Charrier's road house, 1,900 feet southwest of; west of Calumet-Eagle River highway, at top of hill, 14 feet from center of highway, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1907, Michigan".....	47 20 00.5	88 21 07.0
Frank Charrier's road house, 1,900 feet northeast of; road southeast, 35 feet northeast to large stump, 40 feet southeast to haw bush.....	47 20 30.7	88 20 35.4
Cliff station, at east side of highway at north corner of large grounds, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1907, Michigan".....	47 22 15.8	88 18 49.8
Township-line post just west of highway.....	47 22 48.1	88 17 54.7
Phoenix, narrow-gage railroad over outlet to large pond..	47 23 21.8	88 16 38.3
Eagle River, west of highway at turn, about 400 feet west of public school building, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1907, Michigan".....	47 24 37.4	88 18 00.8
Eagle River light-house.....	47 24 49.6	88 17 53.3

ALONG THE LAKE SHORE, EAGLE RIVER TO SHIP CANAL.

T. 58 N., R. 32 W., northeast corner sec. 24.....	47 24 53.4	88 17 54.6
Lake Superior water line at mouth of Silver Creek.....	47 23 59.7	88 20 06.5
Fivemile Point, in north part of red sandstone formation, 3 feet above water level, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907, Michigan".....	47 23 35.4	88 21 54.7
Sevenmile Point, about 0.75 mile southwest of; in southwest part of large outcrop of stone, 500 feet northeast to Stone Island, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1907, Michigan".....	47 21 45.4	88 25 50.1
Hill Creek, cross cut on birch tree at mouth.....	47 20 07.8	88 27 46.9
Tamarack pumping station, 2 miles east of; in top of sandstone post, on south side of wood road, 30 feet from lake shore, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1907, Michigan".....	47 18 43.6	88 28 43.4
T. 57 N., R. 32 W., northeast corner sec. 33 (Michigan Geological Survey position).....	47 18 02.3	88 29 21.8
Tamarack pumping station, drain pipe in retaining wall...	47 17 24.6	88 30 21.6
Calumet-Hecla pumping station, in northwest part of concrete well, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1907, Michigan".....	47 16 34.0	88 31 40.1
T. 56 N., R. 34 W., northeast corner sec. 23, marked by large gas pipe.....	47 14 35.5	88 34 24.9
Bear Creek, 110 feet northeast of mouth, 10 feet from high lake-shore bank, on James Smith's farm, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1907, Michigan".....	47 14 39.7	88 34 34.6

Geographic positions—Continued.

ALONG THE LAKE SHORE, EAGLE RIVER TO SHIP CANAL—continued.

Station.	Latitude.	Longitude.
Bench monument (dressed stone 6 by 8 inch post), at Dan Washburn's saloon.....	47 13 43.0	88 37 18.6
Section corner (no numbers), gas pipe.....	47 13 42.8	88 37 18.6
Lilly Creek, 300 feet northeast of canal road bridge, east of highway, 50 feet from southwest corner of stable, in top of concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 12, 1907, Michigan".....	47 12 21.7	88 36 50.1
T. 55 N., R. 34 W., northeast corner sec. 4, cedar post....	47 11 59.7	88 36 58.9
Cottage on canal bank, letters "a. m." cut on board fence.....	47 10 02.8	88 38 13.9
Swedetown Creek, at junction of canal road with road to Lakeside Cemetery, 1.75 miles northwest of Hancock, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1907, Michigan".....	47 08 21.0	88 37 14.6
Hancock, iron pin in stone 530 feet west of Ingot street crossing "South Shore" Railroad.....	47 08 02.6	88 36 18.2

ALONG DULUTH, SOUTH SHORE AND ATLANTIC RAILWAY.^a

Milepost 1, road crossing.....	47 09 55.5	88 30 43.2
Milepost 2, track opposite.....	47 09 22.6	88 29 43.1

ALONG HIGHWAYS, QUINCY MILL TO TRAP ROCK RIVER.^a

Quincy stamp mill, 3,400 feet northeast of; on west side of Hancock-Lake Linden pike, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 15, 1907, Michigan".....	47 09 15.9	88 27 09.3
Hubbel, Main street crossing Mineral Range Railroad.....	47 10 20.5	88 25 49.3
Lake Linden, near south corner of Calumet-Hecla Company's property, 55 feet west to Main street crossing railroad, about 400 feet southwest to Mineral Range station, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 16, 1907, Michigan".....	47 10 59.3	88 24 57.5
Lake Linden, in northeast part of; forks of pike just east of Trap Rock River Bridge (center of intersection).....	47 11 46.1	88 23 44.1
Lake Linden, 2 miles southeast of; on east side of Torch Lake, 15 feet west of center of T road east, in post, aluminum tablet stamped "Prim. Trav. Sta. No. 17, 1907, Michigan".....	47 10 24.9	88 23 34.0
T. 55 N., R. 32 W., northeast corner sec. 17, T road east, 15 feet west to tree.....	47 10 15.5	88 23 00.0
T. 55 N., R. 32 W., northeast corner sec. 16, center of east-west road at north-south fence.....	47 10 16.2	88 21 43.2
T. 55 N., R. 32 W., 18 feet north and 3 feet west of northeast corner sec. 15, north of new road, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 18, 1907, Michigan".....	47 10 16.3	88 20 26.6

^a This line starts from adjusted position at Boston or Franklin Jr. mine and follows Duluth, South Shore and Atlantic Railway to point near Quincy stamp mill; thence along highway to Lake Linden connecting with adjusted point at Kearsage station.

Geographic positions—Continued.

ALONG HIGHWAYS, QUINCY MILL TO TRAP ROCK RIVER—continued.

Station.	Latitude.	Longitude.
T. 55 N., R. 32 W., northeast corner post sec. 15.....	47 10 16.2	88 20 26.6
T. 56 N., R. 32 W., quarter corner east side of sec. 33.....	47 12 25.3	88 21 43.1
T. 56 N., R. 32 W., at northeast corner of end of lane 0.25 mile south and 0.25 mile east of northeast corner sec. 28, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 19, 1907, Michigan".....	47 13 30.2	88 21 05.0
Trap Rock River, center of wagon bridge over.....	47 15 00.7	88 22 16.4
Forks of road, stone in pit (no corner).....	47 15 50.9	88 24 08.5

AHMEEK, EAST ALONG HIGHWAYS, TO STATION NO. 20.

Mohawk, T road south, northeast corner public school grounds.....	47 18 13.9	88 21 52.5
Mohawk, 1.6 miles southeast of; north of Mohawk-Gay public road, at corner of fence in plain view of highway, in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 20, 1907, Michigan".....	47 17 55.4	88 20 07.9
Mohawk, northeast corner sec. 33, T. 57 N., R. 32 W.....	47 18 02.3	88 21 45.8

Chelsea, Fowlerville, Laingsburg, Lansing, Mason, and St. Johns quadrangles.

INGHAM AND LIVINGSTON COUNTIES.

In cooperation with the State, the following geographic positions were determined by C. B. Kendall in 1908. The line begins with adjusted position of primary-traverse station No. 17 and follows highways west to a point 4.5 miles northeast of Williamston; thence south via Williamston to a point 2 miles southeast of Meadville; thence east via Plainfield, being tied to station No. 19, 1905. For the control of Mason quadrangle, the line starts at adjusted position of the point 4.5 miles northeast of Williamston and follows highways east via Haslett to a point 3 miles northeast of Lansing; thence south via Delhi to a point 2.5 miles southeast of Aurelius; thence east along line between townships 1 and 2 north, being tied to adjusted position 2 miles southeast of Meadville.

FOWLERVILLE QUADRANGLE.

Magnetic declination, north border, $0^{\circ} 43'$ east; south border, $0^{\circ} 06'$ west; west border, $0^{\circ} 06'$ east.

Geographic positions along highways.

COHOCTAH WEST TO NORTHWEST CORNER OF QUADRANGLE.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 4 N., R. 4 E., northeast corner sec. 31, crossroads.....	42	42	00.6	84	00	59.4
T. 4 N., R. 3 E., northeast corner sec. 36, crossroads.....	42	41	59.3	84	02	09.9
T. 4 N., R. 3 E., northeast corner sec. 25, T road west, 35 feet west to C. E. Stoddard's mail box.....	42	42	51.7	84	02	12.2
T. 4 N., R. 3 E., northeast corner sec. 24, T road east, 15 feet east to G. D. Cook's mail box in corner of triangle..	42	43	44.0	84	02	14.5
T. 4 N., R. 3 E., quarter corner east side of sec. 13, crossroads, 30 feet southeast to telephone pole, 30 feet northwest to corner post of wire fence.....	42	44	10.4	84	02	15.6
T. 4 N., R. 3 E., 5 feet south of quarter corner east side of sec. 14, in T road south, iron post stamped "Prim. Trav. Sta. No. 1, 1908, Michigan, Elevation 907".....	42	44	09.9	84	03	26.9
T. 4 N., R. 3 E., quarter corner north side of sec. 14, stone at T road west.....	42	44	36.3	84	04	04.0
T. 4 N., R. 3 E., northeast corner sec. 15, T road southeast, 95 feet south to corner of bridge, 90 feet east to corner of bridge.....	42	44	36.4	84	04	39.6
T. 4 N., R. 3 E., northeast corner sec. 16, T lane south....	42	44	36.2	84	05	50.3
T. 4 N., R. 3 E., northeast corner sec. 17, iron stake at crossroads.....	42	44	35.8	84	07	01.5
T. 4 N., R. 3 E., 40 feet northwest of northeast corner sec. 17, in northwest corner of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 2, Michigan, Elevation 887, 1908".....	42	44	36.1	84	07	02.0
T. 4 N., R. 3 E., northeast corner sec. 18, T road south, 15 feet south to corner of triangle, 35 feet southeast to poplar.....	42	44	35.6	84	08	12.6
T. 4 N., R. 2 E., northeast corner sec. 13, T road east, line between Ingham and Livingston counties, 5 feet east to center of triangle.....	42	44	34.3	84	09	17.1
T. 4 N., R. 2 E., 30 feet southeast of sixteenth corner south of northeast corner sec. 14, in corner of fence at T road east along sixteenth section line, iron post stamped "Prim. Trav. Sta. No. 3, 1908, Michigan, Elevation 898".....	42	44	21.1	84	10	26.8
T. 4 N., R. 2 E., northeast corner sec. 14, 10 feet west to old burnt stump in center of triangle.....	42	44	34.3	84	10	28.3
T. 4 N., R. 2 E., northeast corner sec. 15, center of road at north-south fence.....	42	44	35.7	84	11	39.3
T. 4 N., R. 2 E., northeast corner sec. 16, fence north, hedge row south.....	42	44	36.6	84	12	51.2
T. 4 N., R. 2 E., quarter corner north side of sec. 16, 30 feet southwest of crossroads, iron post stamped "Prim. Trav. Sta. No. 4, 1908, Michigan, Elevation 897".....	42	44	36.7	84	13	27.0
T. 4 N., R. 2 E., northeast corner sec. 17, center of road at north-south wire fence.....	42	44	37.3	84	14	02.2
T. 4 N., R. 2 E., quarter corner north side of sec. 17, T road north.....	42	44	38.2	84	14	37.2
T. 4 N., R. 2 E., quarter corner east side of sec. 31, T road north, 15 feet south to fence corner post, 20 feet north to center of triangle.....	42	41	36.5	84	14	59.1

Geographic positions along highways—Continued.

MEADVILLE VIA PLAINFIELD TO SOUTHWEST CORNER OF HOWELL QUADRANGLE.

Station.	Latitude.	Longitude.
Mount Pleasant Church, 1,500 feet west of; T road south 35 feet southeast to center of triangle.....	° ' " 42 31 09.9	° ' " 84 14 40.3
T. 2 N., R. 2 E., quarter corner east side of sec. 31, T road north, 50 feet northwest to southeast corner cemetery fence, 20 feet south to fence corner, 100 feet northeast to corner white schoolhouse.....	42 31 09.43	84 14 22.5
T. 2 N., R. 2 E., east line sec. 32, T road north, center of east-west road.....	42 31 02.3	84 13 11.6
T. 2 N., R. 2 E., center of sec. 34, center of intersection of crossroads, 35 feet southwest to fence corner, 35 feet northwest to fence corner.....	42 31 06.5	84 11 25.5
T. 2 N., R. 2 E., stone quarter corner east side of sec. 34, crossroads, 30 feet southwest to stone painted "978.2"....	42 31 05.5	84 10 49.5
T. 2 N., R. 2 E., quarter corner east side of sec. 35, center of intersection of crossroads, 25 feet southwest to corner of fence, 40 feet southeast to primary traverse station No. 7.	42 31 03.3	84 09 37.9
T. 2 N., R. 2 E., quarter corner east side of sec. 35, 40 feet southeast of intersection of crossroads, in corner of wire fence, iron post stamped "Prim. Trav. Sta. No. 7, 1908, Michigan, Elev. 948".....	42 31 03.1	84 09 37.6
Reeves Corners, northeast corner sec. 2, T. 1 N., R. 2 E., stone 10 feet east of corner of fence and 40 feet northeast of intersection of crossroads.....	42 30 37.1	84 09 35.6
Livingston-Ingham County line, 4 corners, center of crossroads, 30 feet northeast to plank fence, 25 feet southwest to telephone pole.....	42 30 06.3	84 08 26.1
T. 1 N., R. 3 E., quarter corner east side of sec. 4, center of crossroads intersection.....	42 30 13.7	84 05 15.1
Schoolhouse, T road south, 25 feet south to small tree in center of triangle, 25 feet north to fence.....	42 30 12.4	84 03 44.9
T. 1 N., R. 3 E., east line sec. 2, T road south, 20 feet northeast to oak, 30 feet southwest to fence corner.....	42 30 03.6	84 02 50.6

MASON QUADRANGLE.

Magnetic declination: East border, 0° 06' west; north border, 0° 17' east; west border, 0° 23' east; south border, 0° 13' east.

Geographic positions along highways.

FROM NORTHWEST CORNER OF FOWLerville QUADRANGLE VIA WILLIAMSTON TO MEADVILLE.

Station.	Latitude.	Longitude.
T. 4 N., R. 2 E., northeast corner sec. 18, T road south...	42° 44' 38.6"	84° 15' 12.5"
T. 4 N., R. 2 E., northeast corner stone sec. 19, crossroads.	42 43 46.7	84 15 08.7
Folton school, northeast corner sec. 30, T. 4 N., R. 2 E., crossroads, 35 feet northeast to post, 110 feet southeast to corner of schoolhouse.....	42 42 54.6	84 15 05.2
T. 4 N., R. 1 E., quarter corner east side of sec. 36, center of road at west edge of cemetery, north-south Locke- Williamston township line.....	42 41 37.1	84 15 50.3
T. 4 N., R. 1 E., quarter corner east side of sec. 35, center of intersection of cross streets.....	42 41 36.94	84 17 01.2
Williamston, 30 feet south of center of Grand street and 40 feet east of center of Cedar street, iron post stamped "Prim. Trav. Sta. No. 5, 1908, Michigan, Elev. 868"....	42 41 18.7	84 16 51.5
T. 3 N., R. 1 E., northeast corner sec. 11, center of inter- section of crossroads.....	42 40 23.3	84 16 57.1
T. 3 N., R. 1 E., northeast corner sec. 14, crossroads, 75 feet northwest to schoolhouse.....	42 39 31.6	84 16 55.0
T. 3 N., R. 1 E., northeast corner sec. 23, center of inter- section of crossroads.....	42 38 39.4	84 16 52.6
T. 3 N., R. 1 E., northeast corner sec. 23, 44 feet north- west of intersection of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, 1908, Michigan, Elev. 908"....	42 38 39.7	84 16 53.0
T. 3 N., R. 1 E., northeast corner sec. 24, Leroy-Wheatfield township line, intersection of crossroads, 125 feet north- east to schoolhouse.....	42 38 39.3	84 15 41.2
T. 3 N., R. 1 E., northeast corner sec. 25, T road east.....	42 37 47.6	84 15 39.1
T. 3 N., R. 1 E., northwest corner sec. 31, T road east, center of north-south road.....	42 36 55.6	84 15 36.9
T. 3 N., R. 1 E., northeast corner sec. 36, T road west, corner of north-south road.....	42 36 55.1	84 15 36.9
T. 2 N., R. 1 E., northeast corner sec. 1, corner of Leroy, Wheatfield, Ingham, and Oak townships, center of in- tersection of crossroads.....	42 36 03.1	84 15 35.3
T. 2 N., R. 1 E., northeast corner sec. 12, T road east.....	42 35 05.8	84 15 34.1
T. 2 N., R. 1 E., northeast corner sec. 12, T road west....	42 35 05.1	84 15 34.1
T. 2 N., R. 1 E., northeast corner sec. 13, T road east, 25 feet east to telephone pole in center of triangle.....	42 34 14.0	84 15 33.1
T. 2 N., R. 1 E., northeast corner sec. 13, T road west, 20 feet west to center of triangle.....	42 34 13.1	84 15 33.1
T. 2 N., R. 1 E., northeast corner sec. 24, T road east, 10 feet east to center of triangle.....	42 33 21.4	84 15 32.1
T. 2 N., R. 1 E., northeast corner sec. 24, T road west, 10 feet west to center of triangle.....	42 33 21.1	84 15 32.1
T. 2 N., R. 1 E., north line sec. 25, center of road at east- west rail fence, 125 feet southeast to corner of school- house.....	42 32 28.7	84 15 48.8
Meadville, four corners crossroads, 5 feet northeast to two telephone poles, 40 feet southwest to fence post.....	42 32 18.4	84 15 45.0
T. 2 N., R. 1 E., northeast corner sec. 36, center of road at fence.....	42 31 36.3	84 15 30.1

Geographic positions along highways—Continued.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
T. 4 N., R. 1 E., northeast corner sec. 13, center of intersection of crossroads, north-south Locke-Williamston township line.....	42 44 39.4	84 16 07.8
T. 4 N., R. 1 E., northeast corner sec. 14, T road south, 20 feet south to center of triangle, 10 feet northeast to telephone pole.....	42 44 38.8	84 17 17.8
T. 4 N., R. 1 E., northeast corner sec. 14, 150 feet east of T road south, on north edge of east-west road, 340 feet west of T road north, iron post stamped "Prim. Trav. Sta. No. 9, 1908, Michigan".....	42 44 39.2	84 17 15.8
T. 4 N., R. 1 E., northeast corner sec. 15, T road south, 10 feet south to center of triangle.....	42 44 39.0	84 18 29.2
T. 4 N., R. 1 E., quarter corner north side of sec. 15, center of intersection of crossroads, 125 feet southwest to white church.....	42 44 39.0	84 19 04.6
T. 4 N., R. 1 E., quarter corner north side of sec. 16, T road south, 30 feet southwest to stone painted "905.3," 10 feet south to center of triangle.....	42 44 39.2	84 20 15.1
T. 4 N., R. 1 E., northeast corner sec. 17, T road north, 15 feet north to primary traverse station No. 10, in center of triangle.....	42 44 39.3	84 20 50.5
T. 4 N., R. 1 E., 15 feet north of northeast corner sec. 17, T road north, in corner of triangle, iron post stamped "Prim. Trav. Sta. No. 10, 1908, Michigan".....	42 44 39.5	84 20 50.5
T. 4 N., Rs. 1 E. and 1 W., T road west on north-south Meridian-Williamston township line, 25 feet west to center of triangle, 25 feet east to telephone pole painted "670.7".....	42 44 14.4	84 21 49.0
T. 4 N., R. 1 W., northwest corner sec. 13, T road southeast, west edge of north-south road, 25 feet southeast to center of triangle, 50 feet southeast to corner post of wire fence painted "877.05 G S".....	42 44 21.2	84 22 48.6
T. 4 N., R. 1 W., near center of west line of sec. 12, road forks northeast and southeast, center of triangle.....	42 44 47.4	84 22 58.2
T. 4 N., R. 1 W., quarter corner east side of sec. 11, cross fences.....	42 44 53.2	84 23 00.2
Haslett Park, 1,500 feet west of station, in center of triangle at T road west, iron post stamped "Prim. Trav. Sta. No. 11, 1908, Michigan".....	42 44 50.2	84 24 30.4

NEAR WEST BORDER.

Lansing, 2.5 miles east of; center of sec. 13, T. 4 N., R. 2 W., electric railroad crossing T road south at East Lansing, center of track, 30 feet north to center of Michigan avenue.....	42 44 00.5	84 29 38.8
T. 4 N., R. 2 W., in southeast corner NW $\frac{1}{4}$ sec. 13, 30 feet north of center of Michigan avenue, 45 feet northwest of T road south, 70 feet northwest of street corner crossing, iron post stamped "Prim. Trav. Sta. No. 12, 1908, Michigan, Elev. 837".....	42 44 01.1	84 29 39.3

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
T. 4 N., R. 2 W., near center of sec. 24, Grand Trunk Railway crossing, center between two south tracks.....	° ' " 42 43 08.8	° ' " 84 29 38.6
T. 4 N., R. 2 W., quarter corner north side sec. 25, center of intersection of crossroads.....	42 42 42.1	84 29 38.6
T. 4 N., R. 2 W., 1,320 feet west of center of sec. 25, T road south, center of east-west road, 20 feet south to center of triangle.....	42 42 16.1	84 29 56.2
T. 1 N., R. 2 W., northeast corner sec. 1, stone in center of east-west road at north-south fence, corner of Vevay, Aurelius, Leslie, and Onondaga townships.....	42 30 33.6	84 28 58.5
T. 1 N., R. 1 W., northeast corner sec. 6, T road south, 50 feet east to crossroads.....	42 30 33.6	84 27 46.5
T. 2 N., R. 1 W., southeast corner of sec. 31, T road north, 70 feet west to crossroads.....	42 30 33.6	84 27 44.9
T. 2 N., R. 1 W., southeast corner sec. 32, 70 feet west to center of crossroads.....	42 30 33.4	84 26 34.2
Eden, 1 mile south of post-office, in SE. $\frac{1}{4}$ sec. 33, T. 2 N., R. 1 W., center of intersection of crossroads, 70 feet west to Michigan Central Railroad crossing.....	42 30 33.2	84 25 41.2
T. 2 N., R. 1 W., southeast corner sec. 34, T road north, center of east-west road, 5 feet north to center of triangle.....	42 30 32.8	84 24 12.8
T. 1 N., R. 1 W., 1,320 feet west of northeast corner of sec. 2, T road south, center of east-west road, 15 feet south to center of triangle.....	42 30 32.7	84 23 20.8
T. 2 N., R. 1 W., 1,320 feet west of southeast corner of sec. 35, T road north, center of east-west road, 25 feet north to center of triangle.....	42 30 32.7	84 23 19.7
T. 1 N., R. 1 W., northeast corner sec. 1, center of intersection of crossroads.....	42 30 32.4	84 21 51.6
T. 2 N., R. 1 W., in southeast corner of sec. 36, 30 feet northwest of center of intersection of crossroads, at corner of fence, iron post stamped "Prim. Trav. Sta. No. 16, 1908, Michigan".....	42 30 32.6	84 21 51.9
T. 1 N., R. 1 E., quarter corner east side of sec. 6, T road east, center of west edge of triangle.....	42 30 13.7	84 21 22.2
T. 1 N., R. 1 E., near south line of sec. 4, T road south, center of north border of triangle.....	42 29 56.7	84 19 47.8
T. 1 N., R. 1 E., east line sec. 33, north-south fences, center of road at crossing.....	42 30 27.1	84 19 01.0
T. 1 N., R. 1 E., 900 feet south of east-west Ingham-Bunker Hill township line, T road north, center of south border of triangle.....	42 30 35.6	84 18 25.9
T. 1 N., R. 1 E., near southwest corner of SE. $\frac{1}{4}$ sec. 3, about 700 feet north of east-west Ingham-Bunker Hill township line, on east edge of north-south road, in fence corner, iron post stamped "Prim. Trav. Sta. No. 17, 1908, Michigan, Elev. 981".....	42 30 50.8	84 18 23.1
T. 1 N., R. 1 E., northeast corner sec. 3, stone near fence corner at bend of road to east.....	42 30 44.4	84 17 50.5
T. 1 N., R. 1 E., northeast corner sec. 2, center of east-west road.....	42 30 44.4	84 16 40.3

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
Reeves School, 125 feet northwest of schoolhouse, center of intersection of crossroads, 100 feet north to maple, 45 feet southeast to telephone pole, 30 feet northeast to center of large triangle	° ' " 42 30 44.1	° ' " 84 16 01.7
New brick church (Stockbridge Methodist), 75 feet southwest of; T road north, 30 feet northwest to telephone pole in triangle, 30 feet southwest to front-yard gate.....	42 30 10.7	84 14 27.1
T. 1 N., R. 2 E., east-west White Oak-Stockbridge township line, center of north-south road at east-west fence...	42 30 43.6	84 14 38.2
Mount Pleasant Church, 1,500 feet west of; T road south, 35 feet southeast to center of triangle.....	42 31 09.9	84 14 40.3

CHELSEA QUADRANGLE.

Magnetic declination: North border, 0° 06' east.

Geographic positions along highways along north border.

Station.	Latitude.	Longitude.
Plainfield, in south face at southwest corner of foundation to Presbyterian Church; aluminum tablet stamped "Prim. Trav. Sta. No. 8, Michigan, 1908, Elev. 958" ...	° ' " 42 39 48.9	° ' " 84 06 47.9
Plainfield, at east edge of; northeast corner sec. 8, T. 1 N., R. 3 E., T road south.....	42 29 48.4	84 06 26.4
Prim. Trav. Sta. No. 19, 1905 (Hawkins).....	42 29 46.9	84 01 04.6

LAINGSBURG QUADRANGLE.

Magnetic declination: South border, 0° 17' east.

Geographic positions along highways near south border.

Station.	Latitude.	Longitude.
Haslett Park, northwest corner of; in NE. $\frac{1}{4}$ sec. 10, T. 4 N., R. 1 W., T road west, center of north-south road, 25 feet west to center of triangle, 15 feet northeast to hickory tree.....	° ' " 42 45 13.9	° ' " 84 24 31.4
T. 4 N., R. 1 W., quarter corner north side of sec. 9, T road north, center of east-west road, 20 feet north to center of triangle.....	42 45 19.1	84 25 57.5
T. 4 N., R. 1 W., northeast corner sec. 8, center of east-west road at north-south fence, 50 feet northwest to brick schoolhouse.....	42 45 18.8	84 26 33.2
T. 4 N., R. 1 W., northeast corner sec. 7, T road south, 10 feet south to center of triangle.....	42 45 18.5	84 27 45.2
T. 4 N., R. 1 W., on north-south Meridian-Lansing township line, intersection of 4 corners.....	42 45 33.2	84 29 02.0

ST. JOHNS QUADRANGLE.

Geographic positions along highways near southeast corner.

Station.	Latitude.	Longitude.
T. 4 N., R. 2 W., 2,000 feet north of northeast corner sec. 2, T road south on section line, center of east-west road.....	° ' " 42 45 38.4	° ' " 84 30 12.8
T. 4 N., R. 2 W., northeast corner sec. 2, center of north-south road at wire fence west.....	42 45 18.7	84 30 13.1

LANSING QUADRANGLE.

Magnetic declination: East border, 0° 23' east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
T. 4 N., R. 2 W., northeast corner sec. 14, junction of old state road and road north, 25 feet northwest to center of triangle, 25 feet south to hickory tree.....	° ' " 42 44 25.7	° ' " 84 30 13.1
T. 3 N., R. 2 W., northeast corner sec. 2, T road south, 25 feet southeast to center of triangle, 30 feet southwest to boulder, east-west Lansing-Delhi township line.....	42 40 57.8	84 30 13.8
T. 3 N., R. 2 W., northeast corner sec. 2, on west edge of T road south and 60 feet south of center of east-west road, iron post stamped "Prim. Trav. Sta. No. 13, 1908, Michigan, Elev., 869".....	42 40 57.3	84 30 13.9
T. 3 N., R. 2 W., northeast corner sec. 11, crossroads, 15 feet west to center of triangle.....	42 40 08.6	84 30 12.9
T. 3 N., R. 2 W., northeast corner sec. 14, center of intersection of crossroads.....	42 39 16.5	84 30 12.5
Holt station, 90 feet north of northeast corner, bend of road south, 40 feet east of center of main track of Michigan Central Railroad; iron post stamped "Prim. Trav. Sta. No. 14, 1908, Michigan, Elev., 882".....	42 38 39.2	84 30 22.0
Holt, quarter corner north side of sec. 23, T. 3 N., R. 2 W., cross streets at Delhi, center of intersection, 25 feet southwest to telephone pole, 25 feet northeast to corner store porch.....	42 38 24.4	84 30 55.1
Holt, 1 mile southeast of post-office, road forks south and southeast, telephone pole in center of triangle.....	42 37 42.1	84 30 11.4
T. 3 N., R. 2 W., northeast corner sec. 35, crossroads, stone in center of intersection.....	42 36 39.6	84 30 11.4
T. 2 N., R. 2 W., northeast corner sec. 2, T road east, west edge of triangle, east-west Delhi-Aurelius township line.....	42 35 47.2	84 30 11.6
T. 2 N., R. 2 W., northeast corner sec. 11, crossroads, center of intersection.....	42 34 55.6	84 30 11.3
T. 2 N., R. 2 W., northeast corner sec. 14, ditch to east, center of north-south road.....	42 34 03.2	84 30 10.7
T. 2 N., R. 2 W., northeast corner sec. 23, T road west, stone and iron bolt in center of north-south road.....	42 33 10.9	84 30 10.4
T. 2 N., R. 2 W., northeast corner sec. 26, center of intersection of crossroads.....	42 32 18.6	84 30 10.0

Geographic positions along highways near east border—Continued.

Station.	Latitude.	Longitude.
T. 2 N., R. 2 W., northeast corner sec. 35, center of intersection of crossroads.....	° ' " 42 31 25.9	° ' " 84 30 09.6
Barns School, 140 feet east of; northeast corner sec. 35, T. 2 N., R. 2 W., 50 feet northwest of; center of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 15, 1908, Michigan".....	42 31 26.3	84 30 10.1
T. 1 N., R. 2 W., northeast corner sec. 2, center of intersection of crossroads, east-west Aurelius-Onondaga township line.....	42 30 33.6	84 30 09.1

MINNESOTA-WISCONSIN.

PRIMARY TRAVERSE.

Afton, Center City, Farmington, Hastings, Isanti, Rush City, St. Croix Falls, St. Paul, Stillwater, and White Bear quadrangles.

CHISAGO, DAKOTA, ISANTI, RAMSEY, AND WASHINGTON COUNTIES, MINN.; PIERCE AND ST. CROIX COUNTIES, WIS.

The following geographic positions based on Ramsey triangulation station and the United States Mississippi River Commission triangulation stations at Newport and Hastings were determined in 1908 by J. R. Ellis.

The lines follow the railroads and highways near borders of quadrangles. A discrepancy of 1 to 4 seconds was found at points near St. Croix between this work and the line run by George T. Hawkins in 1895 through the same territory. Only a portion of the old work was used to form a circuit; the rest has not been changed, as the old work closed within itself. To reduce positions determined in 1896 to approximate United States standard add 0.9" to latitudes and add 8.5" to longitudes.

STILLWATER QUADRANGLE.

Magnetic declination: South border, 8° 24' east; north border, 8° 20' east; east border, 6° 30' east.

Geographic positions.

ALONG HIGHWAYS NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Hugo, middle of station.....	° ' " 45 09 31.7	° ' " 92 59 37.1
T. 31 N., R. 21 W., northeast corner sec. 8.....	45 11 45.3	92 58 42.3
Forest Lake, 2.5 miles southeast of; corner of sections.	45 14 33.8	92 58 47.4
Forest Lake, 2.25 miles south of station, just east of road crossing, 20 feet south and 66 feet west to center of road crossing, iron post stamped "Prim. Trav. Sta. No. 8, Minnesota, 1908".....	45 14 34.8	92 59 01.8

Geographic positions—Continued.

ALONG HIGHWAYS NEAR NORTH BORDER—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of T road west at quarter corner.....	45 14 47.5	92 58 41.0
Center of crossroads.....	45 14 21.6	92 57 28.7
T. 32 N., R. 21 W., northeast corner sec. 28.....	45 14 21.9	92 57 28.7
T. 32 N., R. 21 W., northeast corner of sec. 27, at T road north, on stone.....	45 14 21.4	92 56 16.0
Center of T road north, on section line.....	45 14 34.0	92 54 25.5
T. 32 N., R. 21 W., northeast corner sec. 25, on stone.....	45 14 20.0	92 53 39.6
Scandia, 4 miles west and 1 mile south of; in southwest corner of Big Lake schoolhouse yard; 30 feet south and 24 feet west to tree in center of triangle formed by forks of road, iron post stamped "Prim. Trav. Sta. No. 9, Minnesota, 1908".....	45 14 12.3	92 53 06.2

ALONG HIGHWAYS NEAR EAST BORDER.

Scandia, 1 mile southeast of; center of crossroads.....	45 14 27.9	92 47 24.4
Vassa School, 0.75 mile west of; center of T road north....	45 14 10.3	92 46 44.0
Copas, 0.5 mile northeast of station; Vassa station, 45 feet east and 30 feet north to center of T road west, iron post stamped "Prim. Trav. Sta. No. 1, Minnesota, 1908"....	45 14 05.2	92 45 52.4
Marine, 0.5 mile north of station, road crossing under railroad.....	45 12 31.4	92 47 04.7
Marine station.....	45 12 01.1	92 47 00.3
Marine, 50 feet northeast to lamp post, 50 feet east to northwest corner of Burot's store porch, at cross streets.....	45 11 55.3	92 46 09.4
T. 31 N., R. 20 W., northeast corner sec. 12.....	45 11 44.0	92 46 25.4
F. E. Nelson's mail box, center of T road east.....	45 10 14.7	92 45 57.5
Arcola School, 20 feet south and 5 feet west to northeast corner of schoolhouse yard, road forks.....	45 08 38.5	92 45 40.4
Center of Stillwater-Marine pike at township line.....	45 07 24.1	92 45 58.4
Stillwater, 3 miles north and 1.5 miles east of; at northwest corner of fence at junction of roads, iron post stamped "Prim. Trav. Sta. No. 10, Minnesota, 1908".....	45 06 39.2	92 46 53.3
T. 30 N., R. 20 W., northeast corner sec. 10, T road east....	45 06 28.9	92 46 54.0
T. 30 N., R. 20 W., northeast corner sec. 15.....	45 05 36.5	92 46 53.8

ALONG NORTHERN PACIFIC RAILWAY NEAR STILLWATER.

Stillwater, in north part of; Northern Pacific Railway bridge No. 11 over Stillwater-Marine pike.....	45 04 23.4	92 48 25.7
Stillwater, east Chestnut street crossing of Northern Pacific Railway, track nearest station.....	45 03 21.8	92 48 15.6

Geographic positions—Continued.

ALONG STILLWATER BRANCH OF CHICAGO AND NORTHWESTERN RAILWAY SOUTH OF STILLWATER.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing, 600 feet north of switch block to spur	45	02	35.3	92	47	41.8
Road crossing, east-west section line	45	01	17.3	92	47	52.9
T. 29 N., R. 20 W., northeast corner sec. 9	45	01	17.3	92	48	06.2
Stillwater, just east of junction, road crossing	45	00	57.7	92	48	24.4

ALONG HIGHWAYS NEAR SOUTH BORDER.

T. 29 N., R. 20 W., northeast corner sec. 18	45	00	25.7	92	50	33.7
St. Elmo, 1 mile east of; road crossing	45	00	08.5	92	51	45.0
T. 32 N., R. 19 W., quarter corner north side of sec. 30, stone	45	14	19.1	92	45	48.0
Otisville, road crossing of Minneapolis, St. Paul and Sault Ste. Marie Railway	45	14	46.4	92	45	51.0
Stillwater Junction, 1 mile southeast of; north-south road crossing the Chicago and Northwestern Railway; 38 feet southwest to point between tracks at road crossing, iron post stamped "Prim. Trav. Sta. No. 17, Minnesota, 1908" ..	45	00	30.7	92	47	39.9

CENTER CITY QUADRANGLE.

Magnetic declination: East border, $8^{\circ} 24'$ east; north border, $10^{\circ} 10'$ east; west border, $11^{\circ} 02'$ east.

Geographic positions along highways.

NEAR EAST BORDER.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 32 N., R. 20 W., northeast corner sec. 24, stone	45	15	10.8	92	46	25.9
Center of guide post "Scandia 2 miles," T road	45	15	23.5	92	46	18.2
Guide post "Taylors Falls 11 miles," 25 feet due east to corner of wire fence, road west	45	16	15.6	92	46	39.4
Washington-Chisago county line, center of T road west ..	45	17	46.8	92	46	07.6
T. 32 N., R. 20 W., northeast corner sec. 1, Washington- Chisago county line, stone	45	17	46.8	92	46	25.8
Washington-Chisago county line, 1 mile north of; 40 feet due north to guide post "Osceola 2.5 miles," road forks ..	45	18	33.8	92	45	28.8
T. 33 N., R. 20 W., northeast corner sec. 36, center of crossroads	45	18	38.3	92	46	24.8
T. 33 N., R. 20 W., northeast corner sec. 25, center of crossroads	45	19	30.5	92	46	24.8
Center of T road west	45	20	35.2	92	46	25.8
Long Lake School, in southeast corner of yard, 75 feet south and 50 feet east to T road west, 80 feet northwest to southeast corner of school building, iron post stamped "Prim. Trav. Sta. No. 2, Minnesota, 1908"	45	21	31.2	92	46	52.5

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Shafer, about 1 mile southwest of; center of crossroads....	45 22 41.7	92 46 08.9
T. 33 N., R. 19 W., northeast corner sec. 6.....	45 22 58.3	92 45 13.1
T. 34 N., R. 19 W., northeast corner sec. 19.....	45 25 34.9	92 45 16.6
Holuquist School No. 43, northeast corner sec. 7, T. 34 N., R. 19 W., 10 feet northeast to elm tree.....	45 27 19.6	92 45 18.9
T. 34 N., R. 19 W., northeast corner sec. 6, center of T road east.....	45 28 11.7	92 45 17.6
T. 35 N., R. 19 W., corner sec. 31, stone.....	45 29 04.3	92 45 18.2
Almelund, 1.5 miles east and 0.5 mile north of; at south- west corner of crossroads, 25 feet east and 30 feet north to northeast corner sec. 30, T. 35 N., R. 19 W., iron post stamped "Prim. Trav. Sta. No. 4, Minnesota, 1908".	45 29 56.0	92 45 18.5

NEAR NORTH BORDER.

T. 35 N., R. 20 W., northeast corner sec. 25.....	45 29 55.5	92 46 30.9
Almelund, in northwest part of; center of T road south- west.....	45 29 34.5	92 47 14.3
T. 35 N., R. 20 W., quarter corner, at center of crossroads, stone.....	45 29 29.8	92 48 59.3
Kost, 0.75 mile east of post-office, center of crossroads.....	45 29 30.1	92 50 51.8
Kost, just west of post-office, 25 feet east and 25 feet south to center of T road west, iron post stamped "Prim. Trav. Sta. No. 5, Minnesota, 1908".....	45 29 32.6	92 52 04.5
T. 35 N., R. 20 W., center stone sec. 30, 10 feet east to T road north.....	45 29 30.4	92 53 18.9
T. 35 N., R. 21 W., northeast corner of sec. 25.....	45 29 56.4	92 53 53.4
Center of T road south.....	45 29 31.3	92 55 45.4
T. 35 N., R. 21 W., northeast corner sec. 27, T road south, iron hub.....	45 29 57.5	92 56 22.6

NEAR WEST BORDER.

T. 34 N., R. 21 W., quarter corner east side of sec. 18....	45 25 59.6	92 59 58.9
Stacy, 1 mile north of; road crossing.....	45 24 40.8	92 59 09.6
Stacy, road crossing at station.....	45 23 48.7	92 59 15.3
Stacy, 1 mile south of station, 53 feet west and 33 feet south to center of road crossing, iron post stamped "Prim. Trav. Sta. No. 7, Minnesota, 1908".....	45 23 03.8	92 59 25.0
Wyoming, about 1 mile north of; east-west road crossing..	45 21 17.2	92 59 50.6
T. 33 N., R. 21 W., northeast corner sec. 18.....	45 21 17.2	92 59 53.6
Wyoming, just south of station, east-west road crossing....	45 20 11.6	92 59 55.6
Milepost 27, 260 feet north of; road crossing.....	45 18 59.7	92 59 16.8
Center of bridge near Washington-Chisago county line....	45 18 01.5	92 59 17.5
Forest Lake station.....	45 16 43.4	92 59 08.7

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
Forest Lake, about 1.75 miles south of station, road crossing.....	° ' " 45 15 14.0	° ' " 92 59 07.2
Guidepost "Forest Lake 7 miles," at forks of road	45 15 00.4	92 51 32.7
Scandia, 2 miles west of; center of T road north.....	45 15 03.4	92 50 52.8
Scandia, center of cross streets, 50 feet southwest to corner of cemetery fence, 50 feet southeast to stone post at corner of churchyard.....	45 15 12.5	92 48 22.0
Scandia, quarter corner north side of sec. 23, T. 32 N., R. 20 W.....	45 15 11.2	92 48 15.0

ISANTI QUADRANGLE.

Magnetic declination: East border, $11^{\circ} 02'$ east.*Geographic positions along highways near east border.*

Station.	Latitude.	Longitude.
T. 35 N., R. 21 W., northeast corner sec. 30.....	° ' " 45 29 58.0	° ' " 93 00 04.8
T. 35 N., R. 21 W., northeast corner sec. 31, center of T road west, at schoolhouse	45 29 06.0	93 00 04.3
T. 35 N., R. 22 W., northeast corner sec. 36, crossroads, Chisago-Isanti county line.....	45 29 06.1	93 01 18.0
T. 34 N., R. 22 W., northeast corner sec. 1, Chisago-Isanti county line.....	45 28 13.9	93 01 18.3
T. 34 N., R. 22 W., northeast corner stake sec. 12, Chisago-Isanti county line.....	45 27 17.6	93 01 16.1
T. 34 N., R. 22 W., northeast corner sec. 13, Chisago-Isanti county line.....	45 26 25.9	93 01 15.3

RUSH CITY QUADRANGLE.

Magnetic declination: South border, $10^{\circ} 10'$ east.*Geographic positions along highways near south border.*

Station.	Latitude.	Longitude.
North Branch, 1 mile east and 0.33 mile south of; center of T road south.....	° ' " 45 30 24.1	° ' " 92 57 36.4
North Branch, main street crossing Northern Pacific Railroad at station.....	45 30 41.5	92 58 49.7
North Branch, 1 mile west of; 40 feet east and 30 feet north to center of T road south, iron post stamped "Prim. Trav. Sta. No. 6, Minnesota, 1908".....	45 30 36.8	93 00 05.0

WHITE BEAR QUADRANGLE.

Geographic positions near east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
White Bear station.....	45 05 06.1	93 00 36.0
Bald Eagle Junction.....	45 05 57.4	93 00 12.4

ST. CROIX FALLS QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Shafer, 80 feet west of station, iron post stamped "Prim. Trav. Sta. No. 3, Minnesota, 1908," elevation 941.....	45 23 14.7	92 44 51.1
T. 34 N., R. 19 W., quarter corner north side of sec. 32, center of crossroads at Shafer School.....	45 23 50.9	92 44 37.1
Shafer, 2.72 miles north and 0.5 mile east of; center of T road north.....	45 25 35.8	92 44 20.8

FARMINGTON QUADRANGLE.

Geographic positions near northeast corner.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rich Valley, 1.5 mile east of station, at northwest corner of crossroads, 30 feet south and 30 feet east to stone corner sec. 25, T. 115 N., R. 19 W., iron post stamped "Prim. Trav. Sta. No. 13, Minnesota, 1908".....	44 44 47.0	93 02 03.5
T. 115 N., R. 18 W., corner sec. 30.....	44 44 46.1	93 00 53.4

HASTINGS QUADRANGLE.

Magnetic declination: North border, 5° 51' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
MINNESOTA.		
	° ' "	° ' "
Rich Valley, 2.5 miles east of station, 20 feet north to fence post, T road south.....	44 44 32.4	92 59 40.1
Rich Valley, about 4 miles east of; center of T road.....	44 44 31.0	92 57 58.5
Schoolhouse (No. 23), center of road opposite.....	44 44 32.4	92 56 55.7
T. 115 N., R. 18 W., northeast corner sec. 26.....	44 44 44.9	92 56 01.4
T. 115 N., R. 18 W., northeast corner sec. 25.....	44 44 44.9	92 54 48.6
T. 115 N., R. 17 W., northeast corner sec. 30.....	44 44 44.9	92 53 37.4

Geographic positions along highways near north border—Continued.

Station.	Latitude.	Longitude.
MINNESOTA—continued.		
Hastings, 1.5 miles west of; at southwest corner of Oakwood Cemetery, iron post stamped "Prim. Trav. Sta. No. 14, Minnesota, 1908".....	44 44 45.0	92 53 14.6
T. 115 N., R. 17 W., northeast corner sec. 29, T road north.	44 44 44.6	92 52 24.3
Hastings, just north of station, street crossing Chicago, Milwaukee and St. Paul Railway.....	44 44 39.6	92 50 49.2
St. Croix River, center of drawbridge.....	44 44 53.0	92.48 14.0
WISCONSIN.		
Prescott, in southeast part of; 25 feet south to large post, road forks.....	44 44 37.7	92 47 16.0
T. 26 N., R. 20 W., corner of sec. 14.....	44 44 48.6	92 45 40.1
Prescott, about 2.33 miles east of; south of east-west road, at corner of fence and about 0.25 mile east of northeast corner sec. 14, T. 26 N., R. 20 W., iron post stamped "Prim. Trav. Sta. No. 15, 1908".....	44 44 48.5	92 45 21.8

ST. PAUL QUADRANGLE.

Magnetic declination: East border, 7° 48' east.

Geographic positions along highways and railway near east border.

Station.	Latitude.	Longitude.
Ramsey triangulation station, United States standard value used in 1896.....	44 59 20.08 44 59 19.2	93 00 27.51 93 00 19.00
T. 29 N., R. 22 W., northeast corner sec. 23, center of T road north.....	44 59 31.2	93 00 17.2
T. 29 N., R. 22 W., northeast corner sec. 27, center of crossing of White Bear avenue and east-west road.....	44 58 39.1	93 01 30.1
T. 29 N., R. 22 W., northeast corner sec. 34, Minnehaha avenue at White Bear avenue north.....	44 57 47.2	93 01 30.1
T. 28 N., R. 22 W., quarter corner stone east side of sec. 14.	44 54 44.1	93 00 15.5
A. E. Mattram's residence, center of T road.....	44 54 53.5	93 00 51.9
T. 28 N., R. 22 W., northeast corner stone sec. 26.....	44 53 26.9	93 00 14.6
Red Rock Park, east side of Burlington Railroad at road crossing, just inside of railroad right of way, 30 feet south and 70 feet west to road crossing, iron post stamped "Prim. Trav. Sta. No. 12, Minnesota, 1908".....	44 52 48.5	93 00 11.9
Newport, tile and iron pipe on right of way of Chicago, Burlington and Quincy Railroad branch which runs to bridge at St. Paul Park at lower end of Newport, 7 meters east of center of track. Large two-story white frame house, azimuth 312° 01', 43.2 meters, 10-inch elm blazed, azimuth 161° 16', 28 meters (U. S. Mississippi River Commission bench-mark post 258÷2).....	44 51 26.70	93 00 10.80

Geographic positions along highways and railway near east border—Continued.

Station.	Latitude.	Longitude.
Inver Park, road crossing at Chicago, Rock Island and Pacific Railway station.....	° ' " 44 50 53.0	° ' " 93 01 03.2
Inver Park, 1.5 miles south of station, road crossing.....	44 49 38.2	93 00 42.4
Milepost 341, 1,520 feet south of; private road crossing.....	44 48 11.8	93 01 38.2
T. 27 N., R. 22 W., center of sec. 27.....	44 47 50.6	93 02 20.9
Overhead road crossing about 0.25 mile east of railroad crossing.....	44 47 45.3	93 02 23.8
T. 27 N., R. 22 W., quarter corner south side of sec. 34....	44 46 32.2	93 02 02.7
T. 115 N.; R. 19 W., northeast corner sec. 13.....	44 46 32.2	93 02 02.0
T. 29 N., R. 22 W., northeast corner sec. 35, center of crossroads.....	44 57 47.1	93 00 17.2

AFTON QUADRANGLE.

Magnetic declination: North border, 8° 24' east; east border, 5° 23' east; south border, 5° 51' east; west border, 7° 48' east.

Geographic positions.

ALONG RAILWAY AND HIGHWAYS NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Lake Elmo station, 0.33 mile west of; at southeast corner of road crossing, just inside of Chicago and Northwestern Railway fence, 40 feet north and 25 feet west to road crossing (south track), 25 feet west and 20 feet south to center of T road east, iron post stamped "Prim. Trav. Sta. No. 11, Minnesota, 1908".....	° ' " 44 59 47.7	° ' " 92 53 15.8
Lake Elmo station, 1.75 miles west of; road crossing.....	44 59 43.6	92 54 58.5
Oak Dale station, north-south road crossing (south track).....	44 59 39.9	92 56 37.7
T. 29 N., R. 21 W., northeast corner sec. 20.....	44 59 32.2	92 56 37.7
Crossing north-south road on section line.....	44 59 32.5	92 57 51.2
T. 29 N., R. 21 W., northeast corner sec. 19.....	44 59 31.6	92 57 51.2
T. 29 N., R. 22 W., corner sec. 24, center T road west, Washington-Ramsey county line.....	44 59 32.4	92 59 03.9
T. 29 N., R. 22 W., corner sec. 36, center of crossing of north-south Washington-Ramsey county-line road and Minnehaha avenue.....	44 57 47.9	92 59 04.1
T. 28 N., R. 22 W., northeast corner sec. 1, crossroads at Washington-Ramsey county line.....	44 56 55.4	92 59 03.8
T. 28 N., R. 22 W., northeast corner sec. 12, Washington-Ramsey county line.....	44 56 03.7	92 59 03.2
T. 28 N., R. 22 W., northeast corner stone sec. 13, Washington-Ramsey county line.....	44 55 11.2	92 59 02.8
Newport station, road crossing Chicago, Milwaukee and St. Paul Railway at.....	44 52 00.5	92 59 57.8

Geographic positions—Continued.

ALONG HIGHWAYS NEAR SOUTH AND EAST BORDER.

Station.	Latitude.	Longitude.
Hastings, about 0.5 mile above north approach of wagon bridge at; 200 meters below railroad crossing of Chicago, Milwaukee and St. Paul Railway and Chicago, Burlington and Quincy Railroad, 125 meters above wagon road crossing, 1 meter south of south right-of-way fence of Chicago, Milwaukee and St. Paul Railway; to 10-inch box-elder blazed, azimuth $330^{\circ}42'$, 41.1 meters, tile and iron pipe (Mississippi River Commission bench-mark post No. 253-2).....	$^{\circ}$ $'$ $''$ 44 45 20.60	$^{\circ}$ $'$ $''$ 92 51 23.40
Point Douglas, road crossing Burlington Railroad, 900 feet east to trestle.....	44 45 00.1	92 49 01.8
T. 26 N., R. 20 W., northeast corner sec. 8.....	44 45 39.9	92 49 19.6
T. 26 N., R. 20 W., northeast corner sec. 5.....	44 46 32.3	92 49 20.5
Guidepost at T road south.....	44 46 44.7	92 49 02.1
Shearers, 0.75 mile west of station, center of crossroads....	44 47 24.4	92 48 23.5
Center of crossroads at schoolhouse.....	44 49 08.6	92 48 03.5
T. 27 N., R. 20 W., northeast corner stone sec. 21.....	44 49 08.6	92 47 59.7
Center of T road east, just north of bridge.....	44 50 05.9	92 47 48.8
Center of crossroads.....	44 50 52.4	92 47 50.2
T. 27 N., R. 20 W., northeast corner sec. 4, oak tree.....	44 51 43.1	92 48 04.0
Center of T road southwest.....	44 51 42.2	92 48.04.6
Center of crossroads, 50 feet north and 25 feet east to mail box.....	44 52 35.3	92 48 03.6
Afton, 1.25 miles southwest of; center of crossroads.....	44 53 01.1	92 47 43.8
Afton, in southern part of; at northeast corner of T road east, 200 feet east and 35 feet south to road crossing Chicago, Milwaukee and St. Paul Railway, 100 feet north and 25 feet east to Young's grist mill, iron post stamped "Prim. Trav. Sta. No. 16, Minnesota, 1908".....	44 53 44.5	92 46 58.3
Afton, in northern part of; northeast corner sec. 22, T. 28 N., R. 20 W.....	44 54 19.8	92 46 52.9
Afton, about 1 mile north of; forks of road, 25 feet southeast to guideboard (Point St. Marys).....	44 55 12.5	92 46 35.3
Lakeland, 1.75 miles south of; guidepost at T road north..	44 55 55.1	92 46 15.6
Large post (said to be quarter corner north side of sec. 2)..	44 56 56.2	92 46 15.3
Lakeland School, just south of; center of crossroads, 55 feet southeast to guidepost, 35 feet southwest to corner of fence.....	44 57 35.7	92 46 14.8
McKean School, center of T road.....	44 58 48.8	92 47 27.3

MISSISSIPPI.

PRIMARY TRAVERSE.

Sardis quadrangle and Tallahatchie drainage district, sheets 1, 2, 5-7, 9-11, 13-22, 24-31, 34, and 35.

BOLIVAR, CARROLL, COAHOMA, DE SOTO, GRENADA, LEFLORE, PANOLA, QUITMAN, SUNFLOWER, TALLAHATCHIE, TATE, AND TUNICA COUNTIES.

In cooperation with the State, the following geographic positions, except those from Friar Point to Clarksdale and those near the borders of the Clarksdale 15-minute quadrangle, were determined by F. J. McMaugh and C. A. Clunet in 1908. The excepted positions were determined by Mr. McMaugh in 1907. The positions in the northern half of the Tallahatchie drainage district were determined by Mr. McMaugh and those in the southern half of the district by Mr. Clunet, and are based upon the position of permanent bench mark No. II of the U. S. Engineer Corps at Friar Point, Helena, Ark., astronomic datum. To reduce these positions to United States standard datum add 2.7 seconds to the values for latitude and subtract 1.8 seconds from the values for longitude. The lines were run along highways, railroads, and levees and when practicable followed the borders of 10-minute quadrangles. A permanent station mark, consisting of the regulation iron bench-mark post was set at approximate intervals of 3 miles along the routes traversed.

SHEET NO. 1, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 4° 48' east.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost marked "M 16 N. O. 439," east rail opposite post.	34 56 46.1	90 09 31.4
Walls, 3 feet southeast of southwest corner of Bozemen's store, iron post stamped "Prim. Trav. Sta. No. 53, 1908, Miss."	34 57 25.1	90 09 08.6
Road crossing	34 57 41.5	90 09 04.4
Levee, railroad crossing	34 58 42.4	90 08 41.5
Lake View, southeast corner of pump house, 64 feet west of track, iron post stamped "Prim. Trav. Sta. No. 54, 1908, Miss."	34 59 17.3	90 08 28.7
Mississippi-Tennessee state line	34 59 35.3	90 08 19.6
Standpipe on siphon, 3 feet south of	34 58 20.1	90 09 51.8

Geographic positions—Continued.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads.....	34 50 41.3	90 08 58.4
Road, forks of; northwest and northeast.....	34 51 32.2	90 08 55.2
Wilson's store, in grass plot, intersection of T road north, iron post stamped "Prim. Trav. Sta. No. 66, 1908, Miss.".....	34 52 23.2	90 08 41.6
Bridge, west end of.....	34 52 48.0	90 09 28.1

SHEET NO. 2, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge over slough.....	34 55 08.2	90 12 01.6
Glover, 1.5 feet south of southeast corner of platform of store, iron post stamped "Prim. Trav. Sta. No. 52, 1908, Miss.".....	34 55 56.9	90 10 52.2

ALONG LEVEE.

Lake View, 5.54 miles west of; just south of Will Green's store, 6 feet west of oak tree, on state line, iron post stamped "Prim. Trav. Sta. No. 55, 1908, Miss.".....	34 59 39.3	90 13 14.4
Milepost.....	34 59 54.9	90 13 56.9
Milepost marked "9-10".....	34 58 05.0	90 15 36.5
Norfolk Landing, about 0.25 mile east of; in center of grass-plot triangle, 50 feet west of gateway on T road east, iron post stamped "Prim. Trav. Sta. No. 56, 1908, Miss.".....	34 57 40.1	90 15 13.0

ALONG HIGHWAYS.

Gateway to Boss plantation.....	34 56 47.7	90 14 34.6
T. 2 S., R. 10 W., northeast corner sec. 22, iron pipe.....	34 55 05.6	90 13 14.3
T. 2 S., R. 10 W., northeast corner sec. 23.....	34 54 13.4	90 13 12.8
Clacks, 59 feet east of road crossing at forks to northeast and southeast near station, iron post stamped "Prim. Trav. Sta. No. 15, 1908, Miss.".....	34 50 42.9	90 17 40.2
Penton, at corner of picket fence, 115 feet southwest of railroad crossing at station, iron post stamped "Prim. Trav. Sta. No. 16, 1908, Miss.".....	34 51 51.5	90 16 49.8
Road crossing.....	34 52 37.5	90 15 34.8
Milepost "M 22 No. 433".....	34 53 18.8	90 14 11.8
Lake Cormorant, 2 feet north of northwest corner of F. J. Withers & Company's store, iron post stamped "Prim. Trav. Sta. No. 24, 1908, Miss.".....	34 54 11.0	90 12 55.1

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Crossroads	34 53 21.0	90 13 06.0
Marienette, at west edge of right of way, 50 feet west of road crossing, iron post stamped "Prim. Trav. Sta. No. 25, 1908, Miss."	34 52 17.0	90 13 06.5
Milepost marked "J 206 M 24"	34 51 08.7	90 13 16.3
Road forks northwest and west, 5 feet north to mail box, 10 feet east to stump	34 53 19.5	90 10 02.7
Lake Cormorant, 2.5 miles southeast of; intersection of T road north with east-west road, iron post stamped "Prim. Trav. Sta. No. 67, 1908, Miss."	34 53 20.0	90 11 05.6
T road south, intersection with east-west road	34 54 12.1	90 11 05.6
Lake Cormorant, concrete monument No. 1, marked "Miss., 1908" on south side; "U. S. G. S." on north side..	34 54 13.6	90 13 07.6

SHEET NO. 5, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Colored church and school, crossroads near	34 48 58.3	90 20 36.6
T road south	34 48 58.0	90 22 11.7
Robinsonville, 3.5 miles west of; intersection of T road north to Commerce, iron post stamped "Prim. Trav. Sta. No. 57, 1908, Miss"	34 48 58.1	90 22 48.7
North-south road, 30 feet east of gate	34 48 57.8	90 23 47.1
Commerce, about 4 miles south of; in banquette on east side of levee, about 250 feet west of small house, iron post stamped "Prim. Trav. Sta. No. 58, 1908, Miss."	34 47 30.6	90 23 47.9
Mangum Bros. store, 25 feet north of; at gate, iron post stamped "Prim. Trav. Sta. No. 10, 1908, Miss."	34 40 34.5	90 26 48.0
T. 5 S., R. 12 W., northeast corner sec. 2	34 41 01.0	90 25 42.3
Gate across road	34 41 16.7	90 24 42.9
Center of iron bridge	34 41 10.4	90 23 53.9

ALONG LEVEE.

Milepost marked "30-31"	34 45 48.9	90 23 59.9
Tunica, 6 miles northwest of; at Johnson's store, outside of and at northeast corner of fence south of road, iron post stamped "Prim. Trav. Sta. No. 59, 1908, Miss."	34 44 32.6	90 24 24.5
Tramway crossing levee	34 44 11.1	90 25 22.4
Tramway crossing levee	34 44 10.1	90 26 41.5
Johnson's store, 3.9 miles south of; in berm on east side of levee about 350 feet southwest of Hill's gin, iron post stamped "Prim. Trav. Sta. No. 60, 1908, Miss."	34 43 17.3	90 28 11.7

Geographic positions—Continued.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Main road crossing.....	34 40 09.3	90 23 08.2
Road crossing at cotton gin.....	34 40 45.7	90 23 03.3
Tunica, 400 feet south of station, 20 feet northeast of road crossing, 3 feet south of signpost, iron post stamped "Prim. Trav. Sta. No. 9, 1908, Miss.".....	34 41 14.1	90 22 59.1
Milepost marked "M 38 N. O. 417".....	34 41 59.8	90 22 53.3
Tunica, 2.5 miles north of; 50 feet east of track, near crossing, opposite section house, iron post stamped "Prim. Trav. Sta. No. 11, 1908, Miss.".....	34 43 37.5	90 22 39.3
Hollywood, crossing.....	34 44 39.9	90 21 33.7
Hollywood, at southwest corner of fence at T road east, about 140 feet east of track; iron post stamped "Prim. Trav. Sta. No. 12, 1908, Miss.".....	34 44 39.2	90 21 32.3
Hollywood, in southeast corner of agricultural department yard opposite station.....	34 44 41.1	90 21 34.0
Road crossing.....	34 45 46.4	90 20 56.9
Road crossing east and west.....	34 46 31.2	90 20 37.6
Tunica, south meridian stone, near south fence of Tunica county court-house yard, east of southwest corner of fence.....	34 41 16.2	90 22 52.1
Tunica, north meridian stone, 484.3 feet north of south meridian stone, north of fence, on south side of street, and east of northwest corner of same fence.....	34 41 21.0	90 22 52.1

SHEET NO. 6, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south.....	34 48 58.3	90 19 57.0
Pritchard, 3.27 miles east of; in grass plot at intersection of road northeast to Arkabutla with bluff road, iron post stamped "Prim. Trav. Sta. No. 61, 1908, Miss.".....	34 41 16.9	90 11 37.0

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Bowdre, 1.5 feet south of southwest corner of store building, iron post stamped "Prim. Trav. Sta. No. 13, 1908, Miss.".....	34 47 43.8	90 19 56.0
Robinsonville, 0.5 mile south of; bridge marked "L 29-43" over large creek.....	34 48 37.1	90 19 16.5
Robinsonville, at southeast corner of hotel fence, 50 feet west of track, iron post stamped "Prim. Trav. Sta. No. 14, 1908, Miss.".....	34 48 58.7	90 19 00.7
Bridge "L 27-90" over slough.....	34 49 43.5	90 18 26.1
Banks, 47.7 feet northeast of crossing, iron post stamped "Prim. Trav. Sta. No. 26, 1908, Miss.".....	34 49 33.4	90 13 47.2

Geographic positions—Continued.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge over slough.....	34 48 40.5	90 14 04.8
Road crossing.....	34 47 03.4	90 14 36.5
Lost Lake, at south end of picket fence, 111 feet west of track, iron post stamped "Prim. Trav. Sta. No. 27, 1908, Miss.".....	34 47 02.5	90 14 38.2
Milepost marked "J 200 M 30".....	34 46 05.6	90 14 40.2
Bridge over slough.....	34 44 53.2	90 14 39.3
Lost Lake, 2.3 miles south of; 55.2 feet east of track, iron post stamped "Prim. Trav. Sta. No. 28, 1908, Miss.".....	34 44 31.1	90 14 38.5
Milepost marked "J 197 M 33".....	34 43 29.2	90 14 36.6
Road crossing.....	34 42 14.6	90 14 17.5
Pritchard, 2.5 feet south of southeast corner of P. F. Wade's store, iron post stamped "Prim. Trav. Sta. No. 29, 1908, Miss.".....	34 42 09.7	90 14 17.8
Road crossing.....	34 41 24.4	90 14 14.3
Milepost marked "J 193 M 37".....	34 40 02.4	90 14 10.0

SHEET NO. 7, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 03' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 5 S., R. 9 W., northeast corner sec. 5.....	34 41 04.1	90 09 46.6
Pratt's bridge, 4 miles south of; at crossroads near Shepherd School, east of road, iron post stamped "Prim. Trav. Sta. No. 62, 1908, Miss.".....	34 41 54.9	90 09 29.7
Road forks north and northeast.....	34 42 04.9	90 09 29.3
Fuller's store, road forks.....	34 43 00.9	90 09 18.3
Crossroads, intersection.....	34 44 04.8	90 09 20.4
T. 4 S., R. 9 W., probable northeast corner sec. 16, black gum tree.....	34 44 04.5	90 09 20.2
Wooden bridge, north end of; over bayou.....	34 44 56.7	90 09 05.6
Pratt's bridge, at south end, east of road, iron post stamped "Prim. Trav. Sta. No. 63, 1908, Miss.".....	34 45 19.3	90 08 38.4
Bridge, south end of; on north side of Coldwater Bottom..	34 46 12.1	90 08 47.9
Cub Lake, in grass plot at intersection of crossroads, 85 feet south of Dockery and Emerson store, iron post stamped "Prim. Trav. Sta. No. 64, 1908, Miss.".....	34 47 10.2	90 08 56.3
T lane east.....	34 48 03.0	90 08 55.9
Intersection with T road east.....	34 48 55.2	90 08 56.4
T lane east.....	34 49 35.4	90 08 57.8
Eudora, in corner of wire fence, in northeast corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 65, 1908, Miss.".....	34 49 49.4	90 08 57.9

SHEET NO. 9, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge.....	34 38 39.7	90 14 04.9
Savage, 3 feet south of; southeast corner of store, iron post stamped "Prim. Trav. Sta. No. 30, 1908, Miss.".....	34 38 00.1	90 13 36.4
Road crossing.....	34 37 34.6	90 13 22.6
Road crossing.....	34 36 19.9	90 13 09.6
Milepost marked "J 187 M 43".....	34 35 00.8	90 12 55.7
Sarah, 1.5 feet east of southeast corner of store, 67 feet west of railroad crossing, iron post stamped "Prim. Trav. Sta. No. 31, 1908, Miss.".....	34 34 13.3	90 12 39.5
Milepost marked "J 185 M 45".....	34 33 24.7	90 12 12.8
Askew, at corner of wire fence 156.2 feet west of railroad crossing, iron post stamped "Prim. Trav. Sta. No. 32, 1908, Miss.".....	34 31 55.2	90 11 46.0
Crenshaw, 0.5 mile north of; road crossing.....	34 30 37.8	90 11 45.6
Crenshaw, 1 foot west and 4 feet south of northwest corner of hotel piazza, iron post stamped "Prim. Trav. Sta. No. 33, 1908, Miss.".....	34 30 08.8	90 11 43.9

ALONG HIGHWAYS.

T road south, stone 15 feet west of.....	34 34 57.4	90 18 17.4
Evansville, 9.5 miles southeast of; at Walnut Lake, 2 feet east of northeast corner of store building on J. M. Tucker's plantation, iron post stamped "Prim. Trav. Sta. No. 50, 1908, Miss.".....	34 35 16.8	90 17 54.7
Walnut Lake, 5 feet north of south end of bridge over....	34 34 46.8	90 16 21.3
T. 6 S., R. 10 W., northeast corner sec. 8.....	34 34 59.5	90 16 16.4
Sarah, 3.1 miles west of; north of road 150 feet east of bridge, iron post stamped "Prim. Trav. Sta. No. 51, 1908, Miss.".....	34 35 01.7	90 15 24.2
Gateway, center of.....	34 35 01.8	90 14 20.5
Dundee, 9.1 miles east of; 60 feet west of west end of bridge over Coldwater River at Gerlach's camp, iron post stamped "Prim. Trav. Sta. No. 46, 1908, Miss."...	34 30 04.8	90 19 47.8
Bridge.....	34 30 29.2	90 17 52.3
Crenshaw, 6 miles west of; at southeast corner of fence around negro cabin at edge of clearing, iron post stamped "Prim. Trav. Sta. No. 47, 1908, Miss.".....	34 30 17.3	90 17 13.0
Crenshaw, 3 miles west of; intersection at west side of T lane south, in corner of fence south of east-west road, iron post stamped "Prim. Trav. Sta. No. 48, 1908, Miss."...	34 30 35.4	90 14 04.0
Quitman, Panola-Tunica county line.....	34 30 37.4	90 11 56.4
Crenshaw, concrete monument No. 2.....	34 30 15.1	90 11 32.9

SHEET NO. 10, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

EVANSVILLE, WEST ALONG HIGHWAY, TO O. K.; THENCE SOUTHWEST TO FLOWER LAKE.

Station.	Latitude.	Longitude.
Austin, about 40 feet southeast of southeast corner of old court-house at road forks; bolt leaded in 6-inch square granite post flush with ground.....	° ' " 34 38 24.9	° ' " 90 27 02.6
Levee, top of.....	34 38 24.9	90 27 05.2
O. K., center of store and post-office.....	34 37 48.4	90 27 44.6
Grass plot, near angle in levee at road forks.....	34 37 18.2	90 28 11.6
O. K., 3 miles south of; on top of levee, 20 feet south of junction of old and new levees at Flower Lake; iron post stamped "Prim. Trav. Sta. No. 17, 1908, Miss.".....	34 35 53.1	90 29 45.5
Austin, in corner of wire fence S. 84° 30' W. 90 feet from front door, bolt leaded in top of 6-inch square stone monument.....	34 38 28.1	90 26 57.4
Iron post stamped "Mississippi River Commission, U. S. B. M., 1907".....	34 37 57.9	90 28 32.8
Indian mound, high point on sassafras tree on edge of bank at O. K. landing, near O. K. triangulation point.....	34 37 54.1	90 28 52.6
Road south.....	34 32 18.4	90 29 14.8
Friendship Church, T road south near.....	34 32 18.4	90 28 50.2
Road north to Tunica, a point 90 feet east of east end of bridge over creek.....	34 38 46.6	90 24 27.2
Bridge center.....	34 38 48.0	90 25 16.5
Small bridge over slough.....	34 38 35.2	90 25 55.4

ALONG LEVEE.

Milepost, stone set flush with ground marked "42-43"....	34 38 36.2	90 26 54.8
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ALONG HIGHWAYS.

T road north.....	34 38 24.3	90 21 53.6
Evansville, 2.8 miles east of; at crossroads, iron post stamped "Prim. Trav. Sta. No. 23, 1908, Miss.".....	34 38 25.2	90 20 26.9
Iron pipe.....	34 36 15.0	90 20 24.9
Evansville, 6.3 miles southeast of; at crossroads, iron post stamped "Prim. Trav. Sta. No. 49, 1908, Miss.".....	34 35 23.9	90 20 23.6
Bridge, west end of.....	34 34 55.2	90 20 12.2
Section corner, iron pipe.....	34 31 26.7	90 26 11.2
Dundee, 2.8 miles east of; at intersection of T road north of north side of east-west road, iron post stamped "Prim. Trav. Sta. No. 44, 1908, Miss.".....	34 31 27.1	90 24 25.9
Dundee, 6 miles west of; on west side of Twomile Lake, 35.8 feet west of north gateway of Doctor Stewart's plantation, iron post stamped "Prim. Trav. Sta. No. 45, 1908, Miss.".....	34 30 22.0	90 22 23.8
Road forks east and south.....	34 30 35.0	90 21 43.1

Geographic positions—Continued.

HAMLIN, NORTHEAST ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD, TO EVANSVILLE.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hamlin, station platform.....	34 30 14.4	90 27 24.9
Dundee, 10 feet east of southeast corner of Alexander's store, iron post stamped "Prim. Trav. Sta. No. 5, 1908, Miss.".....	34 31 27.0	90 27 22.3
Center of bridge over ditch.....	34 31 53.6	90 27 04.4
Private road crossing, 235 feet south of bridge.....	34 32 44.7	90 26 32.9
Maud, 2 feet north of northwest corner of J. W. Lake & Co.'s store, iron post stamped "Prim. Trav. Sta. No. 6, 1908, Miss.".....	34 33 36.8	90 26 11.5
Private road crossing.....	34 34 54.1	90 25 55.8
Clayton, directly opposite station, 4 feet north of mail crane and 10.5 feet west of center of track, iron post stamped "Prim. Trav. Sta. No. 7, 1908, Miss.".....	34 36 00.8	90 24 59.6
Road crossing.....	34 36 31.6	90 24 33.3
Beaver Dam station, road crossing.....	34 37 21.4	90 23 51.0
Evansville, opposite south end of station, 47.6 feet east of center of main track, 2.5 feet west of barb-wire fence, iron post stamped "Prim. Trav. Sta. No. 8, 1908, Miss.".....	34 38 15.6	90 23 23.0

SHEET NO. 11, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: South half of east border, 5° 40' east.

Geographic positions.

SOUTHWEST ALONG HIGHWAYS TO STATE LEVEE.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost "48-49," on levee.....	34 35 24.1	90 30 55.0
T road south, intersection with east-west levee road.....	34 35 23.3	90 31 00.6
T lane east, iron stub in road near.....	34 34 53.6	90 31 00.4
Siphon.....	34 34 14.0	90 31 10.3
O. K., 6.1 miles south of; at road forks near gateway on Norfleet plantation, iron post stamped "Prim. Trav. Sta. No. 18, 1908, Miss.".....	34 34 12.5	90 31 00.5
Standpipe on siphon about 200 feet southwest of intersection of T road east (tie point to Gardner's tape control line).....	34 33 07.4	90 31 13.5
Intersection of levee with road to Trotters Point.....	34 32 31.2	90 31 43.3
O. K., about 8 miles southwest of; at angle in levee about 0.3 mile south of store, iron post stamped "Prim. Trav. Sta. No. 19, 1908, Miss.".....	34 32 01.2	90 32 38.3
Milepost marked "55-56".....	34 31 28.8	90 32 36.4
State levee, road crossing.....	34 30 30.8	90 32 34.6
Milepost "53-54".....	34 32 44.4	90 31 32.3
Center of road opposite church.....	34 32 17.2	90 30 35.5

SHEET NO. 13, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: North half of east border, $5^{\circ} 40'$ east.*Geographic positions.*

STATE LEVEE, SOUTHWEST ALONG HIGHWAY, TO FRIAR POINT.

Station.	Latitude.	Longitude.
State levee, 3.3 miles south of; at foot of slope on levee about 450 feet west of Thompson's store, iron post stamped "Prim. Trav. Sta. No. 20, 1908, Miss."	34 27 58.8	90 33 27.8
State levee, 6.5 miles south of; at angle of levee 50 feet east of milestone, iron post stamped "Prim. Trav. Sta. No. 21, 1908, Miss."	34 25 12.3	90 33 42.8
Road forks northeast and north	34 24 27.2	90 34 21.4
Friar Point, 2.5 miles north of; 200 feet south of T lane to house, 300 feet north of large tree east of road, iron post stamped "Prim. Trav. Sta. No. 22, 1908, Miss."	34 23 26.1	90 36 00.2
Crossing of road to steamboat landing	34 22 40.4	90 38 01.6
Friar Point, bench mark No. 2, in northeast end of south-east wall of brick building of W. H. Dickerson, copper bolt 1 centimeter in diameter leaded horizontally in brick wall (tie point)	34 22 07.6	90 38 21.5

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Friar Point, bench mark No. 2, in northeast end of south-east wall of Dickerson Building, in block 2 of Fuller's addition, center of copper bolt	34 22 07.6	90 38 21.5
Friar Point, road crossing 500 feet south of station	34 21 51.0	90 37 59.5
Sessions station	34 20 27.4	90 37 55.2
Rudyard, road crossing	34 20 05.0	90 32 10.0
Rudyard, 1.0 mile north of; road crossing	34 21 00.1	90 31 50.0
Coahoma, 1.0 mile west of; road crossing	34 22 13.0	90 32 15.5
Mileposts 401-402, road crossing between	34 22 09.6	90 34 19.3
Mileposts 400-401, center of bridge between	34 22 07.8	90 35 22.8
Mileposts 398-399, road crossing between	34 22 04.8	90 37 15.2
Friar Point, southeast corner of station	34 21 56.5	90 37 55.2

ALONG HIGHWAYS.

Coahoma, 2.5 feet north of northwest corner of hotel, iron post stamped "Prim. Trav. Sta. No. 1, 1908, Miss."	34 22 07.2	90 31 14.7
T lane south	34 22 18.0	90 30 02.5

SHEET NO. 14, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

COAHOMA, NORTHEAST ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD, TO HAMLIN.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Moon, at south end of station, road crossing.....	34 25 17.5	90 29 19.4
Moon station, 1.5 feet south of southwest corner of Carr Bros.' store, iron post stamped "Prim. Trav. Sta. No. 2, 1908, Miss."	34 25 18.2	90 29 18.6
Lula station, 158 feet north of northwest corner of town hall, iron post stamped "Prim. Trav. Sta. No. 3, 1908, Miss."	34 27 15.5	90 28 39.5
Coahoma-Tunica county line crossing.	34 28 01.9	90 28 23.8
Lula, 2.25 miles north of; 2 feet north of milepost "M 54 N. O. 401," iron post stamped "Prim. Trav. Sta. No. 4, 1908, Miss."	34 29 12.5	90 28 01.8

ALONG HIGHWAY.

Coahoma, 3.5 miles southeast of; at bend of road at negro cabin, 1.5 feet from wire fence, iron post stamped "Prim. Trav. Sta. No. 1-A, Miss., 1908"	34 21 12.9	90 28 38.8
T lane north.....	34 20 40.2	90 28 24.0

SHEET NO. 15, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 16' east.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	34 29 18.9	90 11 46.4
Crenshaw, 2.5 miles south of; 86.5 feet east of track near road crossing, iron post stamped "Prim. Trav. Sta. No. 34, 1908, Miss."	34 27 55.3	90 11 35.1
Road crossing.....	34 27 09.8	90 12 15.8
East-west road crossing.....	34 26 16.2	90 13 04.8
Sledge, 2.5 feet north of northwest corner of J. A. Hank's store, iron post stamped "Prim. Trav. Sta. No. 35, 1908, Miss."	34 25 55.1	90 13 21.0
Road crossing.....	34 25 11.8	90 14 03.7
Falcon, southwest corner of bulkhead at station, iron post stamped "Prim. Trav. Sta. No. 36, 1908, Miss."	34 23 39.6	90 15 28.1
Bridge.....	34 22 55.4	90 16 08.2
Darling, 2.5 feet northwest of telegraph pole, 12 feet north of platform, iron post stamped "Prim. Trav. Sta. No. 37, 1908, Miss."	34 21 27.2	90 16 31.7
Road crossing.....	34 20 12.9	90 16 32.3

Geographic positions—Continued.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of bridge.....	34 29 57.8	90 19 01.0
T road east.....	34 29 54.1	90 11 19.9
Intersection of road east.....	34 28 55.1	90 10 48.8
Crenshaw, 4.1 miles south of; in southeast corner of cross-roads, iron post stamped "Prim. Trav. Sta. No. 38, 1908, Miss.".....	34 27 09.0	90 10 52.1

BENCH MARK 34, 2.5 MILES SOUTH OF CRENSHAW, TO BENCH MARK 37 AT DARLING.

Bench mark 38.....	34 27 09.0	90 10 53.2
Station T 294 (= T 326, A-3 line).....	34 21 06.9	90 10 02.1

SHEET NO. 16, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 13' east.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mastodon, road forks west and southwest.....	34 27 00.5	90 09 27.7
Road forks east and southeast.....	34 26 49.4	90 08 53.1
Road forks west and north.....	34 26 07.7	90 07 55.1
T road north, 10 feet northwest of intersection with east-west road, at edge of grass plot.....	34 25 20.8	90 07 52.4
Sardis and Delta Railroad crossing at Malone's store.....	34 25 20.5	90 07 17.2
Delta, south of road about 100 feet east of T road south, iron post stamped "Prim. Trav. Sta. No. 39, 1908, Miss.".....	34 24 33.6	90 05 48.5
Delta, 3 miles southeast of; 0.5 mile north of Ballentine post-office, at intersection of second-class T road west with road north from Ballentine, iron post stamped "Prim. Trav. Sta. No. 40, 1908, Miss.".....	34 23 36.3	90 05 07.4
Delta, 5.8 miles southeast of; at road forks, near Harley Johnson's mail box, iron post stamped "Prim. Trav. Sta. No. 41, 1908, Miss.".....	34 22 28.5	90 03 31.0
North side of intersection of T road north.....	34 22 19.0	90 02 23.6
Batesville, 6.5 miles northwest of; at intersection of Sardis and Batesville roads near mail boxes, iron post stamped "Prim Trav. Sta. No. 42, 1908, Miss.".....	34 22 18.6	90 00 32.0

Geographic positions—Continued.

BY TALLAHATCHIE DRAINAGE COMMISSION.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Station T 20 (D-10 line).....	34 26 14.7	90 08 05.8
Station T 41 (= T 302, D-8 line).....	34 21 17.5	90 06 16.1
Bench mark T 44 at pump house (= T 290).....	34 21 05.8	90 07 37.7
Station 283 (= Watson's line east).....	34 20 13.3	90 08 31.6
Station 284 (= B. M.)	34 20 20.2	90 08 31.1

SHEET NO. 17, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 51' east.

Geographic positions.

BENCH MARK 21-A, 1908, NORTH AND EAST, CHECKED ON LINE DARLING TO CRENSHAW.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Station M. 35, junction lines D-2 and D-12.....	34 11 45.6	90 08 06.8
Station M. 15, junction lines D-3 P. B. M.....	34 13 15.1	90 08 02.8
Station M. 1-W. 39.....	34 14 00.8	90 08 02.8
Station T. 69 (= crossing line D-4).....	34 14 48.6	90 08 18.6
Station T. 96 (= junction line D-5).....	34 16 44.1	90 08 10.4
Station T. 102 (= junction line D-5).....	34 16 33.9	90 08 32.6
Section corner.....	34 16 53.3	90 08 32.4
Bench mark at crossing line D-6.....	34 18 38.1	90 08 31.8

ALONG HIGHWAYS.

	Latitude.	Longitude.
	° ' "	° ' "
Crossroads in woods.....	34 10 26.8	90 04 04.5
Yacona River, at south end of steel bridge over; iron post stamped "Prim. Trav. Sta. No. 24-A, 1908, Miss.".....	34 11 00.6	90 04 01.1
T lane west.....	34 11 31.4	90 03 57.6
Fork of roads at schoolhouse.....	34 12 11.9	90 03 41.7
Quarter corner east side sec. 15, red oak at fence line.....	34 12 37.5	90 03 41.2
Tacowa, in front of blacksmith shop, 7 feet east of gum tree, iron post stamped "Prim. Trav. Sta. No. 25-A, 1908, Miss.".....	34 13 25.6	90 03 48.0
Large lone walnut tree at crossroads.....	34 13 32.6	90 04 33.0
South end of bridge over ravine.....	34 14 19.1	90 04 11.7
Gate across road.....	34 15 15.2	90 04 30.3
Tacowa, 3 miles north of; at southwest corner of bridge over creek, 200 feet northeast cabin, iron post stamped "Prim. Trav. Sta. No. 26-A, 1908, Miss.".....	34 15 19.3	90 04 28.5
Large gum tree at road forks at gin and new store, tree is outside fence line.....	34 15 58.6	90 04 18.7

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gatepost at road fork at cabin.....	34 16 49.0	90 03 04.5
Batesville, 6 miles south of; east of road, at southeast end of bridge over creek, iron post stamped "Prim. Trav. Sta. No. 27-A, 1908, Miss."	34 16 50.2	90 02 52.8
East-west T road.....	34 17 42.4	90 02 41.6
T road south.....	34 17 42.4	90 01 43.9
Batesville, 3 miles southwest of; east of road, 12 feet south of southwest corner of frame church, iron post stamped "Prim. Trav. Sta. No. 28-A, 1908, Miss."	34 17 48.6	90 00 33.8

SHEET NO. 18, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 6° 08' east.

Geographic positions.

BENCH MARK 54-A TO 11-A LAMBERT (PART OF CIRCUIT).

Station.	Latitude.	Longitude.
	° ' "	° ' "
Old road cut-off, in hub to right of road.....	34 10 33.2	90 14 05.8
Hub marked "390+50," at intersection of road and lane, 5 feet from fence corner.....	34 11 21.2	90 14 01.3
Perkins's old mill (burned) hub 5 feet to right of tramway, 100 feet north of boiler.....	34 11 20.0	90 15 02.1
Siding switch, 50 feet from; hub 3 feet to left of tramway.....	34 11 15.8	90 15 40.9

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Milepost marked "M 67 J 163".....	34 15 43.8	90 16 20.4
Center of bridge.....	34 16 09.5	90 16 20.1
Drawbridge, just south of; road crossing.....	34 17 36.3	90 16 20.0
Milepost marked "J 166 M 64".....	34 18 20.0	90 16 24.0
Station 12 (Clunet)=station 284 (McMaugh), just south of road crossing.....	34 18 33.9	90 16 28.0
Hinchcliff, in northeast corner of yard to Johnson's store, iron post stamped "Prim. Trav. Sta. No. 19-A, 1908, Miss."	34 18 34.1	90 16 28.7
Milepost marked "J 167 M 63".....	34 19 11.5	90 16 32.6
Station C 3=M 51=P.B.M.H.O.W.O.....	34 11 44.7	90 10 01.7
Milepost M 73.....	34 10 33.3	90 16 53.7
Center of road opposite cabin on north side.....	34 13 00.0	90 15 49.1
Junction of roads at Coldwater River, Mr. Ellison's gate..	34 13 20.4	90 14 50.9
Coldwater River, in northeast corner of Mr. Ellison's front yard, just south of junction of roads, iron post stamped "Prim. Trav. Sta. No. 12-A, 1908, Miss."	34 13 19.8	90 14 50.8

Geographic positions—Continued.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gate across road at store.....	34 13 01.1	90 14 06.6
Gate across road at cabin.....	34 12 07.4	90 14 17.8
Center of road opposite store.....	34 11 10.6	90 13 51.4
Mouth of Coldwater River at Ferry, on west side of river 5 feet north of box-elder tree, iron post stamped "Prim. Trav. Sta. No. 20-A, 1908, Miss.".....	34 10 50.3	90 12 58.6
Lumber camp, pump opposite.....	34 10 58.1	90 11 56.5
Opposite house south of road.....	34 10 43.3	90 11 08.6
Mouth of Coldwater River, 3 miles east of; at gate of abandoned house, 1.5 feet inside of east gatepost, iron post stamped "Prim. Trav. Sta. No. 21-A, 1908, Miss.".....	34 10 30.4	90 10 20.9

EAST ALONG HIGHWAYS, BELEN TO MARKS.

Small bridge over drain in road.....	34 16 17.2	90 19 59.6
Belen, 3 miles east of; at road forks, at southeast side of bridge over Cassidy's Bayou, iron post stamped "Prim. Trav. Sta. No. 9-A, 1908, Miss.".....	34 15 55.0	90 19 11.7
Cassidy's Bayou, west end of bridge over; at T road south.	34 16 13.8	90 18 44.5
Marks, road crossing 150 feet south of station.....	34 15 22.1	90 16 23.9
Marks, south end of station near telegraph pole, iron post stamped "Prim. Trav. Sta. No. 10-A, 1908, Miss.".....	34 15 22.9	90 16 23.5

ALONG RAILROAD.

Road crossing.....	34 14 23.1	90 16 33.9
Small road crossing.....	34 12 57.5	90 16 48.3
Road crossing north of Lambert.....	34 12 12.2	90 16 56.0
Lambert, southwest corner of hotel yard, iron post stamped "Prim. Trav. Sta. No. 11-A, 1908, Miss.".....	34 12 05.0	90 16 56.0
Road crossing.....	34 11 28.4	90 17 09.4
Center of small bridge.....	34 10 20.8	90 17 54.4
Marks, concrete monument No. 3, south of church.....	34 15 14.7	90 16 12.7

SHEET NO. 19, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Jonestown, at south side of gate across road just east of Illinois Central Railroad crossing, iron post stamped "Prim. Trav. Sta. No. 2-A, 1908, Miss.".....	34 19 24.6	90 27 33.2
Road forks (line turns northeast).....	34 19 08.1	90 27 03.5
Section corner post.....	34 19 37.8	90 27 03.5
Jonestown, 3 miles east of; at road forks, northeast of stream crossing, 10 feet north of large tree, in triangle of roads, iron post stamped "Prim. Trav. Sta. No. 3-A, 1908, Miss.".....	34 19 38.1	90 25 45.5
Gate across road at cabin marked "173.2".....	34 19 05.1	90 24 40.2
Belen, 4 miles northwest of; west of lane at T road east at negro cabin, iron post stamped "Prim. Trav. Sta. No. 4-A, 1908, Miss.".....	34 18 45.2	90 23 02.8
T road east to Belen.....	34 17 15.9	90 22 46.5
Lane to northeast.....	34 16 58.9	90 22 19.6
Belen (station 86 junction point).....	34 16 26.7	90 21 19.4
Belen, in corner stone of east side of east entrance to court-house; tablet stamped "Elev. 172".....	34 16 22.1	90 21 19.2
T lane east at section corner.....	34 15 41.3	90 21 04.3
T lane southeast.....	34 15 14.4	90 21 38.0
Belen, 3 miles southwest of; 5 feet south of gate post at Little Stone plantation, at junction of T lane south with main Belen-Lyons road, iron post stamped "Prim. Trav. Sta. No. 5-A, 1908, Miss.".....	34 15 05.0	90 23 36.0
White gate across road.....	34 14 12.9	90 23 42.7
T lane east.....	34 13 16.2	90 23 20.2
T lane east.....	34 12 28.0	90 23 21.2
Sabino, at fence corner, road forks, at store and post-office, iron post stamped "Prim. Trav. Sta. No. 6-A, 1908, Miss.".....	34 12 15.7	90 24 29.0
T lane east to house.....	34 11 20.7	90 25 18.4
Cassidy Bayou, east end of bridge over.....	34 10 02.5	90 25 54.3
T road east.....	34 16 38.1	90 20 40.0
T: 27 N., R. 3 W., northwest corner SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 10, iron pipe at crossroads.....	34 13 19.7	90 29 24.8

360 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

SHEET NO. 20, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Clover Hill, 0.9 mile south of station, road crossing.....	34 15 38.6	90 32 36.1
Clover Hill, 1.2 miles north of station, road crossing.....	34 17 28.4	90 32 45.8
Clover Hill, at southwest corner of railing around section house, in ground, iron pipe.....	34 17 28.7	90 32 44.3
Clover Hill, 0.8 mile north of; road crossing.....	34 18 08.5	90 32 49.2
Clover Hill, 1.5 miles north of; road crossing.....	34 18 37.5	90 32 42.2
Road crossing.....	34 19 26.3	90 32 24.4
Dickerson, road crossing north of station.....	34 19 13.4	90 38 12.8
Dickerson, 1.3 miles south of; road crossing.....	34 18 35.3	90 38 25.0
Stoval station.....	34 17 49.9	90 38 45.0

ALONG HIGHWAYS.

House.....	34 10 04.5	90 30 31.8
T. 27 N., R. 3 W., northeast corner sec. 33.....	34 10 29.2	90 30 13.0
Clarksdale, 4 miles east of; northwest corner of 4 corners, corner of fence, iron post stamped "Prim. Trav. Sta. No. 7, 1907".....	34 12 14.5	90 30 16.3
T lane south, 23 feet south to corner wire fence, 63 feet northwest to oak tree.....	34 12 59.8	90 30 12.1
Black Bayou Creek, bridge over.....	34 14 43.5	90 30 17.6
T lane south.....	34 15 00.5	90 31 44.8
Clover Hill, road crossing south of.....	34 14 51.7	90 32 33.9

SHEET NO. 21, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Intersection of roads, 35 feet northeast to corner of wire fence, 50 feet southeast to small tree on east side of road, 50 feet west to top of old levee.....	34 15 54.7	90 41 26.2
T road north.....	34 15 54.1	90 42 11.4
Four corners, 15 feet southeast, 25 feet northeast, 15 feet southwest, and 17 feet northwest to corner of wire fence, T. 27 N., R. 5 W., quarter corner north side of sec. 33..	34 15 53.6	90 43 13.8
Road crossing levee.....	34 15 27.8	90 43 42.0
T road west crossing levee.....	34 13 10.5	90 43 25.8
Road crossing levee.....	34 14 46.7	90 43 33.6

Geographic positions—Continued.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Greengrove, 0.5 mile north of; road crossing.....	34 10 13.9	90 45 14.7
Farrell, 50 feet west of main line, 2 feet north of edge of freight platform, iron post stamped "Prim. Trav. Sta. No. 1, 1907, Miss.".....	34 15 41.5	90 40 21.0

SHEET NO. 22, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads.....	34 19 34.5	89 57 50.9
T road east.....	34 18 13.2	89 59 31.3
T road north at sawmill.....	34 18 33.9	89 58 59.3
Batesville, 0.25 mile south of; Illinois Central Railroad crossing.....	34 18 33.7	89 57 30.9
Batesville, in southwest corner of court-house yard, iron post stamped "Prim. Trav. Sta. No. 29-A, 1908, Miss.".....		
..... {McMaugh..	34 19 01.2	89 57 10.1
..... {Clunet.....	34 18 59.9	89 57 06.0
Error ^a	00 00 1.3	00 00 4.1

SHEET NO. 24, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Greengrove, 0.5 mile southwest of; forks of road.....	34 09 22.2	90 45 47.5
T. 26 N., R. 5 W., quarter corner west side of sec. 6.....	34 09 16.8	90 45 53.5
Road forks.....	34 08 33.6	90 45 49.1
T. 26 N., R. 5 W., center of sec. 18, iron post.....	34 07 33.2	90 45 22.7
Coahoma-Bolivar county line, boundary tree.....	34 07 08.6	90 45 01.1
T. 26 N., R. 5 W., sec. 19, southeast corner NE. $\frac{1}{4}$ NE. $\frac{1}{4}$, 6 feet south and 33 feet north to wire-fence corners.....	34 06 57.4	90 44 51.4
Road forks.....	34 06 30.6	90 44 36.1
T. 26 N., R. 5 W., quarter corner north side of sec. 29, large tree.....	34 06 14.6	90 44 34.1
Road forks.....	34 05 38.3	90 44 38.2

^a The closure of F. J. McMaugh's line from Crenshaw to Batesville and C. A. Clunet's line from Crevi to Batesville, on primary-traverse station No. 29-A at Batesville, is large, and no adjustment has been made; hence the discrepancy between the individual values of primary-traverse station No. 29-A at Batesville.

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Alligator, at northeast corner of Methodist Church, iron post stamped "Prim. Trav. Sta. No. 3, Miss., 1907".....	° ' " 34 05 27.0	° ' " 90 43 19.4
T. 26 N., R. 5 W., quarter corner south side of sec. 28.....	34 05 21.8	90 43 15.8
Cross lanes.....	34 00 07.7	90 44 33.6
Intersection of roads, 22 feet north to nail in root on east side of blazed hickory tree.....	34 00 07.2	90 43 49.7
T lane south.....	34 00 06.8	90 42 46.6
T. 25 N., R. 5 W., southeast corner sec. 27, south of road, 5 feet west of corner of fence, iron post.....	34 00 06.5	90 41 43.2
Bridge over drain.....	34 00 06.8	90 40 47.1
Greengrove, in northwest corner of Mrs. Richardson's yard, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Miss.".....	34 09 45.8	90 45 37.9

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD, ALLIGATOR TO HUSHPUCKENA.

Road under bridge.....	34 04 19.3	90 43 51.4
Milepost 90, road crossing 1,900 feet south of.....	34 03 49.0	90 44 07.1
Duncan, road crossing.....	34 02 38.3	90 44 43.5
T. 25 N., R. 5 W., quarter corner east side of sec. 18.....	34 02 19.1	90 44 51.4
Hushpuckena, road crossing north of.....	34 01 00.3	90 45 19.3
Hushpuckena, in corner of railway station and platform, iron post stamped "Prim. Trav. Sta. No. 4, Miss., 1907".....	34 00 21.4	90 45 15.4

SHEET NO. 25, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Section line, stub marking, 12 feet west of corner of fence, 27 feet east of center of road.....	° ' " 34 00 06.6	° ' " 90 38 35.0
T. 25 N., R. 4 W., northeast corner SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 30....	34 00 18.2	90 38 34.8
Negro church, front door.....	34 00 43.8	90 38 25.2
Schapley's gateway.....	34 02 24.9	90 37 33.3
Intersection of roads.....	34 02 44.6	90 36 56.2
Intersection of roads.....	34 02 22.8	90 36 33.4
Roundaway, on north side of railway station, near center of platform; iron post stamped "Prim. Trav. Sta. No. 5, Mississippi, 1907".....	34 00 49.2	90 35 53.0
Gateway in east-west fence.....	34 01 10.0	90 34 27.4
Five corners.....	34 02 11.2	90 32 42.9
Iron pipe marking section line.....	34 02 11.3	90 32 37.2

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
T. 25 N., R. 3 W., quarter corner east side of sec. 16, 40 feet southwest to post-oak tree at corner of fence, iron pipe marking section line.....	34 02 11.2	90 32 22.5
T road.....	34 02 57.8	90 30 44.8
T. 25 N., R. 4 W., northeast corner SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 9, iron pipe.....	34 02 49.6	90 30 13.4
T road east.....	34 01 58.4	90 30 14.0
Corner of fence at 90-degree bend in road.....	34 03 06.4	90 30 13.3
Claremont, 0.3 mile northeast of; road forks.....	34 07 27.6	90 31 15.5
Claremont station, 100 feet south of; road crossing (located by McMaugh in 1907).....	34 07 09.0	90 31 23.1
T lane east.....	34 09 57.1	90 31 32.0
T. 26 N., R. 3 W., quarter corner north side of sec. 5.....	34 09 37.5	90 31 48.1

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Dublin, 1 mile north of; road crossing.....	34 05 01.2	90 30 00.3
Matson, road crossing near.....	34 05 50.8	90 30 36.8
Matson, 1.5 miles north of; road crossing.....	34 06 55.4	90 31 15.0
Claremont, road crossing south of.....	34 07 09.0	90 31 23.1
Boone, road crossing north of.....	34 07 59.3	90 31 53.0
Durham, road crossing north of.....	34 09 11.3	90 32 35.7

SHEET NO. 26, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions.

MARKS, SOUTHWEST ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD, TO TUTWILER; THENCE NORTHWEST TO DUBLIN.

Station.	Latitude.	Longitude.
Carr, at road crossing.....	34 05 36.0	90 20 24.4
Vance, north of station, road crossing.....	34 04 27.9	90 21 00.3
Vance, southwest corner of station, iron post stamped "Prim. Trav. Sta. No. 15a, 1908, Miss.".....	34 04 24.6	90 21 01.6
Road crossing.....	34 03 29.5	90 21 41.5
Vance, 3 miles south of; west side of track at crossing, 2 feet east of fence, iron post stamped "Prim. Trav. Sta. No. 16a, 1908, Miss.".....	34 02 35.8	90 23 05.3
Road crossing.....	34 01 55.4	90 24 07.2
Road crossing.....	34 01 30.4	90 24 45.7
Tutwiler, southwest corner of George Peters's barber shop, iron post stamped "Prim. Trav. Sta. No. 17a, 1908, Miss." (line continues northwest).....	34 00 51.5	90 25 53.3

Geographic positions—Continued.

MARKS, SOUTHWEST ALONG ZAZOO AND MISSISSIPPI VALLEY RAILROAD, TO TUTWILER; THENCE NORTHWEST TO DUBLIN—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tallahatchie-Coahoma county-line crossing.....	34 01 25.7	90 27 03.9
Road crossing.....	34 02 53.8	90 28 15.9
Tutwiler, 3.5 miles northwest of; northeast side of track at road crossing, iron post stamped "Prim. Trav. Sta. No. 18a, 1908, Miss.".....	34 02 53.8	90 28 15.8
Center of bridge.....	34 03 47.3	90 28 59.7
Dublin, Mr. Easum's hotel yard, iron post stamped "Prim. Trav. Sta. No. 6, 1907".....	34 04 22.5	90 29 26.8
Dublin, road crossing.....	34 04 22.6	90 29 28.6

ALONG HIGHWAYS.

Bellevue, at northeast corner of Mrs. Bobo's store, iron post stamped "Prim. Trav. Sta. No. 7a, Miss., 1908"....	34 09 08.6	90 26 29.0
Midway between two gates across road.....	34 08 57.1	90 27 04.2
Road forks at very large oak stump.....	34 08 30.0	90 27 49.5
Melancholy Bayou, road forks, at north end of old bridge, iron post stamped "Prim. Trav. Sta. No. 8a, Miss., 1908"....	34 07 32.0	90 29 13.9
Center of bridge.....	34 00 31.3	90 25 01.7
Center of bridge.....	34 00 00.2	90 23 56.1
Road fork.....	34 04 03.9	90 29 41.8

SHEET NO. 27, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 6° 06' east.

Geographic positions.

ALONG RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lambert, 3 miles south of; west side of track, at north end of platform at switch to sawmill, iron post stamped "Prim. Trav. Sta. No. 13-A, Miss., 1908".....	34 09 44.3	90 18 13.7
Alfrey switch at south end of station.....	34 08 47.2	90 18 43.7
Center of bridge over bayou.....	34 07 39.8	90 19 19.2
Longstreet, at road crossing.....	34 06 46.0	90 19 47.6
Longstreet, southwest corner of Longstreet Mercantile Co.'s store, iron post stamped "Prim. Trav. Sta. No. 14-A, Miss., 1908".....	34 06 46.7	90 19 46.5

Geographic positions—Continued.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
T road west over bridge.....	34 00 37.7	90 16 58.8
Murphy (Bessie), 0.5 mile south of, road forks at negro cabin, 535 feet to track, iron post stamped "Prim. Trav. Sta. No. 52-A, 1908, Miss.".....	34 00 49.8	90 17 01.2
Murphy, gate across the road.....	34 01 21.6	90 16 55.3
Center of bridge.....	34 01 48.4	90 16 52.0
Stover, at southwest corner of store east of track, opposite sawmill on west side, iron post stamped "Prim. Trav. Sta. No. 53-A, 1908, Miss.".....	34 02 52.9	90 16 45.2

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Milepost "M 81".....	34 03 35.6	90 16 52.4
Pates, road crossing 25 feet southeast of signal board.....	34 04 49.6	90 16 54.8
Milepost "M 78".....	34 06 12.1	90 16 54.5
Chancy, at northeast corner of Lamb Fish Co.'s hotel west of track, iron post stamped "Prim. Trav. Sta. No. 54-A, 1908, Miss.".....	34 07 16.3	90 16 55.5
Milepost "M 76".....	34 07 56.6	90 16 54.1
Milepost "M 75".....	34 08 48.8	90 16 54.0
Milepost "M 74".....	34 09 41.1	90 16 53.8

BENCH MARK 54-A TO 11-A AT LAMBERT; FROM BENCH MARK 54-A, VIA BENCH MARK 14-A AT LONGSTREET AND TATES RAILROAD CROSSING, TO STATION 21.

Chancy, about 2 miles east and 0.5 mile north of; hub at junction of dummy tracks.....	34 07 46.6	90 14 31.0
Chancy, about 3 miles northeast of; station 27 (=station M 388).....	34 08 17.0	90 13 51.0
Turner place, corner of; hub 170 feet east of bridge over Tallahatchie River, 30 feet north of fence.....	34 08 39.1	90 13 54.9
Turner place, hub on right edge of road, 100 feet east of Sarah Hoke's house.....	34 09 47.2	90 14 14.4
Hub in path, 25 feet west of dead oak, 30 inches in diameter.....	34 07 17.5	90 17 46.1
Cabin, 100 feet north of; 50 feet northeast of pump, hub 8 feet east of road.....	34 07 41.9	90 18 42.5
Junction of path and railway, tack in railway west of west rail, marked by stake.....	34 07 46.7	90 19 15.9
Station 245 (=B 15), hub in road 12 feet east of 40-inch red oak and 10 feet north of sweet-gum tree.....	34 06 19.6	90 18 54.6
Bridge over drain, hub in road 140 feet east of and 10 feet north of 15-inch white-oak tree.....	34 05 50.5	90 18 49.1
Hub in road 12 feet north of 18-inch hickory.....	34 05 50.6	90 18 05.1
Roads from Pates to L street and Vance, 40 feet south of 24-inch hickory, hub at intersection.....	34 05 23.0	90 17 48.8
Possum Bayou, on east bank of; hub at root of 18-inch elm tree, 125 feet from center of bridge.....	34 04 53.3	90 17 07.4

Geographic positions—Continued.

BENCH MARK 54-A TO 11-A AT LAMBERT; FROM BENCH MARK 54-A VIA BENCH MARK 14-A AT LONGSTREET AND TATES RAILROAD CROSSING, TO STATION 21—continued.

Station.	Latitude.	Longitude.
Tram track, hub 3 feet south of; 10 feet southwest of 12-inch white oak.....	° ' " 34 05 14.3	° ' " 90 16 24.3
Dummy track (south branch), hub in center of.....	34 05 12.5	90 15 01.7
Hub 7 feet east of track, station 372 (=M 411).....	34 05 59.6	90 13 30.0

SHEET NO. 28, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 57' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Charleston, west of Yazoo and Mississippi Valley Railroad track, at northeast end of Hunter's restaurant, nearly opposite station, iron post-stamped "Prim. Trav. Sta. No. 37-A, 1908, Miss.".....	° ' " 34 00 16.8	° ' " 90 04 10.5
Road forks.....	34 00 49.9	90 04 23.6
Will Stegall's mail box just south of church.....	34 01 31.3	90 04 25.6
Road west through gate.....	34 02 08.0	90 04 27.0
Charleston, 3 miles north of; east of road, on wire-fence line, 6 feet south of gate, 400 feet south of J. N. Craig's house, iron post stamped "Prim. Trav. Sta. No. 38-A, 1908, Miss.".....	34 02 28.7	90 04 27.2
Crossroads.....	34 03 25.4	90 04 45.1
Road west.....	34 03 52.6	90 05 01.1
Charleston, 6 miles north of; on west side of road, 30 feet north of stream crossing, 350 feet southwest of dwelling, iron post stamped "Prim. Trav. Sta. No. 39-A, 1908, Miss.".....	34 05 02.1	90 05 04.3
Stream crossing, at road forks.....	34 06 12.9	90 04 39.9
Crevi, 1 mile south of; road fork at foot of hill, iron post stamped "Prim. Trav. Sta. No. 40-A, 1908, Miss.".....	34 07 32.2	90 04 35.5
Thompson's mail box at lane west.....	34 07 49.0	90 04 35.0
Crevi, south end of bridge.....	34 08 40.6	90 04 38.1
Crevi, foot of hill north of; wooden post at road forks.....	34 09 07.6	90 04 38.9
Crowder Plantation, gate across road at southwest corner of stable (this position is on Tocowa quadrangle).....	34 10 43.5	90 09 12.0
Mouth of Coldwater River, 6 miles east of; at northeast corner of fence south of road, 300 feet east of cabin, iron post stamped "Prim. Trav. Sta. No. 22-A, 1908, Miss.".....	34 09 34.0	90 08 35.0
Blazed tree north of road.....	34 09 18.5	90 06 29.2
Crevi, 3 miles northwest of; in front of Dave Newton's house, south of road, 12 feet east of gum tree, iron post stamped "Prim. Trav. Sta. No. 23-A, 1908, Miss.".....	34 09 06.8	90 05 40.6
Wooden plat at road forks at foot of hill.....	34 09 07.6	90 04 38.9
Fork of roads.....	34 09 33.1	90 04 31.2

SHEET NO. 29, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 45' east.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks.....	33 59 05.5	90 09 59.7
Gladys, 50 feet northeast of crossing, 2 feet south of telegraph pole, east of track, iron post stamped "Prim. Trav. Sta. No. 36-A, 1908, Miss.".....	33 59 03.9	90 09 10.3

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Milepost "C 4 P 22".....	33 59 18.6	90 07 59.1
Milepost "C 3 P 23".....	33 59 29.2	90 06 57.6
Road crossing.....	33 59 37.9	90 06 07.1
Road crossing.....	33 59 53.3	90 04 37.9
Milepost "P 20 C 6".....	33 58 26.9	90 00 34.4
Road crossing.....	33 57 45.7	90 09 53.6

CHARLESTON, ALONG HIGHWAYS VIA LEVERETT, TO MACEL.

Intersection of road with spur track.....	33 59 51.7	90 04 04.7
Road forks south and southeast.....	33 59 01.5	90 04 16.8
Intersection with road west.....	33 58 12.6	90 04 19.6
Charleston, 3.25 miles south of; in side of corner of wire fence about 260 feet southeast from house west of road, iron post stamped "Prim. Trav. Sta. No. 60-A, 1908, Miss.".....	33 57 42.7	90 04 22.9
Artesian well inside of fence, end of pipe.....	33 56 35.4	90 04 20.8
T road east, intersection with.....	33 55 37.6	90 04 07.8
Paynes, 2 feet north of northwest corner of Danman & Hey's store, iron post stamped "Prim. Trav. Sta. No. 61-A, 1908, Miss.".....	33 55 19.5	90 04 08.8
Center of front of church.....	33 54 46.8	90 04 04.9
Road east.....	33 54 11.7	90 03 58.3
Road west.....	33 53 21.2	90 03 52.5
Paynes, 3.81 miles southwest of; the Illinois farm, 2 feet east of northeast corner of store at Leverett plantation, iron post stamped "Prim. Trav. Sta. No. 62-A, 1908, Miss.".....	33 52 55.6	90 04 37.8
Cross lane.....	33 52 56.5	90 05 46.8
Wrong Prong Bridge, east end of.....	33 52 56.7	90 06 59.5
Paynes post-office, 6.7 miles south of; 35 feet west of west end of bridge over Askalmore Creek, iron post stamped "Prim. Trav. Sta. No. 63-A, 1908, Miss.".....	33 53 07.8	90 07 30.6
Road forks, 15 feet west of corner of fence.....	33 52 22.7	90 08 50.7
Paynes post-office, 9.4 miles south of; at northwest corner of Bell's Chapel, iron post stamped "Prim. Trav. Sta. No. 64-A, 1908, Miss.".....	33 51 40.6	90 09 23.9
Road forks south and southwest, intersection, 4 feet west of gate.....	33 51 14.1	90 09 52.5

SHEET NO. 30, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 6° 01' east.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
T lane north.....	33° 56' 51.3"	90° 18' 26.8"
Webb, 3.5 miles east of; in southwest corner of Andrew Graham's cabin yard at forks of road, iron post stamped "Prim. Trav. Sta. No. 33-A, 1908, Miss."	33 56 35.5	90 17 40.3
Railroad right-of-way crossing, center of.....	33 57 01.8	90 17 04.7
Road forks.....	33 57 24.5	90 16 04.5
Section corner, blazed tree.....	33 57 43.0	90 15 31.4
Telephone pole at southwest corner of fence to first house on southeast side of road south of Locopolis.....	33 58 12.6	90 14 25.5
Locopolis, McKee Ferry, at southeast corner of Eugene Roger's house on south bank of river, iron post stamped "Prim. Trav. Sta. No. 34-A, 1908, Miss."	33 58 33.6	90 13 57.0
Gate across road.....	33 58 59.4	90 13 23.5
Mr. Denman's house, at bend in road, telephone pole....	33 59 05.9	90 12 50.1
Bridge over bayou, west end of.....	33 59 06.2	90 11 27.0
Locopolis, 3.5 miles east of; in woods 120 feet east of bridge over bayou, north of road, 8 feet east of small gum tree, iron post stamped "Prim. Trav. Sta. No. 35-A, 1908, Miss."	33 59 05.8	90 10 43.4
Sumner, 3.5 miles east of; at T road north over Cassidy Bayou, south of road, iron post stamped "Prim. Trav. Sta. No. 51-A, 1908, Miss."	33 58 35.2	90 19 17.3
T lane south.....	33 58 45.0	90 18 32.3
Road forks.....	33 59 06.0	90 18 01.1
T lane south at cabin.....	33 59 46.3	90 17 17.9
Swan Lake, concrete monument No. 4, near southwest corner of iron bridge over Tallahatchie River.....	33 52 54.3	90 15 48.0

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Milepost "P 18 C 8".....	33 56 49.6	90 10 19.8
Road crossing.....	33 56 24.2	90 10 31.6
Effie, northeast corner of station, 1 foot from corner of platform, iron post stamped "Prim. Trav. Sta. No. 41-A, 1908, Miss."	33 56 13.6	90 10 36.8
Tipo, road crossing, Lamb Fish Lumber Company camp..	33 54 41.3	90 10 53.6
Tipo, 1.5 miles south of; at road crossing, 1 foot north of signboard east of track, iron post stamped "Prim. Trav. Sta. No. 42-A, 1908, Miss."	33 53 19.1	90 10 56.7
Milepost "P 13 C 13".....	33 52 32.6	90 10 56.6
Road crossing.....	33 51 35.3	90 10 56.2
Milepost "P 11 C 15".....	33 50 48.1	90 10 55.9

Geographic positions—Continued.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Whitehead, in front of station.....	33 50 44.1	90 17 33.2
Road crossing.....	33 50 59.6	90 17 10.8
Milepost "M 106 J 125".....	33 51 56.8	90 16 56.7
Swan Lake, at southeast corner of W. E. Hawkins's store west of track opposite station, iron post stamped "Prim. Trav. Sta. No. 49-A, 1908, Miss.".....	33 52 46.2	90 17 14.8
Swan Lake, road crossing.....	33 52 48.7	90 17 15.6
Road crossing under bridge.....	33 53 39.3	90 17 57.9
Road crossing.....	33 53 56.2	90 18 42.7
Milepost "M 102 J 129".....	33 54 28.0	90 19 26.6
Albin, at northwest corner of Zerry Robinson's store east of track, iron post stamped "Prim. Trav. Sta. No. 50-A, 1908, Miss.".....	33 54 48.1	90 19 48.7

SHEET NO. 31, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 6° 12' east.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	33 59 40.3	90 23 19.1
Sumner, 2 miles northwest of; at northwest corner of yard of Jim Evans, 15 feet north of cattle shed, 8 feet west of hickory tree, iron post stamped "Prim. Trav. Sta. No. 30-A, 1908, Miss.".....	33 59 38.7	90 23 17.6
Road crossing.....	33 59 13.3	90 22 49.5
Sumner, in northeast corner of Mrs. Matthews's front yard, 300 feet south of county jail, iron post stamped "Prim. Trav. Sta. No. 31-A, 1908, Miss.".....	33 58 07.5	90 22 15.3
Sumner, south of station, road crossing.....	33 58 13.4	90 22 14.9
Milepost "J 133 M 98".....	33 57 22.9	90 21 26.9
T lane north.....	33 56 53.4	90 20 03.4
Road crossing.....	33 56 09.5	90 20 17.5
Webb, near telegraph pole, 30 feet east of northeast corner of station, 1 foot south of board walk, iron post stamped "Prim. Trav. Sta. No. 32-A, 1908, Miss.".....	33 56 47.4	90 20 42.3
Road crossing, 50 feet north of bridge.....	33 59 41.1	90 26 53.5
Milepost "J 133 M 94".....	33 59 17.4	90 27 16.7
Milepost "J 132 M 95".....	33 58 37.0	90 27 56.5
Milepost "J 131 M 96".....	33 57 56.8	90 28 36.4
Rome, 3 feet northeast of northwest corner of hotel, 169 feet east of track, iron post stamped "Prim. Trav. Sta. No. 55-A, 1908, Miss.".....	33 57 45.8	90 28 44.6

Geographic positions—Continued.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD—continued.

Station.	Latitude.	Longitude.
Road crossing.....	33 57 23.0	90 29 10.0
Minot, road crossing.....	33 56 31.6	90 29 27.6
Road crossing.....	33 55 59.5	90 29 36.7
Parchman, at northwest corner of bulkhead, 15 feet west of track, iron post stamped "Prim. Trav. Sta. No. 56-A, 1908, Miss.".....	33 55 03.8	90 29 52.6
Milepost "P 1 W 10".....	33 54 45.4	90 28 13.4
Road crossing.....	33 54 28.3	90 26 57.6
Milepost "P 3 W 8".....	33 54 14.3	90 26 16.6
Milepost "P 4 W 7".....	33 53 50.8	90 25 39.2
Milepost "P 5 W 6".....	33 53 50.5	90 24 38.2
Milepost "P 6 W 5".....	33 53 50.1	90 23 34.1
Milepost "P 7 W 4".....	33 54 08.4	90 22 40.0
Webb, 3 miles west of; 2 feet northwest of milepost "W 3 P 8", iron post stamped "Prim. Trav. Sta. No. 59-A, 1908, Miss.".....	33 54 49.8	90 22 02.0
Road crossing near new sawmill.....	33 55 12.4	90 21 41.4
Road crossing.....	33 56 05.4	90 21 21.1

ALONG HIGHWAYS.

Gate across road.....	33 58 42.0	90 21 48.5
Gate across road.....	33 58 51.9	90 20 20.6

SHEET NO. 34, TALLAHATCHIE DRAINAGE DISTRICT.

Geographic positions along Yazoo and Mississippi Valley Railroad.

Station.	Latitude.	Longitude.
Road crossing.....	33 49 55.4	90 10 22.8
Philipp, 3 miles north of; on east side of track, 2 feet south of milepost "P 3 C 23," iron post stamped "Prim. Trav. Sta. No. 45-A, 1908, Miss.".....	33 44 56.4	90 10 19.0
Milepost "P 2 C 24".....	33 44 19.5	90 10 59.8
Milepost "P 1 C 25".....	33 44 36.7	90 11 56.4
Philipp, road crossing south of station.....	33 45 16.9	90 12 23.7
Philipp, at northeast corner of Beard & Co.'s store at south end of railroad bridge over Tallahatchie River, iron post stamped "Prim. Trav. Sta. No. 46-A, 1908, Miss.".....	33 45 30.0	90 12 25.7
Road crossing.....	33 45 53.3	90 13 26.2
Bridge center, east of road crossing.....	33 45 59.0	90 14 11.1
Milepost "M 114 J 117".....	33 46 30.3	90 15 04.2
Milepost "M 113 J 118".....	33 47 08.3	90 15 44.3

Geographic positions along Yazoo and Mississippi Valley Railroad—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Deer Mound, road crossing at Somerville Bros. store.....	33 47 29.9	90 16 00.4
Black Bayou Junction, west of track at road crossing, iron post stamped "Prim. Trav. Sta. No. 47-A, 1908, Miss."..	33 47 56.1	90 16 12.7
Leflore-Tallahatchie county line, road crossing.....	33 48 34.2	90 16 30.3
Black Bayou station, road crossing.....	33 49 22.1	90 17 03.8
Road crossing.....	33 49 44.0	90 17 40.1
Glendora, west of railroad track, west of road crossing, north of station, opposite cotton gin, iron post stamped "Prim. Trav. Sta. No. 48-A, 1908, Miss.".....	33 49 52.1	90 17 54.1

SHEET NO. 35, TALLAHATCHIE DRAINAGE DISTRICT.

Magnetic declination: 5° 37' east.

Geographic positions.

ALONG YAZOO AND MISSISSIPPI VALLEY RAILROAD.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Macel, east of railroad at northwest corner of Mr. F. F. Willingham's store, iron post stamped "Prim. Trav. Sta. No. 43-A, 1908, Miss.".....	33 49 20.0	90 09 50.7
Macel, south of station, road crossing.....	33 49 17.7	90 09 48.0
Road crossing.....	33 48 56.0	90 09 22.2
Road crossing at gin.....	33 48 18.3	90 08 57.4
Macel, 3 miles south of; 2 feet south of milepost "P 6 C 30," iron post stamped "Prim. Trav. Sta. No. 44-A, 1908, Miss.".....	33 47 03.7	90 08 55.0
Milepost "P 5 C 21".....	33 46 19.2	90 09 04.7
Milepost "P 4 C 22".....	33 45 37.8	90 09 40.8

ALONG HIGHWAYS.

Bridge, south end of.....	33 49 53.0	90 09 46.0
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SARDIS QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks, east and southeast, at bridge.....	34 21 54.6	89 59 47.0
Batesville, 4 miles northwest of; at intersection of north-south road with T road west, near center of grass plot, iron post stamped "Prim. Trav. Sta. No. 43, 1908, Miss.".....	34 21 52.8	89 58 31.3
Road forks, northwest and northeast, south edge of grass plot.....	34 21 07.7	89 58 09.3
Road northeast.....	34 20 17.8	89 58 06.6

MISSISSIPPI-ALABAMA-TENNESSEE.

PRIMARY TRAVERSE.

Cloverdale, Iuka, and Savannah quadrangles.

COLBERT AND LAUDERDALE COUNTIES, ALA.; TISHOMINGO COUNTY, MISS.; HARDIN AND WAYNE COUNTIES, TENN.

The following geographic positions on approximate United States standard datum were determined by F. J. McMaugh in 1907. The line starts from adjusted position about 1 mile east of Stout post-office, Tenn., and follows highways south along east border of Iuka quadrangle to Dickson, Ala.; thence northwest along the Southern Railway to Iuka, Miss.; thence southwest along highways to southwest corner of Iuka quadrangle; thence north along highways near west border of Iuka quadrangle to Red Sulphur Springs, Tenn.; thence east along highways near state line to point of beginning.

IUKA QUADRANGLE.

Magnetic declination: East border, $3^{\circ} 09'$ east; south border, $4^{\circ} 16'$ east; west border, $4^{\circ} 51'$ east; north border, $3^{\circ} 54'$ east.

Geographic positions.

ALONG HIGHWAYS NEAR STATE LINE.

Station	Latitude.	Longitude.
TENNESSEE.		
Stout, 1 mile east of post-office, 66 feet from southeast corner of store, nail in notched root of oak tree.....	35 01 52.7	87 57 46.2
Road forks to east and southeast.....	35 01 17.3	87 57 26.2
Road forks to northwest and north.....	35 00 43.4	87 56 32.4
Road fork to north about 600 feet south of state line.....	35 00 14.6	87 55 39.4
ALABAMA. ^a		
T lane west.....	34 53 22.9	88 01 19.7
Stump at edge of grass plot at road forks to southwest and southeast.....	34 52 57.1	88 01 32.8
Road forks to southwest and south.....	34 51 45.8	88 00 35.7
East-west crossroads.....	34 51 15.3	88 00 00.4

WEST ALONG SOUTHERN RAILWAY, DICKSON TO STATE LINE.

Dickson, south of main track, near railroad crossing, iron post stamped "Prim. Trav. Sta. No. 2, 1907".....	34 45 35.1	88 00 27.6
Dickson, 0.7 mile west of; road crossing.....	34 45 39.5	88 01 10.2
Dickson, 2 miles west of; second-class road crossing.....	34 45 47.0	88 02 24.9
Margarum, east of; road crossing.....	34 46 0.04	88 03 55.5
Riverton, center of track opposite station.....	34 46 11.1	88 04 41.5
Big Bear Creek, center of large iron bridge over.....	34 46 38.0	88 05 52.8
Mississippi-Alabama state line, boundary stone.....	34 46 40.2	88 06 47.3

^a See Cloverdale quadrangle for first part of this line.

Geographic positions—Continued.

ALONG SOUTHERN RAILWAY TO IUKA, THENCE ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
MISSISSIPPI.		
Road crossing near mail crane.....	34 46 23.5	88 07 46.3
Road crossing.....	34 46 40.9	88 09 00.4
Iuka, 2 miles southeast of; water tank.....	34 47 21.2	88 09 47.2
Iuka, 0.5 mile east of; road crossing.....	34 48 30.3	88 11 02.8
Iuka, in northeast corner of yard of Leatherwood Hotel, iron post stamped "Prim. Trav. Sta. No. 8, 1907".....	34 48 38.2	88 11 36.0
Iuka, 1 mile southwest of; T road east.....	34 48 12.7	88 12 13.7
Schoolhouse, front door of.....	34 47 32.5	88 13 01.5
Bridge over creek, center of.....	34 46 28.1	88 13 05.5
Prospect church and school, center of front of.....	34 45 46.8	88 13 32.0
Road forks to south and southeast.....	34 46 15.4	88 14 25.5
Road forks to south and southwest.....	34 46 56.8	88 15 16.0
Five Points, 22 feet west to blazed pine tree marked "P. T. Sta. 477" in blue keel, 33 feet southwest to blazed tree with blue cross marks.....	34 47 37.6	88 15 42.4
G. W. Bishop's house, opposite southwest corner, 8 feet northeast of corner of fence, iron post stamped "Prim. Trav. Sta. No. 9, 1907".....	34 48 41.8	88 15 55.7
T. 3 N., R. 10 W., northeast corner sec. 20.....	34 48 42.1	88 15 41.6
T. 3 N., R. 10 W., northeast corner sec. 17.....	34 49 35.0	88 15 41.7
East-west and north-south crossroads.....	34 50 04.4	88 15 27.0
Small bridge over stream.....	34 50 53.1	88 14 23.1
Crossroads, 18 feet northeast to W. A. Broughton's mail box.	34 51 00.6	88 13 59.9
T. 2 N., R. 10 W., northeast corner sec. 3.....	34 51 18.7	88 13 34.5
T. 3 N., R. 10 W., northeast corner sec. 34.....	34 52 08.3	88 13 33.9
Road forks east and southeast.....	34 52 35.8	88 13 36.5
Eaves, 60 feet northwest of northwest corner of store, iron post stamped "Prim. Trav. Sta. No. 10, 1907".....	34 53 18.5	88 14 25.0
Road forks west and southwest.....	34 54 05.8	88 14 39.7
Yellow Creek, north of; road forks west and southwest....	34 54 55.3	88 14 47.2
Crossroads, 28 feet northeast to mail box, 22 feet northeast to red-oak tree, 16 feet southeast to hickory tree with signboard reading "Iuka 10 miles".....	34 55 25.5	88 15 25.6
T road west.....	34 56 26.9	88 15 01.2
Crossroads.....	34 57 10.1	88 14 59.4
Road forks southeast and southwest.....	34 58 02.6	88 14 51.4
Sandy Creek, road crossing.....	34 59 03.8	88 14 27.0
Intersection of lane with road to Red Sulphur, approxi- mate location of state line.....	34 59 42.9	88 14 31.0

CLOVERDALE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks south and southeast	34 59 29.3	87 55 39.5
Road forks south and southwest	34 58 57.4	87 56 09.3
T road west	34 58 12.9	87 57 04.4
Hollow road at intersection with east-west road	34 57 23.7	87 57 23.6
Road to northwest	34 56 24.1	87 58 28.8
T road east	34 55 37.2	87 58 56.0
Township line crossing road between sections 1 and 36. . .	34 55 08.6	87 59 10.2
Wright post-office, in northeast corner of Arthur Call's yard, iron post stamped "Prim. Trav. Sta. No. 1, 1907"	34 54 16.1	87 59 29.8
Wright post-office, T. 1 S., R. 14 W., northeast corner sec. 11	34 54 16.6	87 59 28.3
Signboard marked "Riverton 7 miles"	34 50 41.4	87 59 36.8
Road forks east and southeast	34 50 05.4	87 59 18.8
T road east	34 49 23.1	87 58 50.1
Road forks south and southeast	34 48 15.3	87 58 49.8
Road forks east and southeast, 16 feet west to corner barb- wire fence, 22 feet east to hickory tree	34 47 37.7	87 59 27.3
Road forks southeast and south, north of Harris farm	34 46 53.7	87 59 50.0

SAVANNAH QUADRANGLE:

Geographic positions along highways near state line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Red Sulphur Springs, 20 feet north of road forks to north and east, near small pine tree, iron post stamped "Prim. Trav. Sta. No. 1, 1907"	35 00 23.2	88 14 20.2
Crossroads, stream crossing	35 00 33.7	88 13 10.6
T road west, 40 feet south of stream crossing	35 00 58.9	88 10 56.9
State line, road forks south and southeast, 12 feet southwest to blazed pine tree, 22 feet north to blazed red-oak tree ..	35 00 25.1	88 09 30.5
Road forks north, northeast, and southeast, 13 feet north- west to corner of rail fence	35 00 04.6	88 08 37.0
Road forks north and east, opposite Swinford's mail box ..	35 00 07.8	88 07 19.2
State line, red oak at road forks northeast and southeast ..	35 00 10.6	88 06 38.3
Walnut Grove, 6 miles east of; at corner of rail fence on road to Stout, iron post stamped "Prim. Trav. Sta. No. 2, 1907"	35 00 08.4	88 05 34.6
Road forks north and northeast	35 00 59.2	88 05 08.6
Road forks north and northeast	35 01 24.2	88 04 30.1
Road forks north and northeast	35 01 04.9	88 03 09.4
T road northeast	35 01 26.5	88 01 53.4

Geographic positions along highways near state line—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks north and northeast.	35 01 34.7	88 00 50.0
Road forks east and southeast.	35 01 08.9	88 00 12.2
Wayne-Hardin county line, gum tree.	35 01 11.9	87 59 11.1
Stout, on north bank of stream and in line with east face of store and post-office, iron post stamped "Prim. Trav. Sta. No. 3, 1907"	35 01 12.8	87 59 12.2
Stout, 1 mile east of; nail in root of oak.	35 01 52.7	87 57 46.2

MISSISSIPPI-TENNESSEE.

PRIMARY TRAVERSE.

Belmont, Burnsville, Burtons, Corinth, Iuka, and Pittsburg Landing quadrangles.

ALCORN AND TISHOMINGO COUNTIES, MISS.; HARDIN COUNTY, TENN.

The following geographic positions on approximate United States standard datum were determined in 1908 by F. J. McMaugh. The line starts from adjusted position at Red Sulphur Springs and follows highways west and south to Corinth; thence along Mobile and Ohio Railroad to Rienzi, and east along highways to adjusted position at Prospect Church.

PITTSBURG LANDING QUADRANGLE.

Magnetic declination: South border, 5° east.

Geographic positions along highways near south border of quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Red Sulphur Springs, 1.3 miles south by 2.3 miles west of; 130 feet west of small stream, crossroads.	35 00 01.4	88 16 52.6
Red Sulphur Springs, about 1 mile south by 2.5 miles west of; 15 feet west to two red-oak trees west of road, inter- section of Red Sulphur Springs-Counce road with road south to Sharpes Bridge.	35 00 19.8	88 17 04.6
Red Sulphur Springs, 1.3 miles south by 3.25 miles west of; south of road, blazed pine tree (probably on Missis- sippi-Tennessee state line).	35 00 02.5	88 17 46.8

BURNSVILLE QUADRANGLE.

Magnetic declination: North border, 5° east; south border, $4^{\circ} 16'$ east.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$
Center of Sandy Creek.....	34 59 42.2	88 15 10.4
Red Sulphur Springs, 1 mile south by 1.8 miles west of; at road forks south and west, leaning sycamore tree.....	34 59 36.8	88 16 07.2
Red Sulphur Springs, about 2.5 miles south by 4 miles west of; road forks west and south (road to west is very grassy).....	34 58 58.5	88 18 32.9
Red Sulphur Springs, 3 miles south and 4 miles west of; intersection of Doskie-Red Sulphur Springs road and road to Sharpes Bridge.....	34 58 20.6	88 18 26.7
Sharpes Bridge, 0.8 mile south by 0.8 mile east of; 10 feet west of small creek; T lane east.....	34 58 34.2	88 19 32.3
Chambers Creek, east end of Sharpes Bridge over.....	34 59 18.3	88 20 27.0
Kendrick, 1.5 miles north by 1.75 miles east of; at T road west, iron post stamped "Prim. Trav. Sta. No. 69, Miss., 1908".....	34 59 31.4	88 21 05.0
Alcorn-Tishomingo county line, crossing of road and small creek.....	34 59 41.9	88 21 54.6
Mississippi-Tennessee state line, sycamore tree, marked "U.S.G.S.P.T.".....	34 59 44.4	88 22 15.6
Kendrick, 1.5 miles north by 0.5 miles east of; at S. L. Williams's mail box, 12 feet east to mail box, road forks.....	34 59 24.8	88 22 27.6
Kendrick, opposite Kendrick's store, center of road.....	34 58 10.8	88 23 01.2
Kendrick, 0.6 mile west of; road forks northwest and southwest.....	34 58 06.9	88 23 47.0
Kendrick, 0.8 mile south by 2 miles west of; opposite small forked blackjack blazed on three sides, top of rise.....	34 57 31.7	88 25 12.0
Corinth, 1 mile north by 4.5 miles east of; on north side of east-west road, iron post stamped "Prim. Trav. Sta. No. 70, Miss., 1908".....	34 57 31.5	88 26 11.7
Corinth, 0.25 mile north by 4 miles east of; 7 feet south to black-gum tree, 10 feet east to corner of picket fence, intersection of north-south road with T lane east.....	34 56 53.0	88 26 43.9
Corinth, 3.5 miles east of; 16 feet southwest to Corinth signboard on tree, 50 feet southeast to gate, crossroads....	34 56 40.1	88 27 15.6
Corinth, on south side of road 2.5 miles east of; in line with Box Chapel, old stump.....	34 56 40.5	88 28 19.2

Geographic positions along highways—Continued.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Rienzi, 0.5 mile north by 2 miles east of; crossroads.....	34 46 30.6	88 29 52.6
Schoolhouse, opposite; center of road.....	34 46 55.6	88 29 17.1
Schoolhouse, 0.3 mile south by 0.3 mile east of; crossroads.....	34 46 36.2	88 28 50.8
Jacinto, 1 mile north and 2 miles west of; road forks north-west, north, and northeast.....	34 46 25.2	88 27 59.0
Jacinto, 0.5 mile north by 1.8 miles west of; road south-west.....	34 46 06.5	88 27 47.3
Jacinto, 0.25 mile south by 0.75 mile west of; at top of hill, crossroads.....	34 45 24.8	88 26 41.2
Jacinto, opposite gateway to yard of schoolhouse, center of road.....	34 45 37.6	88 25 49.8
Jacinto, 1 mile east of; at intersection of Jacinto-Burns-ville and Jacinto-Iuka roads, iron post stamped "Prim. Trav. Sta. No. 73, Miss., 1908".....	34 45 39.0	88 24 50.7
Alcorn-Tishomingo county line.....	34 45 19.4	88 24 23.6

CORINTH QUADRANGLE.

Magnetic declination: East border, 5° 09' east.

Geographic positions along Mobile and Ohio Railroad, Corinth to Rienzi.

Station.	Latitude.	Longitude.
Corinth, crossing of Seventh and Madison streets.....	34 56 41.4	88 30 59.2
Corinth, in northeast corner of court-house yard, iron post stamped "Prim. Trav. Sta. No. 71, Miss., 1908".....	34 56 04.9	88 31 13.5
Milepost "M 328 E. St. L. 316".....	34 55 17.6	88 31 13.6
Milepost "M 327 E. St. L. 317".....	34 54 27.3	88 30 57.7
Milepost "M 326 E. St. L. 318".....	34 53 36.6	88 30 45.0
Corinth, 3.3 miles south of; road crossing.....	34 53 11.7	88 30 40.2
Hintons crossing.....	34 51 39.4	88 30 06.0
Alcorn siding; road crossing near sawmill.....	34 50 46.0	88 30 00.5
Milepost "M 322 E. St. L. 322".....	34 50 16.3	88 30 18.7
Milepost "M 320 E. St. L. 324," 70 feet north of; second-class road crossing.....	34 48 48.0	88 31 25.0
Milepost "M 319 E. St. L. 325," 100 feet south of; road crossing.....	34 47 56.5	88 31 44.4
Milepost "M 318 E. St. L. 326".....	34 47 05.4	88 31 46.5
Rienzi, 72 feet southeast of road crossing, in triangular plot, iron post stamped "Prim. Trav. Sta. No. 72, Miss., 1908".....	34 46 02.0	88 31 42.2
Section corner.....	34 46 11.7	88 31 36.6
Rienzi, 0.5 mile north by 1 mile east of; opposite milepost 61, road forks east and southeast.....	34 46 26.0	88 30 41.9

BURTONS QUADRANGLE.

Magnetic declination: North border, $4^{\circ} 16'$ east.*Geographic positions along highways near north border of quadrangle.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Near guideboard "Tuscumbia 46 miles," road forks.....	34 44 52.5	88 23 52.8
S. T. Clark's mail box, about 150 east of; road forks.....	34 44 52.4	88 22 44.1
At mail box, road forks east and southeast.....	34 44 46.5	88 21 36.4
Intersection of Old Cairo-Burnsville and Old Cairo-Jacinto roads.....	34 44 28.6	88 21 21.2
Old Cairo, former post-office.....	34 43 39.2	88 20 58.4
Old Cairo, 0.5 mile south by 1 mile east of; road forks northeast and southeast.....	34 43 13.2	88 19 54.8
Holcut, road crossing Illinois Central Railroad.....	34 43 36.6	88 18 26.0
Holcut, 1 mile east of; at top of hill near mail box 48, crossroads.....	34 43 26.8	88 17 35.4
Holcut, about 1.5 miles east of; intersection of road forks east and southeast with T road south.....	34 43 28.4	88 16 50.2
Holcut, about 2 miles east of; 3 feet north of northwest corner of store near crossroads church, iron post stamped "Prim. Trav. Sta. No. 74, Miss., 1908".....	34 43 29.5	88 16 19.6
Small bridge, about 50 feet east of; road forks north and northeast.....	34 43 46.0	88 15 31.2

BELMONT QUADRANGLE.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Prospect Church, about 1.5 miles north by 1 mile west of; road forks south and southwest.....	34 44 24.5	88 14 33.1
Prospect Church; west face of.....	34 45 46.80	88 13 32.00

IUKA QUADRANGLE.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Red Sulphur Springs, 0.5 mile south by 0.25 mile west of; road forks south and west.....	34 59 55.2	88 14 38.0

MISSOURI.

PRIMARY TRAVERSE.

Centerville, Edgehill, and Ironton quadrangles.

IRON AND REYNOLDS COUNTIES.

In cooperation with the State, the following geographic positions, based on approximate United States standard datum, were determined by J. R. Ellis in 1907. The line starts from primary traverse station No. 540 at Caledonia and follows highways and private roads south to near the southeast corner of Edgehill quadrangle; thence west to point about 3 miles southwest of Black; thence north to Joseph's Chapel, connecting with primary-traverse station No. 394.

EDGEHILL QUADRANGLE.

Magnetic declination: South border, 6° east; east border, 5° 37' east; west border, 6° 24' east.

Geographic positions along highways.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Caledonia, 1 mile south of; T road east, 18 feet due west to cross on fence post.....	37 44 52.6	90 46 14.9
Spanish land grant, large elm tree at corner.....	37 43 49.0	90 45 10.3
Bellevue, about 3 miles southwest of; center of crossroads on top of divide, 10 feet west to blaze on small tree.....	37 39 13.2	90 46 09.9
Road at point 30 feet southwest of road forks on East Fork of Black River, 35 feet northeast to arrow on maple, 10 feet east to cross on small walnut.....	37 37 54.2	90 46 38.4
Munger post-office, 1.25 miles northeast of; 270 feet southwest of forks at Sawyer's mill (old site), north of east-west road, hydrant south of road bears S. 50° 30' E. 61.2 feet, in top of limestone 7 by 6 by 30 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1907, Missouri".	37 36 39.8	90 46 30.4
T. 34 N., R. 2 E., southeast corner sec. 35, Iron-Reynolds county line.....	37 36 06.1	90 47 04.8
Weimers Hill, road forks on west part of.....	37 34 44.3	90 45 56.0
T. 33 N., R. 3 E., east line sec. 7, road at arrow painted on tree.....	37 33 21.2	90 44 50.6
Center of Devil's tollgate.....	37 33 17.1	90 45 00.3
Center of road at Iron-Reynolds county line, just west of vacant house, 10 feet southwest to arrow on small tree..	37 32 54.8	90 46 10.6
Little Taum Sauk Creek, south side of; road forks.....	37 32 43.3	90 46 35.4
Long field, northeast corner of; road north.....	37 32 32.5	90 47 51.7
T. 33 N., R. 2 E., mound of stone at northeast corner sec. 22.	37 31 55.7	90 48 23.8
Smithboro, guideboard on large elm tree at road forks 1 mile northeast of post-office.....	37 30 29.4	90 48 40.4
Smithboro-Hogan road, 280 feet south of; 130 feet west of Iron-Reynolds county line, 10 feet north to nail in blaze on red oak, in limestone ledge on hillside, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1907, Missouri".....	37 30 45.6	90 46 14.9

Geographic positions along highways—Continued.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Smithboro-Hogan road at crossing with Iron-Reynolds county line, 6 feet north to blazed bush north of road..	37 30 48.0	90 46 13.4
Smithboro, northeast corner sec. 33, T. 33 N., R. 2 E.	37 30 10.4	90 49 31.8
Smithboro, 0.25 mile southwest of post-office, 40 feet east to forks of road, arrow painted on corner of board fence..	37 30 02.0	90 49 48.7
Road fork, about 300 feet above mouth of Walkers branch, 30 feet northeast to arrow on sycamore.....	37 30 49.9	90 50 37.4
Road fork at southeast corner of field, 10 feet south and 5 5 feet west to arrow on white oak.	37 31 08.0	90 51 39.6
T. 33 N., R. 2 E., approximate northeast corner sec. 19 (this is within 30 feet of true location of corner).....	37 31 04.0	90 51 41.2
Black, about 1.6 miles south and 0.5 mile east of post-office, T road east just north of creek, 30 feet southeast to cross on large sycamore.	37 30 19.7	90 55 32.0
Black, 0.5 mile south of post-office, road forks just west of Black River, arrow on elm tree bears S. 60° E., 50 feet..	37 31 20.6	90 56 04.5
Black, 1.5 miles south by 1.5 miles west of; painted arrow on forked tree at dim road southwest from Black Center-ville road.....	37 30 23.9	90 57 49.5

NEAR WEST BORDER.

Black, just east of post-office, northeast corner sec. 28, T. 32 N., R. 1 E.	37 31 46.8	90 56 07.8
Black, 1.25 miles north and 0.5 mile west of; road forks at forks of creek; arrow painted on tree.....	37 32 53.0	90 56 46.1
Dennison's (J. B.) farm, at T road east, arrow on stump..	37 34 06.0	90 57 44.9
T. 33 N., R. 1 E., quarter corner north side of sec. 5, Iron-Reynolds county line.....	37 36 12.3	90 57 36.1
Guidepost, "Edgehill 2 miles—Clones 5 miles," at forks of road.....	37 36 19.7	90 57 27.9
Goodland, road forks 2 miles southeast of post-office, 25 feet southwest to guidepost "Goodland 2 miles".....	37 37 24.6	90 58 14.8
T. 34 N., R. 1 W., quarter corner east side of sec. 26, 6 feet southeast to leaning white oak "B. T".....	37 38 03.2	90 59 10.2
Goodland, at south end of T lane north, in top of limestone 15 by 8 by 40 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1907, Missouri".....	37 38 00.4	90 59 52.8
Goodland, T lane southwest 2 miles north of post-office...	37 39 52.4	90 59 46.0
Guideboard on maple tree at road forks.....	37 40 47.2	90 59 39.5
Thomas Crocker's residence, just northeast of; at road forks; arrow painted on hickory tree.....	37 42 34.3	91 00 13.9
State road, at ridge road north from; arrow on white-oak tree.	37 43 04.8	91 00 24.4
T. 35 N., R. 1 W., northeast corner sec. 22, cedar post at Washington-Iron county line.....	37 44 19.2	91 01 08.9
Road west at southeast corner of field.....	37 44 53.6	91 01 06.2
T. 35 N., R. 1 W., northeast corner sec. 15, post in mound of stone.....	37 45 11.3	91 01 07.7
Prim. Trav. Sta. No. 394, 1903.....	37 47 40.7	91 01 14.3

IRONTON QUADRANGLE.

Magnetic declination: West border, $5^{\circ} 37'$ east.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
Schoolhouse, just south of; telephone pole No. P. B. 3342, at road northeast.....	37 42 50.8	90 44 44.1
Bellevue, 1 mile north by 0.25 mile west of; post-oak tree at T road north.....	37 42 08.7	90 44 44.2
T. 34 N., R. 3 E., center of north-south road at north township line; wire fence east.....	37 41 33.8	90 44 29.5
Bellevue, southwest corner of W. R. Read's store at crossroads.....	37 41 16.2	90 44 25.2
Bellevue, 1 mile south of; center of T road east.....	37 40 31.0	90 43 58.4
T. 34 N., R. 3 E., northeast corner sec. 18.....	37 39 38.1	90 44 45.8

CENTERVILLE QUADRANGLE.

Magnetic declination: North border, 6° east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
T. 32 N., R. 1 E., northeast corner sec. 1, 35 feet due west to west end of lane.....	37 29 19.4	90 52 58.6
Township corner, 800 feet southwest of; 80 feet southwest to T road, in top of sandstone 14 by 8 by 30 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 12, 1907, Missouri".....	37 29 16.2	90 53 08.4
Rayfield's (W. M.) residence, on tree at T road southwest, guideboard "Centerville 6 miles—Lesterville 4 miles".....	37 28 58.4	90 53 51.5
Black, 2 miles south by 2.75 miles west of; 350 feet southwest to crossing of trail and dim road, 6.5 feet northeast to "P. T. Sta. 13" painted on black oak, on top of ridge; in top of flint bowlder, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1907, Missouri".....	37 29 52.0	90 58 47.7

Higdon and Weingarten quadrangles.

BOLLINGER, MADISON, PERRY, ST. FRANCOIS, AND ST. GENEVIEVE COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1907 by J. R. Ellis. The line for Higdon quadrangle starts at primary-traverse station No. 4, 2 miles west of Avon, and follows highways south near west border of quadrangle to Cornwall; thence east along highways near south border to Patton; thence north along highways near east border to Farmington-Perryville road at road south to Silver Lake. The line for Weingarten quadrangle

starts from Vause triangulation station of the Mississippi River Commission, follows highways south near east border, continues west near south border, and is tied to a point near southeast corner of Farmington quadrangle.

HIGDON QUADRANGLE.

Magnetic declination: West border, $5^{\circ} 12'$ east; south border, $5^{\circ} 01'$ east; east border, $4^{\circ} 33'$ east.

Geographic positions.

ALONG WEST BORDER.

Station.	Latitude.	Longitude.
Avon, 2 miles west of; just east of Avon-Farmington and north-south road crossing, 10 feet west to honey-locust tree, iron post stamped "Prim. Trav. Sta. No. 4, 1907, Missouri".....	37 45 02.7	90 15 33.2
St. Genevieve-St. Francois county line, 15 feet north to junction of fences west of road.....	37 43 33.2	90 16 07.6
Road forks, 10 feet north to center of triangular grass plot, 10 feet east to north-south section line.....	37 42 34.5	90 16 28.1
Libertyville, guidepost at crossroads.....	37 42 12.9	90 17 17.8
Crossroads, at southeast corner of rail fence, 15 feet north-west to telephone pole, approximate Mine Lamotte claim line.....	37 40 48.7	90 17 25.0
Rock Creek schoolhouse, road forks, 27 feet west to guide-board.....	37 39 45.3	90 17 21.7
St. Francois-Madison county line, center of road in front of cabin, 50 feet north to cross on telephone pole.....	37 38 31.0	90 17 02.0
Mine Lamotte Co.'s store, 1,250 feet south of; in north face of stone abutment at southeast corner of bridge over branch, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1907".....	37 37 07.9	90 17 19.8
Mine Lamotte, 1 mile south of post-office; in front of stone building, large stone monument on Mine Lamotte claim boundary.....	37 36 14.1	90 17 30.4
Fredericktown, Iron Mountain station semaphore, North American Lead Co.'s plant.....	37 34 01.7	90 17 38.2
Switch block to spur.....	37 33 42.0	90 16 42.9
Fredericktown, 1.25 miles east of; 40 feet east of road forks to D. B. Rhodes's mail box.....	37 33 33.8	90 16 02.6
North American Lead Co.'s boundary post just east of road.....	37 33 07.9	90 15 38.2
Fredericktown, 2 miles east and 2.5 miles south of; W. J. Lincoln's blacksmith shop, in southwest corner of foundation, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1907, Missouri".....	37 43 47.8	90 15 15.6
T. 33 N., R. 7 E., northeast corner sec. 27.....	37 31 35.6	90 14 58.6
Cornwall, 1.5 miles northwest of station; road north, 20 feet north to cross on hickory sapling.....	37 31 03.8	90 13 36.2
Cornwall, station board.....	37 30 37.8	90 12 22.8

Geographic positions—Continued.

ALONG SOUTH BORDER.

Station.	Latitude.	Longitude.
Cornwall, 1.5 miles southeast of; road crossing under Iron Mountain Railway bridge.....	37 29 49.6	90 11 25.8
T. 32 N., R. 8 E., northeast corner sec. 8, north-south fence 400 feet west of Mills residence.....	37 28 54.1	90 10 51.1
Walnut tree used as gatepost at T lane northeast.....	37 29 03.4	90 09 27.6
Road forks, 40 feet southeast to guidepost "Marble Hill 18 miles," 30 feet southwest to west corner of triangle..	37 29 11.6	90 08 41.3
T. 32 N., R. 8 E., stake at quarter corner east side of sec. 3, Madison-Bollinger county line.....	37 29 14.2	90 08 37.6
Patton, 6.5 miles west of; west of road at road forks at J. J. Stone's residence 1 mile east of county line, south-west corner of Stone's porch bears N. 58° 20' E. 132.51 feet, aluminum tablet in sandstone 26 by 8 by 9 inches, stamped "Prim. Trav. Sta. No. 7, 1907, Missouri".....	37 29 55.8	90 07 28.3
T. 32 N., R. 7 E., northeast corner sec. 1.....	37 29 45.7	90 06 15.4
T. 32 N., R. 8 E., northeast corner stone sec. 6.....	37 29 44.7	90 05 13.4
T road north.....	37 29 43.7	90 04 19.4
Patton, 0.5 mile northwest of; stump at road south from Farmington-Patton road.....	37 30 10.3	90 01 24.9

ALONG EAST BORDER.

Patton, in southeast corner of foundation to Johnson Brothers' mill, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1907, Missouri".....	37 30 01.0	90 00 47.9
T. 33 N., R. 9 E., northeast corner sec. 35; iron pipe.....	37 30 32.5	90 00 44.4
Grindstaffe, road west at blacksmith shop, center of intersection.....	37 31 18.2	90 00 27.0
T. 33 N., R. 9 E., northeast corner stone, sec. 23, at mouth of lane.....	37 32 18.8	89 59 37.1
Jackson-Farmington road at road north to Alliance, center of intersection.....	37 33 11.2	89 59 15.5
Alliance, T road west at church.....	37 33 40.7	89 59 48.1
Road forks just north of White Water River, 80 feet southeast to guideboard "Appleton 30 miles".....	37 35 08.6	90 00 25.9
Heitman's mill, T road north, 50 feet north and 15 feet west to southeast corner of mill.....	37 35 43.6	90 01 41.4
Center of road at Bollinger-Perry county line.....	37 35 51.5	90 01 55.0
Yount's store, 0.2 mile southeast of; center of crossroads..	37 36 16.1	90 02 19.6
Yount's store, 0.75 mile northeast of; at road forks on top of hill, north of Perryville road, in limestone 26 by 8 by 6 inches, set 24 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1907, Missouri".....	37 36 34.2	90 01 55.1
T. 34 N., R. 9 E., northeast corner stone sec. 27.....	37 37 35.9	90 01 05.7
Little Saline River, 0.5 mile west of; center of T road.....	37 39 06.5	90 00 32.8
Silverlake, T road south, 45 feet north to door of Catholic Church.....	37 41 00.1	89 59 29.7
Mine Lamotte, road forks, 20 feet west to guideboard.....	37 41 48.0	90 00 38.1
New road southwest, center of intersection.....	37 43 33.0	90 00 16.0
Farmington-Perryville road at road south to Silverlake, 15 feet to mail box.....	37 43 57.2	89 59 22.6

WEINGARTEN QUADRANGLE.

Magnetic declination: East border, $4^{\circ} 28'$ east, south border, $5^{\circ} 4'$ east.

Geographic positions along highways.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Vause triangulation station, stone post on high hill, 300 meters back from river 3 miles above St. Marys, 0.5 mile below Aux Vases River (stone was found broken).....	37 54 48.4	89 59 19.5
Residence of W. H. Schwent's, stone at road forks.....	37 54 16.7	89 59 52.5
Lane, at turn of road, southeast section corner stone.....	37 53 18.5	90 00 29.6
Stone in road, 390 feet due west to Spanish claim corner at Charles Fitchcomb's residence.....	37 52 55.0	90 01 32.4
Spanish claim corner.....	37 52 55.0	90 01 37.2
Ozara School, crossroads, 15 feet northwest to corner fence post, 30 feet north to telephone pole.....	37 52 24.8	90 02 05.3
Ozara, 1.25 miles south of; at south corner of John Zahferliff's farm, 50-feet north of road forks, just north of Saline Creek, iron post stamped "Prim. Trav. Sta. No. 1, 1907, Missouri".....	37 50 50.1	90 01 56.6
Old sawmill site, 28 miles to Farmington, 4 miles to Minnith, large sycamore tree at road forks.....	37 50 13.2	90 01 04.5
Schoolhouse, 0.25 mile south of; center of gate on north-east-southwest Spanish claims line.....	37 49 27.6	90 01 03.4
Railroad crossing just east of Little Saline Creek.....	37 49 10.2	90 00 46.0
St. Genevieve-Perry county line.....	37 48 59.6	90 00 10.3
Old Mine Lamott road, road north at W. E. Cambran's residence, 10 feet north to gatepost, 15 feet west to arrow on post.....	37 48 16.0	89 59 25.6
T road south just west of barn, 0.25 mile southwest of burnt mill, 36 feet southeast to corner picket fence.....	37 47 50.8	89 59 59.8
T. 35 N., R. 9 E., northeast corner sec. 2, 20 feet southwest to large white-oak bearing tree.....	37 46 17.2	89 59 56.2
Cedar fork, road intersection, maple tree in center of triangle.....	37 46 38.9	89 59 59.8
Stone at mouth of lane, pine road southwest.....	37 46 02.2	89 59 25.5
Cedar Fork Church, 2 miles east of; 4 feet north to south-east corner of Henry Willand's blacksmith shop, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Missouri".....	37 45 08.7	89 58 18.4
Farmington-Perryville road at T road 400 feet east to Henry Huber's residence.....	37 44 14.2	89 58 52.4

Geographic positions along highways—Continued.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Cedar Fork Church, T road north, 20 feet northeast to arrow on tree.....	37 44 25.3	90 00 30.1
T road west up West Branch of Cedar Fork, small elm snag leaning to west.....	37 45 19.5	90 01 17.9
Perry-St. Genevieve county line, old Farmington road, 180 feet east of road to northeast	37 45 43.6	90 02 27.3
T. 35 N., R. 9 E., 0.25 mile south of northeast corner sec. 7, 0.25 mile southwest of Clem Robinson's residence.....	37 45 30.2	90 03 32.8
Railroad crossing at old site of Minnith.....	37 47 01.5	90 04 02.2
Mouth of lane, road forks at John Eberlie's residence.....	37 46 39.8	90 05 01.6
Approximate range line	37 47 03.5	90 05 31.6
Ulam, 2 miles northeast of old post-office site, cross cut on telephone pole at road forks.....	37 46 51.9	90 06 46.6
Ulam, near old post-office site, west of St. Marys-Farmington road, at road south to Fredericktown, iron post stamped "Prim. Trav. Sta. No. 3, 1907, Missouri".....	37 45 40.2	90 08 02.1
T. 35 N., R. 8 E., northeast corner sec. 17, in field near T road northwest to Coffman.....	37 44 36.2	90 09 54.8
T. 35 N., R. 8 E., 0.5 mile southwest of, northeast corner sec. 17, road forks, 30 feet east to wire around maple tree.	37 44 19.6	90 10 10.6
Road to north.....	37 44 14.9	90 10 55.5
Avon, west part of; T road north 20 feet northeast to corner stone wall.....	37 45 03.6	90 13 24.9
Avon, 2 miles west of; just east of Avon-Farmington and north-south road corners, 10 feet west to honey-locust tree, iron post stamped "Prim. Trav. Sta. No. 4, 1907, Missouri".....	37 45 02.7	90 15 33.2
Farmington-Avon and Farmington-Coffman road junction, 15 feet north to guideboard "St. Genevieve 25 miles".....	37 45 32.2	90 16 13.6
Sec. 1, 0.5 mile southeast of quarter corner east side of; crossroads.....	37 45 44.4	90 18 06.0

Edgar Springs, Rolla, St. James, Vienna, and Waynesville quadrangles.

DENT AND PHELPS COUNTIES.

In cooperation with the State, the following geographic positions on approximate United States standard datum were determined in 1908 by J. R. Ellis, and are based on the primary-traverse line run along the St. Louis and San Francisco railroad by G. T. Hawkins in 1897. The line starts at Rolla station and follows highways near the four borders of Rolla quadrangle.

52752°—Bull. 440—10—25

ST. JAMES QUADRANGLE.

Magnetic declination: West border, $5^{\circ} 51'$ east.*Geographic positions along highways near west border.*

Station.	Latitude.	Longitude.
T. 37 N., R. 8 W., northeast corner sec. 12, center of crossroads.....	37 57 05.2	91 44 56.8
Crossing, range line with northeast-southwest road.....	37 58 03.5	91 44 56.7
Crossing, northeast-southwest road with "Frisco" railroad, between mileposts 107 and 108.....	37 58 34.2	91 43 51.1
T. 37 N., R. 8 W., northeast corner sec. 1.....	37 57 57.7	91 44 56.7
T. 38 N., R. 7 W., northeast corner sec. 31.....	37 58 48.8	91 43 33.0
T. 38 N., R. 7 W., northeast corner stone sec. 30, crossroads at cemetery.....	37 59 41.1	91 43 32.9
T. 35 N., R. 7 W., northeast corner stone sec. 6, Phelps-Dent county line.....	37 47 27.4	91 43 54.5
T. 36 N., R. 7 W., southeast corner sec. 31.....	37 47 27.4	91 43 51.8
Crossroads at north end of lane.....	37 48 20.9	91 44 51.4
Crossroads at F. P. Stone's mail box, 10 feet southeast to cross on post-oak tree.....	37 49 42.7	91 44 48.7
Lecoma, about 2 miles south of; in sandstone 24 by 8 by 5 inches, south of T road north, just east of S. L. Armeson's residence, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1908, Mo.".....	37 45 03.1	91 44 30.5
T. 35 N., R. 7 W., northeast corner sec. 18, T road west....	37 45 42.1	91 43 56.8
T. 35 N., R. 7 W., northeast corner sec. 7, T road east to Lake Springs, neighborhood road west.....	37 46 34.0	91 43 55.5
T. 36 N., R. 8 W., northeast corner sec. 1.....	37 52 42.7	91 44 59.7
T. 37 N., R. 7 W., northwest corner sec. 31, fence east....	37 53 35.9	91 44 59.2
T. 37 N., R. 8 W., northeast corner sec. 26.....	37 54 27.8	91 44 58.9
Rolla, 1.25 miles southeast of; T road south on range line, 30 feet west and 30 feet north to telegraph pole.....	37 56 07.1	91 44 56.6

ROLLA QUADRANGLE.

Magnetic declination: East border, $5^{\circ} 51'$ east; south border, $6^{\circ} 03'$ east; west border, $7^{\circ} 06'$ east; north border, $6^{\circ} 25'$ east.*Geographic positions along highways near borders.*

Station.	Latitude.	Longitude.
Road forks, blaze on small black-oak tree.....	37 59 51.8	91 49 23.4
Doc. Turner's grist mill, southeast corner.....	37 59 47.7	91 53 15.3
T. 38 N., R. 9 W., northeast corner sec. 27, corner of fence at road forks.....	37 59 11.8	91 53 46.8
Road forks, about 200 feet north of log house.....	37 59 46.5	91 57 41.0
T. 38 N., R. 10 W., northeast corner sec. 25.....	37 59 40.5	91 58 04.8

Geographic positions along highways near borders—Continued.

Station.	Latitude.	Longitude.
Boulevard ford of Gasconade River, nail in root of ash tree at east side (river 300 feet wide).....	° ' " 37 59 28.9	° ' " 91 57 58.9
Freeler farm, at corner of wire fence, blaze on post oak about 30 feet west of junction of Duncan Creek and Mungy Branch.....	37 59 23.3	91 58 48.6
T. 38 N., R. 10 W., 0.25 mile north of northeast corner stone sec. 35.....	37 59 03.7	91 59 09.6
Mungy School (No. 1), in southeast corner of foundation, near site of original Mungy post-office, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1908, Mo.".....	37 59 17.8	91 59 58.3
Road fork, cross on small white-oak tree.....	37 45 08.7	91 59 17.0
Road fork, in old grown-up field.....	37 45 26.8	91 58 20.6
T. 35 N., R. 10 W., quarter corner east side of sec. 13.....	37 45 23.6	91 58 17.2
T. 35 N., R. 10 W., northeast corner sec. 13.....	37 45 50.0	91 58 16.3
Road fork, 30 feet east of corner of fence.....	37 45 10.4	91 57 49.4
Arlington, center of track opposite "Frisco" railroad bridge over Gasconade River, in southeast corner of east stone pier to bridge, tablet stamped "697 Elev." (established by E. L. McNair).....	37 55 15.1	91 58 33.9
Arlington, 1 mile southwest of; 25 feet southeast to blaze on sycamore tree, road forks to Clementine and to Spring Creek.....	37 54 31.6	91 59 08.5
T. 7 N., R. 10 W., northeast corner stone sec. 26.....	37 54 31.9	91 59 14.5
Road forks northeast of deserted house.....	37 53 56.3	91 59 55.9
T. 35 N., R. 8 W., northwest corner S. $\frac{1}{2}$ NE. $\frac{1}{4}$ sec. 15....	37 45 30.9	91 47 36.6
T road north at log house.....	37 45 18.8	91 46 19.2
T. 36 N., R. 8 W., stone at quarter corner east side of sec. 13.	37 50 31.4	91 45 02.9
T. 36 N., R. 8 W., northeast corner stone sec. 13, T road east.....	37 50 58.4	91 45 02.1
Aluminum tablet set in limestone 43 by 12 by 8 inches, set near northeast corner sec. 12, T. 36 N., R. 8 W., 45 feet north and 20 feet east to section corner, bench mark stamped "Prim. Trav. Sta. No. 8, 1908, Mo.".....	37 51 50.2	91 45 01.3
T. 36 N., R. 7 W., northwest corner sec. 7.....	37 51 50.6	91 45 01.0
T. 37 N., R. 8 W., northeast corner sec. 11, old gatepost....	37 57 05.2	91 46 03.3
Rolla, center of track opposite station.....	37 57 00.8	91 46 15.32
Rolla, north meridian bench-mark post stamped "Prim. Trav. Sta. No. 9, 1908, Missouri".....	37 57 10.2	91 46 21.2
T. 38 N., R. 7 W., northeast corner sec. 19, crossroads at Walton's store, 10 feet south to post-oak tree.....	38 00 33.7	91 43 32.8
A. D. Walton's field, in southwest corner, crossroads at Walton's store, aluminum tablet set in stone 30 by 13 by 8 inches, stamped "Prim. Trav. Sta. No. 1, 1908, Mo.".....	38 00 33.9	91 43 32.3
T. 38 N., R. 8 W., northeast corner sec. 24.....	38 00 33.7	91 44 38.9
T road W.....	38 01 00.6	91 44 55.7

VIENNA QUADRANGLE.

Magnetic declination: South border, $6^{\circ} 25'$ east.*Geographic positions along highways near south border.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Macedonia, southeast corner of porch to Brewster's store..	38 01 21.7	91 46 18.5
T. 38 N., R. 8 W., northeast corner sec. 15.....	38 01 25.8	91 47 08.6
T. 38 N., R. 8 W., stone at quarter corner north side of sec. 16.	38 01 23.9	91 48 47.4
Carney's residence, corner fence post on state road at road west.....	38 00 40.6	01 48 46.4
T. 38 N., R. 8 W., quarter corner north side of sec. 20.....	38 00 30.0	91 49 53.7
Road forks.....	38 00 28.3	91 51 00.1
Hawthorne's house, road forks in front of; 15 feet east to blaze on post oak.....	38 00 44.2	91 51 32.2
Old Coloin farm, 20 feet west and 10 feet south to center of T road north, 0.25 mile west of center of sec. 13, aluminum tablet set in stone 28 by 14 by 5 inches, stamped "Prim. Trav. Sta. No. 2, 1908, Missouri".....	38 00 54.6	91 52 21.8
Stone quarter corner between sections at T road north....	38 00 54.7	91 52 38.5
T. 38 N., R. 9 W., center corner stone sec. 23.....	38 00 03.4	91 53 12.9
Cave Creek, just west of; road on east line sec. 20.....	38 00 09.3	91 55 56.4
Pet William's residence, T road south.....	38 00 10.0	91 56 10.2
Perkins Ford-Newburg road, center of crossing of; about 0.75 mile west of Pet Smith's residence.....	38 00 07.3	91 56 58.0

WAYNESVILLE QUADRANGLE.

Magnetic declination: East border, $7^{\circ} 06'$ east.*Geographic positions along highways near east border.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks.....	37 58 50.8	92 00 11.9
Rolla-Dixon road fork, at road northwest near A. N. Duncan's house.....	37 58 21.1	92 01 04.8
Corner at bearing trees Phelps-Pulaski county line, about $\frac{1}{2}$ mile southwest of A. N. Duncan's residence.....	37 58 24.8	92 01 20.0
Mill Creek, road forks, just south of; 10 feet west of jet....	37 57 55.4	92 01 42.4
Road forks, 200 feet northwest of; northwest corner of field at deserted house, cross cut on black oak.....	37 45 24.4	92 00 21.0
Franks, "Frisco" Railroad crossing just west of.....	37 57 17.3	92 02 09.1
Franks, south rail opposite center of platform at station...	37 57 17.1	92 02 28.7
Franks, road crossing 1,000 feet east of station.....	37 57 11.0	92 02 18.4
Blacksmith shop, just north of; road forks at north end of lane.....	37 52 50.0	92 01 03.1
Clementine, T road west at post-office, 40 feet south and 15 feet west to center of T road; 40 feet south and 30 feet west to quarter corner north side of sec. 10, T. 36 N., R. 10 W., aluminum tablet set in sandstone 30 by 14 by 8 inches, stamped "Prim. Trav. Sta. No. 4, 1908, Mo."....	37 51 57.8	92 00 55.8

Geographic positions along highways near east border—Continued.

Station.	Latitude.	Longitude.
T. 36 N., R. 10 W., northeast corner sec. 15; small pile of stone at corner.....	° ' " 37 51 04.7	° ' " 92 00 24.3
Crook's farm, T road east on section line.....	37 51 04.7	92 00 20.3
Clementine, about 2 miles southeast of; junction of Arlington-Spring Creek road with road northwest to Clementine post-office, 15 feet southeast to cross on fence post..	37 50 02.2	92 00 10.8
T. 36 N., R. 10 W., quarter corner east side of sec. 27.....	37 48 54.3	92 00 23.3
T. 36 N., R. 10 W., northeast corner sec. 34, charred stump with witness trees.....	37 48 27.7	92 00 22.3
T. J. Ansley's mail box, just north of; 15 feet west to blaze on black oak, road forks.....	37 47 56.2	92 00 38.0
T. 35 N., R. 10 W., northeast corner sec. 9, Pulaski-Phelps county line.....	37 46 44.9	92 01 33.6
Spring Creek School, aluminum tablet set in southwest corner of schoolhouse, stamped "Prim. Trav. Sta. No. 5, 1908, Missouri".....	37 45 50.8	92 00 59.5

EDGAR SPRINGS QUADRANGLE.

Magnetic declination: North border, 6° 03' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
	° ' " 37 44 46.4	° ' " 91 56 54.5
Road fork, 200 feet west of log cabin.....		
Flat, post-office, northeast corner stone, sec. 20, T. 35 N., R. 9 W.....	37 44 56.0	91 56 07.7
Flat, T road east at post-office and store, 20 feet east and 10 feet north to southeast corner of store porch.....	37 44 47.3	91 56 05.0
Flat, crossroads, east of post-office, 15 feet southeast to cross cut on post oak.....	37 44 28.0	91 54 50.8
Smith's farm, stake corner at.....	37 44 27.8	91 53 58.0
Everett Jenkin's residence, about 2,000 feet east of; in center of top of large sandstone about 10 feet long by 5 feet wide jutting into Corn Creek at ford near forks; aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1908, Missouri".....	37 44 27.1	91 53 07.0
Road forks at east end of lane.....	37 44 26.8	91 52 30.0
Edgar Springs, about 3 miles north of; at junction of Edgar Springs road and new road north, just north of Bodock place, 12 feet west to post-oak tree used as telegraph pole.	37 44 27.0	91 51 27.8
T. 35 N., R. 9 W., quarter corner, east side of sec. 25, at Mr. Baker's residence.....	37 43 35.0	91 51 45.2
Road forks, 10 feet southwest, to blaze on post-oak.....	37 44 11.6	91 50 11.2
Crossroads.....	37 44 32.0	91 49 48.9
T. 35 N., R. 8 W., northeast corner sec. 21, Phelps-Dent county line.....	37 44 51.8	91 48 26.6
Center of T road north, about 400 feet southeast of Curtis's blacksmith shop.....	37 44 51.6	91 45 41.2
T. 35 N., R. 8 W., northeast corner sec. 24, center of T road west.....	37 44 51.4	91 45 08.0

MONTANA.

TRIANGULATION STATIONS.

Missoula quadrangle.

MISSOULA AND RAVALLI COUNTIES.

During the summer of 1908 Arthur Stiles obtained additional primary control for Missoula 30 minute quadrangle by reoccupying Miller, McLeod, and St. Mary stations, occupying one new station, and locating several points by intersections. Positions are based on Helena-Hamilton mean astronomic datum.

BLACK LEAD, MISSOULA COUNTY, MONT.

(Not occupied.)

On the highest boulder on the mountain, about 400 feet east of the main summit and about 0.25 mile from where the Black Lead trail passes over the first divide; on divide between Montana and Idaho about 6 miles southwest of Lolo Hot Springs.

Signal: A flag staff 10 inches thick and 30 feet long fastened in top of boulder.

Station mark: Aluminum tablet cemented in top of boulder.

[Latitude, $46^{\circ} 43' 40.70''$. Longitude, $114^{\circ} 38' 36.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stark.....	7 50 08	4. 6092439
Miller.....	86 51 00	4. 7634639
St. Mary.....	128 02 02	4. 5894827

BLUE MOUNTAIN, MISSOULA COUNTY, MONT.

(Not occupied.)

On the divide between Lolo and O'Brien creeks and the Bitter Root River, about 5 miles west of the Buckhouse Bridge. The forestry trail from Hayes Creek to Lothrop passes just south of the peak.

Signal: A flagstaff nailed in top of high green tree on north edge of peak. There are some other high trees northeast of the signal, but on the south and west side the peak is bare.

Station mark: Center of signal tree which is blazed on the south side and has the letters "U. S." outlined with nails in the blaze.

Reference mark: Aluminum tablet cemented in solid rock; true azimuth $357^{\circ} 58'$, distance 48.8 feet.

[Latitude 46° 49' 02.50". Longitude 114° 11' 08.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McLeod.....	32 59 45	4. 5683140
Miller.....	105 54 12	4. 3763554
Stark.....	315 50 05	4. 6254245

LOLO PEAK, MISSOULA COUNTY, MONT.

(Not occupied.)

On the highest part of the extreme western edge of a very high, flat-topped peak in the Bitter Root Mountains, overlooking the valleys of Lolo Creek and Bitter Root River, and about 10 miles northwest of Florence. From Carlton and Smith's ranch follow trail which leads up the divide to Carlton Lake; thence up the right-hand fork of the canyon to the summit of the main divide just north of the station.

Signal and station mark: Center of cairn 7 feet high.

Reference mark: Aluminum tablet cemented in solid rock at northeast edge of cairn.

[Latitude 46° 41' 01.26". Longitude 114° 14' 13.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Miller.....	72 46 37	4. 4491363
St. Mary.....	181 24 46	4. 2775636
Stark.....	330 29 57	4. 7150467

M'LEOD, MISSOULA COUNTY, MONT.

The highest peak of group of mountains lying south of Jocko River and north of Missoula, on a southern extension of the Mission Range. It is plainly visible from Jocko post-office and Jocko Valley. Summit is round and barren, the broken rock having a deep amphitheater on northeast. Peak is easily ascended on foot, from pass on north, 800 feet below summit, but animals may be taken to the station by approaching the peak along the southern slope.

Signal and station mark: Cairn 9 feet high over aluminum tablet cemented in rock in place.

392 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 47° 05' 48.80". Longitude 113° 55' 17.53.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
St. Mary.....	20 50 35.53	200 36 31.51	4. 8411536
Blue.....	32 59 45	.....	4. 5683140
Murphy.....	43 00 58	.....	3. 7622636
Petty Creek.....	61 04 55	.....	4. 6236614
Stark.....	89 23 47.46	268 55 14.94	4. 6929809
Squaw Peak.....	102 09 17	.....	4. 5263702
McDonald.....	180 27 37.90	0 27 37.60	4. 5046578
Holland.....	207 38 01.81	27 53 02.63	4. 7424174
Monture.....	251 18 33.13	71 46 10.73	4. 7006137
Kamas.....	324 59 10.07	145 12 31.92	4. 6081045
Quigg.....	347 04 26.19	167 13 20.58	4. 8445761
Miller.....	355 50 47.28	175 52 21.13	4. 5757137

MILLER, MISSOULA COUNTY, MONT.

On a high, round-topped knob, about 10 miles (air line) southeast of Missoula. Knob at top is timbered on north, east, and west slopes; is grassy and open on south. It is between Little Park Creek, a branch of Miller Creek, and Main Miller Creek; about 2 miles northeast of Hayes's sawmill and 2 miles southeast of mouth of Little Park Creek. Good camp on Miller Creek.

Station mark: Aluminum tablet cemented in solid rock.

[Latitude 46° 45' 32.90". Longitude 113° 53' 09.05".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willow.....	3 23 06.95	183 21 29.21	4. 6882822
St. Mary.....	45 09 31.93	224 53 56.85	4. 5873858
Lolo Peak.....	72 46 37	.....	4. 4491363
Black Lead.....	86 51 00	.....	4. 7634639
Blue.....	105 54 12	.....	4. 3763554
Petty Creek.....	113 33 59	.....	4. 6346012
Stark.....	125 27 29.76	304 57 28.06	4. 8052800
Squaw Peak.....	141 27 43	.....	4. 7563559
Murphy.....	168 42 03	.....	4. 5312102
McLeod.....	175 52 21.13	255 50 47.28	4. 5757137
Quigg.....	337 08 42.48	157 16 02.01	4. 5212790

MURPHY, MISSOULA COUNTY, MONT.

(Not occupied.)

A high peak about 15 miles north of Missoula, near head of Grant Creek, overlooking Fort Missoula and valley of Bitter Root River.

Signal and station mark: Rock cairn 7 feet high.

[Latitude $47^{\circ} 03' 31.80''$. Longitude $113^{\circ} 58' 24.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McLeod		43 00 58	3. 7622636
Miller.....		168 42 03	4. 5312102

PETTY CREEK, MISSOULA COUNTY, MONT.

(Not occupied.)

On the southeast edge of a high, flat, burned mountain, north of some green trees, about 8 miles southeast of Lothrup; on the divide between Petty Creek, Lolo Creek, and Missoula River. The forestry trail between Lothrup and Hayes Creek passes within 50 feet of the station.

Signal and station mark: Pine-pole tripod 30 feet high over center of two connected stumps.

Reference mark: Cross mark and the letters "U. S." cut deep in the rock; true azimuth $320^{\circ} 12'$, distance 21 feet 7 inches.

[Latitude $46^{\circ} 54' 46.84''$. Longitude $114^{\circ} 24' 16.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McLeod		61 04 55	4. 6236614
Miller.....		113 33 59	4. 6346012
Stark.....		327 14 39	4. 3697838

SQUAW PEAK, NEAR MISSOULA-SANDERS COUNTY LINE, MONTANA.

(Not occupied.)

On a sharp, lone peak, locally known throughout the whole country side and visible for miles around, near boundary line between Missoula and Sanders counties, about 15 miles northeast of Lothrup.

Signal and station mark: Rock cairn 9 feet high.

394 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 47° 09' 34.91". Longitude 114° 21' 16.95".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McLeod.....		102 09 17	4. 5263702
Miller.....		141 27 43	4. 7563559
Stark.....		244 45 40	4. 2584119

ST. MARY, RAVALLI COUNTY, MONT.

Eight miles west of Stevensville. From Curlew extension, north end of Curlew mine, follow the ridge nearly to top; thence follow right-hand ridge to main dividing ridge, along which a trail is plainly blazed to the lake, which is about 1.5 miles north of station and 8 miles northwest of Curlew.

Signal and station mark: Cairn 8 feet in diameter, 10 feet high, over copper bolt in solid rock.

[Latitude 46° 30' 47.79". Longitude 114° 14' 35.27".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ward (1).....	4 35 14. 87	184 33 32. 40	4. 5797243
Ward (2).....	4 47 49. 15	184 46 01. 41	4. 5820774
El Capitan.....	11 54 41. 10	191 48 04. 30	4. 7578320
Black Lead.....	128 02 02		4. 5894827
Stark.....	158 48 25. 70	338 34 05. 26	4. 8379868
Lolo Peak.....	181 24 45		4. 2775636
Willow.....	310 52 19. 34	131 06 13. 50	4. 5129510
Daly.....	331 01 52. 82	151 11 32. 72	4. 5495169
North Base.....	345 50 08. 51	165 53 52. 84	4. 4330820
South Base.....	347 58 33. 55	168 02 43. 96	4. 5515850

STARK, MISSOULA COUNTY, MONT.

On the south edge of the top of the northern and higher of two peaks, about 3 miles southwest of Stark post-office. Is most easily reached by following up the long ridge to the left of McFarland hay barn.

Signal and station mark: Pine-pole tripod 20 feet high; aluminum tablet set in rock.

Reference mark: A cross mark and the letters "U. S." cut deep in rock; true azimuth 7° 47', distance 11 feet.

[Latitude 47° 05' 25.35". Longitude 114° 34' 15.56".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black Lead.....	7 50 08	.....	4. 6092439
Squaw Peak.....	244 45 40	.....	4. 2584119
McLeod.....	268 55 14. 94	89 23 47. 46	4. 6929809
Miller.....	304 57 28. 06	125 27 29. 76	4. 8052800
Blue.....	315 50 05	.....	4. 6252445
Petty Creek.....	327 14 39	.....	4. 3697838
Lolo Peak.....	330 29 57	.....	4. 7150467
St. Mary.....	338 34 05. 26	158 48 25. 70	4. 8379868

Blackfoot, Cutbank, and Heart Butte quadrangles.**BLACKFEET INDIAN RESERVATION AND TETON COUNTY.**

In 1907 additional triangulation for the control of the Blackfeet Indian Reservation was extended from Alias, Durham, Half Dome, and Connie stations, based on the Helena-Hamilton mean bases and astronomic stations. Six primary stations were occupied and numerous points were located by the 3-point method and by intersections. This work was done by H. L. Baldwin, in connection with the subdivision of the Blackfeet Indian Reservation under the supervision of the General Land Office.

ALIAS, TETON COUNTY, MONT.

On highest butte, about 10 miles north of Cook's ranch, on Cutbank Creek, near southeast corner of sec. 14, T. 35 N., R. 9 W.

Station mark: Iron bench-mark post set 3 feet in ground.

[Latitude 48° 47' 08.07". Longitude 112° 44' 04.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cyclone.....	17 58 12. 67	197 51 53. 51	4. 5264870
Cutbank.....	72 16 38. 65	252 00 11. 85	4. 4498243
Lincoln.....	123 43 09. 50	303 29 32. 88	4. 4239834
Milk River.....	196 26 39. 15	16 30 22. 76	4. 3289271
Landslide.....	205 59 54. 50	26 04 08. 53	4. 1951016
Baker.....	233 01 47. 08	53 09 24. 16	4. 1900240
Headlight.....	268 44 07. 68	89 03 20. 27	4. 4952805
Orient.....	301 48 43. 62	122 11 26. 55	4. 6412187
Badger.....	335 39 20. 73	155 50 00. 70	4. 6287748
Connie.....	350 37 29. 81	170 40 27. 45	4. 4743217

BADGER, TETON COUNTY, MONT.

On a prominent hill in the NE. $\frac{1}{4}$ sec. 22, T. 31 N., R. 7 W.

Station mark: Iron post set $3\frac{1}{2}$ feet in ground at summit of hill.

[Latitude $48^{\circ} 26' 12.54''$. Longitude $112^{\circ} 29' 51.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
G. M.....	24 27 15	.....	4. 54983
Sita.....	47 35 26.67	227 25 31.36	4. 3469576
Cyclone.....	103 50 28.90	283 33 32.19	4. 4581440
Connie.....	126 34 23.40	306 26 41.84	4. 1973317
Alias.....	155 50 00.70	335 39 20.73	4. 6287748
Headlight.....	199 22 50.69	19 31 20.20	4. 6208617
Orient.....	231 36 28.74	51 48 29.07	4. 4005416

CONNIE, TETON COUNTY, MONT.

On a high bluff north of Two Medicine Creek, about 1.5 miles east of Schoot's ranch and about 4 miles east of Old Mission. Is a little east of the center of sec. 20, T. 32 N., R. 8 W.

Station mark: Iron bench-mark post set 3 feet in ground.

[Latitude $48^{\circ} 31' 15.94''$. Longitude $112^{\circ} 40' 08.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sita.....	8 38 54.94	188 36 40.32	4. 3921263
Cyclone.....	80 29 41.67	260 20 26.08	4. 1886324
Cutbank.....	123 22 09.97	303 02 47.64	4. 5789289
Alias.....	170 40 27.45	350 37 29.81	4. 4743217
Baker.....	191 02 18.10	11 06 56.51	4. 5960195
Headlight.....	221 19 21.61	41 35 34.27	4. 6025849
Orient.....	258 58 08.68	79 17 51.54	4. 5179523
Badger.....	306 26 41.84	126 34 23.40	4. 1973317

CYCLONE, TETON COUNTY, MONT.

On high ridge near northwest corner of sec. 35, T. 32 N., R. 10 W., a few hundred feet north of the Browning-Pigeon wagon road at beginning of long descent to Two Medicine road, about 10 miles southeast of Browning.

Station mark: Iron post set 3 feet in ground.

[Latitude 48° 29' 52.73''. Longitude 112° 52' 30.07'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Heart Butte.....	6 47 13.07	186 45 10.99	4. 4550683
Half Dome.....	31 06 09.57	210 57 01.18	4. 4665777
Durham.....	98 41 07.84	278 33 34.82	4. 0988699
Alias.....	197 51 53.51	17 58 12.67	4. 5264870
Connie.....	260 20 26.08	80 29 41.67	4. 1886324
Badger.....	283 33 32.19	103 50 28.90	4. 4581440
Sita.....	332.02 11.35	152 09 11.42	4. 3925014

DURHAM, TETON COUNTY, MONT.

A high point on the ridge 0.75 mile south of Durham station on Great Northern Railway.

Station mark: Aluminum bolt set in a rock 2 feet long buried even with surface of ground.

[Latitude 48° 30' 53.68''. Longitude 113° 02' 34.88'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Half Dome.....	5 36 24.55	185 34 48.53	4. 4330247
Elk.....	36 29 36.39	216 18 14.18	4. 5000046
Observation.....	74 28 54.88	254 16 10.92	4. 3375263
Divide.....	122 52 09.10	302 36 06.04	4. 4952861
Cutbank.....	169 04 21.35	249 01 49.31	4. 3395795
Alias.....	216 55 45.97	37 09 39.24	4. 5764569
Cyclone.....	278 33 34.82	98 41 07.84	4. 0988699

G. M., TETON COUNTY, MONT.

On a very prominent hill about 10 miles a little south of west of Dupuyer, from which it is readily reached; in sec. 30, T. 28 N., R. 8 W., about 25 feet east of the second guide meridian west, and about 500 feet (estimated) south of the northwest corner of sec. 30..

Signal: An unsymmetrical, trimmed pine tree 12 feet in height. Directions were observed to tree from stations Badger, Sita, and Heart Butte, but the return directions were not taken. Two vertical angle observations from points 9 miles distant give elevation of 5,123 feet above sea level.

[Latitude 48° 08' 46.7". Longitude 112° 41' 42.1'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Heart Butte.....	122 52 02	302 41 58	4. 29947
Sita.....	174 08 01	354 06 56	4. 24003

HEADLIGHT, TETON COUNTY, MONT.

On Headlight Butte about 11 miles north of Cutbank; near the center of sec. 18, T. 35 N., R. 5 W.

Station mark: Aluminum tablet set in one of the large sandstone rocks composing the summit.

[Latitude 48° 47' 27.60". Longitude 112° 18' 32.77'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger.....	19 31 20.20	199 22 50.69	4. 6208617
Connie.....	41 35 34.27	221 19 21.61	4. 6025849
Alias.....	89 03 20.27	268 44 07.68	4. 4952804
Orient.....	346 19 12.67	166 22 44.92	4. 3890367

HEART BUTTE, TETON COUNTY, MONT.

On Heart Butte, serving as one of the defining points of the boundary between Blackfeet Indian Reservation and Lewis and Clark National Forest, but station is not at the same point as the boundary monument. The elevation above sea as determined by vertical angles from a large number of points is 6,863 feet.

Signal: A cairn 8 feet high with a 6-foot base, on summit.

Station mark: Aluminum tablet set in solid rock under cairn.

Reference mark: The boundary monument of stone, 6 feet high with a 6-foot base; azimuth to monument 349° 15', distance 101.5 feet.

[Latitude 48° 14' 36.01". Longitude 112° 55' 13.39'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Half Dome.....	105 23 28.94	285 16 23.50	4. 0861796
G. M.....	122 52 02	302 41 58	4. 29947
Cyclone.....	186 45 10.99	6 47 13.07	4. 4550683
Sita.....	246 26 08.09	66 35 09.22	4. 212246

LITTLE PLUM, TETON COUNTY, MONT.

(Not occupied.)

A mountain peak close to and west of line between Blackfeet Indian Reservation and Lewis and Clark National Forest. Latitude $48^{\circ} 16'$, $38.2''$; longitude $113^{\circ} 00' 32.1''$.

ORIENT, TETON COUNTY, MONT.

On the highest ground in the vicinity, about 5 miles southeast of Cutbank; about 500 feet north of the quarter corner east side of sec. 34, T. 33 N., R. 5 W., and probably very close to the section line.

Station mark: Iron post set 42 inches in ground.

Reference mark: Rock pile N. 13.5° W. about 8 feet.

[Latitude $48^{\circ} 34' 37.09''$. Longitude $112^{\circ} 13' 50.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger.....	51 48 29.07	231 36 28.74	4.4005416
Connie.....	79 17 51.54	258 58 08.68	4.5179523
Alias.....	122 11 26.55	301 48 43.62	4.6412187
Headlight.....	166 22 44.92	346 19 12.67	4.3890367

SEVILLE, TETON COUNTY, MONT.

(Not occupied.)

Center of water tank at Seville railroad station, on the Great Northern Railway.

[Latitude $48^{\circ} 37' 56.6''$. Longitude $112^{\circ} 38' 47.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Baker.....	12 40 49	4.43123
Alias.....	339 05 12	4.26085

SITA, TETON COUNTY, MONT.

On prominent elevation near center of SE. $\frac{1}{4}$ of sec. 1, T. 29 N., R. 9 W.

Station mark: Iron post set 3 feet in ground near south end of ridge. Elevation above sea level 4,792 feet.

[Latitude 48° 18' 06.38". Longitude 112° 43' 08.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Heart Butte.....	66 35 09.22	246 26 08.09	4. 212246
Cyclone.....	152 09 11.42	332 02 11.35	4. 3925014
Connie.....	188 36 40.32	8 38 54.94	4. 3921263
Badger.....	227 25 31.36	47 35 26.67	4. 3469576
G. M.....	354 06 56	174 08 01	4. 24003

SECONDARY POINTS, BLACKFEET INDIAN RESERVATION, TETON COUNTY, MONT.

Points located (1) by 2 or more intersections, or (2) by "3-point" observations, or (3) by connections with a located point. Magnetic variations: G. M., N. 23° 23' E.; Cyclone, N. 21° 48' E.; Orient, N. 21° 45' E.

Geographic positions.

Stations.	Latitude.	Longitude.
	° ' "	° ' "
T. 35 N., R. 11 W., northeast corner sec. 23.....	48 47 06.6	112 59 41.6
T. 33 N., R. 8 W., quarter corner east side of sec. 9.....	48 37 59.3	112 38 46.6
T. 29 N., R. 9 W., quarter corner north side of sec. 12...	48 17 49.2	112 42 58.6
T. 29 N., R. 9 W., northeast corner sec. 5.....	48 18 41.3	112 47 30.2
T. 35 N., R. 6 W., quarter corner east side of sec. 13.....	48 47 33.1	112 19 07.6
T. 31 N., R. 10 W., northeast corner sec. 1.....	48 29 05.93	112 50 05.87
T. 30 N., R. 7 W., northeast corner sec. 4.....	48 23 53.56	112 30 39.57
T. 33 N., R. 13 W., northeast corner sec. 1.....	48 34 05.18	113 14 04.99
T. 33 N., R. 11 W., northeast corner sec. 1.....	48 39 17.86	112 58 22.95
T. 32 N., Rs. 8 and 9 W., closing corner of township.....	48 34 04.68	112 42 18.66
T. 36 N., R. 6 W., northeast corner sec. 23.....	48 52 19.94	112 20 26.86
T. 33 N., R. 6 W., northeast corner sec. 12.....	48 38 25.70	112 19 07.06
Gravel Hill (monument).....	48 21 48.6	112 32 05.3
Bushy Butte, south of Midvale (elevation 8,869 feet)....	48 22 44.3	113 08 23.0
Cutbank water tank.....	48 38 19.4	112 19 44.5
Sweet Grass Butte (conical peak).....	48 50 58.5	111 22 24.5
Love Rock.....	48 54 46.3	112 33 18.1
Indian grave.....	48 25 46.3	112 49 33.9
Red spire of church at Dupuyer.....	48 11 43.9	112 29 45.9
Catholic Church at Dupuyer.....	48 11 38.7	112 29 52.4
House west of Conrad Lake.....	48 17 51.4	112 18 37.5

MONTANA-NORTH DAKOTA.

TRIANGULATION STATIONS.

Glendive quadrangle.

DAWSON AND VALLEY COUNTIES, MONT.; MCKENZIE COUNTY, N. DAK.

In 1906 triangulation was extended by R. H. Chapman, partly across the area included between meridians 104° and 105° west longitude and parallels 47° and 48° north latitude, in connection with the topographic mapping of a degree quadrangle, about Glendive, Mont. For all primary stations signals were erected and permanent station marks set. The conditions under which work was prosecuted made it necessary to omit several very desirable sites, the work being preliminary in character. During 1907 D. F. C. Moor continued the scheme southward.

The following positions depend on stations Montana, Lanark, and Cutoff, of the Missouri River Commission, which have been corrected for latitude and longitude to the work of the Geological Survey by constants obtained in previous years at several stations in north-central Montana by H. L. Baldwin. The latitude adopted is that of International boundary monument No. 318, corrected graphically for station error to the mean parallel of $49^{\circ} 00' 04.90''$. The longitude depends on the astronomic longitude of the schoolhouse and church spire at Chinook, as determined by the Coast and Geodetic Survey in the fall of 1903. The Missouri River Commission distances and azimuths were used without correction. The azimuths given are those brought from the Missouri River Commission points as far south as the line between Benning and Threemile. Azimuths were observed at each of these stations and the computations of points south of this line were made with a mean value of the observed azimuths. No correction for the new azimuth or corresponding difference in position was made to points north of the Benning-Threemile line.

BENNING, DAWSON COUNTY, MONT.

About 16 miles east of Glendive on highest point of divide between Box Elder and Glendive creeks, 0.75 mile northeast of Bennings ranch at head of Griffith Creek.

Station mark: Aluminum tablet set in stone level with surface.

Reference mark: Northeast corner sec. 27, T. 16 N., R. 57 E.; true azimuth $188^{\circ} 59'$, distance 1,170 feet.

[Latitude 47° 07' 14.33". Longitude 104° 28' 34.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Caine ^a	53 23 32.31	233 15 49.34	4. 2209188
Hollicker ^a	102 44 39.22	282 24 34.37	4. 5498404
Threemile ^a	115 32 42.66	295 18 25.62	4. 4353290
Burns ^b	159 37 24.99	339 31 16.31	4. 4807415
Burns ^a	159 37 39.49		
Blue Camel ^b	236 56 18.17	57 09 54.25	4. 4457369
Blue Camel ^a	236 56 32.67		

^a Mean of azimuths observed at Benning and Threemile.^b Azimuths as computed from north.

BLUE CAMEL, DAWSON COUNTY, MONT.

Highest point of a high bare mountain about 30 miles a little north of east of Glendive; 20 miles due north of town of Wibaux and variously known locally as Blue Mountain and Camels Hump. It lies between the heads of Smith and Cottonwood creeks, 3 miles north-west of Hall's ranch (winter camp).

Station mark: Triangulation tablet in solid rock under a cairn 4 feet high used as a signal.

[Latitude 47° 15' 25.85". Longitude 104° 10' 01.68".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Benning	57 09 54.25	236 56 18.17	4. 4457369
Hollicker	82 57 03.23	^a 236 56 32.67	4. 7668249
Threemile	86 04 53.09	265 36 58.31	4. 6821486
Burns	111 23 26.00	291 03 39.16	4. 5608159
Zoo	121 11 03.68	300 36 29.42	4. 8377246
Wandell	145 47 13.82	325 33 15.66	4. 6265144
Gramma	194 46 32.60	14 50 52.54	4. 4621387

^a Mean of observed azimuths.

BURNS, DAWSON COUNTY, MONT.

On easternmost point of prairie mesa 4 miles north of Thirteenmile Creek and about 12 miles northwest from Head Works camp on Yellowstone River; 2 miles southwest of Murphy ranch, and 1 mile west of road from Burns Creek schoolhouse to Glendive. An old road runs up ridge to station. The ground to west and southwest is a little higher.

Station mark: Bronze tablet in sandstone 18 by 16 by 16 inches set in ground level with surface.

Reference marks: (1) A triangle cut in sandstone block; true azimuth $202^{\circ} 44'$, distance 8.0 feet. (2) Beer bottle with neck level with surface; true azimuth $16^{\circ} 35'$, distance 15.2 feet.

[Latitude $47^{\circ} 22' 32.30''$. Longitude $104^{\circ} 36' 56.19''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cain.....	4 06 22.726	.....	4.5841072
Threemile.....	40 07 42.38	219 59 32.54	4.3375902
Wandell.....	204 33 05.54	24 38 56.42	4.3793044
Gramma.....	249 59 26.63	70 23 36.07	4.6416860
Blue Camel.....	291 03 39.16	111 23 26.00	4.5608159
Benning.....	339 31 16.31	159 37 24.99	4.4807415

CAINE, DAWSON COUNTY, MONT.

(Not occupied.)

On a small timbered knoll, the highest of several in the bad lands, about 6 miles southeast of Glendive and about 3 miles northeast of Fisher's ranch on Sand Creek. A road up Caines Coulee leads nearly to point.

Station mark: Large pine tree, about 30 inches in diameter, with lower branches trimmed, about 10 feet north of highest point of knoll. The tree leans toward the north and is most prominent from that direction.

[Latitude $47^{\circ} 01' 52.65''$. Longitude $104^{\circ} 39' 06.40''$.]

To station—	Azimuth. ^a	Back azimuth. ^a	Log. distance.
	° ' "	° ' "	Meters.
Hollicker.....	129 44 16.19	309 31 55.45	4.4421395
Threemile.....	152 27 58.42	332 21 25.38	4.3875038
Burns.....	184 05 01.71	.....	4.5841072
Benning.....	233 15 49.34	53 23 32.31	4.2209188

^a All azimuths from mean of observations at Benning and Threemile.

CUTOFF, DAWSON COUNTY, MONT.

A station of the Missouri River Commission, on knoll at edge of prairie, on bluff overlooking the Missouri River, 5.5 miles a little south of west of town of Mondak.

Station mark: Iron post of the Missouri River Commission, top projecting 2 feet above surface of ground.

[Latitude 47° 59' 54.15". Longitude 104° 09' 57.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jackson.....	57 22 36.85	237 15 20.94	4.1603417
Tribute.....	101 18 36.8	281 07 02.4	4.2952808
Lanark.....	157 43 09.18	337 40 11.84	4.1142866
Montana.....	246 04 05	66 09 06.88	3.9635241
Nickel.....	334 03 05.75	154 10 41.17	4.4656640

GRAMMA, DAWSON COUNTY, MONT.

On highest point at north end of Brick Red Mesa, east of Yellowstone River, 10 miles north of Smith Creek. The mesa is highest land in vicinity, and is close to North Dakota-Montana boundary line.

Signal: Rough tripod with brush top, black flag, and white targets.

Station mark: Aluminum tablet in sandstone block 14 inches square by 6 inches thick, level with surface.

[Latitude 47° 30' 33.14". Longitude 104° 04' 08.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue Camel.....	14 50 52.54	194 46 32.60	4.4621387
Burns.....	70 23 36.07	249 59 26.63	4.6416860
Wandell.....	102 40 16.61	282 21 56.16	4.5045309
Lovering.....	136 26 09.27	316 13 23.56	4.4963322
Jackson.....	157 22 26.70	337 10 54.34	4.7032558
Nickel.....	191 06 38.10	11 09 53.92	4.4569824

HOLLICKER, DAWSON COUNTY, MONT.

On the prairie about 12 miles northwest of Glendive, at highest part of ridge at head of Dry Creek, between Deer Creek and upper Seven-mile Creek, about 3 miles southwest of Hollicker's ranch. Station is best reached by wagon road up Dry Creek, which passes 0.75 mile south of station.

Station mark: Aluminum tablet in stone 6 inches square by 4 inches, set level with surface.

Reference marks: (1) Bottle buried neck level with surface, 12.6 feet northeast of center; (2) bottle similarly buried, 18.95 feet south of center.

[Latitude 47° 11' 24.39". Longitude 104° 55' 57.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Threemile.....	248 15 11.25	68 20 59.61	4.0315141
Blue Camel.....	262 23 35.02	.....	4.7668249
Benning.....	282 24 34.37	102 44 39.22	4.5498404
Caine.....	309 31 55.45	129 44 16.19	4.4421395
Hoopup.....	344 52 27	164 55 41	4.3299249

HOOPUP, DAWSON COUNTY, MONT.

(Not occupied.)

A secondary station on flat ridge 0.5 mile south of ranch on Hoopup Creek, about 15 miles southwest of Glendive, and about 3 miles west of Yellowstone River.

Station mark: Peg in ground.

Reference marks: (1) 4-foot post set in ground to north, distant 17.3 feet; (2) 4-foot post to west, 17.35 feet; (3) 4-foot post to south, 15.50 feet; (4) 4-foot post to east, 16.65 feet; (5) fence post 6 feet high to north, 32.65 feet.

[Latitude 47° 00' 16.05". Longitude 104° 51' 33.39".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hollicker.....	164 55 41	344 52 27	4.3299249
Threemile.....	190 12 30.81	10 15 05.21	4.3981325

JACKSON, DAWSON COUNTY, MONT.

On northern of two high mesas about 15 miles west of Dore post-office, N. Dak. It is 0.25 mile northwest of Sioux Pass and about 4 miles west of Jackson's sheep ranch on Fourmile Creek.

Signal: Twelve-foot tetrapod; black-red target; black flag.

Station mark: Drill hole in sandstone 18 by 14 by 8 inches, level with surface.

Reference marks: Beer bottle, neck level with surface; true azimuth 213° 25', distance 16.9 feet.

[Latitude 47° 55' 41.24". Longitude 104° 19' 44.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lovering.....	5 01 50.20	185 00 35.42	4.3799901
Midbutte.....	38 41 34	218 31 19	4.44181
Redwater.....	66 46 37	246 27 23	4.54693
Tribute.....	148 18 39	328 14 21	4.1366014
Lanark.....	199 57 23.97	20 01 43.62	4.3247168
Cutoff.....	237 15 20.94	57 22 36.85	4.1603417
Montana.....	240 38 00	60 50 15	4.37283
Nickel.....	306 22 38.02	126 37 28.24	4.4922044
Gramma.....	337 10 54.34	157 22 26.70	4.7032558

LOVERING, DAWSON COUNTY, MONT.

On east point of grassy mesa about 10 miles west of Sidney and south of waters of Lonetree Creek.

Station mark: Aluminum tablet in block of quartzite 15 by 12 by 6 inches set level with surface.

Reference marks: (1) Nail in top of peg 1 inch above surface; true azimuth 12° 45', distance 9.05 feet. (2) Nail in top of peg 1 inch above surface; true azimuth 157° 10', distance 12.16 feet. (3) Nail in peg 1 inch above surface; true azimuth 245° 29', distance 11.39 feet.

[Latitude 47° 42' 47.54". Longitude 104° 21' 25.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wandell.....	31 07 21.00	211 01 44.86	4.2646960
Midbutte.....	98 37 21	278 28 21	4.18641
Jackson.....	185 00 35.42	5 01 50.20	4.3799901
Nickel.....	258 33 54.40	78 49 57.79	4.4418193
Gramma.....	316 13 23.56	136 26 09.27	4.4963322

MIDBUTTE, DAWSON COUNTY, MONT.

(Not occupied.)

Highest of three buttes on Meadow Branch of South Fork of Fox Creek 0.75 mile south of Three Buttes post-office, McKenzie ranch, and 20 miles northwest from Tokna post-office.

Station mark: Highest point on butte.

[Latitude 47° 44' 01.49". Longitude 104° 33' 34.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Redwater.....	116 50 42	296 41 45	4. 22887
Jackson.....	218 31 19	38 41 34	4. 44181
Lovering.....	278 28 21	98 37 21	4. 18641

REDWATER, DAWSON COUNTY, MONT.

Highest point of conical hill on divide between East Redwater and Fox Creeks, 8 miles due north of Oliver Oakley's ranch (Enid post-office), about 1 mile west of Enid-Culburtson road.

Signal: Tripod with red and white targets and brush top, 18 feet high.

Station mark: Bronze tablet in sandstone 24 by 12 by 10 inches, level with surface.

[Latitude 47° 48' 08.50". Longitude 104° 45' 40.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Zoo.....	29 19 04.9	209 10 46.3	4. 4619119
Tribute.....	224 16 04	44 31 01	4. 5547505
Jackson.....	246 27 23	66 46 37	4. 54693
Midbutte.....	296 41 45	116 50 42	4. 22887

THREEMILE, DAWSON COUNTY, MONT.

On small knoll on east end of mesa south of the head of Threemile Creek, on divide between it and Deer Creek, 1½ miles southwest of Kolberg's ranch on Threemile Creek.

Station mark: Aluminum tablet set in stone 18 by 12 by 8 inches, level with surface.

Reference marks: Quarter corner north side of sec. 23, T. 17 N., R. 56 E.; true azimuth 153° 43', distance 17.5 feet.

[Latitude 47° 13' 33.10". Longitude 104° 48' 02.70".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hoopup ^a	10 15 05.21	190 12 30.81	4. 3981325
Hollicker ^a	68 20 59.61	248 15 11.25	4. 0315141
Burns ^b	219 59 32.54	40 07 42.38	4. 3375902
Blue Camel ^b	265 36 58.31	86 04 53.09	4. 6821486
Blue Camel ^a	265 37 12.81	.....	.....
Benning ^a	295 18 25.62	115 32 42.66	4. 4353290
Caine ^a	332 21 25.38	152 27 58.42	4. 3875038

^a Mean of azimuths observed at Benning and Threemile.^b Azimuths as computed from north.

TRIBUTTE, DAWSON COUNTY, MONT.

On east end of highest of four buttes known as Missouri River Three Buttes, south of river, about 10 miles southwest of Culburtson, about 8 miles northwest of Donald's ranch, between waters of Cherry Creek and Missouri River.

Signal: Tripod 10 feet high; red, black, and white targets.

Station mark: Bronze tablet set in soft sandstone block 18 by 14 by 8 inches, level with surface.

Reference marks: (1) 1-inch hole drilled through sandstone set on edge 19.8 feet northeast of center; (2) cross cut in sandstone ledge 36.4 feet south of center and 12 feet below it.

[Latitude 48° 01' 58.42". Longitude 104° 25' 31.54".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Redwater.....	44 31 01	224 16 04	4.5547505
Lanark.....	240 16 46.88	60 25 24.50	4.2194126
Cutoff.....	281 07 02.4	101 18 36.8	4.2952808
Jackson.....	328 14 21	148 18 39	4.1366014

WANDELL, DAWSON COUNTY, MONT.

On highest point of easternmost tongue of grassy mesa, 10 miles northwest of Tokna post-office, at head of Crane Creek, 1 mile northwest of Alex Wandell's horse ranch.

Station mark: 6-inch pole 14 feet long, set in ground 3 feet.

Reference marks: (1) pit 6.3 feet a little south of east from center of pole; (2) pit 7.6 feet, a little south of west from center of pole; (3) pit 8 feet a little east of north from center of pole.

[Latitude 47° 34' 17.41". Longitude 104° 29' 00.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burns.....	24 38 56.42	204 33 05.54	4.3793044
Zoo.....	90 48 53.67	270 28 14.48	4.5451765
Lovering.....	211 01 44.86	31 07 21.00	4.2646960
Nickell.....	239 48 05.26	60 09 43.84	4.6266097
Gamma.....	282 21 56.16	102 40 16.61	4.5045309
Blue Camel.....	325 33 15.86	145 47 13.82	4.6265144

ZOO, DAWSON COUNTY, MONT.

A high knoll on prairie divide between waters of Missouri and Yellowstone rivers, about 35 miles a little west of north of Glendive. About 5 miles northwest of ranch in drawhead of Burns Creek. Station is about 20 feet from edge of bluff to north. The drainage to east is to north branch of Burns Creek, to west into Redwater Creek.

Station mark: Bronze tablet in sandstone 12 by 10 by 8 inches, set level with surface. Four inches under stone is an empty fruit can with middle of bottom under center.

Reference marks: (1) Peg 1 inch above surface; true azimuth $53^{\circ} 10'$, distance 13 feet. (2) Peg 1 inch above surface; true azimuth $209^{\circ} 10'$, distance 17.8 feet.

[Latitude $47^{\circ} 34' 30.16''$. Longitude $104^{\circ} 56' 58.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Redwater.....	209 10 46.3	29 19 04.9	4.4619119
Wandell.....	270 28 14.48	90 48 53.67	4.5451765
Blue Camel.....	300 36 29.42	121 11 03.68	4.8377246

LANARK, VALLEY COUNTY, MONT.

A station of the Missouri River Commission, on a prominent conical hill with white bluff and overhanging rock on south side; about 4.5 miles from Missouri River and 2.5 miles northwest of Little Muddy crossing on Buford-Mondak road to Lanark; west of railway track.

Signal: Tetrapod 14 feet high; black and white targets.

Station mark: Iron post of Missouri River Commission, 8 inches above surface.

[Latitude $48^{\circ} 06' 23.86''$. Longitude $104^{\circ} 13' 55.77''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jackson.....	20 01 43.62	199 57 23.97	4.3247168
Tributte.....	60 25 24.50	240 16 46.88	4.2194126
Montana.....	301 52 29.38	122 00 28.32	4.1962704
Cutoff.....	337 40 11.84	157 43 09.18	4.1142866

MONTANA, VALLEY COUNTY, MONT.

Station of the Missouri River Commission, on highest point of river bluffs 1.5 miles northwest of town of Mondak; highest point visible from town.

Signal: Tetrapod 16 feet high; black and white targets.

Station mark: Iron post of Missouri River Commission.

[Latitude $48^{\circ} 01' 54.70''$. Longitude $104^{\circ} 03' 11.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jackson.....	60 50 15	240 38 00	4. 37283
Cutoff.....	66 09 06.88	246 04 05	3. 9635241
Lanark.....	122 00 28.32	301 52 29.38	4. 1962704
Nickel.....	351 46 32.82	171 49 07.34	4. 4817482

NICKEL, M'KENZIE COUNTY, N. DAK.

On a high butte about 2 miles west of Nickel's ranch, about 6 miles southeast of Cartwright post-office and 10 miles northeast of Sidney. Just north of butte are two sharp conical hills; and 0.25 mile south is a similar hill as high as station, called Cedar Butte.

Signal: Tripod 14 feet high; red and white target.

Station mark: Bronze tablet in granite block 18 by 14 by 14 inches, set level with surface.

Reference mark: (1) Nail in peg; true azimuth $84^{\circ} 58'$, distance 8.3 feet. (2) Nail in peg; true azimuth $250^{\circ} 06'$, distance 6.2 feet.

[Latitude $47^{\circ} 45' 43.03''$. Longitude $103^{\circ} 59' 43.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gramma.....	11 09 53.92	191 06 38.10	4. 4569824
Wandell.....	60 09 43.84	239 48 05.26	4. 6266097
Lovering.....	78 49 57.79	258 33 54.40	4. 4418193
Jackson.....	126 37 28.24	306 22 38.02	4. 4922044
Cutoff.....	154 10 41.12	334 03 05.75	4. 4656640
Montana.....	171 49 07.34	351 46 32.82	4. 4817482

NEVADA.

TRIANGULATION STATIONS.

Ely special quadrangle.

WHITE PINE COUNTY.

In 1906 Fred McLaughlin triangulated a small area at Ely, Nev., in connection with the survey of a special map. Four primary stations were occupied and several secondary points cut in from them. The positions, distances, and azimuths depend upon the points Wheeler and Ward North, the former a primary and the latter a secondary station of the Coast and Geodetic Survey. A figure adjustment was made for the four new stations only, the connection with the Coast Survey points being through closed triangles.

ELY, WHITE PINE COUNTY, NEV.

On highest point of ridge 1.5 miles north of town of Ely.

Station mark: Triangulation tablet set in solid rock.

[Latitude $39^{\circ} 15' 55.87''$. Longitude $114^{\circ} 54' 06.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ward North.....	14 49 39	194 48 03	4. 153165
Saxton.....	46 01 17.7	226 00 17.9	3. 498185
Rib.....	75 08 05.5	255 04 18.8	3. 948853
Lane.....	105 30 28.9	285 29 49.7	3. 188143
Wheeler Peak.....	301 10 46	121 33 02	4. 775262

ELY, BRICKYARD, WHITE PINE COUNTY, NEV.

(Not occupied.)

Smokestack of brickyard in Steptoe Valley east of Ely.

[Latitude $39^{\circ} 14' 04.09''$. Longitude $114^{\circ} 50' 07.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ward North.....	42 20 46	222 16 39	4. 14426
Ely.....	121 00 31	300 58 00	3. 82579

412 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

ELY, CHAINMAN MINE, WHITE PINE COUNTY, NEV.

(Not occupied.)

Smokestack.

[Latitude 39° 15' 17.95". Longitude 114° 55' 39.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lane.....	205 20 30	25 20 50	3. 24315
Ely.....	242 22 15	62 23 14	3. 40194

ELY, COLUMBIA SHAFT, WHITE PINE COUNTY, NEV.

(Not occupied.)

Ventilator of hoist.

[Latitude 39° 15' 36.82". Longitude 114° 57' 39.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lane.....	254 30 57	74 32 32	3. 57392
Saxton.....	299 25 21	119 26 36	3. 51246

ELY, COPPER FLAT MINE (?), WHITE PINE COUNTY, NEV.

(Not occupied.)

Smokestack.

[Latitude 39° 15' 30.8". Longitude 114° 59' 32.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rib.....	27 25 26	207 25 05	3. 23142
Saxton.....	284 17 59	104 20 25	3. 75724

ELY, COURT-HOUSE, WHITE PINE COUNTY, NEV.

(Not occupied.)

[Latitude 39° 14' 52". Longitude 114° 53' 18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saxton.....	86 13 24	266 11 53	3. 53750
Ely.....	149 04 45	329 04 14	3. 35867

ELY, PILOT KNOB MINE (?), WHITE PINE COUNTY, NEV.

(Not occupied.)

South smokestack.

[Latitude 39° 15' 44.4". Longitude 115° 01' 28.62".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lane.....	265 09 47	85 13 47	3.96120
Saxton.....	282 22 28	102 26 08	3.93108
Rib.....	313 52 57	133 53 50	3.44482

ELY, RUTH MINE, WHITE PINE COUNTY, NEV.

(Not occupied.)

Largest smokestack.

[Latitude 39° 15' 20.62". Longitude 114° 58' 02.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lane.....	250 11 42	70 13 32	3.64636
Saxton.....	287 57 45	107 59 14	3.55182

ELY, SOUTH END PEAK, WHITE PINE COUNTY, NEV.

(Not occupied.)

About 0.25 mile south of Keystone mine.

[Latitude 39° 16' 39.29". Longitude 114° 58' 00.93".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lane.....	282 37 12	102 39 02	3.62678
Saxton.....	316 25 25	136 26 53	3.68712

LANE, WHITE PINE COUNTY, NEV.

On edge of highest bluff on south side of hill, about 3 miles west-northwest of Ely and 1 mile north of Lane City.

Station mark: Triangulation tablet set in solid rock under a cairn 4 feet high.

414 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 39° 16' 09.25". Longitude 114° 55' 08.56'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saxton.....	16 41 41.3	196 41 20.8	3.433540
Rib.....	69 14 01.5	249 10 54.0	3.880733
Ely.....	285 29 49.7	105 30 28.9	3.188143

RIB, WHITE PINE COUNTY, NEV.

On highest hill in range, locally known as Rib Hill, about 7 miles west-southwest of Ely and 1.5 miles south of Copper Flat.

Station mark: Triangulation tablet set in solid rock.

[Latitude 39° 14' 41.78". Longitude 115° 00' 04.84'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lane.....	249 10 54.0	69 14 01.5	3.880733
Ely.....	255 04 18.8	75 08 05.5	3.948853
Saxton.....	269 05 16.9	89 08 03.8	3.801137
Ward North.....	336 36 04	156 38 14	4.096797

SAXTON, WHITE PINE COUNTY, NEV.

On north end of ridge, locally known as Saxton Peak, about 2 miles west of Ely and 0.75 mile south of Chainman mine.

Station mark: Triangulation tablet set in solid rock, under cairn 5 feet high.

[Latitude 39° 14' 44.96". Longitude 114° 55' 41.07'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rib.....	89 08 03.8	269 05 16.9	3.801137
Lane.....	196 41 20.8	16 41 41.3	3.433540
Ely.....	226 00 17.9	46 01 17.7	3.498185

WARD NORTH, WHITE PINE COUNTY, NEV.

A secondary point of the Coast and Geodetic Survey on summit of the north end of a narrow ridge about 8 miles south of Ely.

Station mark: Triangulation tablet set in solid rock, under cairn 5 feet high.

[Latitude α 39° 08' 29.8''. Longitude α 114° 56' 38.2''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rib.....	156 38 14	336 36 04	4. 096797
Ely.....	194 48 03	14 49 39	4. 153165
Wheeler α	287 21 20	107 45 11	4. 757762

 α Coast and Geodetic Survey.

WHEELER, WHITE PINE COUNTY, NEV.

Coast and Geodetic Survey station on mountain locally known as Jeff Davis Peak, most prominent peak of Snake Range, which lies between Spring Valley and Snake Valley.

Station mark: Half-inch copper bolt set in a $\frac{3}{4}$ -inch drill hole at top in center of stone pier.

[Latitude α 38° 59' 09.868''. Longitude α 114° 18' 47.882''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ward North α	107 45 11	287 21 20	4. 757762
Ely.....	121 33 02	301 10 46	4. 775262

 α Coast and Geodetic Survey.

NEW MEXICO.

PRIMARY TRIANGULATION STATIONS.

Silver City quadrangle.

GRANT COUNTY.

In the summer of 1907 Fred McLaughlin extended triangulation eastward from the line from Bullard to Canyon, so as to control the Silver City 30-minute quadrangle. Eight new stations were selected, occupied, and permanently marked, and several points were located by intersections.

Stations Bear, Bayard, and Lone are nearly or quite identical with stations located by the Wheeler Survey in 1879. Positions are based on the Maricopa, Ariz., astronomic datum.

BAYARD, GRANT COUNTY, N. MEX.

Identical with the Wheeler astronomic station, on the summit of a rounded hill of syenite rock just outside the quadrangle of the post at its southwestern corner.

Station mark: Aluminum tablet cemented in rock placed over foundation of the Wheeler astronomic pier.

416 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $32^{\circ} 47' 42.73''^a$; $32^{\circ} 47' 40.35''^b$. Longitude $108^{\circ} 09' 09.44''^a$; $108^{\circ} 09' 08.77''^b$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lone.....	15 29 48.21	195 28 47.74	4. 0374460
Bear.....	102 39 32.80	282 32 50.30	4. 2966200
Hermosa.....	223 10 30.28	43 12 09.46	3. 8423094

^a From Maricopa base.^b Wheeler observed value.

BEAR, GRANT COUNTY, N. MEX.

On Bear Mountain, about 8 miles northwest of Silver City; probably 6 or 8 feet east of the point occupied by the Wheeler survey.

Station mark: Aluminum tablet cemented in solid rock:

[Latitude $32^{\circ} 50' 02.96''^a$; $32^{\circ} 50' 00.7''^b$. Longitude $108^{\circ} 21' 32.15''^a$; $108^{\circ} 21' 31.6''^b$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burro.....	14 23 05.87	194 20 41.43	4. 4480312
Bullard.....	50 10 44.50	230 04 54.72	4. 3407143
Canyon.....	157 05 07.01	337 01 43.60	4. 3967277
Black.....	245 55 54.55	66 02 17.93	4. 3032764
Hermosa.....	268 08 35.38	88 16 57.37	4. 3817791
Bayard.....	282 32 50.30	102 39 32.80	4. 2966200
Lone.....	312 01 39.91	132 07 21.39	4. 3448371
Silver City.....			4. 01335

^a From Maricopa base.^b Wheeler observed value.

BLACK, GRANT COUNTY, N. MEX.

On highest point of range, about 4 miles east of Pinos Altos post-office.

Station mark: Aluminum tablet cemented in solid rock, under a cairn 5 feet high.

[Latitude $32^{\circ} 54' 28.56''$. Longitude $108^{\circ} 09' 45.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lone.....	4 52 59.02	184 52 18.14	4. 3654209
Silver City.....			4. 27901
Bear.....	66 02 17.93	245 55 54.55	4. 3032764
Canyon.....	117 51 21.92	297 41 33.84	4. 5011909
Hermosa.....	322 28 49.24	142 30 48.30	3. 9715720

BULLARD, GRANT COUNTY, N. MEX.

On a rocky cone (200 by 50 feet on top) about 20 miles southeast of Cliff post-office. A good wagon road leads from Cliff, via Mango Springs, "H. W." ranch, and Saddle Rock Canyon, to foot of peak, 1 mile from station.

Station mark: Bronze triangulation tablet cemented in solid rock, under cairn 9 feet high and 4 feet in diameter.

[Latitude $32^{\circ} 42' 26.95''$. Longitude $108^{\circ} 32' 18.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Secho.....	61 10 38.66	240 56 34.21	4.6692474
Line.....	110 20 16.09	290 05 21.36	4.6611612
Pleasant.....	150 23 41.25	330 10 35.08	4.8784318
Canyon.....	190 48 06.90	10 50 34.58	4.5760629
Bear.....	230 04 54.72	50 10 44.50	4.3407143
Burro.....	323 01 29.62	143 04 54.05	4.2156656

BURRO, GRANT COUNTY, N. MEX.

On the middle peak of the Burro Mountains, about 20 miles southwest from Silver City.

Station mark: Aluminum tablet cemented in solid rock, under a cairn 5 feet high.

[Latitude $32^{\circ} 35' 20.65''$. Longitude $108^{\circ} 25' 59.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bullard.....	143 04 54.05	323 01 29.62	4.2156656
Bear.....	194 20 41.43	14 23 05.87	4.4480312
Lone.....	242 06 32.48	62 14 36.98	4.4227439

CANYON, GRANT COUNTY, N. MEX.

On a sharp, brushy hill, on rocky ridge south and east of Gila River, about 6 miles northeast of Cliff post-office. Easily ascended from Gila River west of station up level, grassy ridge; thence to first gap south of hill; thence north on ridge to station.

Station mark: Bronze triangulation tablet cemented in solid rock.

52752°—Bull. 440—10—27

[Latitude $33^{\circ} 02' 28.22''$. Longitude $108^{\circ} 27' 46.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bullard.....	10 50 34.58	190 48 06.90	4.5760629
Line.....	67 11 46.73	246 54 19.96	4.7347506
Sunset.....	97 16 44.58	276 51 41.38	4.8571778
Pleasant.....	122 55 39.16	302 40 00.62	4.7232391
Mogollon.....	154 08 38.08	334 04 18.19	4.4502461
Black.....	297 41 33.84	117 51 21.92	4.5011909
Bear.....	337 01 43.60	157 05 07.01	4.3967277

FIERRO, GRANT COUNTY, N. MEX.

On a timbered hill about 2 miles east of Fierro post-office. An old wagon road from Fierro runs about 1,000 feet south of station.

Station mark: Aluminum tablet cemented in solid rock.

[Latitude $32^{\circ} 50' 34.37''$. Longitude $108^{\circ} 03' 58.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hermosa.....	86 17 40	266 16 31	3.52328
Nun.....	347 42 16	167 42 46	3.83475

HERMOSA, GRANT COUNTY, N. MEX.

On a prominent peak about 2 miles west of Fierro post-office.

Station mark: Aluminum tablet cemented in solid rock, under a cairn 3 feet high.

[Latitude $32^{\circ} 50' 27.35''$. Longitude $108^{\circ} 06' 06.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lone.....	26 14 52.09	206 12 12.52	4.2396252
Bayard.....	43 12 09.47	223 10 30.28	3.8423094
Bear.....	88 16 57.37	268 08 35.38	4.3817791
Black.....	142 30 48.30	322 28 49.24	3.9715720
Fierro.....	266 16 31	86 17 40	3.52328
Nun.....	323 27 52.57	143 29 32.25	3.9053288

LONE, GRANT COUNTY, N. MEX.

Identical with Station C of the Wheeler Survey, on the south peak of a group of hills, 7 or 8 miles southeast of Silver City.

Station mark: Aluminum tablet cemented in solid rock, under cairn 4 feet high.

[Latitude $32^{\circ}42'01.72''^a$; $32^{\circ}41'59.3''^b$. Longitude $108^{\circ}11'01.25''^a$; $108^{\circ}11'00.5''^b$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burro.....	62 14 36.98	242 06 32.48	4.4227439
Bear.....	132 07 21.39	312 01 39.91	4.3448371
Black.....	184 52 18.14	4 52 59.02	4.3634209
Bayard.....	195 28 47.74	15 29 48.21	4.0374460
Bayard (Wheeler).....	195 28 26.3	15 29 26.7	4.0393925
Hermosa.....	206 12 12.52	26 14 52.09	4.2396252
Nun.....	233 47 31.81	53 51 50.75	4.1886738

^a From Maricopa base.

^b Wheeler observed value.

NUN, GRANT COUNTY, N. MEX.

On top of bluff on north end of range, about 2 miles southeast of Santa Rita post-office.

Station mark: Aluminum tablet cemented in solid rock, under cairn 3 feet high.

[Latitude $32^{\circ}46'57.57''$. Longitude $108^{\circ}03'02.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lone.....	53 51 50.75	233 47 31.81	4.1886738
Bayard.....	98 19 02.65	278 15 43.93	3.9844992
Hermosa.....	143 29 32.25	323 27 52.57	3.9053288
Fierro.....	167 42 46	347 42 16	3.83475

SILVER CITY, GRANT COUNTY, N. MEX.

(Not occupied; sighted from two points.)

Center of cupola of court-house.

[Latitude $32^{\circ}46'06.74''$. Longitude $108^{\circ}16'51.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black.....			4.27901
Bear.....			4.01335

SECONDARY TRIANGULATION STATIONS.

Fort Bayard special quadrangle.

GRANT COUNTY.

In 1908 C. E. Cooke located six additional points for the control of this special area. Several stations located by Fred McLaughlin in 1907 were reoccupied with a transit, and positions were computed on the Maricopa (Ariz.) base.

CASPER, GRANT COUNTY, N. MEX.

On a hill 2.25 miles southwest of Fort Bayard military post, 0.12 mile west of west boundary of reservation, 0.5 mile south of Fort Bayard-Silver City road.

Signal and station mark: Flag on staff 14 feet high; gas pipe driven in ground flush with surface.

[Latitude $32^{\circ} 47' 03.91''$. Longitude $108^{\circ} 11' 09.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Paesky.....	193 19 51	13 20 22	3. 79595
Flats.....	224 12 09	44 13 13	3. 64510
Bayard.....	249 01 39	69 02 44	3. 52410

CENTRAL, GRANT COUNTY, N. MEX.

In Fort Bayard Military Reservation, on a hill 0.5 mile west of Central, 100 feet north of south boundary of Fort Bayard Military Reservation.

Signal and station mark: Pole 10 feet high supported by rock cairn 4.5 feet high.

[Latitude $32^{\circ} 46' 44.57''$. Longitude $108^{\circ} 09' 38.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Casper.....	104 10 53	284 10 04	3. 38606
Flats.....	190 51 36	10 51 51	3. 58322
Bayard.....	203 04 32	23 04 47	3. 28946
East Pasture.....	252 10 07	72 10 44	3. 27835

COPPER, GRANT COUNTY, N. MEX.

On west point of ridge in Fort Bayard Military Reservation, 1.5 miles northeast of Fort Bayard military post, and one-eighth mile north of road in lane to Copper Flat.

Signal and station mark: Pole 10 feet high wired to stump 5 feet high.

[Latitude $32^{\circ} 48' 32.02''$. Longitude $108^{\circ} 08' 03.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Eaton.....	161 12 30	341 11 55	3. 71708
Hermosa.....	220 28 49	40 29 52	3. 66949

FLATS, GRANT COUNTY, N. MEX.

On slight rise in Fort Bayard Military Reservation, 1.25 miles north of Fort Bayard military post, 400 feet east of road leading north from post.

Signal and station mark: Pole 10 feet high supported by rock cairn 3 feet high.

[Latitude $32^{\circ} 48' 46.68''$. Longitude $108^{\circ} 09' 11.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Central.....	10 51 51	190 51 36	3. 58322
Casper.....	44 13 13	224 12 09	3. 64510
Paesky.....	150 41 48	330 41 14	3. 52423
Eaton.....	181 06 48	1 06 50	3. 65162
Hermosa.....	237 07 26	57 09 06	3. 75700

PAESKY, GRANT COUNTY, N. MEX.

On high hill in Fort Bayard Military Reservation, one-half mile southeast of Old Paesky ranch house, 3.5 miles northwest of Fort Bayard military post and one-eighth mile west of old sawmill road.

Signal and station mark: Flag on pole 14 feet high; gas pipe driven in ground flush with surface.

[Latitude $32^{\circ} 50' 21.36''$. Longitude $108^{\circ} 10' 13.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tubbs.....	6 44 31	186 44 21	3. 62377
Casper.....	13 20 21	193 19 51	3. 79595
Eaton.....	227 43 09	47 43 45	3. 36724
Hermosa.....	268 20 21	88 22 35	3. 80890
Flats.....	330 41 14	150 41 48	3. 52423
Bayard.....	341 01 57	161 02 32	3. 71322

TUBBS, GRANT COUNTY, N. MEX.

On south point of hill in Fort Bayard Military Reservation, 1.5 miles northwest of Fort Bayard military post, 0.5 mile east of west boundary of reservation, and 0.5 mile north of Fort Bayard-Silver City road.

Signal and station mark: Pole 10 feet high supported by rock cairn 4 feet high.

[Latitude $32^{\circ} 48' 05.78''$. Longitude $108^{\circ} 10' 32.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Casper.....	26 27 24	206 27 04	3.32814
Paesky.....	186 44 21	6 44 31	3.62377
Hermosa.....	237 48 44	57 51 09	3.91327
Bayard.....	288 05 19	108 06 04	3.35909

NEW YORK.

PRIMARY TRAVERSE.

Alexandria Bay, Antwerp, Carthage, Gouverneur, Hammond, Lake Bonaparte, Morristown, and Theresa quadrangles.

JEFFERSON, LEWIS, AND ST. LAWRENCE COUNTIES.

In cooperation with the State, the following geographic positions were determined in the fall of 1908 by F. J. McMaugh. The line starts at Miller triangulation station, about 3 miles northeast of Theresa, and follows highways south and east to Carthage; thence east and north along highways via North Croghan, Natural Bridge, and Sterlingbush to Keenes; thence east near north border of Antwerp quadrangle to starting point. For the Hammond quadrangle the line starts at Miller triangulation station and follows the Rome, Watertown and Ogdensburg Railroad to Hammond; thence along highways to Oak Point and to Brier Hill, closing on a position established by E. L. McNair. Again starting at a position near the southwest corner of Ogdensburg quadrangle, established by Mr. McNair, the line follows highways south via Hickory post-office and Pierces Corners to Keenes, closing on line controlling the Antwerp quadrangle.

ANTWERP QUADRANGLE.

Magnetic declination: East border, $10^{\circ} 51'$ west; west border, $10^{\circ} 41'$ west; north border, $11^{\circ} 17'$ west; south border, $11^{\circ} 26'$ west.

Geographic positions along highways.

MILLER TRIANGULATION STATION TO CARTHAGE.

Station.	Latitude.	Longitude.
Miller triangulation station, on highest land within many miles, 3 miles northeast of Theresa village, copper bolt in boulder.....	° ' " 44 14 21.97	° ' " 75 45 21.08
Road forks west and northwest.....	44 13 19.4	75 44 17.0
Bishops Corners, crossroads at schoolhouse.....	44 13 21.6	75 43 03.3
Halls Corners, 35 feet northwest to mail box, 38 feet northeast to northwest corner of whey tank at cheese factory.....	44 11 57.4	75 41 56.8
Whiting, road forks to north and northwest near schoolhouse.....	44 09 53.1	75 42 47.9
Philadelphia, east face of southeast corner of town hall, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1908, N. Y.".....	44 09 25.3	75 42 26.6
Crossroads, road west to Evans's mill.....	44 08 45.9	75 42 32.6
Strickland schoolhouse, crossroads.....	44 06 55.0	75 42 16.1
Philadelphia, 3½ miles south of; 63 feet south of crossroads, west of road in boulder, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1908, N. Y.".....	44 06 35.0	75 42 12.8
T road east near red house.....	44 05 00.8	75 42 17.3
Crossroads.....	44 04 17.6	75 42 28.6
Four corners.....	44 02 53.2	75 43 02.9
Great Bend, signboard at Freemont Hotel.....	44 02 11.5	75 43 18.2
Stone schoolhouse, road southeast.....	44 02 07.3	75 41 49.9
Deferiet, 0.5 mile south of; in north end of east abutment of highway bridge over Black River, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1908, N. Y.".....	44 02 02.86	75 41 16.61
Herring schoolhouse, southwest corner of.....	44 01 25.70	75 39 22.2

NEAR SOUTH BORDER, CARTHAGE TO NORTH CROGHAN.

T road east at mail box 10.....	44 01 09.7	75 35 09.5
Bridge near cheese factory.....	44 01 46.0	75 34 59.5
Crossroads.....	44 01 54.4	75 32 35.6
Schoolhouse, T road north.....	44 01 55.5	75 32 16.0
North Croghan, 0.5 mile west of; T road north at schoolhouse.....	44 02 02.5	75 30 24.0
North Croghan, 53 feet northwest of railroad crossing, in rock ledge in corner of right of way, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1908, N. Y.".....	44 02 04.63	75 30 00.69

NEAR EAST BORDER, INDIAN RIVER TO STERLINGBUSH.

Indian River, west end of iron bridge over.....	44 04 56.4	75 30 33.8
Road south.....	44 06 35.2	75 31 20.9
Sterlingbush, about 80 feet from iron bridge over Indian River, near center of triangular grass plot in outcrop of ledge about 2 feet square, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1908, N. Y.".....	44 07 04.32	75 31 16.13

CARTHAGE QUADRANGLE.

Magnetic declination: North border, $11^{\circ} 26'$ west.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Railroad crossing.....	43 59 51.6	75 38 05.4
Carthage, center of railroad at Parham street crossing.....	43 59 06.2	75 36 59.3
Carthage, center of water-supply standpipe.....	43 59 02.4	75 36 17.0
McQuillen triangulation station, on a bare rocky hill, known as Mount McQuillen, 1 mile northeast of Carthage, on property of Mrs. Anna Harvey, who lives 500 yards west of station, good view in all directions, in solid rock, aluminum tablet, 6 inches north of old position (old tablet, which was of bronze, was destroyed), stamped "Prim. Trav. Sta. No. 4, 1908, N. Y.".....	43 59 49.7	75 35 27.82

LAKE BONAPARTE QUADRANGLE.

Magnetic declination: West border, $10^{\circ} 51'$ west.*Geographic positions along highways.*

NORTH CROGHAN TO STERLINGBUSH.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south.....	44 03 59.0	75 29 29.3
Natural Bridge, intersection of streets about 200 feet west of Methodist Church, I. O. O. F. hall at corner.....	44 04 04.2	75 29 38.6
Scale platform, southeast corner of; 35 feet south of road forks near limekiln.....	44 04 47.7	75 29 53.2

STERLINGBUSH TO KEENES.

Mail box 62, center of road.....	44 09 06.0	75 29 45.6
Alvin Turner's house, center of road opposite.....	44 11 12.4	75 28 00.7
East Antwerp cheese factory, 128 feet west of; T road southwest of Antwerp, in rock ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1908, N. Y.".....	44 11 48.5	75 28 12.0
T road east.....	44 12 13.9	75 27 53.2
Bridge over small creek.....	44 12 37.0	75 27 13.6
Corner of Lewis and Jefferson counties at St. Lawrence county line, near Rice schoolhouse, granite monument set in concrete.....	44 13 04.4	75 26 45.4
T road north.....	44 13 25.3	75 27 30.5
T road east.....	44 14 43.5	75 30 20.9

HAMMOND QUADRANGLE.

Magnetic declination: East border, $11^{\circ} 46'$ west; west border, $10^{\circ} 49'$ west; south border, $11^{\circ} 17'$ west; north border, $11^{\circ} 55'$ west.

Geographic positions.

ALONG HIGHWAYS, SPRAGUEVILLE, VIA KEENES, TO MILLER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads.....	44 15 07.9	75 31 17.6
Spragueville, intersection of Main and Factory streets, approximately on county line.....	44 15 32.1	75 32 11.4
Keenes, about 60 feet southeast of railroad crossing, east of road, in rock ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1908, N. Y.".....	44 15 43.0	75 32 36.8
Road forks north and northeast.....	44 16 09.9	75 32 30.2
Somerville, in east face of northeast corner of Somerville House, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1908, N. Y. Elev. 460".....	44 16 59.7	75 33 25.7
Crossroads.....	44 17 04.5	75 34 34.2
Road forks.....	44 16 41.9	75 35 42.1
Road forks east and northeast.....	44 17 13.5	75 36 43.6
Oxbow, 15 feet west of flagstaff in concrete post, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1908, N. Y. Elev. 351".....	44 17 14.9	75 37 27.0
Bridge over small creek.....	44 17 10.9	75 38 06.5
Cheese factory, T road north.....	44 15 34.1	75 40 49.1
T road north.....	44 15 03.6	75 43 17.5

ALONG ROME, WATERTOWN AND OGDENSBURG RAILWAY.

Private-road crossing, 0.5 mile north of milepost 107.....	44 22 56.0	75 44 49.5
South Hammond (Oakvale station), 1,479 feet north of; in top of east end of culvert "247 U," aluminum tablet stamped "Prim. Trav. Sta. No. 12, 1908, N. Y.".....	44 24 05.1	75 43 36.8
Overhead crossing.....	44 25 45.0	75 41 54.3
Hammond, semaphore pole at station.....	44 26 52.5	75 41 21.9
Hammond, in west face of concrete steps of town hall, bronze tablet stamped "Prim. Trav. Sta. No. 13, 1908, N. Y. Elev. 361".....	44 26 58.3	75 41 40.2

Geographic positions—Continued.

ALONG HIGHWAYS, NEAR HAMMOND TO KEENES.

Station.	Latitude.	Longitude.
	° ' " :	° ' " :
Road forks northwest and southwest.....	44 27 01.4	75 41 58.8
Chippewa Creek, center of steel bridge over.....	44 28 36.8	75 43 30.0
Road forks west and southeast, at top of hill.....	44 29 00.6	75 43 48.4
North Hammond, 22 feet southwest of S. N. Young's general store, in bowlder; aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1908, N. Y. Elev. 374".....	44 29 09.8	75 43 36.1
T road north, near F. A. Smith's mail box.....	44 29 46.4	75 44 10.8
Ward C. Priest's mail box, center of road.....	44 27 39.6	75 30 23.5
Bert Truax's, T road to barn.....	44 26 41.4	75 31 10.3
R. H. Wilson's mail box.....	44 26 06.4	75 31 44.6
Pierces Corners, front door of Methodist Church.....	44 25 54.4	75 31 56.0
Road forks south and southwest.....	44 25 30.1	75 32 25.5
John Brown's mail box, road forks northwest to Lead Mine farm.....	44 25 05.7	75 32 06.6
Wm. Hess's mail box, road fork southwest.....	44 24 21.7	75 31 56.6
Beaver Creek, iron bridge.....	44 23 59.5	75 31 46.6
T road southwest, 30 feet southwest and 30 feet northwest to corner of wire fence.....	44 23 45.7	75 31 14.2
Pierces Corners, 3.6 miles south of; 15 feet east of center of road, 120 feet south of T road east, 27 feet to telegraph pole, in rock ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 15, 1908, N. Y.".....	44 23 31.9	75 30 53.4
Oswegatchie River, center of bridge.....	44 22 52.7	75 29 53.6
Road west, opposite mail box.....	44 22 01.9	75 30 44.1
Road forks northwest and northeast, 10 feet west to W. H. Nichols's mail box.....	44 21 34.4	75 30 58.4
Little Bow, center of grass plot west of road, 102 feet to door of schoolhouse, 70 feet west to culvert.....	44 21 13.2	75 30 38.1
Road forks to Gouverneur and Natural Dam, 30 feet northwest of J. L. Price's mail box, 55 feet to northeast corner of main part of house.....	44 20 44.1	75 30 14.5
Natural Dam, road forks, 15 feet southeast to corner of fence.....	44 20 14.8	75 30 11.1
Natural Dam, north end of railroad bridge.....	44 19 50.6	75 29 49.5
Railroad and highway crossing south of Gouverneur.....	44 19 16.5	75 29 11.2
Road crossing, 335 feet north of milepost "S 105".....	44 18 25.8	75 30 05.4
Road crossing, about 120 feet west of T road south, A. W. and H. L. Temple's mail box.....	44 17 11.7	75 31 04.1
Matoon siding, road crossing.....	44 16 41.4	75 31 26.6
Keenes, "Prim. Trav. Sta. No. 8, 1908, N. Y.".....	44 15 43.0	75 32 36.8

THERESA QUADRANGLE.

Magnetic declination: East border, $10^{\circ} 41'$ west.*Geographic positions.*

ALONG HIGHWAYS, MILLER TRIANGULATION STATION TO THERESA.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge over small creek.....	44 13 23.2	75 46 08.4
Theresa, at cheese factory, 8 feet southwest to mail box, 35 feet northwest to electric-light pole, 58 feet south- east to corner of wire fence.....	44 12 54.0	75 47 02.9
Theresa, intersection of Main and Commercial streets.....	44 12 54.9	75 47 52.0

ALONG ROME, WATERTOWN AND OGDENSBURG RAILWAY.

Milepost, "Utica 96," track opposite.....	44 13 44.5	75 47 54.2
Milepost, "Utica 97," track opposite.....	44 14 35.0	75 47 54.9

ALEXANDRIA BAY QUADRANGLE.

Magnetic declination: East border, $10^{\circ} 49'$ west.*Geographic positions along Rome, Watertown and Ogdensburg Railway.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost, "Utica 98," 395 feet south of; road crossing.....	44 15 21.2	75 47 42.9
Road crossing.....	44 16 49.2	75 48 14.6
Redwood, center of track opposite south end of station....	44 18 03.8	75 48 08.2
Road crossing.....	44 19 53.3	75 47 22.6
Redwood, 2.3 miles north of; 300 feet north of public road crossing, in center of top of west end of culvert, alumi- num tablet stamped "Prim. Trav. Sta. No. 11, 1908, N. Y.".....	44 19 56.4	75 47 21.2
Private road crossing near milepost 105.....	44 21 03.7	75 46 22.7
Private road crossing 1,100 feet north of milepost 106.....	44 21 58.1	75 45 37.2

MORRISTOWN QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road southeast, 12 feet southeast to L. R. and L. L. Soper's mail box.....	44 31 10.3	75 44 12.7
Crossroads.....	44 31 37.0	75 43 09.3
St. Lawrence, crossroads at cheese factory.....	44 32 27.8	75 41 15.5
Brier Hill, about 800 feet north of post-office; T road east..	44 32 03.9	75 39 46.1
Mud Lake, 7 feet west of center of road, 101 feet from northwest corner of Thomas Townsend's house, 99 feet from southeast corner of Oliver Perry's house, 260 feet north of road east, in bowlder, bronze tablet stamped "Prim. Trav. Sta. No. 87".....	44 30 49.8	75 27 51.1

GOUVERNEUR QUADRANGLE.

Magnetic declination: West border, $11^{\circ} 46'$ west.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Small bridge over slough.....	44 29 48.4	75 28 53.3
Hickory Lake, road opposite cheese factory.....	44 28 53.2	75 29 20.3
Hickory, center of road opposite post-office.....	44 28 32.8	75 29 38.0

OHIO.

PRIMARY TRAVERSE.

Bucyrus, Canal Dover, Carrollton, Circleville, Era, Jackson, Laurelville, Mansfield, Millersburg, Navarre, Norwalk, and Oakhill quadrangles.

CARROLL, CRAWFORD, FAIRFIELD, GALLIA, HOCKING, HOLMES, HURON, JACKSON, LAWRENCE, PICKAWAY, RICHLAND, SCIOTO, SENECA, STARK, TUSCARAWAS, VINTON, AND WAYNE COUNTIES.

In cooperation with the State, the following geographic positions were determined during the field season of 1906 by J. R. Ellis. The lines were tied to points previously located by primary traverse or to triangulation stations as herein described.

JACKSON QUADRANGLE.

Magnetic declination: North border, $+0^{\circ} 25'$ west; east border, $-0^{\circ} 03'$ east; south border, $-0^{\circ} 01'$ east.

Geographic positions.

SOUTH ALONG HIGHWAYS, BENCH MARK NO. 11 TO HAMDEN JUNCTION.

Station.	Latitude.	Longitude.
Pawpaw School, T road north, 1 mile south of schoolhouse, 27 feet west to small bridge.....	39 15 44.0	82 32 26.9
Pawpaw School, 2.5 miles south of; 20 feet southwest to corner of rail fence, 31 feet southeast to black oak.....	39 14 25.5	82 32 40.3
F. W. Hatfield's residence, about 500 feet east of; T road north, 12 feet east to gate post.....	39 13 36.0	82 32 48.2
Road south just east of bridge.....	39 12 16.9	82 32 33.9
T. 8 N., R. 18 W., northeast corner stone sec. 1.....	39 11 43.4	82 32 05.4
Hamden Junction, 1.5 miles north of; T road west, 18 feet due west to center of small bridge.....	39 10 47.8	82 31 30.2

ALONG BALTIMORE AND OHIO SOUTHWESTERN RAILROAD, HAMDEN JUNCTION TO BERLIN.

Hamden Junction, road crossing Baltimore and Ohio Southwestern Railroad, 820 feet north of station.....	39 09 37.6	82 31 23.9
Vinton-Jackson county line, south rail of track.....	39 08 37.5	82 31 59.4
Hamden Junction, 0.75 mile south of; northwest corner of John Potter's field at pike crossing, center of crossing bears N. 9° 30' W. 74.6 feet, iron post stamped "Prim. Trav. Sta. No. 13, 1906, Ohio".....	39 08 34.9	82 31 56.6
Wellston, pike crossing 0.8 mile north of station.....	39 07 57.8	82 31 47.9
Wellston station.....	39 07 19.3	82 32 09.2
Wellston, crossing of Cincinnati, Hamilton and Dayton Railway at cement plant.....	39 06 42.4	82 32 12.3
Milepost 51, 850 feet south of; east-west road crossing.....	39 05 33.9	82 32 16.1
Berlin, crossing of Cincinnati, Hamilton and Dayton Railway.....	39 04 50.0	82 32 33.5

ALONG CINCINNATI, HAMILTON AND DAYTON RAILWAY, BERLIN TO ROCKY HILL.

Milepost 48, north-south pike crossing.....	39 03 50.4	82 32 22.5
Milton-Bloomfield township line.....	39 02 28.9	82 32 05.4
Burris station, 0.25 mile north of road crossing.....	39 01 42.0	82 31 43.4
T. 8 N., R. 17 W., northeast corner sec. 7.....	39 01 35.8	82 31 49.9
Ridgeland station, pike crossing.....	39 00 50.9	82 31 30.2
Rocky Hill, road crossing 1 mile north of station.....	39 00 05.8	82 32 21.7

OAKHILL QUADRANGLE.

Magnetic declination: North border, 0° 01' east; south border, 0° 24' west; southeast border, 0° 35' east.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Rocky Hill station, pike crossing Baltimore and Ohio Railroad	38 59 21.5	82 32 40.6
Rocky Hill station, 0.75 mile south of; northeast corner of J. N. Evans's field at east-west road crossing, center of road crossing bears N. 44° 15' E. 27.2 feet, iron post stamped "Prim. Trav. Sta. No. 14, 1906, Ohio"	38 58 58.8	82 32 39.6
T. 6 N., R. 18 W., quarter corner east side of sec. 13, road west at jog	38 59 02.3	82 33 33.0
T road north near quarter corner east side of sec. 14, 9 feet south to south end of box culvert	38 59 10.5	82 34 41.2
Keystone station, pike crossing Baltimore and Ohio Railroad	38 59 16.4	82 36 19.4
Keystone, 1.66 miles west of station, in southwest corner of Wm. Cloar's field at T road east, cross cut on southeast corner of bridge abutment bears S. 50° W. 37.5 feet, junction of roads bears S. 7° W. 34 feet, iron post stamped "Prim. Trav. Sta. No. 15, 1906, Ohio"	38 59 23.4	82 38 13.1
Franklin Grange Hall, 0.2 mile southwest of; Jackson-Mabee pike, at road northeast, 18 feet southeast to mail box No. 14, 21 feet west to center of gate	38 58 30.7	82 39 35.6
T. 6 N., R. 19 W., northeast corner sec. 24, junction of fences at southeast corner of woods	38 59 08.1	82 40 22.7
Fairview School, 0.5 mile northwest of; T road south, 22 feet northwest to walnut tree, 25 feet southeast to cross cut on small gum tree	38 59 24.9	82 41 12.9
Jackson pike at road south, 27 feet southwest to white-oak tree, 21 feet southeast to corner wire fence	38 59 48.4	82 43 28.1
Cove, 0.5 mile southwest of; east-west road at crossing of Detroit Southern Railroad	39 00 35.4	82 45 09.2
Glade in Jno. Whitman's wood pasture, 440 feet south of road crossing, east of north-south road, spike in north face of white oak bears S. 14° 10' E. 27.3 feet, spike in white oak bears S. 46° E. 31.6 feet, iron post stamped "Prim. Trav. Sta. No. 20"	39 00 44.6	82 46 58.5

NEAR EAST BORDER.

Coal shaft, road crossing at siding	38 57 35.6	82 31 56.3
Rempel, 600 feet north of station; in stone cut, tablet stamped "688" "Prim. Trav. Sta. No. 16, 1906, Ohio" ..	38 56 28.3	82 31 21.6
Milepost 37, 0.3 mile southwest of; north-south road crossing	38 55 34.7	82 31 37.7
McKittericks, 700 feet north of; road crossing	38 54 33.2	82 32 28.6
T. 7 N., R. 17 W., northeast corner stake sec. 19, 20 feet southwest to large white-oak tree	38 54 35.4	82 32 52.0
Milepost 34, 60 feet north of; east-west road crossing	38 53 41.5	82 32 38.3
Kitchen, road crossing just south of station bears N. 85° 30' W. 81 feet, at southwest corner of T road west, iron post stamped "Prim. Trav. Sta. No. 17, 1906, Ohio"	38 52 12.3	82 32 31.9
Kitchen, 1 mile south of; road crossing	38 51 33.0	82 32 13.1
Jackson-Gallia county line	38 51 02.3	82 31 47.9
Milepost 30, 300 feet east of; north-south road crossing ..	38 50 31.7	82 31 21.5

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued..

Station.	Latitude.	Longitude.
Gallia station, road crossing just south of water tank.	38 49 49.6	82 31 04.9
Road fork, "Elev. 851.8" painted on north end of culvert.	38 48 21.0	82 29 18.3
T. 6 N., R. 17 W., northeast corner sec. 26.....	38 48 06.0	82 28 46.7
Wagner triangulation station, a bald hill in Greenfield township, 1.5 miles northwest of Cadmus, 0.5 mile south of Gallia-Portsmouth pike, on land of Jacob Wagner, sandstone post 30 by 15 by 15 inches set 28 inches in the ground, bronze triangulation tablet cemented in 9-inch square dressed top marked "Ohio".....	38 47 24.58	82 28 21.88

NEAR SOUTH BORDER.

Marion Childers's farm, road southeast from pike, 27 feet south to small apple tree, 54 feet northeast to telephone pole.....	38 47 50.2	82 29 58.6
Gallia-Lawrence county line, 0.25 mile north of; south corner of crossroads, 3.5 miles west of Wagner triangulation station, nail in maple bears N. 21° W. 40 feet, nail in hickory bears S. 25° W. 30.8 feet, iron post stamped "Prim. Trav. Sta. No. 18, 1906, Ohio".....	38 47 16.1	82 13 12.5
T road north, 24 feet west to apple tree, 21 feet southeast to dead tree.....	38 46 53.1	82 31 44.8
Lloyd's store, 0.25 mile northeast of; small apple tree in triangle, T road northeast.....	38 47 07.4	82 33 44.2
Cincinnati, Hamilton and Dayton Railway at Gallia-Lawrence county line.....	38 46 42.5	82 34 50.5
Ts. 4, 5 N., R. 18 W., northeast corner sec. 1, approximate southwest corner of Gallia County, blazed black-oak tree.....	38 46 44.1	82 34 58.3
Olive Furnace, 0.5 mile northeast of station; north of Cincinnati, Hamilton and Dayton Railway at road crossing, joint of south rail at crossing bears S. 45° 30' E. 39.5 feet, iron post stamped "Prim. Trav. Sta. No. 19, 1906, Ohio".....	38 45 36.1	82 37 24.2
Olive Furnace, 1 mile southwest of; crossroads 26 feet northwest to small elm, 39 feet north to small sycamore tree.....	38 45 22.6	82 38 40.4
North-south Lawrence-Scioto county line, 14 feet east to maple tree, 26 feet north to junction of fences at road southeast.....	38 45 25.8	82 39 43.6
Madland, northeast corner sec. 6, T. 3 N., R. 18 W., large white-oak tree just east of post-office.....	38 45 48.1	82 40 49.7
Bridge over Piney Creek, about 600 feet northeast of; T road east, 30 feet north to gate hinge, 25 feet northwest to cross on board fence.....	38 46 15.7	82 42 19.6
Andre, 1 mile north of station; private road crossing Detroit, Toledo and Ironton Railroad.....	38 45 37.2	82 43 38.6
Andre, road crossing 70 feet south of station.....	38 44 47.6	82 44 06.2
Andre, northeast corner stone sec. 9, T. 3 N., R. 19 W., at junction of fences 1 mile northwest of station.....	38 45 08.8	82 45 00.8
T road west, 24 feet northwest to E. Strickland's mail box, 24 feet southwest to cross on fence post.....	38 45 22.70	82 46 38.0

BUCYRUS QUADRANGLE.

Magnetic declination: South border, $0^{\circ} 58'$ west; north border, $0^{\circ} 44'$ west; east border, $1^{\circ} 03'$ west.

Geographic positions along highways.

NEAR BUCYRUS TO NEAR CRESTLINE.

Station.	Latitude.	Longitude.
Bucyrus, 3 miles southwest of; road crossing Columbus, Sandusky and Hocking Railroad.....	$40^{\circ} 46' 31.7''$	$82^{\circ} 59' 14.9''$
T. 3 S., R. 16 E., near quarter corner north side of sec. 26, southwest corner of field, T road east, iron post stamped "Prim. Trav. Sta. No. 20, 1906, Ohio".....	$40^{\circ} 45' 39.6''$	$82^{\circ} 59' 13.7''$
T. 3 S., R. 16 E., northeast corner sec. 25, center of east-west road at north-south fence.....	$40^{\circ} 45' 40.3''$	$82^{\circ} 57' 30.5''$
Milepost 75, east-west pike crossing Toledo and Ohio Central Railway, 0.25 mile north of.....	$40^{\circ} 45' 41.0''$	$82^{\circ} 56' 51.3''$
Milepost 74, 2,000 feet south of, east-west road crossing Toledo and Ohio Central Railway.....	$40^{\circ} 44' 23.2''$	$82^{\circ} 56' 07.2''$
T. 3 S., R. 17 E., northeast corner sec. 32, crossroads 0.2 mile south of church.....	$40^{\circ} 44' 23.9''$	$82^{\circ} 54' 54.6''$
T. 3 S., R. 17 E., northeast corner sec. 33, middle of east-west road at rail fence north.....	$40^{\circ} 44' 24.4''$	$82^{\circ} 53' 46.0''$
W. L. Tupp's farm, southwest corner of; northeast corner of T road north, nail in tree in southeast corner of field bears S. 69° W. 49.1 feet, nail in root of elm tree bears S. 12° W. 107.8 feet, iron post stamped "Prim. Trav. Sta. No. 21, 1906, Ohio".....	$40^{\circ} 44' 32.1''$	$82^{\circ} 52' 54.3''$
Whetstone Creek, course north, center of bridge over.....	$40^{\circ} 44' 51.2''$	$82^{\circ} 52' 16.2''$
T. 16 N., R. 21 W., northeast corner sec. 28, T road east, 25 feet northeast and 27 feet southeast to corner fence posts.....	$40^{\circ} 45' 20.8''$	$82^{\circ} 51' 27.2''$
T. 16 N., R. 21 W., northeast corner sec. 27, 24 feet southwest to D. Johnson's mail box, 26 feet northwest to corner fence post.....	$40^{\circ} 45' 20.8''$	$82^{\circ} 50' 20.5''$
T. 16 N., R. 21 W., northeast corner sec. 26, 27 feet southwest and 30 feet southeast to corner fence posts.....	$40^{\circ} 45' 20.9''$	$82^{\circ} 49' 12.0''$
T. 16 N., R. 21 W., northeast corner stone sec. 25.....	$40^{\circ} 45' 20.0''$	$82^{\circ} 48' 02.8''$
T. 20 N., R. 20 W., northeast corner stone sec. 30.....	$40^{\circ} 45' 19.3''$	$82^{\circ} 46' 52.9''$
T. 20 N., R. 20 W., southeast corner stone sec. 19.....	$40^{\circ} 45' 19.3''$	$82^{\circ} 46' 52.8''$
Crestline, 1 mile south and 1 mile west of; nail in cherry tree in corner of field bears N. $70^{\circ} 10'$ 40.9 feet, northeast corner sec. 20 bears N. 53° W. 33.2 feet, iron post stamped "Prim. Trav. Sta. No. 22, 1906, Ohio".....	$40^{\circ} 46' 10.2''$	$82^{\circ} 45' 54.5''$

Geographic positions along highways—Continued.

WEST NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
T. 22 N., R. 20 W., northeast corner sec. 5, stone, T road south.....	° ' " 40 59 43.8	° ' " 82 45 45.3
T road north, 20 feet west to stone corner.....	40 59 44.1	82 46 48.7
T. 18 N., R. 21 W., northeast corner stone, sec. 1.....	40 59 44.8	82 47 47.1
T. 18 N., R. 21 W., northeast corner sec. 2, T road south, 46 feet southeast to corner fence post, 48 feet southwest to telephone pole.....	40 59 45.8	82 48 56.9
T. 18 N., R. 21 W., northeast corner sec. 3, T road south. . .	40 59 47.0	82 50 05.5
T. 1 N., R. 17 E., near southeast corner stone, sec. 35, south of road at T road north, 60 feet east of T road south, corner sec. 35 bears N. 6° 15' W. 15.5 feet, nail in lime tree bears N. 72° 45' E. 111.5 feet, iron post stamped "Prim. Trav. Sta. No. 26, 1906, Ohio".....	40 59 35.8	82 51 44.4
T. 1 S., R. 17 E., northeast corner sec. 3, T road south, 20 feet due north to middle of gate.....	40 59 36.0	82 52 54.9
T. 1 N., R. 17 E., southeast corner sec. 33, T road north, 36 feet northwest to south end of picket fence, 30 feet northeast to corner of yard fence.....	40 59 35.9	82 54 03.3
T. 1 S., R. 17 E., northeast corner sec. 4, T road south....	40 59 35.9	82 54 04.1
Carrothers, 0.33 mile south of; center of crossroads.....	40 59 35.8	82 55 21.8
T. 1 N., R. 17 E., southeast corner stone sec. 31, T road north.....	40 59 35.9	82 56 21.8
T. 1 S., R. 16 E., northeast corner stone, sec. 1, crossroads.	40 59 36.0	82 57 31.1
T. 1 S., R. 16 E., northeast corner sec. 2, crossroads, 40 feet southeast to maple tree, 33 feet northeast to guide-post.....	40 59 36.0	82 58 40.2
Southeast corner of crossroads, northeast corner stone sec. 3 bears S. 40° W. 37.7 feet, iron post stamped "Prim. Trav. Sta. No. 27, 1906, Ohio".....	40 59 36.0	82 59 48.8
T. 1 N., R. 16 E., southeast corner stone sec. 34.....	40 59 36.20	82 59 49.60

MANSFIELD QUADRANGLE.

Magnetic declination: South border, 1° 52' west; north border, 1° 34' west; west border, 1° 03' west.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
T. 20 N., R. 20 W., northeast corner sec. 21, T road south at schoolhouse, 30 feet southwest to corner fence post, 25 feet west to large white-oak tree.....	° ' " 40 46 09.6	° ' " 82 44 45.1
T. 20 N., R. 20 W., northeast corner sec. 22, T road north, white-oak tree, Crawford-Richland county line.....	40 46 08.9	82 43 35.7
T. 20 N., R. 20 W., northeast corner sec. 23, middle of east-west road at north-south fence at schoolhouse No. 3.....	40 46 08.4	82 42 28.8

Geographic positions along highways—Continued.

NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
Schoolhouse No. 10, road north, 20 feet north to center of box culvert.....	° ' " 40 45 57.7	° ' " 82 40 01.4
Ontario, west part of; north of road at T road south, northwest corner of foundation to Doctor Richards's residence, bears S. 47° 15' W. 136.7 feet, nail in honeylocust tree south of road bears S. 7° 45' E. 54.9 feet, iron post stamped "Prim. Trav. Sta. No. 23, 1906, Ohio".....	40 45 36.2	82 38 51.4
Ontario, 0.66 mile east of; T road north, 30 feet northwest to telephone pole, 39 feet northeast to corner fence post.....	40 45 35.1	82 37 59.1
Ontario, 1.75 miles east of; east-west road crossing of Erie Railroad.....	40 45 34.1	82 36 25.8
T. 21 N., R. 19 W., quarter corner east side of sec. 23, crossroads, 24 feet northeast to north end of culvert, 24 feet southeast to south end of culvert.....	40 45 33.2	82 35 25.8
T. 21 N., R. 19 W., quarter corner stone east side of sec. 19.....	40 45 32.4	82 34 16.7
Milepost 271, 645 feet east of; north-south road crossing Erie Railroad.....	40 46 12.6	82 33 06.7
Mansfield, crossing of the Erie and the Baltimore and Ohio railroads, just east of Erie station.....	40 45 58.0	82 31 01.2
Mansfield, flagstaff at State Reformatory.....	40 46 57.6	82 30 11.1

NEAR WEST BORDER.

T. 20 N., R. 20 W., northeast corner sec. 17, T road north, 18 feet southwest to telegraph pole, 29 feet northwest to corner fence post.....	40 47 04.2	82 45 54.8
T. 20 N., R. 20 W., northeast corner sec. 8, 20 feet due south to center of small bridge.....	40 47 56.4	82 45 53.9
T. 20 N., R. 20 W., northeast corner sec. 5, 9 feet northwest to corner rail fence.....	40 48 48.5	82 45 52.0
T. 21 N., R. 20 W., northeast corner sec. 32, crossroads, 27 feet northwest to corner fence post.....	40 49 38.2	82 45 50.8
Schoolhouse No. 4, 0.25 mile north of; crossroads, 21 feet southeast to telegraph pole, 26 feet northwest to corner fence post.....	40 49 54.2	82 44 40.3
T. 21 N., R. 20 W., northeast corner stone, sec. 28.....	40 50 33.8	82 44 39.8
T. 21 N., R. 20 W., northeast corner stone, sec. 21.....	40 51 24.4	82 44 39.3
T. 21 N., R. 20 W., northeast corner sec. 16, 9 feet south to center of culvert.....	40 52 17.4	82 44 38.4
Tiro, 1.5 miles south and 1 mile east of; northwest corner of crossroads, northwest corner foundation to residence bears S. 35° 20' E. 125.2 feet, nail in maple tree bears S. 18° 15' W. 50.8 feet, iron post stamped "Prim. Trav. Sta. No. 24, 1906, Ohio".....	40 52 58.5	82 44 33.4
T. 21 N., R. 20 W., northeast corner stone, sec. 4.....	40 54 04.2	82 44 37.5
T. 22 N., R. 20 W., southeast corner sec. 33.....	40 54 04.2	82 44 37.1
T. 22 N., R. 20 W., northeast corner sec. 28, crossroads, 27 feet northwest to mail box, 33 feet northeast to corner fence post.....	40 55 49.1	82 44 36.8

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
T. 22 N., R. 20 W., northeast corner sec. 21, crossroads, 27 feet southwest to corner fence post, 27 feet northwest to telegraph pole.....	° ' " 40 56 41.6	° ' " 82 44 36.1
T. 22 N., R. 20 W., northeast corner sec. 16, east-west fence.....	40 57 34.7	82 44 36.0
T. 22 N., R. 20 W., northeast corner sec. 9, crossroads, 25 feet due south to center of box culvert.....	40 58 27.4	82 44 36.2
Milepost 325, about 300 feet east of; north-south road crossing Northern Ohio Railway.....	40 58 57.1	82 44 36.3
T. 22 N., R. 20 W., northeast corner sec. 4, T road south, Crawford-Huron county line, 24 feet north to bench mark, station No. 25.....	40 59 43.5	82 44 36.6
T. 22 N., R. 20 W., northeast corner sec. 4, north of road at T road south, iron post stamped "Prim. Trav. Sta. No. 25, 1906, Ohio".....	40 59 43.6	82 44 36.5

NEAR NORTH BORDER.

New Pittsburg, T. 1 N., R. 24 W., south corner secs. 1 and 4, T road north at hotel.....	40 59 43.3	82 43 49.1
T. 22 N., R. 20 W., north corner's secs. 2 and 3, corner of Richland and Crawford counties at Huron County line.....	40 59 43.2	82 43 29.8
T. 22 N., R. 20 W., north corner secs. 1 and 2, wire fence south.....	40 59 42.8	82 42 20.6
T. 22 N., R. 20 W., north corner secs. 1 and 6, wire fence south.....	40 59 42.4	82 41 12.8
Plymouth, public fountain.....	40 59 41.9	82 39 57.2
Plymouth, 0.75 mile east of; county-line road crossing Northern Ohio Railway.....	40 59 40.7	82 39 00.6
Plymouth, 2 miles east of; T. 1 N., Rs. 22 and 23 W., south corner stone secs. 1 and 4 bears N. 12° 15' W. 18.5 feet, nail in blaze on cherry tree bears N. 57° 40' E. 76.6 feet, iron post stamped "Prim. Trav. Sta. No. 28, 1906, Ohio".....	40 59 39.5	82 37 50.6
T. 22 N., R. 19 W., north corner secs. 3 and 4, wire fence south.....	40 59 39.8	82 37 47.8
T. 22 N., R. 19 W., north corner secs. 2 and 3, west end of bridge over ditch.....	40 59 39.2	82 36 38.3
T. 1 N., R. 22 W., south corner secs. 1 and 4, crossroads, 30 feet southwest to W. Hulburt's mail box, 33 feet northwest to large corner fence post.....	40 59 38.1	82 34 57.0
Milepost 58, 1,080 feet northeast of; north-south road crossing Big Four Railway.....	41 00 08.6	82 33 32.6
Milepost 57, 0.5 mile northeast of; east-west road crossing.....	41 00 50.8	82 32 31.1
Greenwich, in foundation of standpipe to city waterworks.....	41 01 37.3	82 31 13.5

NORWALK QUADRANGLE.

Magnetic declination: South border, $1^{\circ} 34'$ west; west border, $1^{\circ} 14'$ west.

Geographic positions.

ALONG HIGHWAYS NEAR WEST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of bridge over large ditch.....	41 01 07.0	82 43 53.1
Ts. 1 and 2 N., Rs. 23 and 24 W., corner secs. 1, 2, 3, and 4, crossroads, 42 feet northwest to guidepost, 28 feet northeast to corner fence post.....	41 01 55.2	82 43 54.7

ALONG BALTIMORE AND OHIO RAILROAD, CHICAGO JUNCTION TO MONROEVILLE.

Chicago Junction, range-line road crossing main line Baltimore and Ohio Railroad.....	41 03 40.0	82 43 59.2
Township line, road crossing.....	41 04 07.4	82 44 11.0
Centertown, road crossing just south of station.....	41 04 58.4	82 45 06.4
Milepost 26, 0.33 mile north of; private road crossing under trestle.....	41 06 03.4	82 45 28.8
Havana, 1.5 miles south of; east-west road crossing.....	41 06 52.9	82 45 23.9
Havana, east line of Baltimore and Ohio property, just south of road crossing, northwest corner of stone porch bears S. 23° E. 117.7 feet, northeast corner foundation to Flath & Gross's undertaking establishment bears S. $52^{\circ} 45'$ W. 74.9 feet, iron post stamped "Prim. Trav. Sta. No. 29, 1906, Ohio".....	41 08 12.2	82 44 49.2
Havana, 0.3 mile north of; township-line road crossing....	41 08 30.4	82 44 41.5
T. 3 N., Rs. 23 and 24 W., corner stone secs. 1, 2, 3, and 4.	41 08 29.8	82 44 10.5
Milepost 22, 0.33 mile north of; east-west road crossing....	41 09 23.0	82 44 18.6
Milepost 20, 1,090 feet south of; road crossing.....	41 10 32.4	82 43 48.5
Pontiac, road crossing just south of station.....	41 11 18.9	82 43 28.3
Milepost 18, 1,435 feet north of; east-west road crossing...	41 12 35.3	82 42 55.4
Monroeville, crossing of the Baltimore and Ohio Railroad and the Lake Shore and Michigan Southern Railway....	41 14 25.4	82 42 08.1
Monroeville, north part of; north of road crossing, at east property line, small maple tree in corner of yard bears S. $63^{\circ} 30'$ E. 46.7 feet, center of Baltimore and Ohio track at road crossing bears S. 57° W. 30 feet, iron post stamped "Prim. Trav. Sta. No. 30, 1906".....	40 14 47.7	82 41 52.5
Monroeville, northwest part of; T road west.....	41 15 01.9	82 42 16.0

ERA QUADRANGLE.

Magnetic declination: North border, $1^{\circ} 56'$ east.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
Era, 430 feet west of station; public road crossing Baltimore and Ohio Railroad.....	39 44 23.2	83 14 38.1
West Union schoolhouse, 0.5 mile northwest of; road north, 27 feet northwest to corner of yard fence, 15 feet east to corner stone.....	39 44 07.7	83 12 58.8
West Union schoolhouse, 0.33 mile southeast of; T road east, 15 feet to south end of culvert.....	39 43 38.9	83 12 18.6
Saranac, T road northwest, 9 feet south to center of bridge, 24 feet southeast to Wm. Sanderson's mail box.....	39 43 20.4	83 10 45.6
Springdale stock farm, T road to southwest, Darby-Millburg township line stone.....	39 43 56.8	83 09 30.5
Big Darby Creek, at ford, on left bank, arrow painted on sycamore tree.....	39 43 47.9	83 07 57.1
Darbyville, 2 miles north of; on east side of Darbyville-Commercial pike at T road west, stone township monument bears S. $72^{\circ} 14'$ W. 14.1 feet, iron post stamped "Prim. Trav. Sta. No. 1, 1906".....	39 43 59.6	83 06 14.2
Shadyside schoolhouse, 1.5 miles east of; stone at T road north.....	39 44 40.2	83 04 48.5
Crossroads at Hall's residence, stone.....	39 44 30.5	83 03 30.6
M. L. Thomas's mail box, T road west, 30 feet southwest to elm tree, 34 feet northwest to north end of culvert.....	39 44 35.1	83 01 25.7
Darbyville-South Bloomfield pike, at pike to north, 39 feet east to arrow, 18 feet south to cross on fence post....	39 43 17.3	83 01 12.4
South Bloomfield, in southeast corner of public school grounds, southeast corner of schoolhouse bears N. 39° W. 73.1 feet, corner iron fence post bears 69° E. 4.5 feet, iron post stamped "Prim. Trav. Sta. No. 2, 1906, Ohio".....	39 42 58.4	82 59 19.6
Center of bridge over canal.....	39 42 49.8	82 58 31.5

CIRCLEVILLE QUADRANGLE.

Magnetic declination: East border, $0^{\circ} 10'$ west; north border, $0^{\circ} 38'$ east; west border, $1^{\circ} 17'$ east.

Geographic positions.

ALONG NORFOLK AND WESTERN RAILWAY, ASHVILLE TO CIRCLEVILLE.

Station.	Latitude.	Longitude.
Ashville, Main street crossing Norfolk and Western Railway.....	° ' " 39 42 46.4	° ' " 82 57 17.5
Milepost 25, 575 feet north of; east-west road crossing.....	39 41 00.7	82 57 21.4
T. 2 N., R. 22 W., northeast corner stone sec. 25.....	39 40 59.3	82 56 47.3
Ritts crossing, 9 feet west of west rail of Norfolk and Western Railway, iron post stamped "Prim. Trav. Sta. No. 3, 1906, Ohio".....	39 39 20.2	82 57 27.7
Point on Norfolk and Western Railway at east-west township-line crossing.....	39 39 15.7	82 57 26.9
Milepost 29, center of track opposite.....	39 37 30.8	82 56 50.4
Circleville, in north side of court-house grounds, iron post stamped "Prim. Trav. Sta. No. 4, 1906, Ohio".....	39 36 02.8	82 56 46.2

ALONG HIGHWAYS NEAR WEST BORDER.

T road east on township line, 36 feet northeast to J. B. Deon's mail box, 24 feet west to old gatepost.....	39 34 00.8	82 57 16.8
Section corners.....	39 34 00.8	82 57 30.2
T road west, 39 feet northwest to corner fence post, 40 feet southwest to D. E. Phillips's mail box.....	39 32 16.0	82 58 00.4
Center of bridge over creek flowing southwest.....	39 31 31.7	82 58 02.5
Nashs Corners, crossroads.....	39 30 31.0	82 58 20.7

ALONG HIGHWAYS NEAR NORTH BORDER.

Ashville, 0.5 mile east of; T road west on range line, 24 feet due east to cross on fence post.....	39 42 50.4	82 56 39.3
Ts. 2 and 9 N., Rs. 21 and 22 W., corner sections.....	39 42 44.4	82 56 39.3
Greenfield School, crossroads at north-south range line between Rs. 21 and 22, 36 feet northwest to corner schoolhouse fence, 39 feet southwest to north end hedge fence.....	39 43 23.5	82 56 36.6
Schoolhouse, about 700 feet south of; crossroads, 24 feet southeast and 22 feet southwest to corner fence posts....	39 43 21.2	82 55 13.5
T. 9 N., R. 21 W., northeast corner sec. 9.....	39 43 36.3	82 53 26.5
T. 9 N., R. 21 W., about 0.25 mile south of; northeast corner sec. 10, east of road at T road east, iron post stamped "Prim. Trav. Sta. No. 5, 1906, Ohio".....	39 43 25.5	82 52 16.1
Crossroads, 27 feet southwest to corner fence post, 25 feet southeast to G. W. Payne's mail box.....	39 43 22.7	82 51 05.1
Fairfield-Pickaway county line, crossroads, 27 feet southeast to corner fence post, 33 feet northwest to guidepost..	39 43 21.6	82 49 52.0
Center of bridge over creek flowing southwest.....	39 43 31.2	82 48 30.9
T. 13 N., R. 20 W., northeast corner stone, sec. 5.....	39 44 02.8	82 47 29.0

Geographic positions—Continued.

ALONG HIGHWAYS NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Royalton, at southeast corner of public-school building, northwest corner of foundation of church bears N. 55° E. 59.6 feet, southeast corner of foundation of school building bears N. 43° 15' W. 6.3 feet, iron post stamped "Prim. Trav. Sta. No. 6, 1906, Ohio".....	39 43 35.6	82 45 59.0
Royalton, 1.33 miles south of; crossroads, 21 feet northwest to willow tree at corner of fence, 27 feet southwest to telephone pole.....	39 42 26.2	82 45 46.4
Royalton Cemetery, crossroads, 23 feet northeast to telephone pole, 27 feet southeast to corner fence post.....	39 41 17.1	82 45 46.2
Royalton Cemetery, 1 mile south of; forks of road, 34 feet east to cross on corner fence post, 39 feet southeast to telephone pole.....	39 40 37.9	82 46 08.2
Royalton Cemetery, about 2 miles south of; road west, 23 feet southwest to Osage-orange tree, 23 feet southeast to telephone pole.....	39 39 56.7	82 45 37.0
Amanda, in west part of; forks of pike, 72 feet northwest to guidepost, 21 feet north to corner fence post.....	39 39 03.6	82 45 07.6
Amanda, 0.75 mile east of; east of pike at T pike west, cross cut on southwest corner of stone culvert bears N. 12° W. 36.5 feet, cross cut on southeast corner of stone culvert bears N. 22° 15' E. 26.9 feet, iron post stamped "Prim. Trav. Sta. No. 7, 1906, Ohio".....	39 38 44.4	82 43 37.9
Road east on township line between Ts. 12 and 13.....	39 38 34.6	82 43 46.0
Amanda, Clear Creek, Hocking, and Madison townships (common corner), northeast corner sec. 1, T. 12 N., R. 20 W.....	39 38 33.2	82 43 22.8
Crossroads, 225 feet west of northeast corner sec. 14.....	39 36 52.1	82 44 43.4
T. 12 N., R. 20 W., northeast corner sec. 14.....	39 36 52.1	82 44 40.6
Oakland, in north part of; T road west on section line, 24 feet northwest to mail box 85, 45 feet southwest to corner blacksmith shop.....	39 36 00.8	82 45 21.1
Crossroads on line between sections, 30 feet northwest and 36 feet southwest to corner fence post.....	39 35 08.5	82 45 34.6
Clear Creek Township, Fairfield-Pickaway county line, southeast corner stone sec. 34, T. 12 N., R. 20 W.....	39 33 24.2	82 46 10.4
Salt Creek Township, on county line, northeast corner, sec. 3, T. 11 N., R. 20 W., 16 feet south to cross on gatepost.....	39 33 23.8	82 46 05.5
Tarleton-Stringtown pike crossing Columbus and Southern Railway.....	39 32 18.7	82 46 12.8
Salt Creek, north corner of bridge over.....	39 31 35.3	82 46 17.3
Stringtown, in southwest corner of William Ballard's pasture, southeast corner of Levi Imer's store bears N. 24° W. 62.4 feet, cross cut on last end of stone culvert bears S. 18° W. 38.5 feet, in top of sandstone post 6 by 10 by 36 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 9".....	39 30 03.5	82 46 27.1
T. 11 N., R. 20 W., northeast corner sec. 22, at crossroads, 33 feet northwest to willow tree, 27 feet southeast to corner post.....	39 30 46.7	82 46 22.7
T. 11 N., R. 20 W., northeast corner sec. 23, at schoolhouse, 21 feet north to cross on fence post.....	39 30 43.0	82 45 16.3

LAURELVILLE QUADRANGLE.

Magnetic declination: North border, $0^{\circ} 29'$ east; east border, $0^{\circ} 28'$ west; south border, $0^{\circ} 25'$ west.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
T. 11 N., R. 20 W., northeast corner sec. 24, Hocking-Pickaway county line, at T road west, 18 feet northwest to mail box 21, 25 feet southwest to arrow on post.....	° ' " 39 30 39.3	° ' " 82 44 10.5
Perry township, northwest corner sec. 19, T. 12 N., R. 19 W..	39 30 42.5	82 44 10.5
T. 12 N., R. 19 W., about 0.33 mile west of; northeast corner sec. 30, T road east, 27 feet northwest to cross on large sycamore tree, 24 feet northeast to J. C. Anderson's mail box...	39 29 45.3	82 43 30.0
T road north on section line, 27 feet southeast to wooden mail box, 18 feet south to G. H. McClelland's mail box...	39 29 48.0	82 42 00.8
T. 12 N., R. 19 W., northeast corner sec. 29.....	39 29 41.8	82 42 00.8
South Perry, south end of bridge at cross-roads.....	39 29 47.8	82 40 19.3
South Perry, 1 mile east of; T road north 15 feet south to cross on fence post.....	39 29 51.9	82 39 11.2
Mound Crossing School, in front yard of; southeast corner of foundation of schoolhouse bears N. 44° E. 40.5 feet, north corner of lower step of entrance to front yard bears S. 12° E. 71.6 feet, iron post stamped "Prim. Trav. Sta. No. 8, 1906, Ohio".....	39 30 22.0	82 37 25.2
Laurel Township, northwest corner sec. 19, T. 12 N., R. 18 W.....	39 30 21.8	82 37 25.8
Perry, northeast corner sec. 24, T. 12 N., R. 19 W., gate-post corner.....	39 30 24.5	82 37 25.6
Rockhouse, T road north, 27 feet northwest to end of board fence, 32 feet northeast to corner picket fence.....	39 29 38.8	82 36 53.7
Moore's sawmill, just south of; T road north, 21 feet west to center of small bridge, 18 feet southwest to west end of gate.....	39 29 54.1	82 35 21.0
Gibsonville, east of; at schoolhouse, crossroads, 63 feet north to corner fence, 60 feet northwest to corner fence post ..	39 30 02.6	82 33 36.8
Gibsonville, 1 mile east of; just south of M. N. McCowen's residence, west of road, nail in locust tree bears N. 30° E. 44.3 feet, nail in locust tree bears S. $40^{\circ} 30'$ E. 33.9 feet, iron post stamped "Prim. Trav. Sta. No. 9, 1906, Ohio"...	39 29 54.2	82 32 41.2
Bridge over Pine Creek, just northeast of; T road north, cross on fence post.....	39 28 10.3	82 32 06.0
Zion Church, T road east, 20 feet south to center of bridge, 18 feet east to arrow cut on board fence.....	39 28 31.3	82 30 34.6
Laurel Township, northeast corner sec. 36, T. 12 N., R. 18 W.	39 28 13.8	82 30 30.2
Blackjack, T road south, 30 feet east to guidepost, 34 feet west to north end of water trough.....	39 28 05.1	82 29 30.0
Barton triangulation station, on a flat cultivated ridge in sec. 18, Washington township, owned by William Barton, who lives 0.25 mile west of station, marble post 30 by 6 by 6 inches set 28 inches in the ground over an earthenware pyramid, ^a top of post marked "U.S.C. & G.S.".....	39 26 22.32	82 29 46.50

^a Reference marks consist of 3 marble posts, 30 by 4 by 4 inches, as follows: (1) True azimuth $99^{\circ} 53'$, distance 140.25 feet; (2) true azimuth $54^{\circ} 31'$, distance 175.8 feet; (3) true azimuth $338^{\circ} 12'$, distance 437.75 feet

Geographic positions along highways—Continued.

NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Stone on township line at north end of wire fence.....	39° 26' 29.7"	82° 30' 39.8"
Joseph Earnhart's blacksmith shop about 400 feet north-east of; T road east, 45 feet east to southwest corner of bridge, 26 feet northeast to cross on fence.....	39° 25' 10.6"	82° 31' 23.4"
Old residence site, T road south, 33 feet north to cross on board fence, 29 feet southeast to corner of old yard.....	39° 24' 06.0"	82° 31' 02.3"
T. 11 N., R. 18 W., northeast corner sec. 25, stake at junction of fences.....	39° 23' 56.4"	82° 30' 52.4"
T. 12 N., R. 17 W., northwest corner sec. 6, stone at topped hickory.....	39° 23' 44.8"	82° 30' 52.4"
Hue, at northwest corner of H. S. Honnold's yard, nail in locust tree bears N. 62° 15' W. 9.6 feet, nail in locust tree bears N. 20° E. 6 feet, iron post stamped "Prim. Trav. Sta. No. 10, 1906".....	39° 23' 25.1"	82° 31' 06.7"
Hocking-Vinton county line, center of road, east-west rail fence, about 700 feet north of N. R. Pettit's residence.....	39° 22' 12.9"	82° 32' 03.2"
Millharm School, road forks, 15 feet north to large white oak.....	39° 21' 22.0"	82° 32' 39.4"
Stella, crossroads, 27 feet southeast to northwest corner of old building, 43 feet southwest to sassafras stump.....	39° 20' 55.1"	82° 33' 05.0"
Stella, 1.25 miles southeast of; road forks 15 feet south to Frank Allen's mail box, 30 feet northwest to stump....	39° 19' 59.4"	82° 32' 18.2"
Centenary Church, about 0.25 mile northeast of; T road south, 9 feet south to center of small bridge, 18 feet west to E. Reinhart's mail box.....	39° 19' 12.4"	82° 32' 33.0"
T. 11 N., R. 17 W., northwest corner sec. 6, west side of Mr. Davis's farm, 27 feet north of junction of fences.....	39° 18' 24.5"	82° 31' 23.1"
H. J. Westcoat's residence, T road north, 37 feet northwest to arrow on fence, 26 feet southeast to guidepost.....	39° 18' 14.9"	82° 31' 37.6"
Curry schoolhouse, 0.25 mile southeast of; T road west, 21 feet south to center of small bridge.....	39° 17' 45.1"	82° 32' 30.0"
T road west, 9 feet southeast to west end of box culvert....	39° 16' 59.6"	82° 32' 17.7"

NEAR SOUTH BORDER.

McArthur, 3.75 miles northwest of; 0.25 mile west of J. T. Hartley's residence, north side of old state road, nail in apple tree bears S. 35° 45' W. 53.7 feet, nail in gum tree bears N. 56° 30' W. 25.3 feet, iron post stamped "Prim. Trav. Sta. No. 11, 1906, Ohio".....	39° 16' 40.1"	82° 32' 09.0"
Schoolhouse, just west of; rail fence south of old state road, T road north.....	39° 16' 13.9"	82° 34' 31.7"
Allensville, northeast corner sec. 8, T. 9 N., R. 18 W., stone in schoolhouse yard.....	39° 16' 23.9"	82° 36' 13.3"
Allensville, center of crossroads.....	39° 16' 21.4"	82° 36' 24.0"
Allensville, 1.33 miles west of; T road north, 21 feet east to southwest corner of covered bridge.....	39° 16' 28.4"	82° 37' 48.2"
Line between Rs. 18 and 19 W., center of old state road, rail fence south.....	39° 16' 16.8"	82° 38' 37.1"

Geographic positions along highways—Continued.

NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
Allensville, 2.5 miles west of; south side of old state road, one-sixth mile west of James Anderson's residence, 30 feet east of T road south, iron post stamped "Prim. Trav. Sta. No. 12, 1906, Ohio".....	39 16 12.8	82 39 04.7
T road north, 30 feet east to center of small bridge.....	39 16 18.3	82 39 46.0
T. 9 N., R. 19 W., northeast corner sec. 15, stone, lane south.....	39 15 43.9	82 40 57.6
Private road south in hollow.....	39 15 04.4	82 42 33.7
Gillespieville, 4 miles east of; T road south, 15 feet south to guidepost.....	39 14 49.1	82 43 33.5
Vinton-Ross county line, road south.....	39 15 10.2	82 45 30.9
T. 9 N., R. 19 W., stone at northwest corner sec. 19, Vinton-Ross county line.....	39 15 07.5	82 45 31.2
Gillespieville, in ground of George Radcliff; southwest corner of Radcliff's residence bears N. 25° 45' E. 98.9 feet, northeast corner of Radcliff's general store bears S. 35° W. 126.3 feet, in top of sandstone post 6 by 10 by 30 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 11".....	39 16 01.9	82 47 24.4

CARROLLTON QUADRANGLE.

Magnetic declination: West border, 2° 20' west; east border, 1° 53' west.

Geographic positions along highways.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Carrollton triangulation station, 2.5 miles east of town of Carrollton on Scroggsfield road on land owned by Mr. Campbell, cut marble post 40 by 6 by 6 inches set 30 inches in the ground, bronze triangulation tablet in center of top marked "U. S. Geological survey, Ohio".....	40 34 35.51	81 01 47.82
T. 14 N., R. 5 W., corner secs. 19, 20, 25, and 26, at junction of fences.....	40 34 24.7	81 03 15.0
Carrollton, Main street crossing of Wheeling and Lake Erie Railroad.....	40 34 25.0	81 05 16.4
Ts. 13, 14, and 15, Rs. 5 and 6 W., corner secs. 1, 6, 31, and 36, at junction of fences.....	34 33 36.5	81 05 36.9
Bridge No. 30 B., 1 mile west of brick plant, in southeast corner of stone abutment of bridge, aluminum tablet stamped "Prim. Trav. Sta. No. 31, 1906, Ohio".....	40 33 59.4	81 07 49.4
Scotts station, north-south road crossing.....	40 33 18.9	81 09 14.4
Dellroy, 1.5 miles east of northwest-southeast road crossing.....	40 33 07.0	81 10 28.3
Dellroy station.....	40 33 29.1	81 12 06.9
Atwood station, road crossing bears S. 41° W., 20 feet, northwest corner of stone retaining wall to culvert, aluminum tablet stamped "Prim. Trav. Sta. No. 32, 1906".....	40 33 10.2	81 14 27.9

Geographic positions along highways—Continued.

NEAR WEST BORDER.

Station.	Latitude.	Longitude.
T. 15 N., R. 7 W., north corner secs. 12 and 18, east and west rail fence at picket fence south.....	° ' " 40 33 51.5	° ' " 81 14 45.0
T. 16 N., R. 7 W., south corner stone secs. 7 and 13.....	40 33 51.5	81 14 45.3
Methodist Church, about 800 feet west of; road forks 26 feet southeast to cross on gate, 15 feet northeast to end of picket fence.....	40 34 30.0	81 14 09.0
Methodist Church, 1 mile north of; T road east 18 feet due north to southwest corner of shed.....	40 35 25.8	81 14 17.9
Top of hill, T road east, 10 feet southwest to small apple tree, 27 feet southeast to corner fence post.....	40 36 21.9	81 14 26.0
Marces, 0.75 mile south of; 135 feet north of T road east, in southwest part of stone abutment of wagon bridge, aluminum tablet stamped "Prim. Trav. Sta. No. 33, 1906".....	40 37 27.6	81 14 42.1
Marces, Catholic Church spire.....	40 38 04.0	81 14 34.6
Marces, T road south; 26 feet southwest to S. Hitt's mail box, 53 feet northwest to southwest corner of yard fence..	40 38 06.8	81 14 45.2
Carroll-Stark county line, center of Waynesburg-Marces road at east-west of fence.....	40 39 02.5	81 15 00.7
Waynesburg, road crossing Pennsylvania Railroad, 170 feet west of station.....	40 40 08.4	81 15 32.2
T. 17 N., R. 7 W., crossroads at quarter corner, east side of sec. 16.....	40 41 15.1	81 15 33.1
T. 17 N., R. 7 W., northeast corner sec. 9, center of road at north-south rail fence, short distance west of brick schoolhouse.....	40 42 34.4	81 15 28.8
Mapleton, 1.75 miles south of; T road west 13 feet northwest to north end of culvert, 21 feet southwest to south end of same culvert.....	40 43 25.4	81 14 40.3
Mapleton, 1 mile south of; crossroads, 15 feet due east to east end of culvert.....	40 44 04.1	81 14 48.9
Mapleton, crossroads, 20 feet southeast to guidepost, 25 feet northwest to corner schoolhouse grounds.....	40 44 47.5	81 14 29.0
Milepost 67, 1,650 feet east of; east-west road crossing of Wheeling and Lake Erie Railroad.....	40 45 58.0	81 14 51.9

CANAL DOVER QUADRANGLE.

Geographic positions.

ALONG WHEELING AND LAKE ERIE RAILROAD, BARRACKS TO NEW CUMBERLAND.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Barracks station, north-south road crossing.....	40 32 00.6	81 14 44.2
T. 15 N., R. 7 W., corner stone secs. 10, 11, 16, and 17, north-south fence at fence west.....	40 32 05.4	81 14 49.6
Carroll-Tuscarawas county line, center of road at north- south fence line.....	40 31 31.2	81 16 00.8
Large barn, T road south, 27 feet northeast to corner of barn, 26 feet west to corner fence post.....	40 31 24.7	81 16 58.1
New Cumberland, 1.25 miles south of; road crossing.....	40 31 35.6	81 18 40.4
New Cumberland, east-west road crossing.....	40 32 38.4	81 18 52.2

ALONG HIGHWAYS.

New Cumberland, 1 mile northwest of; T road north, 25 feet due south to west end of picket fence at gate.....	40 32 59.4	81 19 56.9
Coal shaft, 0.5 mile west of; west end of box culvert at T road north.....	40 33 01.0	81 20 58.4
Fairfield, center of road in front of township house.....	40 32 42.5	81 22 12.9
Johnston, 0.5 mile west of; 6 miles east of Canal Dover, in southwest corner of stone foundation of G. Burgess's barn, aluminum tablet stamped "Prim Trav. Sta. No. 34, 1906".....	40 32 29.8	81 23 09.9
Line between ranges 1 and 2 W., center of road at picket fence south.....	40 31 50.6	81 25 02.1

ALONG PENNSYLVANIA RAILROAD EAST OF CANAL DOVER.

Wagon bridge over Tuscarawas River; east-west road crossing of Pennsylvania Railroad.....	40 31 47.5	81 25 47.1
Milepost 28, private road crossing.....	40 31 01.4	81 27 24.6
Canal Dover, street crossing at station.....	40 31 05.0	81 28 39.8
Canal Dover, in northwest part of; east-west road crossing Baltimore and Ohio Railroad.....	40 31 36.5	81 29 26.6
Canal Dover, at southeast corner of T road southwest, just west of steel bridge over Sugar Creek and about 1 mile northwest of Pennsylvania Railroad station, nail in elm tree bears S. 41° E. 25.6 feet, nail in wild-cherry tree north of road bears N. 23° 2' E. 53.2 feet, T road north- west bears N. 5° W. 44 feet, iron post stamped "Prim. Trav. Sta. No. 42, 1906, Ohio".....	40 31 42.0	81 29 51.6

NAVARRE QUADRANGLE.

Geographic positions.

ALONG BALTIMORE AND OHIO RAILROAD, CANAL DOVER TO STRASBURG.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Shovel works, 1.25 miles north of; east-west road crossing.	40 32 58.1	81 30 03.8
Crown fire-clay works, at south part of; east-west road crossing.....	40 33 43.3	81 30 13.1
Overhead crossing of electric railroad.....	40 34 55.1	81 31 04.2
T. 10 N., R. 3 W., corner stone secs. 19, 20, 21, and 22, in north part of Strasburg.....	40 36 07.4	81 31 45.1

ALONG HIGHWAYS NEAR EAST BORDER.

Strasburg, 1 mile north of; south of road at forks, cross on west end of stone culvert bears S. 74° W. 8.4 feet, south-west corner of residence bears N. 19° 30' E. 135 feet, iron post stamped "Prim. Trav. Sta. No. 35, Ohio, 1906"....	40 36 55.0	81 31 28.7
T. 10 N., R. 3 W., corner secs. 9, 10, 11, and 12, oak tree at cross fences.....	40 37 43.5	81 31 44.6
Schoolhouse, crossroads, 30 feet northeast to guidepost, 32 feet northwest to corner fence post.....	40 38 15.2	81 31 19.8
Tuscarawas-Stark County line, stone in center of north-south road.....	40 39 01.9	81 31 14.8
T 9 N., R. 9 W., northeast corner stone sec. 29.....	40 40 21.0	81 30 39.7
T. 9 N., R. 9 W., northeast corner sec. 20, center of north-south road at east-west rail fence.....	40 41 14.5	81 30 39.3

ALONG WHEELING AND LAKE ERIE RAILROAD, NAVARRE TO MASSILLON.

Navarre, east track of Wheeling and Lake Erie Railroad at crossing of electric railroad just south of station.....	40 43 05.5	81 31 22.2
Navarre, in northwest part of; overhead railroad crossing.	40 43 21.2	81 31 51.4
Navarre, 2.25 miles north of; 26 feet northwest to road crossing, east of Wheeling and Lake Erie Railroad, iron post stamped "Prim. Trav. Sta. No. 36, 1906, Ohio".....	40 45 08.1	81 31 54.4
Columbia station.....	40 46 50.4	81 31 10.8
Massillon, crossing of the Wheeling and Lake Erie Railroad and the Cleveland, Lorain and Wheeling Railway.....	40 47 43.50	81 31 47.30

ALONG HIGHWAYS NEAR NORTH BORDER.

T road east, 24 feet northeast to corner fence post, 24 feet southeast to guidepost.....	40 45 12.1	81 32 49.4
Pigeon Run, T road north.....	40 44 57.2	81 34 35.1
T. 12 N., R. 10 W., northeast corner stone sec. 34, at schoolhouse.....	40 44 58.3	81 35 09.1
T. 12 N., R. 10 W., northeast corner sec. 33, center of road at rail fence north.....	40 45 00.7	81 36 19.4

Geographic positions—Continued.

ALONG HIGHWAYS NEAR NORTH BORDER—continued.

Station.	Latitude.	Longitude.
West Lebanon, 2 miles northeast of; Massillon-Millersburg road, crossroad bears east 20 feet, nail in blaze on white oak bears S. 66° 45' E. 67 feet, iron post stamped "Prim. Trav. Sta. No. 37, 1906".....	40 44 27.7	81 38 06.0
Stark-Wayne county line, center of Millersburg road.....	40 44 05.3	81 38 55.8
T. 11 N., R. 10 W., northeast corner sec. 6, junction of fence, Stark-Wayne county line.....	40 44 13.9	81 38 55.8
West Lebanon, 0.5 mile north of; crossroads, 15 feet southeast to guidepost, 24 feet to south end of culvert.....	40 44 01.0	81 40 07.1
West Lebanon, 0.5-mile north and 1.5 miles west of; crossroads, 24 feet northwest to guidepost, 33 feet northeast to fence post.....	40 44 01.4	81 41 51.3
Kidron, 0.75 mile east of; crossroads, 27 feet southeast to guidepost, 24 feet southwest to south end of box culvert..	40 44 12.1	81 43 53.0
Kidron, southwest corner of crossroads, northwest corner of foundation to creamery, bears S. 68° E. 72 feet, cross cut on southeast corner of foundation to warehouse bears N. 44° 15' W. 86.2 feet, iron post stamped "Prim. Trav. Sta. No. 38, 1906".....	40 44 28.4	81 44 44.5

ALONG HIGHWAYS NEAR WEST BORDER.

T. 16 N., R. 11 W., northeast corner sec. 31, crossroads....	40 44 28.7	81 44 44.3
T. 15 N., R. 11 W., northeast corner sec. 6.....	40 43 35.9	81 44 43.8
Frame schoolhouse, crossroads, 36 feet northeast to guidepost, 48 feet northwest to mail box 50.....	40 42 39.4	81 44 48.0
Gordin School, 0.75 mile north of; crossroads, 39 feet northwest to east gate post, 25 feet northeast to north end of stone culvert.....	40 41 36.2	81 44 47.4
Gordin School, crossroads, 22 feet northeast to corner fence post, 39 feet northwest to mail box 49.....	40 40 57.3	81 44 47.1
Wayne-Holmes county line.....	40 40 04.7	81 44 28.5
Wayne-Holmes county line, 1 mile south of; crossroads, 30 feet northwest to guidepost, 19 feet southwest to west end culvert.....	40 39 12.1	81 43 50.0
Small cemetery, just south of; crossroads, 25 feet southeast to east end of hedge fence, 12 feet southwest to south end of culvert.....	40 38 35.0	81 44 46.6
Fairview, southeast corner of crossroads at schoolhouse, halfway between Mount Hope and Winesburg, nail in east face of large white-oak tree bears S. 73° 30' W. 47.2 feet, iron post stamped "Prim. Trav. Sta. No. 39, 1906".....	40 37 07.0	81 44 40.2
Crossroads, at northwest corner of triangle formed by roads, 9 feet northwest to northwest end of box culvert..	40 35 53.1	81 44 58.7
Schoolhouse No. 3, 500 feet east of; south of Charm-Sugar Creek road at fork to northeast, cross cut on boulder bears N. 20° 30' W. 24.3 feet, iron post stamped "Prim. Trav. Sta. No. 40, 1906".....	40 30 21.7	81 44 50.6

Geographic positions—Continued.

ALONG HIGHWAYS NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
T. 8 N., R. 5 W., corner secs. 1, 2, 9, and 10, junction of fence.....	° ' " 40 30 13.4	° ' " 81 43 36.3
Youter schoolhouse, 1 mile east of; T road north, 36 feet east to N. I. Trayer's mail box.....	40 29 49.0	81 42 02.5
Union cheese factory, T road north, 27 feet northeast of corner rail fence, 43 feet northwest to mail box.....	40 29 26.4	81 40 54.7
Sugar Creek, about 1.5 miles west of Holmes-Tuscarawas county line, 10 feet north to arrow painted on fence post..	40 29 40.2	81 40 05.7
Sugar Creek, 0.75 mile west of; T road south, 10 feet north to junction of fences.....	40 29 50.8	81 39 15.8
Sugar Creek, Main street crossing of Wheeling and Lake Erie Railroad, 215 feet south of station.....	40 30 07.3	81 38 24.4
Sugar Creek, about 0.75 mile northeast of; T road north, 36 feet northwest to corner fence post, 48 feet northeast to corner fence post.....	40 30 29.3	81 37 25.2
Union Hill Church, 0.33 mile north of; at southwest corner of crossroads, northeast corner of E. Crite's residence bears S. 57° 20' W. 23.3 feet, cross cut on west end of culvert bears N. 11° 15' E. 35 feet, iron post stamped "Prim. Trav. Sta. No. 41, 1906".....	40 30 29.4	81 36 38.0
T road north.....	40 30 26.6	81 35 45.1
Sugar Creek-Dover township line, northeast corner sec. 4..	40 30 52.8	81 34 17.4
Schoolhouse No. 2, T road north, 10 feet southwest to south end of bridge.....	40 30 44.4	81 33 00.9
Canal Dover, 2.75 miles west of; crossroads, 21 feet northwest to north end of stone culvert, 29 feet southwest to south end of same culvert.....	40 30 30.9	81 31 28.5

MILLERSBURG QUADRANGLE.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
T road south, 15 feet northwest to north end of culvert....	° ' " 40 35 40.6	° ' " 81 45 07.8
T. 9 N., R. 5 W.; northeast corner sec. 4, stake in fence corner at jog in north-south road.....	40 35 37.3	81 45 43.4
Berlin, 2 miles north and 2 miles east of; stone at T road east.....	40 34 15.7	81 45 10.4
T road west, just south of creek at red barn, 39 feet east to arrow on gatepost, 31 feet south to northeast corner of barn.....	40 33 22.4	81 45 12.5
Walnut Creek, 1.5 miles west of post-office, T road north at school-house; 43 feet northwest to telephone pole, 21 feet south to picket fence.....	40 32 45.3	81 45 08.5
Schoolhouse No. 8, 900 feet southwest of; stone at T road south.....	40 31 26.3	81 45 05.8
T. 8, north line of; 9 feet southeast to southwest corner of machine shed.....	40 31 08.8	81 45 07.4

Caldwell, McConnelsville, and New Lexington quadrangles.

ATHENS, HOCKING, MORGAN, NOBLE, PERRY, AND WASHINGTON COUNTIES.

In cooperation with the State, the following geographic positions were determined by C. B. Kendall in July and August, 1907. The line begins with adjusted position of the Cincinnati and Muskingum Valley Railroad station at New Lexington and follows highways south to Brooks triangulation station. Beginning again at a point about 1 mile south of New Straitsville the line follows highways east via Murray, Bishopville, Stockport, and Beverly to Lowell; thence north to Keith, where it turns west along highways via McConnelsville and Portersville to adjusted position at McCuneville.

NEW LEXINGTON QUADRANGLE.

Magnetic declination: West border, $0^{\circ} 34'$ west; center, $0^{\circ} 56'$ west; south border, $0^{\circ} 38'$ west.

Geographic positions along highways.

NEW LEXINGTON SOUTH.

Station.	Latitude.	Longitude.
New Lexington, center of main track Cincinnati and Muskingum Valley Railroad, opposite station	$39^{\circ} 43' 08.7''$	$82^{\circ} 13' 00.0''$
New Lexington, Perry County court-house, in east face at southeast corner, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1907, Ohio"	$39^{\circ} 42' 50.3''$	$82^{\circ} 12' 29.4''$
New Lexington, 0.7 mile south of court-house, T. 15 N., R. 15 W., section corner under corner of outhouse 150 feet east of public road	$39^{\circ} 42' 15.9''$	$82^{\circ} 12' 25.1''$
New Lexington, 2.2 miles south of; road forks south and southeast, center of triangle	$39^{\circ} 41' 55.8''$	$82^{\circ} 12' 43.3''$
Bristol, about 1.25 miles north of; T. 15 N., R. 15 W., quarter-section corner stone, no numbers	$39^{\circ} 40' 58.8''$	$82^{\circ} 13' 05.9''$
Bristol, at east edge of; T road north, center of triangle	$39^{\circ} 40' 07.4''$	$82^{\circ} 13' 24.3''$
Bristol, at west edge of; 4 corners at store and schoolhouse, 80 feet southwest to northeast corner of schoolhouse	$39^{\circ} 40' 08.0''$	$82^{\circ} 13' 46.2''$
Bristol, 1 mile south of; road forks east and southwest, center of triangle	$39^{\circ} 39' 30.1''$	$82^{\circ} 13' 57.4''$
Bristol, 1.5 miles south of; second-class T road east, east-west section line, T. 15 N., R. 15 W.	$39^{\circ} 39' 15.8''$	$82^{\circ} 13' 48.4''$
Pike-Salt Lick, east-west township line, center of main road 110 feet north of second-class road west	$39^{\circ} 38' 49.1''$	$82^{\circ} 13' 44.1''$
McCuneville, 0.75 mile north of; road crossing Baltimore and Ohio spur track to Jobs mines	$39^{\circ} 38' 17.6''$	$82^{\circ} 13' 30.2''$
McCuneville, at northeast edge of; road crossing Baltimore and Ohio spur track to Jobs mines	$39^{\circ} 37' 42.8''$	$82^{\circ} 14' 00.0''$
McCuneville, at northwest edge of; 2 feet in front of east end of schoolhouse, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Ohio"	$39^{\circ} 37' 43.5''$	$82^{\circ} 14' 09.3''$

Geographic positions along highways—Continued.

NEW LEXINGTON SOUTH—continued.

Station.	Latitude.	Longitude.
McCuneville, 1 mile southeast of; road crossing Baltimore and Ohio Railroad, center of track.....	39 36 48.2	82 13 49.9
Shawnee, Shawnee-Straitsville road crossing the Zanesville and Western Railway, between freight and passenger stations, center of main track.....	39 36 09.6	82 12 45.5
Shawnee, 0.5 mile southwest of; stone section corner, T. 14 N., R. 15 W., on hill, about 300 feet northeast of private coal mine.....	39 35 59.0	82 13 10.2
Shawnee, 0.7 mile southeast of; 4 corners on east-west section line, T. 14 N., R. 15 E.....	39 35 44.7	82 13 18.2
Shawnee, 0.7 mile southeast of; 775 feet west of stone corner on section line, T. 14 N., R. 15 E.....	39 35 44.7	82 13 28.0
New Straitsville, 0.75 mile northeast of; stone section corner, T. 14 N., R. 15 W., on hill, 450 feet west of road, Salt Lick-Straitsville township line.....	39 35 19.2	82 13 30.1
New Straitsville, opposite Columbus and Hocking Coal and Iron Co.'s office, junction of Main and Clark streets..	39 34 40.4	82 14 14.7
New Straitsville, at southeast edge of; public road forks south and southeast, 140 feet south to mine-motor road crossing, 40 feet southeast to signboard, "Colgate 2 miles, Murry City 5 miles, Crawford schoolhouse 1.25 miles".....	39 34 20.4	82 13 22.8
New Straitsville, 1.5 miles southeast of; public road forks south and southeast, signpost.....	39 33 42.2	82 13 22.9
New Straitsville, 1.75 miles southeast of; northeast corner (tile) sec. 6, T. 13 N., R. 15 W., 120 feet east of center of road, Perry-Hocking county line, in small field.....	39 33 35.1	82 13 27.7
Perry-Hocking county line, 0.75 mile south of; public road forks south and southeast, center of triangle.....	39 32 56.9	82 13 24.5
Sandrun, 2.5 miles north of; 4 corners, crossroads, 15 feet north to top of small hill, 60 feet west to chestnut oak...	39 32 49.0	82 13 38.1
Sandrun, 1.25 miles north of; T road east, center of bridge on north-south road.....	39 31 57.6	82 13 53.4
Sandrun, at north edge of; road forks north and northwest, center of triangle.....	39 31 10.2	82 14 19.0
Sandrun, at northwest corner of public schoolhouse, iron post stamped "Prim. Trav. Sta. No. 3, 1907, Ohio".....	39 30 49.0	82 14 12.5
Carbon Hill, at north edge of; road forks north and northwest, 10 feet east to corner of garden, 50 feet northwest to telephone pole.....	39 30 16.7	82 14 55.0
Carbon Hill, 200 feet west of railroad station; road crossing Hocking Valley Railway, center of track.....	39 30 03.5	82 14 47.4
Carbon Hill, 0.75 mile south of station; road crossing new railroad grade just south of schoolhouse, center of track..	39 29 28.1	82 14 59.6
Brooks triangulation station of Coast and Geodetic Survey, on a wooded ridge, near north line sec. 19; Ward Township, 3 miles north of Nelsonville, marble post 29 by 6 by 6 inches set 22 inches in ground above a square earthenware pyramid 5 inches high, top of post marked "U.S.C. & G.S.".....	39 29 01.86	82 13 55.39

Geographic positions along highways—Continued.

NEW STRAITSVILLE EAST.

Station.	Latitude.	Longitude.
New Straitsville, 1.75 miles southeast of; Hocking and Perry county line, New Straitsville-Murray road crossing.	39° 33' 34.2"	82° 13' 15.2"
Coalgate, 0.25 mile north of; road forks north and west, center of small bridge.....	39 33 14.3	82 12 11.1
Coalgate, about 0.5 mile south of; second-class road north up valley, center of small bridge.....	39 32 42.0	82 11 30.6
Murray, 0.5 mile north of station; road crossing Hocking Valley Railway, center of track.....	39 31 15.8	82 10 01.9
Murray, 30 feet south of Hocking Valley Railway station; center of track at street crossing.....	39 30 51.0	82 09 58.2
Murray, 0.75 mile northeast of; forks of road on ridge, second-class T road to southwest center of main road....	39 31 23.5	82 09 34.5
Murray, 1.5 miles northeast of; road north on top of hill 300 feet southeast of dwelling, 110 feet north to bending oak, 20 feet east to top of hill, 15 feet south to stump....	39 31 51.0	82 09 02.8
Dwelling on top of ridge, T road south, 10 feet south to corner of picket fence, 25 feet northwest to southeast corner of dwelling.....	39 32 04.2	82 07 53.4
James Brunten's mail box in triangle, at T road to south..	39 31 59.3	82 07 26.7
McLeish, road crossing the Zanesville and Western Railway, center of main track.....	39 32 09.1	82 06 07.4
McLeish, T road east, 120 feet south of Sunday Creek, center of pike.....	39 31 56.6	82 06 07.6
McLeish, 0.8 mile east of; T road north, center of triangle..	39 32 05.8	82 05 15.6
T. 11 N., R. 14 W., north-south section line, center of road at crossing.....	39 32 04.5	82 05 11.5
Burr Oak, 1 mile south of; T road west, center of triangle..	39 31 46.8	82 04 22.5
Burr Oak, 1.5 miles south of; road crossing the Kanawha and Michigan Railway, 100 feet east of covered bridge over creek, center of track.....	39 31 30.0	82 04 16.9
Bishopville, 0.6 mile northwest of; west entrance to tunnel.	39 31 08.8	82 03 15.8
Bishopville, Main street crossing the Marietta, Columbus and Cleveland Railroad, center of track.....	39 30 46.4	82 02 53.2
Bishopville, at southeast corner of Christian Church and Masonic Hall, iron post stamped "Prim. Trav. Sta. No. 4, 1907, Ohio".....	39 30 47.2	82 02 58.6
Bishopville, 0.8 mile east of; road fork east, pike to northeast, 30 feet east to locust tree, 40 feet west to walnut...	39 30 40.6	82 02 11.9
Bishopville, 1.25 miles northeast of; at 5 corners, walnut tree on west edge of pike.....	39 30 57.8	82 01 37.1
Bishopville, 2.1 miles northeast of; T road east, 25 feet north to oak, 35 feet southwest to locust tree, center of triangle.....	39 31 26.4	82 01 24.3

Geographic positions along highways—Continued.

PORTERSVILLE WEST TO M'CUNEVILLE.

Station.	Latitude.	Longitude.
Portersville, at east edge of; Morgan-Perry county line....	39 40 21.6	82 01 42.3
Portersville, at north edge of; T road west, center of triangle, 30 feet northwest to telephone pole, 25 feet east to tele- phone pole.....	39 40 39.3	82 01 51.8
Portersville, 1 mile west of; T road to north, 30 feet north- east to small dwelling, 12 feet south to wire fence.....	39 40 18.6	82 02 46.9
Sayre, 1.5 miles south of; T road north, center of triangle, 20 feet northwest to sign "Sayre station 1.5 miles," 20 feet northeast to sign "Moxahala 6 miles, Portersville 2 miles".....	39 40 12.1	82 03 38.0
Portersville, 3.25 miles west of; T road east, 50 feet south to oak, 10 feet west to oak.....	39 39 54.2	82 04 45.4
Road crossing the Marietta, Columbus and Cleveland Railroad, center of track.....	39 40 05.8	82 04 56.2
Oakfield, 1.5 miles northeast of; road forks southwest, east, and north, center of triangle.....	39 40 27.1	82 05 50.6
Oakfield, T road north, center of triangle, 10 feet north to telephone pole, 60 feet southwest to corner of dwelling..	39 39 33.7	82 06 57.1
Oakfield, at west edge of; at southwest corner of Oakfield brick schoolhouse, 200 feet northeast of 3 corners, iron post stamped "Prim. Trav. Sta. No. 14, 1907, Ohio"....	39 39 31.8	82 07 14.1
Oakfield, 1 mile southwest of; 1 mile south of Moxahala, T road south, 30 feet northeast to forked walnut, 40 feet southwest to small walnut tree, 15 feet west to T road north.....	39 39 03.0	82 07 45.0
Moxahala, 2 miles southwest of; T road east, 5 feet east to center of triangle, 20 feet southeast to corner of fence...	39 38 35.8	82 08 51.8
T road east, center of triangle, 45 feet west front-yard gate, 75 feet north to corner of barn.....	39 38 33.0	82 09 51.0
Jobs mines, 1.8 miles east of; T road east, center of triangle.	39 38 19.1	82 10 43.8
Jobs mines, 1 mile east of; T road north, 20 feet east to mail box, 31 feet northwest to hickory tree.....	39 38 37.4	82 11 36.2
Jobs mines, forks of road 310 feet north of company store, 10 feet west to buggy house, 100 feet north to front door of old dwelling in road forks.....	39 38 22.8	82 12 40.9
McCuneville, northeast edge of; road crossing Baltimore and Ohio Railroad spur track to Jobs mines.....	39 37 42.84	82 13 59.98

CALDWELL QUADRANGLE.

Magnetic declination: Center, $1^{\circ} 53'$ west; east border, $2^{\circ} 12'$ west; south border, 2° west.

Geographic positions along highways.

ROXBURY FERRY EAST TO LOWELL.

Station.	Latitude.	Longitude.
Roxbury, 1 mile north of ferry, 100 feet east of ford of Mill Creek, road forks southwest and northwest, center of triangle.....	$39^{\circ} 32' 12.4''$	$81^{\circ} 44' 56.2''$
Roxbury, 1.5 miles northeast of ferry, road forks at top of hill, northwest and southwest, 100 feet northwest to large oak, 20 feet northeast to walnut.....	$39^{\circ} 32' 12.5''$	$81^{\circ} 43' 56.7''$
Swifts, 0.5 mile south of ferry; T road up hill to west, west edge of north-south road.....	$39^{\circ} 32' 34.2''$	$81^{\circ} 43' 32.7''$
Swifts; ferry across Muskingum River, ferry bell at west landing.....	$39^{\circ} 33' 13.6''$	$81^{\circ} 43' 18.8''$
Swifts, 50 feet south of station, center of main track Baltimore and Ohio Railroad at road crossing.....	$39^{\circ} 33' 12.5''$	$81^{\circ} 42' 57.5''$
Maple Grove Church, roads north and east, center of triangle.....	$39^{\circ} 33' 05.8''$	$81^{\circ} 42' 12.0''$
Olive Chapel, large oak in northeast corner of crossroads..	$39^{\circ} 33' 13.9''$	$81^{\circ} 41' 04.2''$
Olive Chapel, 1.25 miles east of; 4 corners crossroads, 45 feet south to bridge, 45 feet west to walnut.....	$39^{\circ} 33' 01.7''$	$81^{\circ} 39' 51.9''$
Waterford, 0.5 mile northwest of; 250 feet east of Baltimore and Ohio Railroad, T-road west, small maple tree in center of triangle.....	$39^{\circ} 33' 04.0''$	$81^{\circ} 38' 52.7''$
Waterford, intersection of Water and Ferry streets, 40 feet southeast to northeast corner of C. E. Vaughn & Co.'s store, 55 feet southeast to northwest corner of brick store, 90 feet north to south end of highway bridge over Muskingum River.....	$39^{\circ} 32' 34.3''$	$81^{\circ} 38' 23.3''$
Beverly, intersection of Ferry and Fifth streets.....	$39^{\circ} 32' 52.1''$	$81^{\circ} 38' 21.2''$
Beverly, in top of west wall at north end of Government Canal lock at foot of Fifth street, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907, Ohio".....	$39^{\circ} 32' 52.3''$	$81^{\circ} 38' 32.7''$
Beverly, 1.25 miles northeast of; T road north, signpost painted "Beverly 1 mile, Marietta 19 miles".....	$39^{\circ} 33' 20.4''$	$81^{\circ} 36' 52.4''$
Muskingum River, 0.25 mile south of; top of bare hill, the western of two lone trees.....	$39^{\circ} 32' 19.6''$	$81^{\circ} 35' 22.3''$
Coal Run, 3 corners, T street north, 50 feet northwest to southeast corner of W. P. Steven's store, 40 feet northeast to southwest corner of Ross's store.....	$39^{\circ} 34' 02.2''$	$81^{\circ} 34' 47.8''$
Coal Run, 1 mile southeast of; 300 feet north of road, cupola of schoolhouse.....	$39^{\circ} 33' 32.1''$	$81^{\circ} 33' 47.2''$
Covered bridge over Big Run, 120 feet west of center, T road north, 10 feet south to high telegraph pole, 15 feet north to center of triangle.....	$39^{\circ} 33' 08.3''$	$81^{\circ} 33' 21.9''$
Big Run, 1.5 miles southeast of bridge, second-class T road north, red brick schoolhouse, center of main road..	$39^{\circ} 31' 52.0''$	$81^{\circ} 32' 20.6''$
Upper Lowell, west edge of; 3 corners, T street east, center of triangle.....	$39^{\circ} 31' 53.4''$	$81^{\circ} 31' 18.5''$

Geographic positions along highways—Continued.

ROXBURY FERRY EAST TO LOWELL—continued.

Station.	Latitude.	Longitude.
Lowell dam, U. S. Engineer Corps bench mark, square cut in top of stone on north end of east abutment of dam across Muskingum River, marked thus: "USB□M 608.16".....	39 31 49.5	81 30 54.2
Lowell, junction of streets at east end of highway bridge over river, 15 feet south to elm, 40 feet northwest to corner of dwelling.....	39 31 38.8	81 30 24.7
Lowell, in top of east wall at north end of canal lock No. 3, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1907, Ohio. Ele. 617".....	39 31 35.4	81 30 18.0
Lowell, junction of Walnut and Canal streets, 25 feet west to high telephone pole, 30 feet southeast to corner of brick store.....	39 31 42.6	81 30 22.6

LOWELL NORTH TO KEITH.

Lowell, 0.5 mile north of; T road west, 20 feet southeast to watering trough, 60 feet west to center of bridge over Cras Creek.....	39 32 12.2	81 30 50.4
Lowell, 2 miles north of; road forks north and southeast, center of triangle.....	39 33 17.2	81 31 51.1
White schoolhouse, 1,500 feet north of; T road west, 5 feet west to center of triangle, 40 feet south to telephone pole.....	39 34 23.4	81 31 58.2
Fork of second-class road to southeast, 30 feet south to oak on bank, 30 feet north to oak on north edge of road.....	39 35 03.1	81 31 36.7
Big Run, 30 feet south of bridge over creek; 4 corners, crossroads, 5 feet east to center of triangle.....	39 35 33.5	81 31 54.6
Big Run, 1.4 miles north of; hackberry tree in forks.....	39 36 48.9	81 31 56.0
T. 5 N., R. 9 W., northeast corner stone, sec. 21.....	39 37 43.7	81 31 42.9
Jackson, 0.25 mile north of town house, road forks north and northeast, center of triangle.....	39 37 48.7	81 31 54.2
Keith Fork of Olive Green Creek, 1 mile southeast of; 4 corners, crossroads, 10 feet south to center of triangle, 30 feet southeast to center of bridge.....	39 38 36.4	81 32 10.0
Keith, 1 mile east of; Keith Fork of Olive Green Creek, 500 feet north of, T road west, 5 feet east to center of triangle, 20 feet southwest to cherry tree and sign "Keith 1 mile, Lowell 9 miles, Caldwell 8 miles".....	39 39 15.9	81 32 33.9
Keith, 1 mile east of; 500 feet north of bridge over Keith Fork of Olive Green Creek, at junction with Lowell-Caldwell road, in face of brownstone ledge north of T road west, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1907, Ohio".....	39 39 16.1	81 32 34.1
Keith, 0.6 mile east of; east side sec. 8, T. 5 N., R. 9 W., north edge of road at crossing.....	39 39 23.3	91 32 50.6
Keith, 500 feet east of store, T road north, 35 feet north to south end of covered bridge.....	39 39 26.0	81 33 37.1

Geographic positions along highways—Continued.

KEITH WEST TO MEIGS CREEK.

Station.	Latitude.	Longitude.
Keith, 1.25 miles southwest of; T road north, center of triangle, 125 feet north to covered bridge over creek, 200 feet east to T road south, 120 feet west to Noble-Morgan county line.....	° ' " 39 38 46.2	° ' " 81 35 09.3
Keith, about 1.25 miles southwest of; covered bridge over stream, 120 feet west of Noble-Morgan county line, center of road (house just north of road is said to be about on line).....	39 38 46.6	81 35 10.7
Jordan, 0.5 mile south of schoolhouse; road forks west and south, 30 feet north to corner of fence, 40 feet west to mail box, 50 feet east to creek.....	39 38 35.7	81 36 02.9
Covered bridge over Olive Green Creek, 130 feet west of; T road east, 25 feet west to elm tree, 30 feet north to stream.....	39 38 45.3	81 36 27.2
Covered bridge over Olive Green Creek, 0.5 mile north of; T road west.....	39 39 07.7	81 36 19.5
Smiths School, cupola of schoolhouse.....	39 39 29.6	81 37 08.5
Smiths School, 800 feet west of; road forks north and southwest, center of triangle.....	39 39 28.5	81 37 18.3
Smiths School, 0.7 mile northwest of; road forks south and southeast, ford of stream.....	39 39 24.5	81 37 56.8
Reinersville, 2.25 miles south of; road forks north, east, and west, 3 feet north to B. F. Welch's mail box in triangle.....	39 39 31.6	81 38 48.3
Reinersville, 2.25 miles south of; stone corner sec. 4, T. 6 N., R. 10 W., in field north of east-west road, 200 feet west of road forks.....	39 39 31.3	81 38 50.8
Reinersville, 2 miles south of; junction of Little Olive Green Creek with Allen River, 4 corners, crossroads, large forked elm in triangle.....	39 39 15.3	81 39 39.3
Crossroads church, 0.5 mile north of; T road east, mail box in triangle, 50 feet east to oak tree.....	39 40 23.3	81 41 18.5
Reinersville, 3 miles south of; 450 feet south of crossroads church, in southeast corner of front-yard fence to residence of C. E. Drake, T road north, iron post stamped "Prim. Trav. Sta. No. 10; 1907, Ohio".....	39 39 52.6	81 41 28.3
Ts. 6, 7, 10, and 11 N., Rs. 10, 11 W., stone corner secs. 1, 6, 31, and 36.....	39 40 03.8	81 41 58.6
Dyes Fork of Meigs Creek, center of covered bridge over..	39 39 35.2	81 42 28.6
T. 10 N., R. 11 W., secs. 1 and 2, north and south line between, near Emory Church.....	39 39 32.9	81 43 22.7
Emory Church, 300 feet southwest of; 4 corners, crossroads, center of triangle.....	39 39 40.7	81 43 45.5
Meigs Creek, covered bridge over; crossroads 50 feet west to end of bridge, 20 feet south to corner of fence.....	39 39 17.9	81 44 26.9
Meigs Creek, 600 feet west of covered bridge over; corner stone sec. 10, T. 10 N., R. 11 W., in triangle at second-class T road north.....	39 39 18.6	81 44 35.8

M'CONNELSVILLE QUADRANGLE.

Magnetic declination: Center, $1^{\circ} 02'$ west; south border, $1^{\circ} 06'$ west.

Geographic positions along highways.

BISHOPVILLE EAST TO ROXBURY.

Station.	Latitude.	Longitude.
Mountville, 0.8 mile southwest of; forks 180 feet east of bridge over creek, telephone pole in center of triangle...	° ' " 39 31 11.3	° ' " 81 59 55.3
Mountville, west edge of; T road north, center of triangle, 35 feet northwest to southeast corner of schoolhouse.....	39 31 05.4	81 59 07.8
Mountville, 0.5 mile southeast of; 4 corners, crossroads, 20 feet west to hickory, 80 feet northeast to corner of small dwelling.....	39 30 43.0	81 58 41.2
Moody School (No. 14), 150 feet north of, 400 feet west of covered bridge over Federal Creek, T road east, Charlie Preu's mail box.....	39 31 09.7	81 57 54.3
Elliotts crossroads, 4 corners, 40 feet southwest to store door, 30 feet north to corner blacksmith shop.....	39 31 50.5	81 56 34.7
Elliotts crossroads, 0.75 mile northeast of; 3 corners, roads north and east, 40 feet southeast to walnut tree, 20 feet northeast to corner of fence, 50 feet east to stream crossing.	39 32 19.2	81 56 20.9
Elliotts crossroads, 1.5 miles northeast of; road forks south and southwest, 25 feet southwest to telephone pole, 25 feet southeast to clump of 4 mulberry trees.....	39 32 13.1	81 55 26.3
Westland, 1.3 miles west of; forks at top of hill, roads south and northeast, 20 feet southeast to telephone pole, 50 feet southwest to northeast corner of house.....	39 32 34.1	81 54 51.2
Penn-Marion east-west township line, center of road.....	39 32 38.2	81 54 45.8
Westland, at northeast corner of Westland Grange hall (No. 121), iron post stamped "Prim. Trav. Sta. No. 5, 1907, Ohio".....	39 33 01.7	81 53 47.9
Wolf Creek, east corner of south end of covered bridge over, at roads northeast, northwest, and south.....	39 32 58.6	81 52 23.7
Pennsville, junction of Washington and Columbus streets, 40 feet west to corner of store, 50 feet north to corner of dwelling, 40 feet east to locust tree.....	39 34 27.7	81 51 16.6
Pennsville, at east edge of, cupola of public schoolhouse...	39 34 25.6	81 51 04.9
Pennsville, 0.5 mile southeast of; section corner, T fence in field (no numbers).....	39 34 14.0	81 50 49.6
Pennsville, 0.7 mile southeast of; T road south, 60 feet southeast to telephone pole in triangle, 30 feet west to corner fence post.....	39 34 08.0	81 50 49.8
Road forks northeast, center of pike, 20 feet northwest to mail box, 30 feet east to corner post of wire fence.....	39 33 47.8	81 49 49.0
Stockport, 1.5 miles west of; 4 corners, crossroads, on top of ridge, 35 feet northeast to poplar tree, 90 feet south to corner of dwelling.....	39 32 52.8	81 49 11.4
Stockport, at west edge of, junction of Main street and Broadway, small pipe culvert.....	39 32 55.3	81 47 58.9
Stockport, U. S. Engineer Corps bench mark, square cut in southeast corner of capstone to drawbridge pier of highway bridge over Muskingum River, marked thus: "US B \square M 657.66".....	39 32 52.2	81 47 13.4

Geographic positions along highways—Continued.

BISHOPVILLE EAST TO ROXBURY—continued.

Station..	Latitude.	Longitude.
Stockport, 1.5 miles southeast of; second-class T road northeast, 20 feet north to corner of house, 20 feet northeast to corner of fence.....	° ' " 39 31 55.2	° ' " 81 46 20.4
Roxbury, ferry across Muskingum River, 450 feet north of north landing, in triangle at junction of river road north and road south across river to Roxbury, iron post stamped "Prim. Trav. Sta. No. 6, 1907, Ohio".....	39 31 28.1	81 45 04.2

ROXBURY WEST TO M'CONNELLSVILLE.

Schoolhouse, 600 feet east of; T road to south near top of hill, center of main road.....	39 39 10.8	81 45 11.9
Schoolhouse, 0.5 mile west of; public roads northwest and southwest, center of triangle at forks, 20 feet west and 20 feet north to corner fence posts.....	39 39 04.9	81 45 52.2
Bridge over Fourmile Run, 270 feet east of; T road south, 15 feet south to center of bridge.....	39 38 45.9	81 46 01.8
T. 10 N., R. 11 W., east side of sec. 8 at bend of road to northwest.....	39 38 49.6	81 46 59.8
McConnellsville, 3 miles east of; in angle at road forks, 70 feet west of southwest corner of McKendree Methodist Episcopal Church on the center road, iron post stamped "Prim. Trav. Sta. No. 11, 1907, Ohio".....	39 39 25.9	81 48 29.9
McKendree Church, 0.9 mile west of; T road north, 15 feet northeast to mail box, 20 feet south to plank fence...	39 39 14.6	81 49 23.9
McConnellsville, at southeast corner of veranda of Morgan County court-house, iron post stamped "Prim. Trav. Sta. No. 12, 1907".....	39 38 57.2	81 51 09.6
McConnellsville, center of, cross streets 100 feet southwest of court-house.....	39 38 56.5	81 51 11.2

M'CONNELLSVILLE WEST TO PORTERSVILLE.

Malta, center of intersection of Main and Bell streets.....	39 38 52.0	81 51 35.1
Malta, road forks 300 feet west of sash and door factory, 40 feet west to signpost.....	39 39 04.3	81 51 58.1
Malta, 3 miles west of; T road south, 60 feet southeast to signpost "Malta 3 miles, Pennsville 8 miles, Portersville 7 miles," 40 feet southwest to corner rail fence.....	39 39 24.9	81 54 25.6
Joetown, T road east, 15 feet west to signboard "Morgansville, 3 miles, Tridelphia 3 miles, Malta 4 miles".....	39 40 01.7	81 55 29.3
Deerfield Church, 400 feet southeast of; east side of sec. 27, T. 9 N., R. 13 W.; center of road 350 feet east of crossroads.	39 39 48.0	81 57 14.9
Deerfield Church, 400 feet south of; 4 corners, crossroads, 10 feet west to center of bridge, 15 feet southeast to mail box.....	39 39 48.2	81 57 19.2
Wolf Creek, 40 feet northeast of northeast end of covered bridge, road forks southeast and northwest, center of triangle.....	39 39 52.2	81 57 57.2

Geographic positions along highways—Continued.

M'CONNELSVILLE WEST TO PORTERSVILLE—continued.

Station.	Latitude.	Longitude.
Portersville, 3 miles southeast of; T road south, ford of small stream, 40 feet northwest to sign "Portersville 3 miles," 40 feet southeast to oak.....	° ' " 39 39 51.5	° ' " 81 59 18.2
Portersville, 1.8 miles southeast of; in southeast corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 13, 1907, Ohio".....	39 39 59.4	81 59 51.1

Brinkhaven, Coshocton, Dresden, Millersburg, Mount Vernon, New Comerstown
Perryville, and Plimpton quadrangles.

ASHLAND, COSHOCTON, HOLMES, KNOX, AND WAYNE COUNTIES.

In cooperation with the State, the following geographic positions were determined by C. B. Kendall in August and September, 1907. The lines were run as follows: The first line starts at primary-traverse station No. 56, 1906, and runs west to Tunnel Hill; thence along the Cleveland, Akron and Columbus Railway via Killbuck to Baddow Pass; thence west along public roads to a point 1 mile north of Brinkhaven; thence north along the Pennsylvania Railroad to Greersville; thence west along highways to Wesley Chapel. Here the line branches, south along highways via Danville and Este to Fallsburg and north along highways via Londonville to Hayesville. The second line begins at Kidron primary-traverse station No. 38, 1906, and follows highways west to copper bolt in abutment of Pittsburg, Fort Wayne and Chicago Railway bridge No. 121, near Millbrook, where it turns south via Paint Valley and Welcome to Killbuck; thence east along highways via Charm post-office to primary-traverse station No. 40, 1906; thence south to Baltic and along Pittsburg and Lake Erie Railroad to West Lafayette, where it is tied to primary-traverse station No. 58, 1905.

BRINKHAVEN QUADRANGLE.

Magnetic declination: East border, 2° 12' west; west border, 2° 51' west; north border, 2° 09' west.

Geographic positions.

NORTH ALONG CLEVELAND, AKRON AND COLUMBUS RAILWAY.

Station.	Latitude.	Longitude.
Tunnel Hill, 1 mile east of; center of T road south 10 feet south to center of triangle, 40 feet southwest to maple . . .	40 15 19.6	82 02 02.6
Tunnel Hill, 1 mile north of; road crossing	40 16 12.0	82 02 09.0
Tunnel, north end of	40 16 34.1	82 01 53.7
Warsaw, 2.6 miles south of; road crossing 40 feet east to T road west	40 17 23.7	82 00 47.2
Warsaw, 1.6 miles south of; road crossing at siding, 200 feet west to covered highway bridge	40 18 17.2	82 00 35.3
Warsaw Junction, crossing of the Pittsburgh, Cincinnati, Chicago and St. Louis and the Cleveland, Akron and Columbus Railways, 100 feet east of station	40 19 43.8	82 00 27.6
Baddow Pass, center of highway bridge over Cleveland, Akron and Columbus Railway at north end of summit cut	40 29 32.7	82 08 39.5

WEST ALONG HIGHWAYS.

Crossroads near top of hill, 30 feet southwest to corner fence post, 25 feet southeast to corner of fence	40 29 33.7	82 09 25.7
Brinkhaven, 1 mile north of; center of triangle at forks of road	40 28 58.5	82 11 30.3

ALONG PENNSYLVANIA RAILROAD NEAR MOHICAN RIVER.

Mohican River bridge, center pier	40 29 48.4	82 11 22.2
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ALONG HIGHWAYS NEAR WEST BORDER.

Danville, 1.75 miles southeast of; center of T road east, 200 feet north to road fork northwest, 5 feet east to center of triangle, 40 feet northeast to mail box	40 26 02.1	82 14 39.9
T road west, 15 feet south to culvert, 30 feet northwest to stump corner post to wire fence	40 25 19.7	82 14 42.2
Danville, 3 miles south of; crossroads 30 feet southeast to oak, 50 feet northeast to corner picket fence	40 24 37.8	82 14 44.0
T. 7 N., R. 10 W., stone corner secs. 17, 18, 23, and 24, north edge of T road to west 500 feet south of red barn	40 23 59.2	82 14 45.5
Two-story white house, 700 feet west of; center of T road north	40 23 09.9	82 14 17.5
Zuck, 0.25 mile east of; center of triangle at 3 corners at north end of bridge over Kokosing River	40 22 45.4	82 14 13.7
Brush Run, 4 corners 150 feet northeast of schoolhouse, 10 feet northwest to center of plank bridge, 150 feet north to center Brush Run Bridge	40 22 05.4	82 14 34.3
Brush Run schoolhouse, at northeast corner, 150 feet northeast to 4 corners, iron post stamped "Prim. Trav. Sta. No. 19, 1907, Ohio"	40 22 04.2	82 14 35.5

Geographic positions—Continued.

ALONG HIGHWAYS NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
Brush Run schoolhouse, 1 mile south of; center of triangle at road forks west and southeast.....	° ' " 40 21 22.2	° ' " 82 14 35.6
Esto, 1 mile west of; stone on north edge of east-west road at T road north.....	40 20 00.8	82 14 47.5
Esto, T road south, 25 feet southwest to front-yard gate, 45 feet northwest to store door.....	40 20 03.2	82 13 48.1
Ts. 5 and 6 N., R. 10 W., stone corner secs. 2, 3, 22, and 23, Butler-Jackson township line.....	40 18 43.2	82 13 51.1
Dennis Chapel, 900 feet east of; corner secs. 2, 3, 22, and 23, Ts. 5 and 6 N., R. 10 W., 0.3 mile south of center of triangle at road forks, 30 feet northeast to locust tree.....	40 18 25.4	82 13 53.0
Dennis Chapel, 0.75 mile southwest of; T road northeast, 30 feet east to center of triangle, 30 feet north to telephone pole.....	40 17 55.4	82 14 17.8
Crossroads near top of hill, 40 feet northeast to maple tree, 40 feet northwest to wild-cherry tree.....	40 17 13.8	82 14 34.0
Dennis Chapel, 2.5 miles south and 0.5 mile west of; T road north.....	40 16 21.0	82 14 34.9
Mount Zion Church, 250 feet northwest of; guidepost at 5 corners, marked "Fallsburg 3½ miles, New Castle 8 miles, Bladensburg 3 miles".....	40 15 17.1	82 14 53.1

DRESDEN QUADRANGLE.

Geographic positions along highways near Fallsburg.

Station.	Latitude.	Longitude.
Second-class T road east, 10 feet east to oak, 15 feet south-east to oak.....	° ' " 40 14 08.3	° ' " 82 14 01.6
Fallsburg, about 1.5 miles north of; Charles Smith's mail box in triangle at forks of road 150 feet east of covered bridge over Wakotomeka Creek.....	40 13 18.9	82 14 16.2
Mat Frost's mail box.....	40 12 51.1	82 15 26.8

PLIMPTON QUADRANGLE.

Magnetic declination: East border, 1° 55' west; west border, 2° 12' west; south border, 2° 09' west.

Geographic positions.

ALONG HIGHWAYS NEAR WEST BORDER.

Station.	Latitude.	Longitude.
South Loudonville station, cross streets just west of Main street crossing Pennsylvania Railroad, 35 feet southwest to telephone pole, 35 feet northwest to maple tree.....	° ' " 40 38 08.7	° ' " 82 14 26.7

Geographic positions—Continued.

ALONG HIGHWAYS NEAR WEST BORDER—Continued.

Station.	Latitude.	Longitude.
Loudonville, near center of southeast quarter of city park, 115 feet east of center of Market street, and 150 feet south of center of Main street, northwest corner of First Presbyterian Church bears S. 21° 15' E. 188.6 feet, northeast corner of First Baptist Church bears S. 68° 15' W. 103.3 feet, iron post stamped "Prim. Trav. Sta. No. 20, 1907, Ohio".....	40 38 06.4	82 13 59.2
Loudonville, north edge of; cross streets 40 feet southwest to water trough, 30 feet northeast to maple.....	40 38 25.7	82 13 50.2
Loudonville, 1 mile north of; crossroads 40 feet southwest to apple tree, 30 feet northeast to telephone pole.....	40 39 10.5	82 13 39.3
Loudonville, 2 miles north of; angle of forks 300 feet north of brick schoolhouse, guidepost marked "Hayesville 8 miles, Loudonville 2 miles, Perryville 5 miles, McKay 3 miles".....	40 40 04.2	82 14 03.6
Loudonville, 3 miles north of; triangle at 4 corners, guidepost marked "Hayesville 7 miles, Loudonville 3 miles, Mohican 4 miles, Tylertown 8 miles".....	40 40 42.8	82 14 14.5
McKay, 0.6 mile south of; center of triangle at T road east..	40 41 48.8	82 14 34.2
Ts. 20 and 21 N., R. 16 W., corner secs. 14, 15, 17, and 18...	40 41 48.8	82 14 26.2
McKay, crossroads, 30 feet southwest to northwest corner of store, 12 feet northwest to southeast corner of scale house.	40 42 22.3	82 14 34.1
McKay, 1 mile north of; stone in center of road, at quarter section corner.....	40 43 07.8	82 14 27.0
McKay, 1.25 miles north of; crossroads, center of quadrangle formed by 4 stones set about 5 feet apart.....	40 43 32.8	82 14 27.2
Hayesville, 2.5 miles southeast of; center of triangle at road fork, 30 feet northwest to guidepost marked "Jeromes 5 miles, Loudonv. 7 miles".....	40 44 19.5	82 14 27.4
Wesley Chapel, 200 feet northeast of; center of triangle at 4 corners.....	40 30 11.5	82 15 33.7
Wesley Chapel Cemetery, at southeast corner of; west of Danville-Loudonville road 3.6 miles northeast to Greer, 4 miles south to Danville, iron post stamped "Prim. Trav. Sta. No. 18, 1907, Ohio".....	40 30 10.0	82 15 34.3

ALONG CLEVELAND, AKRON AND COLUMBUS RAILWAY, KILLBUCK TO GLENMONT.

Killbuck, 1 mile west of; road crossing, 250 feet east to milepost C 76.....	40 30 15.5	82 00 21.0
Killbuck, 1.5 miles west of station, road crossing.....	40 30 33.2	82 01 45.0
Milepost C 73, 1,000 feet east of; road crossing.....	40 30 28.0	82 03 17.9
Stone works, second-class road crossing at siding.....	40 30 42.7	82 04 20.5
Glenmont, in northeast corner of grass plot at northwest corner of station, 40 feet north of center of main track, iron post stamped "Prim. Trav. Sta. No. 17, 1907, Ohio".....	40 31 02.4	82 05 26.5
Glenmont, road crossing 1 mile west of station, 200 feet west to milepost C 70.....	40 30 39.0	82 06 28.6
Steel trestle, east end of; center of track over road crossing near.....	40 30 01.8	82 08 05.7

Geographic positions—Continued.

ALONG PENNSYLVANIA RAILROAD NEAR GREERSVILLE.

Station.	Latitude.	Longitude.
Mohigan River, road crossing about 500 feet south of highway bridge.....	° ' " 40 30 32.8	° ' " 82 11 04.6
Edlam, Main street crossing Pennsylvania Railroad 75 feet south of station.....	40 31.21.2	82 11 59.9

ALONG HIGHWAYS.

Center of triangle at T road south, 200 feet west of another T road south	40 30 58.4	82 12 20.4
Greer, 1.5 miles southwest of post-office, telephone pole and T. E. Greer's mail box in center of triangle at T road west.....	40 30 43.2	82 12 51.1
T road north, center of triangle.....	40 30 29.9	82 13 53.1
T road southeast, 5 feet southeast to center of triangle, 40 feet south to guideboard marked "Millersburg 14 miles, Holmesville 7 miles, Wooster 7 miles".....	40 42 45.8	82 00 28.4
Shreve, 1 mile north of; crossroads, 20 feet northwest to large maple, 30 feet southeast to dead mulberry.....	40 41 50.8	82 01 11.0
Shreve, 100 feet east of station, Market street crossing Pittsburgh, Fort Wayne and Chicago Railway.....	40 40 57.9	82 01 21.6
Shreve, 1 mile south of; T road south, center of triangle, Wayne-Holmes county line.....	40 40 05.3	82 01 19.9
Shreve, 2 miles south of; center of triangle at forks of road, 35 feet south to guidepost "Holmesville 6 miles, Shreve 2 miles, Welcome 9 miles".....	40 39 16.1	82 01 03.3
Shreve, 3 miles south of; crossroads, 25 feet southwest to guideboard "Holmes 6 miles, Big Prairie 5 miles, Welcome 8 miles, Shreve 3.5 miles," 25 feet northwest to corner of wire fence.....	40 38 19.6	82 01 15.8
Shreve, 4 miles south of; 6 miles west of Holmesville, 5 miles east of Danville; guidepost at junction of Holmesville-Loudonville road with road south to Killbuck, iron post stamped "Prim. Trav. Sta. No. 23, 1907, Ohio".....	40 37 26.5	82 01 28.8
Center of triangle at T road south, 30 feet southeast to Prim. Trav. Sta. No. 23.....	40 37 26.7	82 01 28.0
Hopewell Church, crossroads, 25 feet northeast to southwest corner of cemetery fence, 30 feet southeast to northwest corner of buggy shed, 80 feet northwest to southeast corner of church.....	40 36 20.7	82 01 28.8
Center of triangle at 3 corners, 450 feet north of iron bridge over Paint Creek, 30 feet northeast to guideboard "Millersburg 6 miles, Paint Valley 1.5 miles, Holmesville 7 miles, Shreve 7 miles, Nashville 6 miles, Welcome 3 miles".....	40 35 25.7	82 01 17.6
Welcome, 2 miles north of; east end of watering trough at crossroads, 50 feet southwest to guideboard "Welcome 2 miles, Paint Valley 1.5 miles, Millersburg 6 miles, Nashville 5 miles," 25 feet east to hickory tree	40 34 36.2	82 01 17.4
Center of triangle at T road north, 40 feet west to guideboard "Welcome 1 mile, Millersburg 6 miles, Paint Valley 2 miles, Shreve 9 miles," 40 feet east to hickory.....	40 33 29.0	82 00 56.4

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Welcome, crossroads 130 feet west of Anderson's store, 40 feet southeast to bridge over Hog Run, 40 feet southwest to guidepost "Killbuck 4 miles, Nashville 5 miles, Glenmont 5 miles, Millersburg 6 miles".....	40 32 47.4	82 01 21.1
Welcome, 1 mile southeast of; oak tree in center of triangle at road forks.....	40 32 00.1	82 00 49.5

PERRYVILLE QUADRANGLE.

Magnetic declination: East border, 2° 12' west.

Geographic positions along highways near east border.

Station:	Latitude.	Longitude.
Wesley Chapel, 1 mile north of; T road west, 5 feet west to center of triangle, 15 feet southeast to maple tree.....	40 31 03.9	82 15 48.9
Welsey Chapel, 2 miles north of; crossroads 40 feet southwest to 3 mail-boxes.....	40 32 00.7	82 15 31.2
Knox-Ashland county line, 1 mile south of; crossroads, 15 feet north to cherry tree, 35 feet west to center of triangle, 40 feet east to 2 mail boxes in triangle.....	40 33 02.0	82 15 34.5
Center of road at Knox-Ashland county line.....	40 33 48.9	82 15 40.0
Junction of Danville-Loudonville and State roads, center of triangle, 30 feet southwest to guidepost "Loudonville 5 miles, Danville 9 miles, Mount Vernon 17 miles," 30 feet north to telephone pole.....	40 34 15.9	82 15 47.3
T road east, 25 feet north to telegraph pole 328, 45 feet south to peach tree on bank.....	40 34 49.3	82 15 47.7
Loudonville, 3 miles south and 1.5 miles west of; center of triangle at road forks 180 feet southwest to bridge over Pine Run, 35 feet southwest to guidepost "Mount Vernon 19 miles, Loudonville 3 miles," 25 feet north to telegraph pole.....	40 35 42.8	82 16 00.1
Loudonville, 2 miles south of; crossroads, 60 feet north to south end of covered bridge over Clear Fork.....	40 36 23.3	82 15 36.4
Loudonville, 1.5 miles southwest of; T road west, 40 feet southwest of telephone pole 3163, 35 feet northwest to to corner picket fence.....	40 37 07.6	82 15 04.3
North-south section line, second-class road south at bend of road to north, 12 feet east to telephone pole painted 1242.....	40 44 59.1	82 15 35.8
Hayesville, primary-traverse station tablet stamped "1244 elev.".....	40 46 21.8	82 15 43.3
Hayesville, 1.25 miles south of; 4 corners, 25 feet southeast to board painted "1, 2, 3, 4, 8".....	40 45 17.2	82 15 35.7
Hayesville, center of fountain at intersection of Main, South Locust, and North Mechanics streets.....	40 46 22.2	82 15 43.7

MILLERSBURG QUADRANGLE.

Magnetic declination: North border, $2^{\circ} 14'$ west; west border, $1^{\circ} 55'$ west; south border, $2^{\circ} 37'$ west.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 16 N., R. 11 W., northeast corner sec. 36.....	40 44 28.4	81 45 57.2
Kidron, 1.5 miles west of; crossroads, 25 feet southwest to guideboard "Orville 7 miles, Mount Hope 7 miles, Apple Creek 3.5 miles, West Lebanon 7 miles," 25 feet southeast to 2 mail boxes.....	40 44 28.5	81 46 32.4
Kidron, 2 miles west of: northeast corner sec. 35, T. 16 N., R. 12 W., crossroads at cheese factory:.....	40 44 28.0	81 47 07.5
Apple Creek, 1.25 miles southeast of; center of crossroads, 40 feet southwest to guidepost "Fredericksburg 6.25 miles, Orville 8 miles, West Lebanon 10.75 miles, Apple Creek 1.25 miles," 50 feet northeast to oak.....	40 44 27.6	81 48 59.5
Apple Creek, 1 mile southeast of; T road south, guidepost "Apple Creek 1 mile, West Lebanon 11 miles, Mount Eaton 8 miles".....	40 44 27.3	81 49 28.5
Apple Creek, highway crossing Cleveland, Akron and Columbus Railway, 300 feet west of station.....	40 44 56.0	81 50 09.7
Center of triangle at road forks, northwest edge of Apple Creek road, 35 feet northwest to guidepost "Moorland 8 miles, Fredericksburg 5 miles, Wooster 5.5 miles, Apple Creek 0.5 mile".....	40 45 19.9	81 51 04.0
T road south, 10 feet south to plank bridge, 25 feet southwest to guidepost "Fredericksburg 4 miles, Moorland 7 miles," Apple Creek 1 mile".....	40 44 43.7	81 51 50.0
T. 16 N., R. 12 W., corner secs. 25, 26, 30, and 31.....	40 44 30.6	81 52 38.2
Apple Creek, 3 miles west of; northeast corner sec. 36, T. 15 N., R. 13 W., crossroads; iron post stamped "Prim. Trav. Sta. No. 21, 1907, Ohio".....	40 44 29.8	81 52 38.4
Apple Creek, about 4 miles west of; T road east at east line sec. 35, 25 feet northeast to guidepost "Apple Creek 3 miles, Wooster Road 2 miles, Moorland 4.5 miles," 5 feet east to center of triangle.....	40 44 12.7	81 53 47.0
Church, crossroads, 30 feet southwest to northeast corner of church, 22 feet east to guideboard "Wooster 5 miles, Fredericksburg 4 miles, Apple Creek 3.5 miles, Moorland 4 miles".....	40 44 00.3	81 53 56.1
T. 15 N., R. 13 W., quarter corner stone, east side of sec. 34, 25 feet south to center of T road south.....	40 43 46.7	81 54 56.6
Millbrook, 1 mile east of; crossroads, center of sec. 33, T. 15 N., R. 13 W., 20 feet southwest to large oak, 30 feet north to telephone pole.....	40 44 00.9	81 56 40.1
Millbrook, 1 mile northeast of; 5 miles southwest of Wooster, at T road east, west of Wooster-Shreve road, at northeast corner of Chas. Part's field; iron post stamped "Prim. Trav. Sta. No. 22, 1907, Ohio".....	40 43 59.6	81 59 33.0
Millbrook, 0.5 mile southeast of; east edge of main road at T road northwest, 35 feet north to corner of fence, 50 feet southwest to guideboard "Blachleyville 5 miles, Moorland 3 miles, Wooster 6 miles, Shreve 3 miles," 100 feet southwest to T road east.....	40 43 19.5	81 59 56.9

Geographic positions along highways—Continued.

NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
Killbuck, 1 mile north and 0.5 mile west of; center of triangle at crossroads, 40 feet north to Smith's mail box, 50 feet east to pump.....	40 31 04.4	81 59 42.3
Killbuck, 0.25 mile northwest of; center of triangle at road forks.....	40 30 24.0	81 59 10.5
Millersburg, 4 miles south of; center of triangle at T road east, 35 feet northeast to corner of picket fence, 45 feet southeast to telephone pole.....	40 30 03.9	81 55 27.9
Center of triangle at road forks southwest and west, 25 feet north to cherry tree, 35 feet south to telephone pole, 40 feet east to walnut tree.....	40 30 01.5	81 53 39.9
Grade, center of triangle at T road east, 40 feet southeast to corner of yard fence, 15 feet west to center of north-south road.....	40 30 27.0	81 53 21.1
Grade, 1 mile east of; roads to east, west, and south, second-class road north, 25 feet southeast to picket fence, 60 feet west to forks.....	40 30 29.3	81 52 22.1
Saltillo, 0.75 mile southwest of; road forks southwest and west, 40 feet southwest to mail box, 15 feet northwest to wire fence.....	40 30 40.1	81 51 18.0
Saltillo, outside of; fence corner in angle of road forks east and southeast, at blacksmith shop; iron post stamped "Prim. Trav. Sta. No. 24, 1907, Ohio".....	40 31 15.2	81 50 53.2
Saltillo, center of triangle at forks of road.....	40 31 15.2	81 50 53.6
Saltillo, 1 mile southeast of; four corners, public road northeast, second-class road southwest, 50 feet northeast to southwest corner of schoolhouse, 50 feet south to elm....	40 30 46.3	81 50 11.2
Saltillo, 1.5 miles southeast of; center of triangle at T road west, 30 feet northwest to farm gate.....	40 30 33.4	81 49 30.9
Trayer's wool factory, center of iron bridge over Dowdys Fork.....	40 30 09.7	81 48 21.9
Trayer's wool factory, 0.5 mile northeast of; center of triangle at T road west, 25 feet north to corner fence post, 30 feet southeast to forked hickory.....	40 30 19.5	81 48 04.2
Charm, T road east, 30 feet west to office door, 25 feet northeast to telephone pole.....	40 30 24.0	81 47 08.3
Charm, 1 mile east of; center of triangle at T road north, 170 feet west of T road south.....	40 30 22.7	81 46 13.7
Killbuck, 450 feet west of station, in north end of east abutment to Cleveland, Akron and Columbus Railway bridge across Killbuck Creek; aluminum tablet stamped "Prim. Trav. Sta. No. 16, 1907.....	40 30 11.8	81 58 59.1

COSHOCTON QUADRANGLE.

Magnetic declination: East border, $2^{\circ} 18'$ west; west border, $2^{\circ} 12'$ west; north border, $2^{\circ} 37'$ west.

Geographic positions.

ALONG CLEVELAND, AKRON AND COLUMBUS RAILWAY, WARSAW TO KILLBUCK.

Station.	Latitude.	Longitude.
Warsaw, 1 mile northeast of; road crossing.....	40 20 07.3	81 59 21.6
Warsaw, 1.33 miles northeast of; road crossing.....	40 20 11.5	81 58.12.7
Warsaw, 1.75 miles northeast of; road crossing.....	40 20 30.9	81 57 37.4
Killbuck Creek, center of iron bridge over.....	40 21 19.8	81 57 38.6
Metham, north end of road crossing, 500 feet northwest of station.....	40 22 05.9	81 59 05.6
Metham, 1.25 miles northeast of station, center iron bridge over Killbuck Creek.....	40 23 00.3	81 58 10.7
Blissfield, road crossing main track 150 feet west of station..	40 24 01.2	81 58 11.2
Blissfield, in northwest corner of C. W. Lepley's front yard, 25 feet south of station, 150 feet southwest of road crossing, 12 feet southeast to northwest corner of Doctor Lepley's office; iron post stamped "Prim. Trav. Sta. No. 15, 1907".....	40 24 01.1	81 58 10.9
Helmick station, road crossing.....	40 23 59.0	81 56 42.9
Layland Sand and Stone Company's works, main track, opposite northeast corner.....	40 25 25.1	81 57 40.2
Layland, road crossing just north of station.....	40 26 12.0	81 57 59.4
Layland, 1.25 miles north of station, center pier of iron railroad bridge over Killbuck Creek.....	40 27 16.1	81 58 16.1
Killbuck, 1.66 miles south of; second-class road crossing..	40 28 12.3	81 58 41.4
Killbuck, at south edge of; road crossing.....	40 29 37.0	81 58 59.3

ALONG HIGHWAYS NEAR NORTH BORDER.

Killbuck, 0.75 mile southeast of; center of triangle at T road west, 20 feet south to large stone.....	40 29 22.4	81 58 39.7
Killbuck, 1.25 miles east of; in triangle at T road south guidepost "Coshocton 21 miles".....	40 29 25.3	81 57 59.6
T. 9 N., R. 13 W., corner secs. 7, 8, 13, and 14.....	40 29 39.6	81 56 59.3
T road west opposite E. C. Shepler's residence, 15 feet east to front gate, 30 feet north to telegraph pole.....	40 29 26.0	81 55 41.5

NEW COMERSTOWN QUADRANGLE.

Magnetic declination: West border, $2^{\circ} 18'$ west.*Geographic positions.*

ALONG HIGHWAYS NEAR WEST BORDER.

Station.	Latitude.	Longitude.
Farmerstown, 0.5 mile west of; quarter corner between secs. 9 and 12, T. 8 N., R. 5 W., T road east.....	40 29 21.6	81 44 12.9
Farmerstown, telephone pole in center of triangle of cross-roads, 50 feet east to top of hill.....	40 29 14.1	81 43 42.6
Farmerstown, 1.5 miles south of; 4 corners, 20 feet southwest to guideboard "New Bedford 2.5 miles, Baltic 3 miles, Sugar Creek 5 miles," 20 feet southeast to west end of stone at north end of culvert.....	40 27 58.8	81 43 40.9

ALONG HIGHWAYS NEAR BAL TIC.

T. 8 N., R. 5 W., corner stone, secs. 19, 20, 21, and 22....	40 27 35.6	81 43 41.7
Holmes-Coshocton county line, corner secs.....	40 26 42.4	81 43 43.7
Baltic, 1 mile west of; Holmes-Coshocton county line at bend of road to east.....	40 26 41.1	81 42 46.6
Baltic, intersection of Main and Maple streets.....	40 26 26.3	81 42 18.1
Baltic, at southwest corner of Baltic Hotel at northeast corner of Main and Maple streets, iron post stamped "Prim. Trav. Sta. No. 25, 1907, Ohio".....	40 26 26.5	81 42 16.9

ALONG WHEELING AND LAKE ERIE RAILROAD, BAL TIC TO WEST LAFAYETTE.

Baltic, 1.5 miles south of; road crossing, 100 feet northeast of milepost Z 46.....	40 25 34.2	81 43 13.5
Baltic, 2.5 miles southwest of; road crossing, 540 feet south of milepost C 99.....	40 24 37.6	81 43 13.3
Chili station, 1 mile northeast of; center of trestle over road crossing, 350 feet south of milepost Z 43 C 101.....	40 22 59.2	81 43 05.5
Chili, road crossing, 150 feet south of station.....	40 22 08.0	81 43 39.2
Chili, in northwest corner of crossroads, 100 feet south and 23 feet east of Wheeling and Lake Erie Railroad station, iron post stamped "Prim. Trav. Sta. No. 26, 1907, Ohio".....	40 22 08.3	81 43 38.9
Chili, 1 mile south of station; road crossing.....	40 21 19.2	81 44 05.5
Fresno, 1.1 miles north of; road crossing, 260 feet south of milepost Z 40 C 104.....	40 20 39.2	81 44 04.2
Fresno, at southeast corner of public-school grounds, northeast corner foundation of school building bears N. $49^{\circ} 15'$ W. 189.2 feet, top of ornamental ball on northwest corner of bridge over White Eyes Creek bears S. $48^{\circ} 30'$ E. 55.2 feet, iron post stamped "Prim. Trav. Sta. No. 27, 1907, Ohio".....	40 20 00.2	81 44 33.7
Fresno, 1 mile south of; road crossing.....	40 19 11.6	81 44 38.7
Fresno, 2 miles south of; road crossing.....	40 18 16.9	81 44 50.8
West Lafayette, 1.5 miles north of; Fresno-West Lafayette road crossing Wheeling and Lake Erie Railroad.....	40 17 51.9	81 44 53.2
West Lafayette, Kirk street crossing Pennsylvania Railroad 100 feet east of station.....	40 16 36.5	81 45 04.2
West Lafayette, Prim. Trav. Sta. No. 58, 1905.....	40 16 33.3	81 44 50.2

MOUNT VERNON QUADRANGLE.

Magnetic declination: East border, $2^{\circ} 51'$ west.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
White School, just north of; T road west, 20 feet south-west to center of triangle, 10 feet east to telephone pole.	° ' " 40 29 18.8	° ' " 82 15 47.4
Center of triangle at forks, 20 feet west to telegraph pole, 30 feet north to telephone pole.	40 28 22.9	82 16 24.2
Danville, center of main east-west and north-south streets, 70 feet southeast to corner of brick store, 75 feet south-west to corner of frame store.	40 27 05.1	82 15 37.8
Danville station, Main street crossing of Cleveland, Akron and Columbus Railway.	40 26 42.4	82 15 39.2

Eaton and Liberty quadrangles.

BUTLER AND PREBLE COUNTIES.

In cooperation with the State, the following geographic positions were determined in 1908 by J. R. Ellis. The line starts from a primary-traverse position near Oxford and follows highways north near west border of Eaton quadrangle, connecting with a primary-traverse position near West Florence.

EATON QUADRANGLE.

Magnetic declination: West border, $1^{\circ} 05'$ east.*Geographic positions along highways near west border.*

Station.	Latitude.	Longitude.
T. 5 N., R. 1 E., near northeast corner sec. 36, T road east.	° ' " 39 29 36.6	° ' " 84 41 47.2
T. 5 N., R. 1 E., northeast corner sec. 25, T road north.	39 30 31.0	84 42 07.4
Fourmile Creek, center of covered bridge over.	39 30 35.5	84 43 01.8
T. 5 N., R. 1 E., northeast corner stone, sec. 26.	39 30 29.4	84 43 14.6
Oxford, in southwest corner of City Hall building, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1908".	39 30 38.4	84 44 23.7
Oxford, north end of College avenue at center of junction with east-west street.	39 30 56.3	84 44 41.3
T. 6 N., R. 1 E., northeast corner sec. 34, center of T road east.	39 34 57.2	84 44 27.6
T. 6 N., R. 1 E., northeast corner sec. 22.	39 36 43.1	84 44 26.8
Ramsey School (No. 2), in northwest corner of schoolhouse, aluminum tablet (elevation 1,038) stamped "Prim. Trav. Sta. No. 2, 1908".	39 37 36.3	84 44 26.2
T. 6 N., R. 1 E., northeast corner sec. 15, center of cross roads.	39 37 35.5	84 44 26.6
T. 6 N., R. 1 E., northeast corner sec. 10, center of cross-roads.	39 38 29.5	84 44 26.6

Geographic positions along highways near west border—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 N., R. 1 E., northeast corner sec. 3, at crossroads.....	39 39 21.7	84 44 26.3
T. 7 N., R. 1 E., southeast corner sec. 34, crossroads.....	39 39 21.7	84 44 26.0
T. 7 N., R. 1 E., northeast corner sec. 34, center of crossroads.....	39 40 14.2	84 44 25.7
T. 7 N., R. 1 E., quarter corner east side of sec. 27, aluminum tablet in northeast corner of concrete bridge just south of crossroads, (elevation 1,093).....	39 40 40.0	84 44 26.0
T. 7 N., R. 1 E., northeast corner sec. 27.....	39 41 06.8	84 44 26.6
T. 7 N., R. 1 E., northeast corner sec. 22, center of T road west.....	39 41 59.7	84 44 26.9
T. 7 N., R. 1 E., northeast corner sec. 15, center of crossroads.....	39 42 52.4	84 44 26.5
T. 7 N., R. 1 E., northeast corner sec. 10, center of crossroads.....	39 43 45.1	84 44 26.7
Eaton, 6 miles west by 0.8 mile south of; 850 feet north of northeast corner sec. 10, aluminum tablet in southwest corner of foundation of bridge (elevation 1,119).....	39 43 53.4	84 44 27.0
Eaton, 6 miles west of; in southeast corner of foundation of concrete bridge, aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1908, Ohio".....	39 44 38.0	84 44 26.8
T. 7 N., R. 1 E., northeast corner sec. 3, center of crossroads.....	39 44 38.0	84 44 27.2
T. 7 and 8 N., R. 1 E., southeast corner sec. 35, T road north.....	39 44 37.8	84 43 18.8

LIBERTY QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse No. 2, 560 feet east of; center of T road south..	39 33 17.3	84 45 13.9
T. 5 N., R. 1 E., northeast corner stone sec. 4, Butler-Preble county line.....	39 34 05.0	84 45 26.1
Bridge over Fourmile Creek, 0.25 mile west of; center of T road east, 5 feet south and 10 feet east to center of grass plot.....	39 34 50.9	84 45 28.9

OKLAHOMA.

TRIANGULATION STATIONS.

Chandler and Shawnee quadrangles.

LINCOLN, POTTAWATOMIE, AND SEMINOLE COUNTIES.

In cooperation with the State during 1906 H. H. Hodgeson extended triangulation over Chandler and Shawnee quadrangles by occupying eleven new stations. Positions are based on Stuart and Harger.

BOULSON, LINCOLN COUNTY, OKLA.

On highest point in pasture and about 200 feet southeast of a clump of brush, 1,700 feet north and 2,400 feet east of corner sec. 33, T. 12 N., R. 4 E., Theodolite elevated 10 feet.

Station mark: Bronze triangulation tablet cemented in sandstone set flush with surface of ground.

[Latitude $35^{\circ} 28' 05.65''$. Longitude $96^{\circ} 53' 11.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Varbel.....	5 28 08.00	185 27 40.40	4. 1009397
Litsey.....	42 45 14.15	222 42 17.41	4. 0543844
Edge.....	61 56 17.84	241 52 57.06	3. 9954952
Stuart.....	175 13 17.69	355 12 59.40	3. 9785894
House.....	274 15 44.81	94 18 41.64	3. 8868022

HARGER, LINCOLN COUNTY, OKLA.

About 0.25 mile southeast of northwest corner and 600 feet south of north line sec. 32, T. 13 N., R. 6 E., on land of John Harger. Theodolite elevated 27.5 feet.

Station mark: A 20-inch post-oak tree having top and branches cut off.

[Latitude $35^{\circ} 33' 47.31''$. Longitude $96^{\circ} 41' 39.85''$.]

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
House.....	41 17 36.60	221 13 51.99	4. 1694969

STUART, LINCOLN COUNTY, OKLA.

In 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 on November 7, 1905.

Station mark: Bronze triangulation tablet cemented in stone set flush with ground.

[Latitude $35^{\circ} 33' 13.45''$. Longitude $96^{\circ} 53' 42.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Edge.....	29 18 32.09	209 15 29.38	4. 2100055
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
House.....	319 52 17.09	139 55 32.38	4. 1190701
Boulson.....	355 12 59.40	175 13 17.69	3. 9785894

DUNN, POTTAWATOMIE COUNTY, OKLA.

Center of chimney on house of C. A. Dunn, in SE. $\frac{1}{4}$ sec. 30, T. 10 N., R. 5 E. Theodolite elevated 20 feet.

[Latitude $35^{\circ} 18' 28.67''$. Longitude $96^{\circ} 48' 26.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Woody.....	117 36 33.74	297 36 09.05	3. 0854871
House.....	181 41 25.96	1 41 37.63	4. 2358553
North Seminole.....	239 48 32.84	59 50 50.37	3. 8419362
South Seminole.....	293 21 44.56	113 24 38.12	3. 9174952
Earlsboro.....	347 27 46.92	167 28 04.97	3. 5607417

EARLSBORO, POTTAWATOMIE COUNTY, OKLA.

About one-half mile northeast of the town of Earlsboro, on highest point of cultivated land in SE. $\frac{1}{4}$ sec. 5, T. 9 N., R. 5 E.

Station mark: Bronze triangulation tablet set 1.5 feet in ground.

Reference mark: Bronze triangulation tablet cemented in sand-stone flush with surface 190.9 feet southeast of station, about 2 feet west of north-south fence, and about 250 feet north of quarter corner on south side of section 5.

[Latitude 35° 16' 33.46". Longitude 96° 47' 55.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dunn.....	167 28 04.97	347 27 46.92	3. 5607417
North Seminole.....	216 31 36.72	36 33 36.14	3. 9428192
South Seminole.....	267 43 27.53	87 46 02.98	3. 8330016

EDGE, POTTAWATOMIE COUNTY, OKLA.

About 3,000 feet south of northeast corner to sec. 16, T. 11 N., R. 3 E., about 3 feet from the west margin of wagon-road right of way. Theodolite elevated 10 feet.

Station mark: Bronze triangulation tablet cemented in sandstone flush with surface.

[Latitude 35° 25' 34.44". Longitude 96° 58' 57.46".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stuart.....	209 15 29.38	29 18 32.09	4. 2100055
Boulson.....	241 52 57.06	61 56 17.84	3. 9954952
Varbel.....	316 19 36.25	136 22 29.16	4. 0380995
Litsey.....	344 07 11.56	164 07 35.50	3. 5810453

HOUSE, POTTAWATOMIE COUNTY, OKLA.

In NW. $\frac{1}{4}$, about 40 feet south and 1,400 feet east of northwest corner sec. 5, T. 11 N., R. 5 E. Theodolite elevated 25 feet.

Station mark: Black-jack tree 16 inches in diameter, the top and branches of which are cut off.

[Latitude 35° 27' 46.96". Longitude 96° 48' 06.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dunn.....	1 41 37.63	181 41 25.96	4. 2358553
Woody.....	5 26 59.41	185 26 23.01	4. 2231498
Varbel.....	36 36 07.56	216 32 43.39	4. 1738069
Boulson.....	94 18 41.64	274 15 44.81	3. 8868022
Stuart.....	139 55 32.38	319 52 17.09	4. 1190701
Harger.....	221 13 51.99	41 17 36.60	4. 1694969
North Seminole.....	338 08 59.56	158 11 05.68	4. 1694502

LITSEY, POTTAWATOMIE COUNTY, OKLA.

On summit of a grassy hill, about 900 feet north and 800 feet west of southeast corner sec. 27, T. 11 N., R. 3 E.

Station mark: Bronze triangulation tablet cemented in sandstone set flush with surface of ground.

[Latitude $35^{\circ} 23' 35.50''$. Longitude $96^{\circ} 58' 16.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Edge.....	164 07 35.50	344 07 11.56	3.5810453
Boulson.....	222 42 17.41	42 45 14.15	4.0543844
Varbel.....	303 04 52.68	123 07 21.61	3.8894100
Tecumseh.....	348 02 05.28	168 03 18.42	4.1881491

TECUMSEH, POTTAWATOMIE COUNTY, OKLA.

Center of chimney on rear end of Tecumseh opera house. The chimney is flush with and about 5 feet north of center of east rear wall of building.

[Latitude $35^{\circ} 15' 25.92''$. Longitude $96^{\circ} 56' 09.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Litsey.....	168 03 18.42	348 02 05.28	4.1881491
Varbel.....	196 55 08.00	16 56 23.58	4.0548392

VARBEL, POTTAWATOMIE COUNTY, OKLA.

On summit of hill in NE. $\frac{1}{4}$, about 250 feet north and 850 feet east of center of sec. 8, T. 10 N., R. 4 E.

Station mark: Bronze triangulation tablet cemented in sandstone set flush with surface of ground.

[Latitude $35^{\circ} 21' 18.12''$. Longitude $96^{\circ} 53' 58.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tecumseh.....	16 56 23.58	196 55 08.00	4.0548392
Litsey.....	123 07 21.61	303 04 52.68	3.8894100
Edge.....	136 22 29.16	316 19 36.25	4.0380995
Boulson.....	185 27 40.40	5 28 08.00	4.1009397
House.....	216 32 43.39	36 36 07.56	4.1738069
Woody.....	302 28 33.22	122 31 20.66	3.9380002

WOODY, POTTAWATOMIE COUNTY, OKLA.

On highest cultivated ground in NW. $\frac{1}{4}$ sec. 30, T. 10 N., R. 5 E.

Station mark: Bronze triangulation tablet set 1.5 feet below surface of ground.

[Latitude $35^{\circ} 18' 46.98''$. Longitude $96^{\circ} 49' 09.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Varbel.....	122 31 20.66	302 28 33.22	3.9380002
House.....	185 26 23.01	5 26 59.41	4.2231498
Dunn.....	297 36 09.05	117 36 33.74	3.0854871

NORTH SEMINOLE, SEMINOLE COUNTY, OKLA.

About 2,000 feet north of southeast corner sec. 14, T. 10 N., R. 5 E., on wagon-road right of way 2 feet from east fence.

Station mark: Bronze triangulation tablet cemented in sandstone set flush with ground surface.

[Latitude $35^{\circ} 20' 22.00''$. Longitude $96^{\circ} 44' 28.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Earlsboro.....	36 33 36.14	216 31 36.72	3.9428192
Dunn.....	59 50 50.37	239 48 32.84	3.8419362
House.....	158 11 05.68	338 08 59.56	4.1694502
South Seminole.....	346 52 01.78	166 52 37.93	3.8424220

SOUTH SEMINOLE, SEMINOLE COUNTY, OKLA.

About 3,000 feet south of common corner of Ts. 9 and 10 N., Rs. 5 and 6 E., on wagon-road right of way 3 feet from west fence.

Station mark: Bronze triangulation tablet cemented in sandstone set flush with surface of ground.

[Latitude $35^{\circ} 16' 42.15''$. Longitude $96^{\circ} 43' 26.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Earlsboro.....	87 46 02.98	267 43 27.53	3.8330016
Dunn.....	113 24 38.12	293 21 44.56	3.9174952
North Seminole.....	166 52 37.93	346 52 01.78	3.8424220

PRIMARY TRAVERSE.

Asher, McComb, Romulus, Shawnee, and Wanette quadrangles.

POTTAWATOMIE COUNTY.

In cooperation with the State, the following geographic positions were determined by H. H. Hodgeson in 1906. The line starts at Tecumseh triangulation station and follows the Gulf, Colorado and Santa Fe Railway to Wanette; thence along highways to Maud; thence northwest along Missouri, Kansas and Texas Railway 7 miles; thence along highways to Earlsboro triangulation station.

SHAWNEE QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
Tecumseh triangulation station, center of chimney on rear (east) end of Tecumseh Opera House, flush with and about 5 feet north of center of rear wall.....	° ' " 35 15 26.0	° ' " 96 56 09.6
T. 9 N., R. 5 E., northeast corner sec. 18.....	35 15 37.8	96 48 24.8
Earlsboro triangulation station, highest point of cultivated land in SW. $\frac{1}{4}$ sec. 5, T. 9 N., R. 5 E., about 0.5 mile northeast of Earlsboro ^a	35 16 33.6	96 47 55.4

^a Station mark: A bronze triangulation tablet set 1.5 feet in ground. Witness mark is a similar tablet cemented in sandstone, set flush with ground 190.9 feet southeast of station; about 2 feet west of north-south fence, and about 250 feet north of quarter corner on south side of section 5.

ASHER QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 N., R. 3 E., northeast corner sec. 21.....	34 59 09.2	96 59 03.1
T. 6 N., R. 3 E., northeast corner sec. 23.....	34 59 09.1	96 56 56.8
T. 6 N., R. 4 E., 100 feet east of northwest corner sec. 19, bench mark 122 stamped "elevation 957".....	34 59 08.6	96 55 52.9
T. 6 N., R. 4 E., northeast corner sec. 19.....	34 59 08.8	96 54 52.1
T. 6 N., R. 4 E., northeast corner sec. 20.....	34 59 08.6	96 53 49.1
T. 6 N., R. 4 E., northeast corner sec. 21.....	34 59 08.4	96 52 45.9
T. 6 N., R. 4 E., 50 feet southeast of northwest corner sec. 27, iron post stamped "Prim. Trav. Sta. No. 165".....	34 58 15.9	96 52 45.6
T. 6 N., R. 4 E., northeast corner sec. 27.....	34 58 15.9	96 51 43.0
T. 6 N., R. 4 E., northeast corner sec. 26.....	34 58 15.5	96 50 40.0
T. 6 N., R. 4 E., northeast corner sec. 25.....	34 58 15.1	96 49 36.5
T. 6 N., R. 5 E., about 40 feet southwest of northeast corner sec. 30, iron post stamped "Prim. Trav. Sta. No. 174".....	34 58 14.9	96 48 34.0
T. 6 N., R. 5 E., northeast corner sec. 29.....	34 58 14.9	96 47 30.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Milestone No. 30, Seminole-Pottawatomie county line	° ' " 34 58 16.9	° ' " 96 46 32.0
T. 6 N., R. 5 E., north line of sec. 21, closing corner Seminole-Pottawatomie county line	34 59 08.2	96 46 32.0
T. 6 N., R. 5 E., north line of sec. 16, closing corner Seminole-Pottawatomie county line	34 59 59.8	96 46 31.7

ROMULUS QUADRANGLE.

Geographic positions.

NEAR TECUMSEH.

Station.	Latitude.	Longitude.
T. 9 N., R. 3. E., northeast corner sec. 23.	° ' " 35 14 46.4	° ' " 96 56 51.8

ALONG THE GULF, COLORADO AND SANTA FE RAILWAY, MILEPOSTS 140 TO 146.

T. 9 N., R. 3. E., north line sec. 27, road crossing.	35 13 54.1	96 58 02.7
Milestone 140, aluminum tablet No. 111 stamped "Elevation 987"	35 13 41.1	96 58 00.7
T. 9 N., R. 3 E., north line sec. 34, road crossing.	35 13 01.5	96 58 15.7
T. 8 N., R. 3 E., north line sec. 11, road crossing.	35 11 18.2	96 57 38.7
Milestone 143, aluminum tablet No. 112 stamped "Elevation 931"	35 11 15.0	96 57 39.0
T. 8 N., R. 3 E., north line sec. 21, road crossing.	35 09 34.3	96 59 14.2

NORTH ALONG HIGHWAYS.

T. 6 N., R. 5 E., north line sec. 9, closing corner Seminole-Pottawatomie county line	35 00 51.9	96 46 31.9
T. 6 N., R. 5 E., north line sec. 3, closing corner Seminole-Pottawatomie county line, iron post stamped "911"	35 01 42.8	96 46 31.7
T. 6 N., R. 5 E., northeast corner sec. 5	35 01 44.2	96 47 30.7
T. 7 N., R. 5 E., northeast corner sec. 32.	35 02 36.2	96 47 30.4
T. 7 N., R. 5 E., northeast corner sec. 31.	35 02 36.4	96 48 33.8
T. 7 N., R. 5 E., northeast corner sec. 30.	35 03 28.5	96 48 33.8
T. 7 N., R. 5 E., northeast corner sec. 19.	35 04 20.6	96 48 33.5
T. 7 N., R. 5 E., northeast corner sec. 7.	35 06 04.9	96 48 33.6
T. 7 N., R. 5 E., northeast corner sec. 6.	35 06 56.7	96 48 33.6
T. 7 N., R. 5 E., northeast corner sec. 5.	35 06 56.8	96 47 30.1
T. 7 N., R. 5 E., north line sec. 3, closing corner Seminole-Pottawatomie county line, iron post-stamped "891"	35 06 56.8	96 46 32.7
T. 8 N., R. 5 E., north line sec. 34, closing corner Seminole-Pottawatomie county line	35 07 49.0	96 46 32.6

476 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

Geographic positions—Continued.

ALONG MISSOURI, KANSAS AND TEXAS RAILWAY.

Station.	Latitude.	Longitude.
Seminole-Pottawatomie county line post of Missouri, Kansas and Texas Railway.....	° ' " 35 10 05.9	° ' " 96 46 36.1
T. 8 N., R. 5 E., north line sec. 16, road crossing.....	35 10 24.6	96 46 44.2
T. 9 N., R. 5 E., east line sec. 31, road crossing.....	35 12 15.4	96 48 25.7
T. 9 N., R. 4 E., east line sec. 36, road crossing.....	35 12 39.1	96 49 28.9

ALONG HIGHWAYS TO EARLSBORO TRIANGULATION STATION.

T. 9 N., R. 4 E., northeast corner sec. 26.....	35 13 53.1	96 50 31.8
T. 9 N., R. 4 E., northeast corner sec. 25.....	35 13 53.9	96 49 28.7
T. 9 N., R. 5 E., northeast corner sec. 30.....	35 13 53.9	96 48 25.3
T. 9 N., R. 5 E., northeast corner sec. 19.....	35 14 46.1	96 48 25.0

WANETTE QUADRANGLE.

Geographic positions.

ALONG THE GULF, COLORADO AND SANTA FE RAILWAY NEAR WANETTE.

Station.	Latitude.	Longitude.
T. 6 N., R. 3 E., north line sec. 19, road crossing.....	° ' " 34 59 08.6	° ' " 97 02 10.8
T. 6 N., R. 3 E., north line sec. 30, road crossing.....	34 58 16.5	97 02 11.2
Wanette, center of main track opposite signal arm Santa Fe station.....	34 57 43.9	97 02 11.4

ALONG HIGHWAYS.

T. 6 N., R. 3 E., northeast corner sec. 30.....	34 58 16.8	97 01 09.4
T. 6 N., R. 3 E., northeast corner sec. 19.....	34 59 08.9	97 01 09.9
T. 6 N., R. 3 E., northeast corner sec. 20.....	34 59 08.9	97 00 06.6

M'COMB QUADRANGLE.

Geographic positions along Gulf, Colorado and Santa Fe Railway, McComb to milepost 158.

Station.	Latitude.	Longitude.
T. 8 N., R. 3 E., east line sec. 20, road crossing.....	° ' " 35 09 02.9	° ' " 97 00 07.4
McComb, center of main track opposite signal arm of Santa Fe station.....	35 09 00.6	97 00 32.7
T. 8 N., R. 3 E., north line sec. 30, road crossing.....	35 08 41.9	97 01 59.9
Milestone 149, bench mark 114 stamped "Elevation 968".....	35 08 18.8	97 02 22.8
T. 7 N., R. 2 E., north line sec. 1, road crossing.....	35 06 58.1	97 03 11.6
Milestone 152, bench mark 115 stamped "Elevation 1038".....	35 05 57.1	97 03 42.2
T. 7 N., R. 2 E., north line sec. 14, road crossing under bridge.....	35 05 13.6	97 03 41.5

Geographic positions along Gulf, Colorado and Santa Fe Railway, McComb to milepost 158—Continued.

Station.	Latitude.	Longitude.
T. 7 N., R. 2 E., north line sec. 23, center of trestle over road crossing.....	° ' " 35 04 21.6	° ' " 97 03 47.8
Milestone 155, bench mark 116 stamped "Elevation 977".....	35 03 25.8	97 03 39.2
T. 6 N., R. 2 E., north line sec. 36, road crossing.....	35 02 37.2	97 02 39.7
T. 7 N., R. 2 E., east line sec. 1, road crossing.....	35 01 34.3	97 02 11.6
T. 6 N., R. 2 E., north line sec. 13, road crossing.....	35 00 00.7	97 02 31.1

Agra, Chandler, Edmond, Guthrie, Luther, McComb, Moore, Newalla, Norman, Oklahoma, Paul's Valley (30'), Perkins, and Shawnee quadrangles.

CLEVELAND, LINCOLN, LOGAN, OKLAHOMA, AND POTTAWATOMIE COUNTIES.

In cooperation with the State, in the spring of 1907, J. R. Ellis extended primary traverse for control of the quadrangles specified above. Lines were tied to Chandler, Flinn, Edge, Tecumseh, and Noble triangulation stations; to a point at Wanette located by primary traverse in 1906, and to a point at the city of Oklahoma located by traverse in 1892.

CHANDLER QUADRANGLE.

Geographic positions along Chicago, Rock Island and Pacific Railway.

Station.	Latitude.	Longitude.
	° ' " 35 42 22.0	° ' " 96 52 47.0
Chandler standpipe (located by triangulation).....		
Chandler station, 150 feet southwest of; at crossing post, iron post stamped "Prim. Trav. Sta. No. 1".....	35 41 43.2	96 52 45.4
North-south road crossing.....	35 42 31.7	96 53 35.7
T. 14 N., R. 4 E., northeast corner sec. 8.....	35 42 35.8	96 53 35.3
T. 14 N., R. 4 E., northeast corner sec. 6.....	35 43 28.4	96 54 40.1
North-south road crossing between secs. 31 and 36.....	35 44 00.8	96 55 42.9
Lowe station, 0.25 mile southeast of; road crossing.....	35 44 26.6	96 56 47.0
T. 15 N., R. 3 E., northeast corner sec. 35.....	35 44 21.0	96 56 47.0

AGRA QUADRANGLE.

Geographic positions along Chicago, Rock Island and Pacific Railway.

Station.	Latitude.	Longitude.
	° ' " 35 45 05.1	° ' " 96 57 51.4
Milepost 500, 0.33 mile west of; north-south road crossing..		
Schoolhouse, north-south road crossing.....	35 45 08.4	96 59 58.2
T. 15 N., R. 3 E., northeast corner sec. 29.....	35 45 12.2	96 59 59.2

PERKINS QUADRANGLE.

Magnetic declination (mean): South border, 9° east.

Geographic positions.

ALONG CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 15 N., R. 3 E., northeast corner sec. 30.....	35 45 12.1	97 01 02.7
Emsey station, east-west road crossing.....	35 46 04.7	97 01 26.6

WEST ALONG HIGHWAYS.

T. 15 N., R. 2 E., northeast corner sec. 24.....	35 46 04.1	97 02 03.0
T. 15 N., R. 2 E., northeast corner sec. 23.....	35 46 05.0	97 03 06.0
T. 15 N., R. 2 E., northeast corner sec. 22.....	35 46 05.0	97 04 10.4
T. 15 N., R. 2 E., northeast corner sec. 21.....	35 46 04.6	97 05 14.7
Fallis, 1.75 miles northeast of; Missouri, Kansas and Texas Railway, north-south road crossing.....	35 45 41.6	97 06 19.1
Fallis, 0.75 mile northeast of; road crossing at east end of Y on Missouri, Kansas and Texas Railway.....	35 45 12.3	97 07 15.4

LUTHER QUADRANGLE.

Magnetic declination (mean): North border, 9° east; south border, 9° 29' east; west border, 9° 32' east.

Geographic positions.

WEST ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Fallis, 0.4 mile south of Missouri, Kansas and Texas Rail- way station, east-west road crossing at switch block, iron post stamped "Prim. Trav. Sta. No. 2, 1903, ADJ 880"...	35 44 18.7	97 07 22.8
T. 15 N., R. 1 E., northeast corner sec. 36, crossroads on Lincoln-Logan county line.....	35 44 19.3	97 08 26.3
T. 15 N., R. 1 E., northeast corner sec. 35, crossroads.....	35 44 19.7	97 09 30.3
T. 15 N., R. 1 E., northeast corner sec. 34.....	35 44 20.4	97 10 34.7
T. 15 N., R. 1 E., 10 feet west of northeast corner sec. 33, at crossroads, iron post stamped "Prim. Trav. Sta. No. 3, 1907, 914 Okla".....	35 44 21.1	97 11 38.8
T. 15 N., R. 1 E., northeast corner sec. 32, T road north...	35 44 21.4	97 12 42.2
T. 15 N., R. 1 E., northeast corner sec. 31, crossroads.....	35 44 21.3	97 13 46.2
Indian meridian, T road east at store, corner secs. 25, 30, 31, and 36, T. 15 N.....	35 44 21.3	97 14 48.9
Indian meridian, 30 feet south of fence post at northeast corner of sec. 36, T. 15 N., in stone, bronze tablet stamped "Prim. Trav. Sta. No. 4, 1907, No. 17, 1080".....	35 44 20.8	97 14 49.2

Geographic positions—Continued.

SOUTH ALONG INDIAN MERIDIAN, CORNER OF TS. 14 AND 15 N., TO CHOCTAW CITY.

Station.	Latitude.	Longitude.
T. 14 N., Indian meridian, northeast corner sec. 6, Oklahoma-Logan county line, crossroads.....	° ' " 35 43 29.4	° ' " 97 14 48.8
T. 14 N., Indian meridian, northeast corner sec. 12, crossroads.....	35 42 36.7	97 14 48.9
T. 14 N., Indian meridian, northeast corner sec. 13, T road east.....	35 41 45.1	97 14 48.8
T. 14 N., Indian meridian, northeast corner sec. 24, crossroads.....	35 40 53.1	97 14 49.1
T. 14 N., Indian meridian, northeast corner sec. 30, crossroads.....	35 40 01.2	97 14 48.9
T. 14 N., Indian meridian, in sec. 30, R. 1 E., 370 feet south of Missouri, Kansas and Texas Railway crossing, 700 feet north of bridge over Deep Fork, close to fence east of road, iron post stamped "16, 967 Prim. Trav. Sta. No. 5, 1907".....	35 39 42.1	97 14 48.5
T. 14 N., Indian meridian, northeast corner sec. 36, crossroads.....	35 39 09.0	97 14 48.8
T. 13 N., Indian meridian, northeast corner sec. 6, crossroads.....	35 38 16.9	97 14 48.9
T. 13 N., R. 1 E., northwest quarter sec. 7, close to fence, meridian right of way and 30 feet south of corner fence post, in top of stone tablet stamped "Prim. Trav. Sta. No. 6, 1907".....	35 37 24.2	97 14 48.5
T. 13 N., Indian meridian, northeast corner sec. 12.....	35 37 24.8	97 14 49.0
T. 13 N., Indian meridian, northeast corner sec. 13, crossroads.....	35 36 33.3	97 14 49.1
T. 13 N., Indian meridian, door to colored schoolhouse...	35 35 40.1	97 14 50.7
T. 13 N., R. 1 E., southwest corner sec. 19, on meridian right of way, 50 feet north of fence post, iron post stamped "Prim. Trav. Sta. No. 7, 1907, No. 13, 1216 feet".....	35 34 49.3	97 14 49.3
T. 13 N., Indian meridian, northeast corner sec. 25, crossroads.....	35 34 48.6	97 14 49.7
T. 13 N., Indian meridian, northeast corner sec. 36, crossroads.....	35 33 56.5	97 14 50.0
T. 12 N., Indian meridian, northeast corner sec. 1, crossroads.....	35 33 03.0	97 14 49.5

GUTHRIE QUADRANGLE.

Magnetic declination (mean): South border, $9^{\circ} 22'$ east.*Geographic positions west along highways.*

Station.	Latitude.	Longitude.
T. 15 N., R. 1 W., northeast corner sec. 26, crossroads at church and schoolhouse.....	$35^{\circ} 45' 14.0''$	$97^{\circ} 15' 52.6''$
T. 15 N., R. 1 W., northeast corner sec. 27, crossroads.....	$35^{\circ} 45' 14.3''$	$97^{\circ} 16' 57.8''$
T. 15 N., R. 1 W., northeast corner sec. 28, crossroads.....	$35^{\circ} 45' 14.1''$	$97^{\circ} 18' 01.9''$
T. 15 N., R. 1 W., northeast corner sec. 29, crossroads.....	$35^{\circ} 45' 15.0''$	$97^{\circ} 19' 05.6''$
T. 15 N., R. 1 W., northeast corner sec. 30, crossroads.....	$35^{\circ} 45' 15.3''$	$97^{\circ} 20' 09.8''$
T. 15 N., R. 2 W., northeast corner sec. 25, crossroads.....	$35^{\circ} 45' 15.2''$	$97^{\circ} 21' 12.6''$
Flinn triangulation station, in sec. 24, T. 15 N., R. 2 W....	$35^{\circ} 46' 00.0''$	$97^{\circ} 22' 02.3''$

EDMOND QUADRANGLE.

Magnetic declination (mean): North border, $9^{\circ} 23'$ east; south border, $9^{\circ} 26'$ east; east border, $9^{\circ} 32'$ east.*Geographic positions.*

Station.	Latitude.	Longitude.
Choctaw, 3.5 miles north and 0.75 mile east of; 0.33 mile west of meridian line, Ts. 12 and 13 N., at east end of bridge over North Fork of Canadian River, triangulation tablet stamped "No. 12, 1906, Prim. Trav. Sta. No. 8, 1907".....	$35^{\circ} 33' 03.5''$	$97^{\circ} 15' 10.3''$
T. 12 N., R. 1 W., northeast corner sec. 2.....	$35^{\circ} 33' 03.2''$	$97^{\circ} 15' 54.4''$
T. 12 N., R. 1 W., northeast corner sec. 11, 30 feet south of fence post, in right of way close to fence, in stone, triangulation tablet stamped "Prim. Trav. Sta. No. 9, 1907".....	$35^{\circ} 32' 10.7''$	$97^{\circ} 15' 54.7''$
T. 12 N., R. 1 W., northeast corner sec. 11.....	$35^{\circ} 32' 11.2''$	$97^{\circ} 15' 54.4''$
T. 12 N., R. 1 W., northeast corner sec. 14, crossroads.....	$35^{\circ} 31' 19.5''$	$97^{\circ} 15' 54.4''$
T. 12 N., R. 1 W., northeast corner sec. 23.....	$35^{\circ} 30' 26.8''$	$97^{\circ} 15' 54.1''$

MOORE QUADRANGLE.

Magnetic declination (mean): North and east borders, $9^{\circ} 26'$ east; south border, $9^{\circ} 46'$ east.*Geographic positions.*

WEST ALONG CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY, CHOCTAW TO OKLAHOMA.

Station.	Latitude.	Longitude.
Choctaw, west of wagon road, in ledge of rock, 40 feet north of town-site limit and 60 feet south of quarter corner, tablet stamped "Prim. Trav. Sta. No. 10, 1907".....	$35^{\circ} 30' 00.0''$	$97^{\circ} 15' 54.6''$

Geographic positions—Continued.

WEST ALONG CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY, CHOCTAW TO OKLAHOMA—continued

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 12 N., R. 1 W., northeast corner sec. 26, crossroads.....	35 29 34.7	97 15 54.4
Chicago, Rock Island and Pacific Railway, section-line road crossing.....	35 29 33.8	97 15 54.4
North-south road crossing.....	35 29 33.3	97 16 58.5
T. 12 N., R. 1 W., northeast corner sec. 27.....	35 29 34.9	97 16 58.5
Section line, north-south road crossing.....	35 29 27.9	97 18 01.7
Section line, north-south road crossing.....	35 29 13.6	97 19 05.1
Range line, north-south road crossing.....	35 29 13.1	97 21 11.5
T. 12 N., R. 2 W., quarter corner east side of sec. 25.....	35 29 09.5	97 21 11.5
Dickson, 0.5 mile east of station, north-south road crossing.	35 29 24.8	97 22 15.2
Dickson station, road crossing.....	35 29 20.6	97 22 47.4
Dickson, 0.5 mile west of station, at road crossing, 33 feet due north to south rail Chicago, Rock Island and Pacific Railway, 33 feet due west to section line, iron post stamped "Prim. Trav. Sta. No. 11, 1907".....	35 29 15.9	97 23 18.8
Road crossing.....	35 28 43.5	97 25 26.5
T. 12 N., R. 2 W., northeast corner sec. 32.....	35 28 45.2	97 25 26.5
Road crossing "Rock Island" and "Frisco" railroads.....	35 28 25.0	97 26 29.5
North-south road crossing.....	35 28 11.3	97 28 36.4
East Oklahoma City, road crossing of the "Rock Island" and the Missouri, Kansas and Texas railways.....	35 28 08.1	97 29 42.2

ALONG HIGHWAYS NEAR EAST BORDER, CHOCTAW VIA HICO TO FRANKLIN.

T. 12 N., R. 1 W., northeast corner sec. 35, crossroads.....	35 28 42.5	97 15 54.6
T. 11 N., R. 1 W., northeast corner sec. 2.....	35 27 50.0	97 15 54.4
T. 9 N., R. 1 W., on east side of north-south road, 18 feet west and 60 feet south to southwest corner sec. 1, iron post stamped "Prim. Trav. Sta. No. 18, 1907".....	35 16 33.2	97 15 53.8
T. 9 N., R. 1 W., northeast corner sec. 10, crossroads, 30 feet west to white-oak tree.....	35 16 32.7	97 15 57.8
T. 9 N., R. 1 W., northeast corner sec. 9, crossroads, 25 feet northwest to mail box, 50 feet southwest to telephone pole.....	35 16 33.0	97 18 01.5
T. 9 N., R. 1 W., northeast corner sec. 8, crossroads, 35 feet northeast to southwest corner of schoolhouse, 35 feet southeast to mail box.....	35 16 33.4	97 16 05.1
T. 9 N., R. 1 W., northeast corner sec. 7, crossroads at Franklin.....	35 16 33.3	97 20 08.3
T. 9 N., R. 2 W., northeast corner sec. 12, crossroads, 30 feet southeast to mail box, 30 feet southwest to corner fence post.....	35 16 33.4	97 21 10.7
T. 9 N., R. 2 W., northeast corner stone sec. 11 crossroads at schoolhouse No. 23.....	35 16 33.4	97 22 14.3

Geographic positions—Continued.

ALONG HIGHWAYS NEAR EAST BORDER, CHOCTAW VIA HICO TO FRANKLIN—continued.

Station.	Latitude.	Longitude.
T. 9 N., R. 2 W., northeast corner sec. 14, south of road, 3 feet north of fence, 15 feet west of corner fence post, 12 feet east of bearing tree, iron post stamped "Prim. Trav. Sta. No. 19, 1907, Oklahoma".....	35 15 40.8	97 22 14.9
T. 9 N., R. 2 W., northeast corner sec. 14, crossroads.....	35 15 41.0	97 22 14.3
T. 9 N., R. 2 W., northeast corner sec. 15, crossroads, 40 feet southeast and 40 feet southwest to corner fence posts.	35 15 41.3	97 23 17.5
T. 9 N., R. 2 W., northeast corner sec. 16, T road east, 30 feet west to fence, 45 feet southeast to corner fence post..	35 15 41.4	97 24 21.1

OKLAHOMA QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
Oklahoma City, road crossing of Choctaw, Oklahoma and Gulf Railroad and the Atchison, Topeka and Santa Fe Railway.....	35 28 12.4	97 30 44.7
Oklahoma City, southwest corner Broadway and Main streets, in southeast face of third stone above sidewalk, on left side of entrance of First National Bank, bronze tablet stamped "Prim. Trav. Sta. No. 12, 1907".....	35 28 06.3	97 30 52.8

NEWALLA QUADRANGLE.

Magnetic declination (mean): North border, 9° 29' east; south and west borders, 9° 26' east; east border, 9° 25' east.

Geographic positions.

EAST ALONG CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY, OKLAHOMA CITY TO HARRAH.

Station.	Latitude.	Longitude.
Choctaw, 1 mile east of; in "Rock Island" right of way, close to fence, and 65 feet southeast of where railway crosses Indian meridian, iron post stamped "Prim. Trav. Sta. No. 13, 1907".....	35 29 49.9	97 14 50.4
North-south roads.....	35 29 56.1	97 12 44.4
T. 12 N., R. 1 E., quarter corner east side of sec. 20.....	35 30 01.2	97 12 44.4
Harrah, 2 miles west of; in north-south right of way of "Rock Island" Railway, 50 feet south of track, 10 feet west of wagon road, in sandstone ledge, tablet stamped "Prim. Trav. Sta. No. 14, 1907. Elev. 1084, No. 8"...	35 29 54.2	97 11 41.7
T. 12 N., R. 1 E., northeast corner sec. 26, crossroads.....	35 29 34.4	97 09 33.1
T. 12 N., R. 1 E., northeast corner sec. 25, Oklahoma-Lincoln county line.....	35 29 32.7	97 08 29.4
T. 12 N., R. 2 E., northeast corner sec. 30, crossroads.....	35 29 32.5	97 07 28.2

Geographic positions—Continued.

ALONG HIGHWAYS, EAST AND SOUTH VIA WINN, TO EDGE TRIANGULATION STATION IN T. 11 N., R. 3 E.

Station.	Latitude.	Longitude.
Harrah, 2 miles east of; T. 12 N., R. 2 E., at crossroads, nail in blaze on white-oak tree bears N. 45° 45' W. 58 feet, corner fence post is 15 feet west, iron post stamped "Prim. Trav. Sta. No. 15, 1907".....	35° 29' 32.5"	97° 07' 27.7"
T. 12 N., R. 2 E., northeast corner sec. 28, crossroads.....	35 29 32.9	97 05 18.6
T. 12 N., R. 2 E., northeast corner sec. 27, crossroads.....	35 29 32.8	97 04 14.1
T. 12 N., R. 2 E., northeast corner sec. 26, crossroads.....	35 29 32.6	97 03 10.5
T. 12 N., R. 2 E., northeast corner sec. 25, crossroads.....	35 29 32.5	97 02 07.5
T. 12 N., R. 3 E., northeast corner sec. 30	35 29 32.6	97 01 04.9
New Salem, crossroads at schoolhouse, northeast corner sec. 29, T. 12 N., R. 3 E., 60 feet north and 10 feet west to tree in SE. $\frac{1}{4}$ sec. 20, 9 feet south of corner fence post, iron post stamped "Prim. Trav. Sta. No. 16, 1907".....	35 29 32.2	97 00 01.2
T. 12 N., R. 3 E., northeast corner sec. 32, crossroads.....	35 28 40.3	97 00 01.0
T. 11 N., R. 3 E., northeast corner sec. 5, crossroads, Lincoln-Pottawatomie county line.....	35 27 48.5	97 00 01.2
T. 11 N., R. 3 E., northeast corner sec. 8, crossroads, Hazel Dell schoolhouse.....	35 26 56.1	97 00 01.9
T. 11 N., R. 3 E., northeast corner sec. 17, crossroads, near H. Varble's mail box.....	35 26 03.3	97 00 00.9
Edge triangulation station.....	35 25 34.4	97 58 57.5

ALONG HIGHWAYS NEAR WEST BORDER.

T. 11 N., R. 1 W., northeast corner sec. 1, crossroads, 30 feet southeast to bearing tree, 55 feet northeast to corner fence	35 27 50.2	97 14 50.8
T. 11 N., R. 1 W., northeast corner sec. 12, crossroads, 45 feet northwest to black-jack tree, 45 feet northeast to corner of fence.....	35 26 57.7	97 14 50.7
T. 11 N., R. 1 W., northeast corner sec. 13, 20 feet north of crossroads.....	35 26 05.7	97 14 50.3
T. 11 N., R. 1 W., northeast corner sec. 24, crossroads.	35 25 16.1	97 14 50.5
T. 11 N., R. 1 W., northeast corner sec. 25, crossroads, 30 feet northeast to fence post, 30 feet northwest to mail box.	35 24 23.4	97 14 50.3
T. 11 N., R. 1 W., northeast corner sec. 36, crossroads.	35 23 32.3	97 14 50.5
T. 11 N., R. 1 E., northeast corner sec. 31, 10 feet northwest to crossroads.....	35 23 31.9	97 13 49.7
T. 10 N., R. 1 E., near northwest corner sec. 5, at Bartholomew's store, 1 foot east to north-south fence, 10 feet north to corner fence post and 40 feet north to Oklahoma-Cleveland county line, iron post stamped "Prim. Trav. Sta. No. 17, 1907, Oklahoma".....	35 22 39.1	97 13 49.2
T. 10 N., R. 1 E., northeast corner sec. 7, crossroads, 35 feet northwest to corner fence, 30 feet northeast to bearing tree.	35 21 47.2	97 13 49.6
Slusher, northeast corner sec. 18, T. 10 N., R. 1 E., crossroads, 20 feet north to bearing tree.....	35 20 54.8	97 13 49.1

Geographic positions—Continued.

ALONG HIGHWAYS NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
T. 10 N., R. 1 E., northeast corner sec. 19, crossroads, 40 feet northeast to G. M. Huston's mail box, 25 feet northwest to wire fence.....	35° 20' 02.3"	97° 13' 48.5"
T. 10 N., R. 1 E., northeast corner sec. 30, crossroads, 60 feet northeast to telephone pole, 40 feet southwest to corner wire fence.....	35 19 09.8	97 13 48.1
T. 10 N., R. 1 E., northeast corner sec. 31, crossroads.....	35 18 17.6	97 13 47.8
Stella, 1 mile south of; northeast corner sec. 32, T. 10 N., R. 1 E., northwest corner of small bridge at crossroads..	35 18 17.1	97 12 44.0
T. 9 N., R. 1 E., northeast corner sec. 5, crossroads.....	35 17 24.8	97 12 43.9
Mayfield schoolhouse, northeast corner sec. 8, T. 9 N., R. 1 E., blazed tree at crossroads.....	35 16 32.6	97 12 43.7
T. 9 N., R. 1 W., northeast corner sec. 12, stump at T road north on Indian meridian.....	35 16 31.6	97 14 50.1
T. 9 N., R. 1 E., northwest corner sec. 16, south of road, 12 feet east and 2 feet north of corner fence post, iron post stamped "Prim. Trav. Sta. No. 21, 1907".....	35 15 40.2	97 12 43.2

ALONG HIGHWAYS NEAR SOUTH BORDER.

T. 9 N., R. 1 E., northeast corner sec. 17, crossroads.....	35 15 40.5	97 12 43.7
T. 9 N., R. 1 E., northeast corner sec. 16, crossroads, 20 feet southwest to hickory, 25 feet northeast to corner fence post.....	35 15 40.5	97 11 39.4
T. 9 N., R. 1 E., northeast corner sec. 15, crossroads.....	35 15 39.6	97 10 36.4
T. 9 N., R. 1 E., southeast corner sec. 11, iron post stamped "Prim. Trav. Sta. No. 22, 1907, Oklahoma. Okla., 1113".....	35 15 39.5	97 09 33.3
T. 9 N., R. 1 E., northeast corner sec. 14, crossroads.....	35 15 39.4	97 09 33.3
T. 9 N., R. 1 E., northeast corner sec. 13, crossroads, Cleveland-Pottawatomie county line.....	35 15 39.4	97 08 29.6
T. 9 N., R. 2 E., northeast corner sec. 18, iron post stamped "Prim. Trav. Sta. No. 23, 1907, Oklahoma".....	35 15 39.1	97 07 26.6
T. 9 N., R. 2 E., northeast corner sec. 17, crossroads, 25 feet northwest to white oak, 45 feet northeast to corner fence post.....	35 15 39.0	97 06 23.5
T. 9 N., R. 2 E., northeast corner sec. 16, crossroads, 30 feet southeast to A. J. Hazerton's mail box.....	35 15 38.8	97 05 19.3
Brown, northeast corner sec. 15, T. 9 N., R. 2 E., crossroads, 15 feet north to well.....	35 15 39.3	97 04 16.5
T. 9 N., R. 2 E., northeast corner sec. 14, crossroads, 15 feet north to west end of culvert.....	35 15 39.4	97 03 12.9
T. 9 N., R. 2 E., northeast corner sec. 13, crossroads, 30 feet northeast to J. B. Rogers's mail box, 15 feet southeast to tree.....	35 15 38.6	97 02 09.4
T. 9 N., R. 3 E., northeast corner sec. 18, crossroads, 45 feet northeast and 45 feet southeast to corner fence posts...	35 15 38.6	97 01 06.8
T. 9 N., R. 3 E., 40 feet west and 30 feet north to northwest corner sec. 16, 2 feet north and 9 feet east of corner fence post on highway right of way, crossroads, iron post stamped "Prim. Trav. Sta. No. 24, 1907, Oklahoma"....	35 15 38.4	97 00 02.8

SHAWNEE QUADRANGLE.

Magnetic declination (mean): South border, $9^{\circ} 08'$ east.

Geographic positions along highways, Brown to Tecumseh triangulation station.

Station.	Latitude.	Longitude.
T. 9 N., R. 3 E., northeast corner sec. 16, crossroads, 15 feet south to black-oak tree.....	$35^{\circ} 15' 38.6''$	$96^{\circ} 58' 59.7''$
T. 9 N., R. 3 E., northeast corner sec. 15, crossroads, 5 feet north to black-jack bush.....	$35^{\circ} 15' 38.6''$	$96^{\circ} 57' 55.4''$
Tecumseh, 0.5 mile southwest of; in top of milepost 137, aluminum tablet stamped "Prim. Trav. Sta. No. 25, 1907, Oklahoma".....	$35^{\circ} 15' 49.3''$	$96^{\circ} 56' 44.5''$
Tecumseh triangulation station, center of chimney on rear (east) end of Tecumseh Opera House, flush with rear wall of building, about 5 feet north of center of rear wall..	$35^{\circ} 15' 25.92''$	$96^{\circ} 56' 09.66''$

M'COMB QUADRANGLE.

Magnetic declination: West border, $9^{\circ} 40'$ east; south border, $9^{\circ} 31'$ east.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
T. 9 N., R. 1 E., northwest corner sec. 16, iron post stamped "Prim. Trav. Sta. No. 21, 1907".....	$35^{\circ} 15' 40.22''$	$97^{\circ} 12' 43.21''$
T. 9 N., R. 1 E., northeast corner sec. 20, crossroads.....	$35^{\circ} 14' 48.6''$	$97^{\circ} 12' 42.8''$
T. 9 N., R. 1 E., northeast corner sec. 29, crossroads, 10 feet northwest to black-oak snag.....	$35^{\circ} 13' 56.6''$	$97^{\circ} 12' 42.7''$
T. 9 N., R. 1 E., northeast corner sec. 32, crossroads, 30 feet due east to corner fence post.....	$35^{\circ} 13' 04.4''$	$97^{\circ} 12' 42.6''$
T. 9 N., R. 1 E., northeast corner sec. 31, T road north....	$35^{\circ} 13' 04.7''$	$97^{\circ} 13' 46.5''$
T. 9 N., R. 1 E., southeast corner sec. 31, T road north, 30 feet northwest to corner fence post.....	$35^{\circ} 12' 13.0''$	$97^{\circ} 13' 46.7''$
T. 8 N., R. 1 E., northeast corner sec. 6, T road south....	$35^{\circ} 12' 13.0''$	$97^{\circ} 13' 48.6''$
T. 8 N., R. 1 E., northeast corner sec. 7, crossroads.....	$35^{\circ} 11' 20.4''$	$97^{\circ} 13' 48.2''$
T. 8 N., R. 1 E., northeast corner sec. 18, crossroads.....	$35^{\circ} 10' 28.2''$	$97^{\circ} 13' 48.2''$
T. 8 N., R. 1 W., northeast corner sec. 13, crossroads....	$35^{\circ} 10' 28.8''$	$97^{\circ} 14' 50.4''$
T. 8 N., R. 1 W., northeast corner sec. 24, crossroads.....	$35^{\circ} 09' 36.6''$	$97^{\circ} 14' 50.4''$
T. 8 N., R. 1 E., southwest corner sec. 19, 8 feet south and 15 feet east of corner fence post in highway right of way at crossroads, iron post stamped "Prim. Trav. Sta. No. 26, 1907, Oklahoma".....	$35^{\circ} 08' 44.8''$	$97^{\circ} 14' 50.0''$
T. 8 N., R. 1 W., northeast corner sec. 36, crossroads, 65 feet due north to lone black-jack tree.....	$35^{\circ} 07' 52.3''$	$97^{\circ} 14' 50.6''$

NORMAN QUADRANGLE.

Magnetic declination (mean): North border, $9^{\circ} 46'$ east; east border, $9^{\circ} 40'$ east.

Geographic positions.

ALONG HIGHWAYS, FRANKLIN TO NORMAN.

Station.	Latitude.	Longitude.
T. 9 N., R. 2 W., northeast corner sec. 21, crossroads, 50 feet northwest to corner fence post.....	35 14 49.5	97 24 21.0
T. 9 N., R. 2 W., northeast corner sec. 20, crossroads, 15 feet west to north end of box culvert.....	35 14 49.9	97 25 24.3
T. 9 N., R. 2 W., northeast corner sec. 29, crossroads, 25 feet southeast to south end of culvert and 35 feet southwest to corner fence post.....	35 13 57.8	97 25 23.9
Norman, center standpipe.....	35 13 27.2	97 26 03.1
Norman, in National Bank, tablet stamped "Prim. Trav. Sta. No. 20, 1907".....	35 13 16.5	97 26 30.1
Norman, 1.3 miles south of; township line crossing Atchison, Topeka and Santa Fe railway.....	35 12 13.5	97 25 57.8

ALONG HIGHWAYS NEAR EAST BORDER.

T. 8 N., R. 1 W., northeast corner sec. 35, crossroads.....	35 07 53.2	97 15 54.8
T. 7 N., R. 1 W., northeast corner sec. 2, crossroads.....	35 07 00.8	97 15 54.3
T. 7 N., R. 1 W., northeast corner sec. 11, crossroads at schoolhouse No. 47.....	35 06 07.0	97 15 54.4
T. 7 N., R. 1 W., northeast corner sec. 14, crossroads.....	35 05 14.6	97 15 54.7
T. 7 N., R. 1 W., northeast corner sec. 23, crossroads.....	35 04 22.4	97 15 54.6
T. 7 N., R. 1 W., 2 feet west and 3 feet north of southeast corner sec. 23, iron post stamped "Prim. Trav. Sta. No. 27, 1907, Oklahoma".....	35 03 30.5	97 15 53.8
T. 7 N., R. 1 W., northeast corner sec. 25, crossroads.....	35 03 30.1	97 15 54.1
T. 7 N., R. 1 W., northeast corner sec. 35, crossroads.....	35 02 38.0	97 15 54.5
T. 6 N., R. 1 W., northeast corner sec. 2, crossroads.....	35 01 45.8	97 15 54.3
T. 6 N., R. 1 W., northeast corner sec. 11, crossroads.....	35 00 52.8	97 15 54.6
T. 6 N., R. 1 W., northeast corner sec. 14, crossroads.....	35 00 00.9	97 15 55.0
T. 6 N., R. 1 W., northeast corner sec. 17, crossroads.....	35 00 01.3	97 19 04.8
T. 6 N., R. 1 W., northeast corner sec. 8, crossroads.....	35 00 53.6	97 19 04.9
Lexington, in southwest corner of high-school grounds, iron post stamped "Prim. Trav. Sta. No. 30, 1907, elev. 1083, Okla.".....	35 01 05.3	97 19 44.9
Lexington, northeast corner sec. 7, T. 6 N., R. 1 W., intersection of streets.....	35 00 53.5	97 20 07.9

Geographic positions—Continued.

ALONG ATCHISON, TOPEKA AND SANTA FE RAILWAY, PURCELL TO NORMAN.

Station.	Latitude.	Longitude.
Purcell, 1,000 feet north of station, east-west road crossing at main line of Atchison, Topeka and Santa Fe Railway.	35 00 58.3	97 21 23.5
Milepost 415, 0.5 mile north of; crossroads.....	35 03 04.7	97 21 50.0
South Canadian River, north end of bridge over.....	35 05 04.1	97 22 51.7
T. 7 N., R. 2 W., northeast corner sec. 10, center of T road east.....	35 06 08.4	97 23 18.4
East-west road crossing.....	35 07 00.8	97 23 21.9
T. 7 N., R. 2 W., northeast corner sec. 3.....	35 07 00.8	97 23 18.5
Noble elevator.....	35 08 16.6	97 23 49.5
North-south road crossing, 0.5 mile north of milepost 407...	35 09 24.3	97 24 21.2
East-west road crossing, 0.33 mile southeast of milepost 405.	35 10 30.0	97 24 52.3
East-west road crossing railroad.....	35 11 22.0	97 25 25.3
T. 8 N., R. 2 W., northeast corner sec. 8, T road north.....	35 11 22.0	97 25 24.0
Norman, 1.3 miles south of; east rail of railroad at township-line crossing.....	35 12 13.5	97 25 57.8

PAULS VALLEY (30') QUADRANGLE.

Magnetic declination: North border, 9° 39' east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Holsenbake Church, northeast corner of yard, 5 feet southwest of black-oak stump, iron post stamped "Prim. Trav. Sta. No. 28, 1907, Oklahoma".....	34 58 16.2	97 15 55.0
T. 6 N., R. 1 W., northeast corner sec. 26, crossroads.....	34 58 16.7	97 15 54.7
T. 6 N., R. 1 W., northeast corner sec. 25, crossroads.....	34 58 16.7	97 14 51.9
Corbett, northeast corner sec. 30, T. 6 N., R. 1 E., crossroads, 45 feet northwest to southeast corner store, 50 feet northeast to southwest corner blacksmith shop.....	34 58 17.0	97 13 48.5
T. 6 N., R. 1 E., northeast corner sec. 29, crossroads.....	34 58 17.3	97 12 44.9
T. 6 N., R. 1 E., northeast corner sec. 28, T road south, 20 feet south to A. J. Smith's mail box.....	34 58 16.9	97 11 41.3
T. 6 N., R. 1 E., southeast corner sec. 21, T road north, 10 feet east to post oak.....	34 58 17.0	97 11 41.2
T. 6 N., R. 1 E., northeast corner sec. 27, center of crossroads.....	34 58 16.9	97 10 38.6
Red Springs School, northeast corner sec. 26, T. 6 N., R. 1 E., crossroads, 25 feet south to center of bridge.....	34 58 16.8	97 09 35.2
T. 6 N., R. 2 E., northwest corner sec. 19, 2 feet north and 6 feet east of corner fence post, iron post stamped "Prim. Trav. Sta. No. 29, 1907, Oklahoma".....	34 58 16.2	97 08 31.1
T. 6 N., R. 1 E., northeast corner sec. 25, crossroads, Cleveland-Pottawatomie county line.....	34 58 16.6	97 08 31.6
T. 6 N., R. 2 E., northeast corner sec. 30, crossroads, 15 feet northeast to bearing tree.....	34 58 15.9	97 07 28.1

Geographic positions along highways near north border—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 N., R. 2 E., northeast corner sec. 29, crossroads.....	34 58 15.8	97 06 24.9
T. 6 N., R. 2 E., northeast corner sec. 28, crossroads.....	34 58 16.0	97 05 21.9
T. 6 N., R. 2 E., northeast corner sec. 27, crossroads.....	34 58 16.5	97 04 18.7
T. 6 N., R. 2 E., northeast corner sec. 26, crossroads.....	34 58 16.5	97 03 15.5
T. 6 N., R. 2 E., northeast corner sec. 25, crossroads.....	34 58 16.5	97 02 12.1
Wanette, east rail opposite signal arm at Atchison, Topeka and Santa Fe Railway station.....	34 57 43.9	97 02 11.4
T. 6 N., R. 1 W., northeast corner sec. 27, crossroads.....	34 58 16.5	97 16 58.0
T. 6 N., R. 1 W., northeast corner sec. 28, T road north...	34 58 16.4	97 18 01.3
T. 6 N., R. 1 W., northeast corner sec. 21, crossroads.....	34 59 08.6	97 18 01.2
T. 6 N., R. 1 W., northeast corner sec. 20, crossroads.....	34 59 09.1	97 19 04.7

OKLAHOMA-KANSAS-MISSOURI.

, PRIMARY TRAVERSE.

Wyandotte (30') quadrangle.

OTTAWA COUNTY, OKLA.; CHEROKEE COUNTY, KANS.; McDONALD AND NEWTON
COUNTIES, MO.

The following geographic positions were determined in 1906 by George T. Hawkins. The line starts at United States Geological Survey triangulation station, Whitewater, Okla., and follows highways east, north, and west near borders of quadrangle to United States Geological Survey triangulation station, Edwards, Kans. Positions are given on the datum of the Indian Territory triangulation of 1895-1897.^a To reduce to United States standard, subtract 1.46 seconds from all latitudes and add 2.10 seconds to all longitudes given in this list.

WYANDOTTE (30') QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
OKLAHOMA.		
Whitewater triangulation station, on flat timbered ridge on south side and 1 mile distant from Whitewater Creek at point 4 miles from the Arkansas line. ^b Stone post 24 by 7 by 7 inches set 22 inches in ground with copper bolt marked "U.S.+G.S." sunk in center of top.....	36 28 43.81	94 41 18.96
Bluff ford of Whitewater Creek.....	36 28 32.2	94 39 04.0
Southwest corner of Missouri, northwest corner of Ar- kansas.....	36 29 59.5	94 37 00.8

^a Fitch, C. H., Triangulation and spirit leveling in Indian Territory: Bull. U. S. Geol. Survey No. 175, 1900, pp. 62, 64.

^b The road from Spavinaw to Southwest City, Mo., passes 1 mile south of station at a point 6 or 7 miles from latter. From corner common to secs. 7, 12, 13, and 18, T. 23 N., R. 24 E., station bears S. 56° 02' W. 31.42 chains.

Geographic positions—Continued.

Station.	Latitude.	Longitude.
MISSOURI.		
	° ' "	° ' "
Southwest City, T road north at south end of Main street...	36 30 38.9	94 36 38.8
Southwest City, 1.5 miles north of; T road east.....	36 31 49.5	94 36 39.4
T. 21 N., R. 34 W., quarter corner north side of sec. 27, T road east.....	36 32 01.1	94 35 50.3
T. 21 N., R. 34 W., quarter corner north side of sec. 26, elbow west and south.....	36 31 58.9	94 34 45.6
T. 21 N., R. 34 W., quarter corner north side of sec. 25, T road west.....	36 31 56.8	94 33 40.6
T. 21 N., R. 34 W., 25 feet southwest of quarter corner north side of sec. 25, 2 feet north of east-west wire fence and 9 feet west of corner of fence, iron post stamped "Prim. Trav. Sta. No. 5, 1906".....	36 31 56.6	94 33 40.8
T. 21 N., R. 34 W., northeast corner sec. 24.....	36 32 47.6	94 33 06.5
Elk River, south bank of; at Yokum ford.....	36 35 03.2	94 33 01.0
Large white house, 500 feet north of; T road east.....	36 35 52.5	94 32 34.8
T. 22 N., R. 34 W., 0.25 mile north of; northeast corner sec. 36, sixteenth corner.....	36 35 51.5	94 32 55.4
Peck, J. B., house of; second-class road north.....	36 36 07.5	94 33 17.6
T. 22 N., R. 34 W., quarter corner east side of sec. 24.....	36 37 36.2	94 32 50.3
T. 22 N., R. 34 W., northeast corner sec. 24, T road south...	36 38 15.3	94 32 48.3
T. 22 N., R. 33 W., northeast corner sec. 18, crossroads.....	36 38 52.3	94 31 41.8
Coy, in northwest corner of hotel yard, 10 feet from near door of grocery, 30 feet northwest of hotel, iron post stamped "Prim. Trav. Sta. No. 6, 1906".....	36 39 41.9	94 31 51.8
Coy, 0.25 mile east of; 3 corners.....	36 39 52.3	94 31 36.8
T. 22 N., R. 33 W., northeast corner sec. 6, 3 corners.....	36 40 36.7	94 31 36.9
Road forks on top of ridge.....	36 41 30.5	94 31 52.9
May, center of sec. 23, T. 23 N., R. 34 W., T road east....	36 42 52.5	94 33 56.0
Large Spring, 0.25 mile east of; 3 corners.....	36 44 20.7	94 32 58.4
T. 23 N., R. 34 W., northeast corner sec. 1, crossroads.....	36 45 52.7	94 32 25.7
T. 24 N., R. 34 W., northeast corner sec. 36, T road south...	36 46 45.0	94 32 23.2
T. 24 N., R. 33 W., northeast corner sec. 31, T road west....	36 46 42.6	94 31 19.9
T. 24 N., R. 33 W., 200 yards northwest of, southeast corner sec. 19, 6 feet northwest of corner of fence, near northwest corner of T road west, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	36 47 35.6	94 31 26.1
Dessa, northeast corner sec. 19, T. 24 N., R. 33 W.....	36 48 25.7	94 31 14.5
T. 24 N., R. 33 W., northeast corner sec. 7.....	36 50 11.7	94 31 09.1
T. 25 N., R. 33 W., sec. 34, south line of, T road south and road northwest.....	36 50 17.4	94 31 08.8
T road east at corner of fence.....	36 50 57.0	94 31 18.1
Crossroads, near large house.....	36 51 45.2	94 31 19.0
T. 25 N., R. 33 W., quarter corner north side of sec. 15....	36 53 47.4	94 31 31.6
Racine, 630 feet north of crossroads, near north-south fence east of road, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	36 53 53.6	94 31 34.3

Geographic positions—Continued.

Station.	Latitude.	Longitude.
MISSOURI—continued.		
T. 25 N., R. 33 W., northeast corner sec. 4.....	36 55 32.8	94 32 01.8
T. 26 N., R. 33 W., southeast corner sec. 33, T road north...	36 55 32.8	94 32 03.0
T. 26 N., R. 33 W., northeast corner sec. 33, road south.....	36 56 24.8	94 32 02.0
T. 26 N., R. 33 W., northeast corner sec. 28, crossroads....	36 57 16.2	94 32 01.0
T. 26 N., R. 33 W., northeast corner sec. 21, crossroads.....	36 58 09.0	94 32 00.0
T. 26 N., R. 33 W., northeast corner sec. 20, T road north..	36 58 09.6	94 33 04.7
T. 26 N., R. 33 W., northeast corner sec. 8, crossroads.....	36 59 54.0	94 33 03.3
T. 26 N., R. 33 W., 50 feet southeast of northeast corner sec. 8, iron post stamped "Prim. Trav. Sta. No. 9, 1906, 1,142 feet".....	36 59 53.8	94 33 02.9
T. 26 N., R. 33 W., northeast corner sec. 7, crossroads.....	36 59 55.1	94 34 07.6
Southeast corner of Kansas, 1 mile south of; road east from line road.....	36 59 10.5	94 37 02.3
KANSAS.		
Southeast corner of Kansas.....	36 59 56.7	94 37 01.2
Southeast corner of Kansas, 0.5 mile northwest of; T road east, at edge of prairie.....	37 00 08.5	94 37 17.6
White schoolhouse, 200 feet southeast of; near north-south wire fence, west of road, iron post stamped "Prim. Trav. Sta. No. 10, 1906, 1016 feet".....	37 01 00.2	94 37 48.0
Quarter corner, T road south.....	37 01 26.7	94 38 53.6
Quarter corner, crossroads.....	37 01 26.8	94 39 59.6
Schoolhouse, T road south.....	37 01 26.9	94 42 11.8
Baxter Springs, crossing of Military and River streets.....	37 01 26.6	94 44 04.5
Baxter Springs, 2 miles south of; at T road north on Kan- sas-Oklahoma line, 2 feet north of east-west wire fence, south of line road, iron post stamped "Prim. Trav. Sta. No. 11, 1906".....	36 59 56.6	94 44 07.0
T. 33 S., R. 24 E., southeast corner sec. 15, T road north....	36 59 56.4	94 45 28.5
T. 33 S., R. 24 E., southeast corner sec. 16, T road north....	36 59 56.8	94 46 34.1
T. 33 S., R. 24 E., southeast corner sec. 17, T road north....	36 59 57.2	94 47 39.5
T. 33 S., R. 24 E., southeast corner sec. 18, T road north....	36 59 57.0	94 48 45.2
Edwards triangulation station, on a prairie hill locally known as Blue Mound, 0.25 mile north of south line of Kansas, at point 6 miles west of Baxter Springs, on land of Mr. Edwards; iron post ^a	37 00 14.6	94 49 23.9

^a Stone post formerly serving as station mark destroyed; iron post set in 1906 in same place.

OREGON.

TRIANGULATION STATIONS.

Mount Hood quadrangle.

CLACKAMAS, LINN, MARION, MULTNOMAH, AND WASCO COUNTIES.

During the season of 1906 C. F. Urquhart extended triangulation from Coast and Geodetic Survey stations Larch and Eagle so as to control the Mount Hood 30-minute quadrangle. Nine stations were occupied and 6 points were located by intersections.

ARQUETTE, CLACKAMAS COUNTY, OREG.

On a bald peak, locally known as Susap Mountain, just above and south of a small meadow and huckleberry patch known as Cold Spring Camp. It is 15 miles by road and trail from Colton post-office. From Colton go south about 2 miles to Mr. Arquette's ranch; thence by road and trail south and east to station. There is a ranger cabin about 1 mile northeast of signal. From this cabin there is a ranger trail north to old hatchery on Clackamas River, but no feed will be found between the two places. Station is not on highest point in vicinity, the higher points being covered with large timber, but it is a very good station.

Signal: Rock cairn 6 feet high with pole in center.

Station mark: Triangulation tablet set in rock under center of cairn, built in 1901.

[Latitude $45^{\circ} 04' 19.88''$. Longitude $122^{\circ} 15' 32.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Squaw.....	224 12 09.16	44 21 27.60	4. 3917361
Olallie.....	305 10 45.95	125 31 47.48	4. 6812361
Jefferson.....	320 21 22.02	140 40 51.13	4. 7574115
Battle Ax.....	340 45 28.54	160 50 34.00	4. 4597197

EAGLE, CLACKAMAS COUNTY, OREG.

A station of the Coast and Geodetic Survey on a high bald peak near the head of the south fork of Eagle Creek. The north fork of same creek passes north of station. The Squaw Lake trail is best way to reach station. Take left-hand trail about 2 miles after leaving wagon road; or continue up trail until camping place one-half mile east of Squaw triangulation station is reached. From here go north to summit of ridge, thence west along ridge to signal.

Station mark: Triangulation tablet cemented in rock under center of cairn 7 feet high.

492 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 45° 16' 25.70''. Longitude 122° 04' 54.64''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barnes.....	118 29 50.0	298 01 16.9	4.773838
Larch.....	179 11 12.21	359 10 58.78	4.4600670
Chinidere.....	211 14 56.75	31 26 31.18	4.6099490
Hood.....	249 40 26.88	69 56 56.61	4.5091584
Squaw.....	325 34 58.67	145 36 44.88	3.7612721

HOOD, AT LINE OF CLACKAMAS AND WASCO COUNTIES, OREG.

(Not occupied.)

On the highest point of Mount Hood.

Signal and station mark: Rock cairn 5 feet high with pole in center, over triangulation tablet cemented in rock.

[Latitude 45° 22' 26.74''. Longitude 121° 41' 42.81''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Squaw.....	59 40 42.08	239 25 59.01	4.4968558
Eagle.....	69 56 56.61	249 40 26.88	4.5091584
Larch.....	120 08 13.57	299 51 28.18	4.5489345
Chinidere.....	159 04 38.07	338 59 40.69	4.4034317
Bald Butte.....	215 15 10.84	35 22 10.71	4.3452942
Lookout.....	284 19 09.16	104 26 29.06	4.1427594
Wilson.....	355 03 01.47	175 04 37.34	4.5346226

SQUAW, CLACKAMAS COUNTY, OREG.

On a high point west of and overlooking Squaw Lake. It is about 12 miles east of William Wilcox's ranch near site of former post-office of Garfield. Follow wagon road from Wilcox's ranch to Linn's saw-mill; thence about 2 miles to an old barn; thence trail to left leads to Squaw Lake, a well-known place in the mountains. This trail crosses ridge on which station is located about 0.25 mile south of signal. All timber has been burned from summit.

Signal: Rock cairn 7 feet high with pole in center.

Station mark: Triangulation tablet cemented in rock under center of cairn, built in 1901.

[Latitude 45° 13' 51.45". Longitude 122° 02' 25.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Battle Ax.....	9 52 11.74	189 48 00.40	4. 6583108
Arquette.....	44 21 27.60	224 12 09.16	4. 3917361
Eagle.....	145 36 44.88	325 34 58.67	3. 7612721
Larch.....	173 47 39.06	353 45 39.19	4. 5289529
Zigzag.....	220 48 48.43	40 55 06.24	4. 2481011
Hood.....	239 25 59.01	59 40 42.08	4. 4968558
Lookout.....	252 44 14.91	73 06 17.10	4. 6275446
Wilson.....	301 02 57.99	121 19 14.47	4. 5461959
Olallie.....	334 12 40.31	154 24 26.36	4. 7024403
Jefferson.....	342 46 39.24	162 56 53.46	4. 8107191

WILSON, AT LINE OF CLACKAMAS AND WASCO COUNTIES, OREG.

On highest point of Mount Wilson, a timbered summit about 4.5 miles (air line) from Clackamas Lake. The Mount Hood-Mount Jefferson ranger trail passes near Clackamas Lake which is 18 or 20 miles south of Summit House and 8 miles from Clear Lake. A good wagon road leads from Summit House to Clear Lake, but the trail from Clackamas Lake to station is difficult to follow. At upper end of lake a shepherd's trail leads southeast and south about 2 miles and then forks. Take right-hand fork which leads to a burn, crossing a ranger trail. Go to summit of ridge in burn, leaving a small peak to right; thence up ridge northeast to mountain. Trail from burn to station was blazed. Lines of sight were cut out, and to extend triangulation in other directions more cutting will have to be done.

Signal: A cairn 12 feet high.

Station mark: Triangulation tablet set in rock 6.5 feet from center of cairn, on line between signal and Lookout Mountain.

[Latitude 45° 04' 01.49". Longitude 121° 39' 27.75".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jefferson.....	14 24 03.33	194 18 04.91	4. 6531447
Olallie.....	17 02 02.05	196 57 34.08	4. 4540718
Battle Ax.....	55 06 58.30	234 46 34.27	4. 6665209
Squaw.....	121 19 14.47	301 02 57.99	4. 5461959
Hood.....	175 04 37.34	355 03 01.47	4. 5346226
Lookout.....	198 55 37.05	19 01 19.94	4. 5109749

ZIGZAG, CLACKAMAS COUNTY, OREG.

(Not occupied.)

On highest point of ridge lying between Zigzag and Sandy rivers. From Salmon post-office follow the Barlow road to a ranch 1 mile below tollgate. Signal can thence be seen on the high burned summit just above and north of ranch.

Signal: A rock cairn 6 or 7 feet high.

Station mark: Triangulation tablet cemented in rock under center of cairn, built in 1901.

[Latitude $45^{\circ} 21' 05.17''$. Longitude $121^{\circ} 53' 33.51''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Squaw.....	40 55 06.24	220 48 48.43	4. 2481011
Larch.....	143 06 12.98	322 57 54.19	4. 4031120

BATTLE AX, MARION COUNTY, OREG.

(Not occupied.)

On the highest point of high mountain west of and overlooking Elk Lake, sometimes called Waldo Lake. There is a trail from Elkhorn post-office to this lake and also a trail from Mount Hood-Mount Jefferson trail.

Signal: A tree, trimmed up in 1901.

Station mark: Triangulation tablet cemented in rock.

[Latitude $44^{\circ} 49' 38.18''$. Longitude $122^{\circ} 08' 20.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Arquette.....	160 50 34.00	340 45 28.54	4. 4597197
Squaw.....	189 48 00.40	9 52 11.74	4. 6583108
Wilson.....	234 46 34.27	55 06 58.30	4. 6665209

JEFFERSON, AT LINE OF MARION, LINN, AND CROOK COUNTIES, OREG.

(Not occupied.)

The western of two very sharp peaks on the summit of Mount Jefferson. This point is probably a little higher than the eastern peak. Looking at this mountain from the west only one peak shows. It is doubtful if anyone has ever reached the summit of this peak, though it would not be difficult to get within 200 or 300 feet (elevation) of summit. The Mount Hood-Mount Jefferson trail passes to west and near foot of mountain and is intersected by the trail from Detroit.

[Latitude 44° 40' 29.43". Longitude 121° 47' 55.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Arquette.....	140 40 51.13	320 21 22.02	4. 7574115
Squaw.....	162 56 53.46	342 46 39.24	4. 8107191
Wilson.....	194 18 04.91	14 24 03.33	4. 6531447

OLALLA, AT LINE OF MARION, WASCO, AND CROOK COUNTIES, OREG.

(Not occupied.)

On the highest point of Olalla Butte, a well-known mountain on the main range of the Cascades. It is at the head of the north branch of Breitenbush Creek and near the head of the South Fork of Clackamas River. The Mount Hood-Mount Jefferson trail passes west of and near foot of mountain. There is a good meadow 2 or 3 miles north of it through which a trail passes.

Signal and station mark: Rock cairn 7 feet high over triangulation tablet cemented in rock.

[Latitude 44° 49' 20.14". Longitude 121° 45' 47.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Arquette.....	125 31 47.48	305 10 45.95	4. 6812361
Squaw.....	154 24 26.36	334 12 40.31	4. 7024403
Wilson.....	196 57 34.08	17 02 02.05	4. 4540718

LARCH, MULTNOMAH COUNTY, OREG.

On the highest summit of Larch Mountain (elevation 4,052 feet), southeast of Bridal Veil on Columbia River; a station of the Coast and Geodetic Survey, on a small rock ledge at north end of a spur from main summit. North side of ledge is a cliff 100 feet high, nearly perpendicular; station is on west point of ledge 20 feet above spur of which it forms the end. Reached from Bridal Veil or Latonville.

Station mark: Brass disk in rock; in same hole and under it is a copper bolt.

Reference marks: Two copper bolts on east summit of ledge, embedded in cement. Barnes, 225° 04'; east by south mark, 62° 39', 15.01 meters; east by southeast mark, 74° 28', 10.89 meters.

[Latitude 45° 31' 59.94". Longitude 122° 05' 13.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yam.....	58 05 47.8	237 20 45.8	4. 9910606
Hult.....	38 01 10.4	217 34 30.8	4. 9038934
Chinidere.....	254 28 32.57	74 40 22.01	4. 3493801
Hood.....	299 51 28.18	120 08 13.57	4. 5489345
Zigzag.....	322 57 54.19	143 06 12.98	4. 4031120
Squaw.....	353 45 39.19	173 47 39.06	4. 5289529
Eagle.....	359 10 58.78	179 11 12.21	4. 4600670

DEFIANCE, AT LINE OF MULTNOMAH AND WASCO COUNTIES, OREG.

(Not occupied.)

High tree on summit of Mount Defiance, a well-known point on west side of Hood River valley, from which it can be reached. This point was not visited, and no accurate description can be given.

[Latitude 45° 38' 57.05". Longitude 121° 43' 19.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chinidere.....	45 02 19.48	224 58 30.80	3. 9913579
Bald Butte.....	309 58 41.46	130 06 51.69	4. 2884763
Lookout.....	335 23 29.63	155 31 59.83	4. 5728823

BALD BUTTE, WASCO COUNTY, OREG.

On a bald hill, the north end of which is covered with large fir trees, about 1 mile south and 2 miles east of Mount Hood post-office. The trail to Long Prairie passes about 1.5 miles south of signal. From point on this trail travel up ridge to station. The only available camping place is at Long Prairie, which is about 2 miles south-southeast of station.

Station mark: Fir tree about 40 feet high, which leans a little to the southeast, trimmed up with the top left for a target; triangulation tablet set in large rock under center of top of tree.

[Latitude 45° 32' 12.11". Longitude 121° 31' 53.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hood.....	35 22 10.71	215 15 10.84	4. 3452942
Chinidere.....	104 25 12.08	284 13 13.65	4. 3526032
Defiance.....	130 06 51.69	309 58 41.46	4. 2884763
Shell Rock.....	357 32 03.58	177 32 14.87	3. 90227125
Lookout.....	358 18 44.59	178 19 05.34	4. 3330655

CHINIDERE, WASCO COUNTY, OREG.

On a high bald point 1 mile west of Wahturn Lake. It is best reached from Mount Hood post-office by going west on county road 3½ miles to Mr. Billing's residence; thence 3 miles by ranger's trail to road up west fork of Hood River; thence up road to point about 1.5 miles above the bridge over West Fork. At this point one road goes to Lost Lake and the other to a camping place on the Lake Fork. Take Lake Fork road 0.5 mile to a warm spring; thence by trail across and up Lake Fork to Divers Creek. Cross Divers Creek and follow ridge to summit. One-fourth mile from summit an old trail (blazed) turns to right. Follow this trail along the ridge and down mountain to Wahturn Lake.

Station mark: Triangulation tablet cemented in rock under center of cairn.

[Latitude 45° 35' 12.55". Longitude 121° 48' 39.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Eagle.....	31 26 31.18	211 14 56.75	4. 6099490
Larch.....	74 40 22.01	254 28 32.57	4. 3493801
Defiance.....	224 58 30.80	45 02 19.48	3. 9913579
Bald Butte.....	284 13 13.65	104 25 12.08	4. 3526032
Shell rock.....	301 19 56.14	121 32 05.43	4. 4148762
Lookout.....	320 11 52.01	140 24 10.02	4. 5466917
Hood.....	338 59 40.69	159 04 38.07	4. 4034317

LOOKOUT, WASCO COUNTY, OREG.

On Lookout Mountain, the highest point on the divide between the East Fork of Hood River and Badger Creek. The forest-ranger trail between Hood River post-office and the Barlow road crosses the ridge about 0.25 mile southwest of signal. The rangers have a small pasture fenced on the north side of mountain. It is about 22

miles by trail from Mount Hood post-office and 17 or 18 miles from Summit House on Barlow road.

Signal: Rock cairn, 6 feet at base and 7 or 8 feet high.

Station mark: Triangulation tablet cemented in rock placed at center of cairn near northeast corner sec. 3, T. 3 S., R. 10 E.

[Latitude $45^{\circ} 20' 34.98''$. Longitude $121^{\circ} 31' 24.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wilson.....	19 01 19.94	198 55 37.05	4. 5109749
Squaw.....	73 06 17.10	252 44 14.91	4. 6275446
Hood.....	104 26 29.06	284 19 09.16	4. 1427594
Chinidere.....	140 24 10.02	320 11 52.01	4. 5466917
Defance.....	155 31 59.83	335 23 29.63	4. 5728823
Bald Butte.....	178 19 05.34	358 18 44.59	4. 3330655
Shell rock.....	178 46 40.62	358 46 32.05	4. 1315961

SHELL ROCK, WASCO COUNTY, OREG.

(Not occupied.)

On the summit of a bald peak locally known as "Shell Rock Butte," 5 miles south of Bald Butte and 8 miles north of Lookout Mountain. The ranger trail from Mount Hood post-office to the Barlow road passes east of and just under peak.

Station mark: Rock cairn which was used for signal.

[Latitude $45^{\circ} 27' 53.45''$. Longitude $121^{\circ} 31' 37.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chinidere.....	121 32 05.43	301 19 56.14	4. 4148762
Bald Butte.....	177 32 14.87	357 32 03.58	3. 9027125
Lookout.....	358 46 32.05	178 46 40.62	4. 1315961

OREGON-WASHINGTON.

TRIANGULATION STATIONS.

Blalock Island, Dayton, Pasco, Prosser, Umatilla, Walla Walla, Wallula, and Zillah quadrangles.

MORROW AND UMATILLA COUNTIES, OREG.; ASOTIN, BENTON, COLUMBIA, FRANKLIN, GARFIELD, KLICKITAT, WALLA WALLA, AND YAKIMA COUNTIES, WASH.

During the season of 1906 triangulation was extended southeastward from stations Hembree, Atanum, and Moxee into Morrow County, Oreg., by C. F. Urquhart and A. I. Oliver. In the fall of 1907 G. T. Hawkins extended the belt of triangulation eastward from stations Lee and McFall, Walla Walla County, Wash., and connected with stations Valentine, Garfield County, and White, Asotin County, which had been located in 1902 by a belt of triangulation extending southward from Spokane. In October, 1907, A. H. Sylvester extended the triangulation eastward from stations Gleason, Granite, and Irrigon so as to control the Umatilla quadrangle, Oregon.

Positions are given on the Spokane datum as computed through the series of figures extending north, west, and south from Spokane.

GLEASON, MORROW COUNTY, OREG.

On highest point of hills east of where Sand Hollow emerges from the hills, being about 5 miles east of Hynd's ranch in Sand Hollow, about 20 miles east of Ione, and about 30 miles south of Irrigon. A road leads from both Ione and Irrigon. The road from Hynd's ranch to Butter Creek passes about 2 miles north of the point, which is easily reached by following up the ridge.

Signal and station mark: Tetrapod, carrying two targets of black cloth at right angles to each other, over aluminum triangulation tablet set in solid rock.

[Latitude $45^{\circ} 29' 09.81''$. Longitude $119^{\circ} 25' 59.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ione.....	86 39 43.16	266 23 28.96	4. 4732193
Ella.....	111 52 07.77	291 37 40.95	4. 4529353
Alder.....	135 44 26.02	315 22 37.42	4. 7524983
Granite.....	169 17 14.10	349 14 33.07	4. 4186603
Irrigon.....	169 38 17.80	349 32 52.93	4. 7349288
Job.....	208 45 52.23	28 51 12.31	4. 3047577
Alkali.....	258 47 17.62	79 02 05.76	4. 4399589

GRANITE, MORROW COUNTY, OREG.

On low hill 2 miles southeast of Sand Lake in Sand Hollow, about 12 miles south of Irrigon post-office on Columbia River. Drive to point via road from Irrigon up Sand Hollow.

Signal and station mark: Tetrapod, carrying two targets at right angles to each other, over aluminum triangulation tablet in granite rock, 12 by 14 by 15 inches, set flush with surface of ground.

[Latitude 45° 43' 04.28". Longitude 119° 29' 45.06."']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ione.....	42 00 45.52	221 47 10.39	4.5685826
Alder.....	113 02 01.61	292 42 51.96	4.5752815
Irrigon.....	169 55 16.16	349 52 32.33	4.4486353
Expansion.....	206 37 06.66	26 44 34.56	4.4772366
Hermiston.....	225 50 57.05	45 59 08.28	4.3141278
Job.....	298 57 06.06	119 05 08.02	4.2219645
Gleason.....	349 14 33.07	169 17 14.10	4.4186603

ALKALI, UMATILLA COUNTY, OREG.

About 17 miles southeast of Echo, Oreg., and 0.75 mile northeast of Slusher's ranch house in Alkali Canyon. It is on highest point of ridge north of said canyon. A wagon road passes close to station on southwest.

Signal and station mark: Tetrapod about 15 feet high, bearing a four-sided target over center of aluminum tablet cemented in solid rock.

[Latitude 45° 32' 01.37". Longitude 119° 05' 14.70."']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gleason.....	79 02 05.76	258 47 17.62	4.4399589
Job.....	125 42 39.19	305 33 10.05	4.3273387
Smith.....	209 03 35.81	29 09 07.76	4.3157444

GEER, UMATILLA COUNTY, OREG.

About 14 miles southwest of Walla Walla, Wash., on high bald hill on south side of Walla Walla Valley.

Signal: Lumber tetrapod with two targets, one of white cloth and one of black cloth, at right angles to each other.

Station mark: Aluminum tablet cemented in stone under signal.

[Latitude 45° 55' 20.98". Longitude 118° 34' 14.71".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wallula.....	116 48 39.43	296 35 53.45	4. 4094274
McFall.....	181 47 51.60	1 48 23.05	4. 4750985
Burg.....	233 51 21.68	54 04 08.67	4. 4529501

HERMISTON, UMATILLA COUNTY, OREG.

On the highest point of the Hermiston Butte 0.25 mile northwest of town of Hermiston. The top of the butte can be reached by team.

Signal and station mark: A tetrapod about 16 feet high, bearing a four-sided target, centered over aluminum tablet cemented in solid basalt.

[Latitude 45° 50' 48.75". Longitude 119° 18' 19.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Job.....	0 39 07.35	180 38 58.91	4. 3507990
Granite.....	45 59 08.28	225 50 57.05	4. 3141278
Expansion.....	173 58 57.20	353 58 13.35	4. 0983715
Juniper.....	240 45 17	61 01 00	4. 51240
Smith.....	301 39 44.46	121 54 39.76	4. 5018700

JOB, UMATILLA COUNTY, OREG.

On a large dome hill locally known as Service Butte about 10 miles southwest of Echo, Oreg. The road from Echo to Vias ranch on Butter Creek passes about 2 miles east of station. Inquire way to Spike's ranch, which is on this road just east of station. The road up Butter Creek passes about 5 miles west of station. The butte can be driven on from any direction.

Signal and station mark: A tetrapod about 15 feet high, bearing a four-sided target, over center of a standard bench-mark post set flush with level of ground.

[Latitude 45° 38' 42.34". Longitude 119° 18' 31.43".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gleason.....	28 51 12.31	208 45 52.23	4. 3047577
Granite.....	119 05 08.02	298 57 06.06	4. 2219645
Hermiston.....	180 38 58.91	0 39 07.35	4. 3507990
Juniper.....	216 46 44	37 02 10	4. 67993
Smith.....	258 05 10.41	78 20 12.61	4. 4454139
Alkali.....	305 33 10.05	125 42 39.19	4. 3273387

JUNIPER, UMATILLA COUNTY, OREG.

(Not occupied.)

On high bare ridge about 7 miles south of Wallula, Wash., in NE. $\frac{1}{4}$ sec. 21, T. 6 N., R. 31 E.; about 2 miles southeast of Columbia River, 0.75 mile south of Washington-Oregon state line, and 1.5 miles north of Juniper Canyon. Station may be reached by private wagon road from northeast.

Signal and station mark: A tetrapod 20 feet high, with two 4-by-4-foot targets at right angles over center of iron bench-mark post set 3 feet in ground.

[Latitude $45^{\circ} 59' 21.6''$. Longitude $118^{\circ} 56' 20.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Smith.....	2 39 30	182 38 40	4.51318
Job.....	37 02 10	216 46 44	4.67993
Hermiston.....	61 01 00	240 45 17	4.51240
Expansion.....	83 41 20	263 24 48	4.47572

SMITH, UMATILLA COUNTY, OREG.

About 15 miles east of Echo and 8 miles west of Pendleton, 2 miles north of Umatilla River, on low uncultivated hill in the midst of wheat lands. E. De Haven's house at the bridge across the Umatilla River near Yoacum is about 4 miles distant. A wagon road passes very close to station, which can be driven to.

Signal and station mark: A tetrapod about 15 feet high, with four-sided target, over center of an aluminum triangulation tablet cemented in rock.

[Latitude $45^{\circ} 41' 46.88''$. Longitude $118^{\circ} 57' 30.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Alkali.....	29 09 07.76	209 03 35.81	4.3157444
Job.....	78 20 12.61	258 05 10.41	4.4454139
Hermiston.....	121 54 39.76	301 39 44.46	4.5018703
Expansion.....	136 02 34.78	315 46 54.83	4.6091247
Juniper.....	182 38 40	2 39 30	4.51318

WHITE, ASOTIN COUNTY, WASH.

On a high, bald knob in a field 400 feet north of the Lewiston-Peola road, 20 miles from Lewiston and 8 miles from Peola.

Station mark: "U. + S." cut in solid rock.

[Latitude $46^{\circ} 19' 29.30''$; $46^{\circ} 19' 27.80''$.^a Longitude $117^{\circ} 21' 12.22''$; $117^{\circ} 21' 12.01''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peola.....	128 01 08.70	307 55 51.12	4. 0756254
Valentine.....	183 39 35.00	3 40 18.88	4. 3061025
Valentine ".....	183 39 39.03	3 40 22.94	4. 3062636
Snake.....	228 03 20.72	48 13 21.11	4. 3762899
Windmill.....	299 39 38.88	119 52 20.44	4. 4149990
Anatone.....	342 35 48.08	162 40 01.34	4. 40120

^a Computed from Spokane through the triangulation of 1892 extending through Whitman County.

EXPANSION, BENTON COUNTY, WASH.

On high dome hill about 3 miles northeast of Umatilla, Oreg., about 2 miles north of Columbia River, and about 2.5 miles northeast of former post-office site of Expansion, Wash. The station is on second prominent hill north of the river, and the Expansion-Kennewick road passes just south of it. There is a good ferry across Columbia River between Umatilla and Expansion.

Signal and station mark: A tetrapod 15 feet high, with four-sided target over center of aluminum tablet cemented in a boulder, 12 by 12 by 18 inches, set flush with ground.

[Latitude $45^{\circ} 57' 32.73''$. Longitude $119^{\circ} 19' 20.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Granite.....	26 44 34.56	206 37 06.66	4. 4772366
Irrigon.....	92 43 36.95	272 33 19.50	4. 2643480
Juniper.....	263 24 48	83 41 20	4. 47572
Smith.....	315 46 54.83	136 02 34.78	4. 6091247
Hermiston.....	353 58 13.35	173 58 57.20	4. 0983715

IRRIGON, BENTON COUNTY, WASH.

On most prominent point on ridge 3 miles north of Columbia River, about 6 miles northwest of Irrigon post-office, and about 2.5 miles northeast of Paterson. The Paterson-Horseheaven road passes very near station.

Signal: Tetrapod carrying two white targets at right angles.

Station mark: Aluminum tablet set in granite boulder, 1 by 1 by 2 feet, set flush with surface of ground with small cairn of rock above it.

[Latitude $45^{\circ} 58' 00.17''$. Longitude $119^{\circ} 33' 33.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ione.....	19 45 30.36	199 34 36.98	4.7682319
Alder.....	66 23 47.98	246 07 19.92	4.5104470
Horse.....	131 16 55.23	311 03 32.91	4.5026412
Bender.....	179 08 50.68	359 08 35.07	4.4938760
Horseheaven.....	229 20 19.13	49 29 48.96	4.3506138
Expansion.....	272 33 19.50	92 43 36.95	4.2643480
Gleason.....	349 32 52.93	169 38 17.80	4.7349288
Granite.....	349 52 32.33	169 55 16.16	4.4486353

ALTO, COLUMBIA COUNTY, WASH.

On knoll in field owned by W. F. Anderson, about 150 yards northeast of center of sec. 27, T. 11 N., R. 37 E.

Signal: Lumber tripod with white and black targets set at right angles to each other. The signal is on ground not the highest in the neighborhood in order that Bolles triangulation station could be seen.

Station mark: A cross cut on center of top of stone block, 24 by 12 by 10 inches, set flush with surface.

[Latitude $46^{\circ} 24' 22.82''$. Longitude $118^{\circ} 10' 04.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bolles.....	13 47 22.14	193 44 44.47	4.2922199
Skyrocket.....	58 54 08.15	238 48 22.66	4.0761693
Chard.....	245 49 10.63	66 03 00.53	4.4274930
Turner.....	268 50 39.26	89 03 17.85	4.3497703
Gantz.....	295 36 11.78	115 49 10.85	4.4073294

GANTZ, COLUMBIA COUNTY, WASH.

In NE. $\frac{1}{4}$ sec. 36, T. 10 N., R. 39 E. In field owned by Mr. Gantz, 58 feet north of the northwest corner of his house, 14.5 feet northeast of elder tree 14 inches in diameter, 24 feet northwest of elder tree 10 inches in diameter, and 9 feet north of gatepost.

Signal: A target in tree.

Station mark: Iron pipe 3 feet long and 1.5 inches in diameter driven flush with surface.

[Latitude 46° 18' 23.88". Longitude 117° 52' 07.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bolles.....	74 07 25.44	253 51 49.94	4. 4599851
Skyrocket.....	98 34 30.48	278 15 46.56	4. 5263299
Alto.....	115 49 10.85	295 36 11.78	4. 4073294
Turner.....	176 53 37.83	356 53 16.70	4. 0610825
Lewis.....	250 25 38.93	70 37 14.53	4. 3386796

TURNER, COLUMBIA COUNTY, WASH.

One-half mile west of village of Turner, on right of way of county road, 6 feet from north-south wire fence west of road, on east edge of W. $\frac{1}{2}$ sec. 25, T. 11 N., R. 39 E.

Signal: Lumber tripod with white and black targets.

Station mark: A cross cut in center of top of stone block, 24 by 14 by 10 inches, set flush with surface.

[Latitude 46° 24' 36.11". Longitude 117° 52' 37.19".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Alto.....	89 03 17.85	268 50 39.26	4. 3497703
Chard.....	191 12 14.67	11 13 25.39	4. 0296467
Pomeroy.....	241 34 00.43	61 42 48.01	4. 2469000
Lewis.....	281 10 40.84	101 22 38.18	4. 3341418
Gantz.....	356 53 16.70	176 53 37.83	4. 0610825

PAGE, FRANKLIN COUNTY, WASH.

On a sage-brush hill about $4\frac{1}{2}$ miles northwest of Page, post-office on opposite side of Snake River from Oregon Railroad and Navigation line. A road leads into the hills from Pasco-Page road about $2\frac{1}{2}$ miles from Page. Follow this road until summit of ridge is reached; thence north along ridge 0.75 mile to signal.

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

Station mark: A United States gauge standard bench-mark post set by Reclamation Service.

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[Latitude $46^{\circ} 21' 45.10''$. Longitude $118^{\circ} 50' 06.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jumpoff Joe.....	38 31 50.78	218 19 01.22	4.5651622
Pasco.....	65 03 24.32	244 52 54.95	4.3127162
White Bluff.....	96 40 32.98	276 22 16.19	4.5130690
Lee.....	261 50 10.67	82 02 34.81	4.3461321
McFalls.....	311 43 12.61	131 55 11.84	4.4562520
Lerlerc.....	344 05 44.61	164 08 08.10	4.1909631

CHARD, GARFIELD COUNTY, WASH.

About 1.5 miles south of Chard, in field in sec. 20, T. 12 N., R. 40 E.

Signal: Lumber tripod with black and white targets.

Station mark: A cross cut in center of top of stone block, 24 by 14 by 14 inches, set flush with surface:

[Longitude $46^{\circ} 30' 16.23''$. Longitude $117^{\circ} 50' 59.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Turner.....	11 13 25.39	191 12 14.67	4.0296467
Alto.....	66 03 00.53	245 49 10.63	4.4274930
Pomeroy.....	278 52 41.44	99 00 18.67	4.1338097

LEWIS, GARFIELD COUNTY, WASH.

About 7 miles south and 1 mile east of Pomeroy, on west end of Calloway hill, in sec. 5, T. 10 N., R. 42 E., in edge of field, 9.5 feet east of north-south fence, 66.5 feet north of east-west fence. The road elbows east and north 80 feet southwest of signal.

Signal: Pine tree 8 inches in diameter and 15 feet high trimmed with small top set 4 feet in ground and braced to fence posts.

Station mark: A cross cut in center of top of stone block, 24 by 14 by 10 inches, set with top 4 inches below surface of ground.

[Latitude $46^{\circ} 22' 19.40''$. Longitude $117^{\circ} 36' 06.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gantz.....	70 37 14.53	250 25 38.93	4.3386796
Turner.....	101 22 38.18	281 10 40.84	4.3341418
Pomeroy.....	156 02 15.52	335 59 05.14	4.1398805
Valentine.....	233 39 44.04	53 51 15.96	4.4026544
Peola.....	257 56 23.32	78 01 53.02	3.9978292

PEOLA, GARFIELD COUNTY, WASH.

About 5 miles north of Peola post-office and 13 miles southeast of Pomeroy. In SE. $\frac{1}{4}$ sec. 31, T. 11 N., R. 43 E., in field, 41.5 feet north of east-west fence, 345 feet west of north-south fence; wagon roads on both north-south and east-west lines.

Signal: Pine pole 10 inches in diameter, 15 feet high, set 4.5 feet in ground.

Station mark: A cross cut in center of top of stone block, 24 by 10 by 8 inches, set with top 7 inches below surface.

[Latitude 46° 23' 26.48''. Longitude 117° 28' 31.07''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lewis.....	78 01 53.02	257 56 23.32	3.9978292
Pomeroy.....	124 34 17.45	304 25 37.03	4.2695916
Valentine.....	219 34 59.58	39 41 01.54	4.2230069
White.....	307 55 51.12	128 01 08.70	4.0756254

POMEROY, GARFIELD COUNTY, WASH.

On north line of sec. 34, T. 12 N., R. 41 E., 3 miles west and 1 mile north of Pomeroy. In county road 9.5 feet north of east-west wire fence south of road and 215 feet east of north-south fence on west line of the section.

Signal: Lumber tripod with black and white targets.

Station mark: A cross cut in center of top of stone, 24 by 8 by 8 inches, set flush with surface.

[Latitude 46° 29' 07.73''. Longitude 117° 40' 29.25''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Turner.....	61 42 48.01	241 34 00.43	4.2469000
Chard.....	99 00 18.67	278 52 41.44	4.1338097
Valentine.....	264 44 34.73	84 59 17.90	4.4161475
Peola.....	304 25 37.03	124 34 17.45	4.2695916
Lewis.....	335 59 05.14	156 02 15.52	4.1398805

VALENTINE, GARFIELD COUNTY, WASH.

About 1.5 miles northeast of Valentine, in sec. 20, T. 12 N., R. 44 E., 247 feet south of east-west fence and 573 feet east of north-south fence in field owned by Mr. Davis.

Signal: Lumber tripod with white and black targets.

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Station mark: Stone post, 30 by 8 by 8 inches, set with top 8 inches below surface. A triangulation tablet is cemented in center of top of post.

[Latitude $46^{\circ} 30' 23.29''$; $46^{\circ} 30' 22.03''$.^a Longitude $117^{\circ} 20' 11.64''$; $117^{\circ} 20' 11.39''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peola.....	39 41 01.54	219 34 59.58	4. 2230069
Lewis.....	53 51 15.96	233 39 44.04	4. 4026544
Pomeroy.....	84 59 17.90	264 44 34.73	4. 4161475
White.....	3 40 18.88	183 39 35.00	4. 3061025
White ^a	3 40 22.94	183 39 39.03	4. 3062636
Wawawai.....	188 57 02.26	8 58 41.36	4. 2703883
Colton.....	243 06 16.93	63 12 36.63	4. 0967792
Snake.....	284 43 02.46	104 52 19.79	4. 2292579
Windmill.....	327 13 23.19	147 25 22.04	4. 5947866

^a Computed from Spokane through the triangulation of 1902 extending through Whitman County.

BOLLES, WALLA WALLA COUNTY, WASH.

On highest hill in neighborhood about 12 miles northeast of Walla Walla, 4 miles nearly south of Bolles Junction, in a wheat field.

Signal and station mark: Lumber tetrapod, with white and black targets set at right angles to each other, over aluminum tablet cemented in stone.

[Latitude $46^{\circ} 14' 06.33''$. Longitude $118^{\circ} 13' 42.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burg.....	11 10 06.33	191 08 06.73	4. 2648022
McFall.....	79 13 52.87	258 59 34.91	4. 4140018
Skyrocket.....	156 42 20.98	336 39 13.58	4. 1466440
Alto.....	193 44 44.47	13 47 22.14	4. 2922199
Gantz.....	253 51 49.94	74 07 25.44	4. 4599851

BURG, WALLA WALLA COUNTY, WASH.

On low bluff on south side of creek, 3.5 miles east of Walla Walla.

Signal and station mark: Lumber tetrapod, with black and white targets set at right angles to each other, over aluminum tablet cemented in stone.

[Latitude $46^{\circ} 04' 21.67''$. Longitude $118^{\circ} 16' 28.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Geer.....	54 04 08.67	233 51 21.68	4.4529501
McFall.....	121 01 42.31	300 49 25.07	4.4080803
Bolles.....	191 08 06.73	11 10 06.33	4.2648022

LEE, WALLA WALLA COUNTY, WASH.

In grain field in SE. $\frac{1}{4}$ sec. 33, T. 11 N., R. 34 E., about 1.75 miles northeast of Lee siding and $1\frac{1}{4}$ miles north of Lee post-office.

Signal: Lumber tripod, with two targets, one of white cloth and one of black cloth, at right angles to each other.

Station mark: Triangulation tablet set under signal in iron pipe $2\frac{1}{2}$ inches in diameter and 4 feet long.

[Latitude $46^{\circ} 23' 25.86''$. Longitude $118^{\circ} 32' 58.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McFall.....	1 48 49.36	181 48 25.69	4.3461110
Lerlerc.....	44 36 57.20	224 26 57.42	4.4032622
Page.....	82 02 34.81	261 50 10.67	4.3461321
Skyrocket.....	282 51 23.19	103 02 12.07	4.2936032

LERLERC, WALLA WALLA COUNTY, WASH.

On a low sage-brush hill about 8 or 9 miles southwest of Eureka Junction, about 3.5 miles west of Adkins siding, in SW. $\frac{1}{4}$ sec. 26, T. 9 N., R. 32 E.

Signal and station mark: Tetrapod, with white and black cloth on it, over triangulation tablet set in rock.

[Latitude $46^{\circ} 13' 41.57''$. Longitude $118^{\circ} 46' 47.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wallula.....	16 39 21.99	196 35 36.96	4.3696717
Jumpoff Joe.....	63 03 55.53	242 48 43.65	4.4836530
Pasco.....	105 20 55.70	285 08 03.64	4.3751992
White Bluff.....	117 06 38.67	296 45 59.58	4.6141305
Page.....	164 08 08.10	344 05 44.61	4.1909631
Lee.....	224 26 57.42	44 36 57.20	4.4032622
McFalls.....	283 31 53.21	103 41 28.35	4.2448410

M'FALL, WALLA WALLA COUNTY, WASH.

On a bunch-grass hill known as McFall Hill, about 7.5 miles southeast of Eureka Junction.

Signal and station mark: Lumber tetrapod with two targets, one of white cloth and one of black cloth, at right angles to each other, over triangulation tablet set in rock.

[Latitude $46^{\circ} 11' 27.63''$. Longitude $118^{\circ} 33' 31.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Geer.....	1 48 23.05	181 47 51.60	4. 4750985
Wallula.....	52 33 22.17	232 20 03.03	4. 4776967
Lerlerc.....	103 41 28.35	283 31 53.21	4. 2448410
Page.....	131 55 11.84	311 43 12.61	4. 4562520
Lee.....	181 48 25.69	1 48 49.36	4. 3461110
Skyrocket.....	228 08 10.81	48 19 22.27	4. 4261572
Bolles.....	258 59 34.91	79 13 52.87	4. 4140018
Burg.....	300 49 25.07	121 01 42.31	4. 4080803

SKYROCKET, WALLA WALLA COUNTY, WASH.

In wheat field on high knoll about 2 miles north of Prescott.

Signal and station mark: A lumber tetrapod, with white and black targets at right angles to each other, over aluminum tablet cemented in stone.

[Latitude $46^{\circ} 21' 03.20''$. Longitude $118^{\circ} 18' 01.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McFall.....	48 19 22.27	228 08 10.81	4. 4261572
Lee.....	103 02 12.07	282 51 23.19	4. 2936032
Alto.....	238 48 22.66	58 54 08.15	4. 0761693
Gantz.....	278 15 46.56	98 34 30.48	4. 5263299
Bolles.....	336 39 13.58	156 42 20.98	4. 1466440

WALLULA, WALLA WALLA COUNTY, WASH.

On hill about 4 miles southeast of Wallula. To reach station cross Walla Walla River at Wallula and continue ascent on main road. Signal is in middle of field and not in sight until quite near.

Signal: Lumber tripod with two targets, one of white cloth and one of black cloth, at right angles to each other.

[Latitude 46° 01' 34.62". Longitude 118° 51' 59.92".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jumpoff Joe.....	112 52 11.77	292 40 46.23	4.3461720
Pasco.....	150 34 00.24	330 24 54.62	4.5179564
Lerlerc.....	196 35 36.96	16 39 21.99	4.3696717
McFall.....	232 20 03.03	52 33 22.17	4.4776967
Geer.....	296 35 53.45	116 48 39.43	4.4094274

PENNSYLVANIA.

TRIANGULATION STATIONS.

Fairfield, Gettysburg, and Newville quadrangles.

ADAMS AND CUMBERLAND COUNTIES.

In cooperation with the State, in the fall of 1906 George T. Hawkins located ten points for the control of Fairfield, Gettysburg, and Newville quadrangles, based on Roundtop, Fickle, Timber Hill, and Roxbury.

BIG FLAT, ADAMS COUNTY, PA.

On the south end of the Big Flat about 0.25 mile south of county line, where it makes a bend, and 200 yards northeast of stone house owned by the State.

Signal: Target on large dead pine.

Station mark: A limestone post 30 by 8 by 6 inches, set 30 inches in ground; tablet cemented in top.

Reference mark: Dead pine signal tree: azimuth 51° 37'; distance 41 feet.

[Latitude 39° 59' 33.45". Longitude 77° 24' 04.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Green.....	4 29 17	184 28 48	4.13522
Hammond.....	237 07 20	57 13 12	4.18914
Fickle.....	252 48 56	72 58 50	4.36014

BISHOP, ADAMS COUNTY, PA.

On a partly cleared hill owned by Mr. Bishop, 1.5 miles northwest of Biglerville, in Butler Township.

Signal: A tripod built of poles and covered with cloth.

Station mark: Brown sandstone post, 30 by 10 by 10 inches, set 28 inches in ground; tablet cemented in top.

[Latitude 39° 56' 51.80''. Longitude 77° 16' 33.30'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Green.....	53 49 03.09	233 43 45.09	4.1642000
Fickle.....	223 41 38.17	43 46 42.17	4.2102363
Round Hill.....	268 39 37	88 47 36	4.23354
Plainview.....	291 04 22	111 07 55	3.92568
Roundtop.....	350 05 42.42	170 07 06.74	4.2600067

FICKLE, ADAMS COUNTY, PA.

On a partly cleared flat ridge near the northern extremity of the county, 2 miles north of Latimore. The station is 30 feet northeast of outcropping ledge on highest part of ridge on land of W. A. Bream. Theodolite elevated 30 feet.

Station mark: A stone post, 36 by 10 by 10 inches, set 30 inches in the ground, in center of top of which is cemented a bronze tablet marked "U. S. Geological Survey—Pennsylvania."

[Latitude 40° 03' 11.94''. Longitude 77° 08' 40.37'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gettysburg-Roundtop.....	15 19 22.10	195 15 43.03	4.4876976
Bishop.....	43 46 42.17	223 41 38.17	4.2102363
Green.....	48 34 17.26	228 23 55.16	4.4871657
Big Flat.....	72 58 50	252 48 56	4.36014
Hammond.....	100 28 18	280 24 16	3.95701
South Mountain.....	211 08 13.70	31 09 18.30	3.6627620
Roundtop.....	253 13 17.53	73 21 43.73	4.2889163
Pulpit.....	322 16 43.84	142 24 17.92	4.4388914

GETTYSBURG-ROUNDTOP, ADAMS COUNTY, PA.

The noted round knob 3 miles south of Gettysburg. Theodolite mounted on upper floor of the iron observation tower, about 70 feet above ground.

Station mark: Center of stone foundation of tower.

[Latitude 39° 47' 10.54''. Longitude 77° 14' 21.74'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fickle.....	195 15 43.03	15 19 22.10	4.4876976
Pulpit Rock.....	252 19 22.35	72 30 33.80	4.4175998
Quirauk.....	67 04 10	246 53 41	4.40570
Green.....	122 00 13.09	301 53 31.37	4.2449718
Bishop.....	170 07 06.74	350 05 42.42	4.2600067
Plainview.....	197 39 09	17 41 17	4.19396
Round Hill.....	217 22 50	37 29 08	4.36276

GREEN, ADAMS COUNTY, PA.

On land owned by the State, 2 miles south of Chambersburg-Gettysburg pike on highest point of the Green Ridge.

The summit was cleared of timber except a red oak, which was trimmed and left for signal.

Station mark: Bronze tablet cemented in solid rock.

Reference mark: Red-oak signal tree; azimuth 347° 24', distance 23.3 feet.

[Latitude 39° 52' 12.14''. Longitude 77° 24' 48.96'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Quirauk.....	23 48 52	203 45 04	4.32305
Big Flat.....	184 28 48	4 29 17	4.13522
Fickle.....	228 23 55.16	48 34 17.26	4.4871657
Bishop.....	233 43 45.09	53 49 03.09	4.1642000
Roundtop.....	301 53 31.37	122 00 13.09	4.2449718

PLAINVIEW, ADAMS COUNTY, PA.

On ridge 0.5 mile west of Plainview, 100 yards north of Jake Moss's house, 10 feet south of rail fence in the wagon-road right of way.

Signal: Cloth target in cedar tree.

Station mark: Marble post, 30 by 7 by 7 inches, set 28 inches in ground; bronze tablet cemented in top of post.

Reference mark: Cedar signal tree; azimuth 155° 00', distance 3.8 feet.

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[Latitude 39° 55' 13.42". Longitude 77° 11' 02.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Roundtop.....	17 41 17	197 39 09	4. 19396
Bishop.....	111 07 55	291 04 22	3. 92568
Round Hill.....	249 43 38	69 47 48	3. 99429

ROUND HILL, ADAMS COUNTY, PA.

(Not occupied.)

About 15 miles northeast of Gettysburg, on a heavily wooded summit, with cleared field on southern slope.

Signal: Target erected by topographer, who plane-tabled the sheet.

[Latitude 39° 57' 04.12". Longitude 77° 04' 32.13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Roundtop.....	37 29 08	217 22 50	4. 36276
Plainview.....	69 47 48	249 43 38	3. 99429
Bishop.....	88 47 36	268 39 37	4. 23354

FLAT ROCK, CUMBERLAND COUNTY, PA.

(Not occupied.)

About 5.5 miles northeast of Newville, on top of mountain, east of the gap, about 1.5 miles, by trail, from summer hotel; a prominent white rock, and the only bare spot seen from the Cumberland Valley.

Signal and station mark: Center of white rock.

[Latitude 40° 15' 16.36". Longitude 77° 24' 49.60".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lee.....	8 43 01	188 39 45	4. 24484
Roxbury.....	59 57 54	239 48 49	4. 36348
Prospect.....	338 59 41	159 01 06	3. 94060

HAMMOND, CUMBERLAND COUNTY, PA.

In Penn Township, on great pile of rock on top of ridge about 1.5 miles north of Henry Clay. From Henry Clay, across the mountain, there is an old road, a fork of which leads east along top of the ridge to within 200 yards of the station.

Signal: Tripod of poles covered with cloth.

Station mark: Bronze tablet cemented in rock.

[Latitude 40° 04' 05.15". Longitude 77° 14' 56.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Big Flat.....	57 13 12	237 07 20	4. 18914
Fickle.....	280 24 16	100 28 18	3. 95701

LEE, CUMBERLAND COUNTY, PA.

About 2 miles northeast of Leesburg, on cultivated hill owned by Mr. Jacoby, 0.25 mile north of Chambersburg-Carlisle Pike.

Signal: A tripod of sawed lumber.

Station mark: Marble post, 30 by 6 by 5 inches, set 26 inches in the ground. In center of top of post is cemented a bronze triangulation tablet.

[Latitude 40° 05' 53.04". Longitude 77° 26' 41.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Shippensburg.....	19 55 11	199 53 53	3. 91194
Roxbury.....	108 31 22	288 23 30	4. 26211
Flat Rock.....	188 39 45	8 43 01	4. 24484
Prospect.....	212 02 56	32 05 34	4. 03720

PROSPECT, CUMBERLAND COUNTY, PA.

In Prospect Hill Cemetery, 1 mile east of Newville.

Signal and station mark: A granite monument (of the Ahl family) 25 feet high; figure on top.

[Latitude 40° 10' 52.36". Longitude 77° 22' 37.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lee.....	32 05 34	212 02 56	4. 03720
Roxbury.....	81 36 54	261 26 24	4. 36870
Flat Rock.....	159 01 06	338 59 41	3. 94060

SHIPPENSBURG, CUMBERLAND COUNTY, PA.

In cleared field of John Hosfeld, 2½ miles southeast of Shippensburg.

Signal: A tripod of sawed lumber.

Station mark: Marble post, 36 by 6 by 6 inches, set 33 inches in the ground. In center of top of post is cemented a bronze triangulation tablet.

516 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude 40° 01' 44.15". Longitude 77° 28' 39.06'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Timber Hill.....	86 50 46	266 48 31	3. 69689
Roxbury.....	132 47 26	312 40 50	4. 29761
Lee.....	199 53 53	19 55 11	3. 91194

ROXBURY, FRANKLIN COUNTY, PA.

(Not occupied.)

On the first ridge northwest of valley on the well-known Roxbury Knob. All timber was cleared from summit except one tree left for signal.

Station mark: Lone signal tree.

Reference mark. Tablet cemented in solid rock 4 feet southeast of signal.

[Latitude 40° 09' 00.74". Longitude 77° 38' 54.28'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chambersburg.....	2 36 35	182 36 06	4. 37343
Strasburg.....	37 25 40	217 21 49	4. 14580
Flat Rock.....	239 48 49	59 57 54	4. 36348
Prospect.....	261 26 24	81 36 54	4. 36870
Lee.....	288 23 30	108 31 22	4. 26211
Shippensburg.....	312 40 50	132 47 26	4. 29761
Timber Hill.....	324 59 40	145 04 01	4. 22450

TIMBER HILL, FRANKLIN COUNTY, PA.

On Timber Hill, about 1.5 miles south of Shippensburg, on land of John Plaster.

Station mark: Lone hickory tree near west edge of a cleared field.

Reference mark. A cross cut in limestone, bearing S. 38° W., distant from signal 11.4 feet.

[Latitude 40° 01' 35.22". Longitude 77° 32' 08.61'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chambersburg.....	47 22 24.50	227 17 34.80	4. 1629694
Parnell.....	66 33 16.13	246 20 39.85	4. 4839373
Strasburg.....	98 18 45.67	278 10 33.96	4. 2627043
Roxbury.....	145 04 01	324 59 40	4. 22450
Shippensburg.....	266 48 31	86 50 46	3. 69689

Bedford quadrangle.

BEDFORD COUNTY.

In cooperation with the State, in October, 1906, George T. Hawkins located four points for the control of Bedford quadrangle, based on stations Dunning and Everett.

DUNNING, BEDFORD COUNTY, PA.

On mountain locally known as Dunning, about 10 miles north of Mount Dallas and 4 miles south of New Enterprise; on timbered land owned by William Over.

Station mark: Bronze tablet marked "U. S. Geological Survey—Pennsylvania," cemented in solid rock.

[Latitude 40° 06' 27.28". Longitude 78° 24' 11.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Everett.....	5 29 26.90	185 28 48.70	4. 1679624
Pigeon.....	75 11 05.30	255 04 57.38	4. 1462093
Lohr.....	96 24 45.84	276 12 52.34	4. 4212414
Rattlesnake.....	169 14 46.9	349 13 15.1	4. 2553913
Duncan.....	188 31 06.2	8 32 57.6	4. 4391035
Tussey.....	207 49 44.6	27 52 15.0	4. 0724843
Government.....	305 21 47.6	125 25 37.3	4. 0157449

EVERETT, BEDFORD COUNTY, PA.

On high summit of Tussey Mountain, about 3 miles south of Everett.

Station mark: Bronze tablet stamped "U. S. Geological Survey—Pennsylvania," cemented in solid rock.

[Latitude 39° 58' 32.14". Longitude 78° 25' 11.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dunning.....	185 28 48.70	5 29 26.90	4. 1679624
Pigeon.....	132 23 12.40	312 17 43.16	4. 2154627
St. Clair.....	161 46 44.57	341 43 55.19	4. 2993576
Lohr.....	125 20 51.84	305 09 37.54	4. 4830772
Government.....	228 43 59.5	48 48 27.0	4. 1180018
Smith.....	260 22 54.7	80 33 28.2	4. 3749415
Ray.....	332 44 03.3	152 48 22.5	4. 3219063

518 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

LOHR, NEAR LINE OF BEDFORD AND SOMERSET COUNTIES, PA.

On top of Allegheny Mountains, near boundary of Somerset and Bedford counties, 0.5 mile south of New Paris. Crum road, 100 yards southeast of cluster of small trees.

Signal: Lumber tripod covered with white cloth.

Station mark: A cross cut on top of sandstone post, 30 by 8 by 6 inches, set 28 inches in ground.

[Latitude 40° 08' 01.32". Longitude 78° 42' 39.20".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
St. Clair.....	265 43 22.16	85 51 48.00	4.2701046
Dunning.....	276 12 52.34	96 24 45.84	4.4212414
Pigeon.....	297 02 43.08	117 08 28.30	4.1540406
Everett.....	305 09 37.54	125 20 51.84	4.4830772

PIGEON, BEDFORD COUNTY, PA.

About 3 miles northwest of Wolfsburg, near north end of the Pigeon Hills, on land of J. E. Arnold, west of north-south rail fence between cornfield and brush.

Signal: A target in tall red oak, which is largest and most northerly of several trees in the fence row.

Station mark: Marble post, 30 by 8 by 6 inches, set 27 inches in ground 3.5 feet south of signal tree.

[Latitude 40° 04' 30.79". Longitude 78° 33' 43.29".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lohr.....	117 08 28.30	297 02 43.08	4.1540406
St. Clair.....	216 49 53.84	36 52 34.11	3.9922272
Dunning.....	255 04 57.38	75 11 05.30	4.1462093
Everett.....	312 17 43.16	132 23 12.40	4.2154627

ST. CLAIR, BEDFORD COUNTY, PA.

About 1.5 miles southeast of St. Clairsville on top of spur and about halfway from base to summit of mountain, near east corner of land belonging to Ross Slonaker, of St. Clairsville. Station was located here instead of on top because main summit is flat and covered with timber, which would have required much work to observe other points to south and southwest.

Signal: A target in pine tree.

Station mark: A tablet cemented in large stone under pile of rocks 6 feet at base and 3 feet high.

Reference mark: Pine signal tree; azimuth $34^{\circ} 56'$; distance 16.4 feet.

[Latitude $40^{\circ} 08' 45.62''$. Longitude $78^{\circ} 29' 34.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pigeon.....	36 52 34.11	216 49 53.84	3.9922272
Lohr.....	85 51 48.00	265 43 22.16	4.2701046
Everett.....	341 43 55.19	161 46 44.57	4.2993576

Smicksburg quadrangle.

JEFFERSON COUNTY.

In cooperation with the State two additional points for the control of Smicksburg quadrangle were located by George T. Hawkins in 1906. Positions are based on stations Palmer and Rowland.

M'GREGOR, JEFFERSON COUNTY, PA.

(Not occupied.)

On a prominent knoll, the summit of which is covered with tall trees, about 1 mile southwest of McGregor. The northeast slope is covered with brush 15 or 20 feet high and has one tall tree which is a prominent landmark on all sides except to the southwest.

Signal and station mark: Lone tree.

[Latitude $40^{\circ} 56' 03.94''$. Longitude $79^{\circ} 13' 29.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Valier.....	273 17 30	93 20 47	3.84864
Palmer.....	306 22 22	126 32 09	4.41704
Rowland.....	344 58 15	164 59 32	4.02618

VALIER, JEFFERSON COUNTY, PA.

About midway between Perryville and Porter, north of road, in cultivated field owned by D. C. McGregor.

Signal: A tripod of sawed lumber.

Station mark: Marble post, 30 by 7 by 7 inches, set 30 inches in ground. In center of top of post is cemented a bronze triangulation tablet.

[Latitude 40° 55' 50.78". Longitude 79° 08' 28.8".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rowland.....	23 35 00	203 33 00	4.03135
McGregor.....	93 20 47	273 17 30	3.84864
Palmer.....	317 13 30	137 20 00	4.31337

PRIMARY TRAVERSE.**Butler, Kittanning, Sewickley, Sharpsburg, and Zelenople quadrangles.****BEAVER, BUTLER, AND LAWRENCE COUNTIES.**

In cooperation with the State, the following geographic positions were determined by C. B. Kendall, in 1906. The line begins with adjusted position at McCaslin and follows highways east to Queen Junction; thence along the Allegheny Western branch of the Bessemer and Lake Erie Railroad to Troutman and east along public roads to a point 1 mile west of Karns; thence south via Chicora to the southeast corner of Butler quadrangle; thence west via Saxonburg, Glade Mills, and Callery to Big Knob triangulation station. The circuit was closed by a line beginning at a point about 3 miles east of Callery and running north via Reibold and Petersville to Muddy Creek Church.

BUTLER QUADRANGLE.

Magnetic declination: North border, 4° 32' west; south border, 3° 53' west; east border, 3° 57' west; west border, 4° 22' west.

*Geographic positions.***ALONG HIGHWAYS NEAR NORTH BORDER, M'CASLIN TO QUEEN JUNCTION.**

Station.	Latitude.	Longitude.
Elora, at junction of Butler-Mercer pike with road leading west to West Liberty, 25 feet south of southeast corner of Grange Hall, iron post stamped "Prim. Trav. Sta. No. 2, 1906".....	40 59 13.6	79 59 14.3
Muddy Creek Church, 5 feet southwest of southwest corner of; center of sandstone boulder.....	40 58 22.6	79 58 24.3
Maple Grove School, 125 feet south of schoolhouse, road forks northwest and southeast, 30 feet south to oak tree and sign "State road 2 miles".....	40 58 34.6	79 57 41.3
Euclid, 1 mile west of; 4 corners at top of hill, 15 feet south to signboard "Muddy Creek 2 miles, Euclid 1 mile, Unionville 4 miles, State road 1 mile.".....	40 58 56.2	79 56 55.1
Euclid, 0.5 mile west of; 4 corners, at top of hill, 25 feet northwest and 30 feet southwest to fence corners.....	40 59 10.5	79 56 19.8

Geographic positions—Continued.

ALONG WESTERN ALLEGHENY BRANCH OF BESSEMER AND LAKE ERIE RAILROAD.

Station.	Latitude.	Longitude.
Queen Junction, crossing of the Bessemer and Lake Erie Railroad (main line).....	40° 58' 02.6"	79° 55' 53.9"
Queen Junction, 1.5 miles east of; public road crossing, center of track.....	40 58 34.3	79 54 19.3
Thorn, 600 feet northeast of station, highway crossing, center of track.....	40 59 11.8	79 53 13.1
Gilbert, 0.25 mile west of station, in coping at south end of west abutment of Western Allegheny Railroad girder span over highway, 50 feet north of 3 corners, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1906".....	40 59 40.6	79 51 57.3
Hooker, 0.75 mile west of station, highway crossing, center of track.....	40 59 46.7	79 50 37.9
Hooker, 100 feet east of station, road crossing, center of track.....	40 59 38.0	79 50 00.5
Hooker, 0.75 mile southeast of; overhead crossing, center of track.....	40 59 06.1	79 49 28.0
Star, 0.25 mile northwest of station, road crossing, center of track.....	40 59 30.2	79 48 38.2

ALONG HIGHWAYS NEAR NORTH BORDER, TROUTMAN TO NEAR KARNS CITY.

Troutman, 0.5 mile west of; 900 feet east of Western Allegheny Railroad, T road west, center of north-south road, 40 feet southwest to corner wire-fence post and sign "Greece 2 miles, Butler 11 miles," 40 feet west to telephone pole.....	40 58 54.4	79 48 07.6
Troutman, T road southeast, 150 feet northeast of store, 40 feet west to corner of blacksmith shop, 20 feet south to corner fence post.....	40 59 16.5	79 47 41.0
Troutman, 1.5 miles northeast of; T road up hill to north, 60 feet southwest to oil well, 35 feet southeast to oak tree.....	40 59 54.2	79 46 29.1
Haysville, signpost at foot of hill, road forks northwest, east, and southwest.....	40 59 53.6	79 45 21.2

ALONG HIGHWAYS NEAR SOUTH BORDER.

Saxonburg station, at Saxon Center, Methodist Episcopal Church, T street east, 60 feet north to corner of church, 35 feet southeast to rock foundation of dwelling.....	40 45 51.8	79 45 57.6
Saxonburg, 1 mile west of station; 4 corners, 15 feet northeast to corner front yard, 35 feet northwest to corner fence.....	40 45 35.3	79 46 42.5
Saxonburg, 1.2 miles east of; T road north, 250 feet east of T road south, 25 feet northwest to sign "Hannahstown 1 mile," 20 feet northeast to wire-fence post.....	40 45 34.3	79 47 15.5
Saxonburg, at east edge of; cupola of the German Lutheran Church.....	40 45 00.8	79 48 34.8
Saxonburg, 0.75 mile west of; T road south, center of east-west road.....	40 45 02.8	79 49 37.1

Geographic positions—Continued.

ALONG HIGHWAYS NEAR SOUTH BORDER—continued.

Station.	Latitude.	Longitude.
Saxonburg, 1.8 miles west of; road forks east and north 300 feet west of bridge over stream, 30 feet southwest to kitchen door to 2-story dwelling, 30 feet east to large boulder.....	40 45 01.9	79 50 31.2
Frazier's mill, 600 feet north of; center of bridge over Thorn Creek, 500 feet east of Bessemer and Lake Erie Railroad.....	40 45 10.5	79 51 16.6
Saxonburg, 4 miles west of; 1.6 miles west of Frazier's mill, in southeast corner of junction of north-south road with T road east, 800 feet west of road forks south and northeast, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	40 45 11.2	79 53 04.8
Callery, 3 miles east of; road forks southeast and southwest 25 feet south to sign "Glade Mills 5 miles, Brownsdale 2 miles".....	40 45 02.2	79 59 04.1
Callery, 3 miles east of; 2 miles south of Brownsdale, in west wall at northwest corner of stone foundation of barn of A. D. Hunter at junction of Glade Mills-Evans City road with T road southwest to Callery, aluminum tablet stamped "Prim. Trav. Sta. No. 9, 1906".....	40 45 01.1	79 59 03.5
Brownsdale, 0.5 mile southwest of; 150 feet southwest of church, road forks southwest and west, large oak.....	40 46 01.6	79 58 24.9
Brownsdale, 4 corners, at top of hill, 50 feet northwest to L. S. Riley's store door, 30 feet west to corner blacksmith shop.....	40 46 25.6	79 57 59.8
Reibold, 1.5 miles southeast of; 4 corners, 25 feet north to oak, 40 feet northwest to dead oak, 20 feet south to apple tree.....	40 46 54.8	79 59 18.2
Reibold, 1 mile south of; road forks southeast and northeast, center of triangle.....	40 47 05.7	79 59 48.6
Reibold, 50 feet east of station, road crossing Baltimore and Ohio Railroad, center of main track.....	40 47 53.5	79 59 42.0
Schoolhouse, 150 feet east of; 4 corners, stone in center of intersection of roads, 20 feet northeast to corner of fence and sign "Butler road 2 miles, Island road 2 miles," 20 feet southeast to corner fence.....	40 55 56.6	79 59 54.2
Swamp Run, 600 feet north of bridge over, 4 corners, 25 feet southeast to signboard "Island road 0.75 mile, Hickory Corner 2 miles," 25 feet northwest to sign "Unionville 2.25 miles, Franklin road 2.25 miles".....	40 57 07.5	79 59 57.2
Muddy Creek Church, 1.75 miles southwest of; junction of Island road and public T road south, forked chestnut tree at junction, 120 feet east to road forks northeast and southeast.....	40 57 46.6	79 59 59.2
Muddy Creek Church, 5 feet southwest of southwest corner, center of sandstone boulder.....	40 58 22.6	79 58 24.29

KITTANNING QUADRANGLE.

Magnetic declination: West border, 3° 57' west.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
Karns, 1 mile northwest of; 0.75 mile southeast of Haysville, in southwest angle of junction of Chicora-Fairview and Haysville-Karns City roads, iron post stamped "Prim. Trav. Sta. No. 4, 1906".....	40 59 44.0	79 44 44.6
Liggett flag station, 150 feet north of Western Allegheny Railroad, road forks northwest and northeast center of triangle.....	40 58 41.9	79 44 50.2
Chicora, at northwest edge of; 300 feet north of brick church, road forks north and northwest, 80 feet north to telephone pole and sign "Fairview 5 miles," 35 feet southwest to telephone pole.....	40 57 21.0	79 44 54.1
Chicora, in sandstone post in northwest corner of the intersection of Main street and Central avenue, iron post stamped "Prim. Trav. Sta. No. 5, 1906".....	40 56 57.1	79 44 31.9
Chicora, at southeast edge of; T road south 250 feet southeast of mill, 40 feet southeast to corner of barn, 35 feet north to board fence.....	40 56 43.0	79 44 14.0
Chicora, 1.3 miles south of; T road east, center of north-south road.....	40 55 47.4	79 44 36.9
Chicora, 2.2 miles south of; crossroads 300 feet northeast of schoolhouse, 60 feet southeast to corner of dwelling, 30 feet northeast to post.....	40 55 04.6	79 44 38.0
Rattigan, 2 miles west of; 4 corners near top of hill, 10 feet southwest to chestnut tree, 30 feet east to 2 hickory trees..	40 54 23.5	79 44 43.4
Rattigan, 1.9 miles west of; road forks southeast and southwest, chestnut tree in triangle.....	40 53 42.6	79 44 30.9
St. Joe, 2.5 miles southeast of; 1.25 mile west of Fenelton, in sandstone post (6 by 6 by 36 inches), 24 inches in ground, in center of triangle at junction of Butler-Fenelton and St. Joe-Fenelton roads, 0.25 mile north of Buffalo, Rochester & Pittsburgh Railroad, tablet stamped "Prim. Trav. Sta. No. 6, 1906".....	40 52 39.1	79 44 56.0
Coylestown, 1.5 miles west of; center of Butler-Kittanning pike at T road north, 225 feet east of road south, 25 feet north to oak tree.....	40 51 28.8	79 44 41.3
Clearfield Catholic Church, 4 corners, 15 feet northeast to double oak, 35 feet south to corner of old church.....	40 50 37.0	79 44 33.7
Clearfield Catholic Church, spire.....	40 50 32.3	79 44 35.0
Clearfield Catholic Church, 1.1 miles south of; T road to west at brick house, center of north-south road, 40 feet southwest to telephone pole, 70 feet northwest to corner of brick house.....	40 49 37.1	79 44 44.5
West Winfield, 2.8 miles northwest of; road forks north and east, 10 feet northwest to 3 mail boxes, 15 feet south to board fence.....	40 48 24.9	79 44 49.9
Marwood, 1.5 miles east of station, crossroads at stone house, 100 feet east to signboard "Coylestown 5 miles, Denney's mill 2 miles," 20 feet south to oak.....	40 47 39.1	79 44 55.3

Geographic positions along highways near west border—Continued.

Station.	Latitude.	Longitude.
Saxonburg, 2 miles east of station, 4 corners at Winfield Grange Hall, 25 feet southeast to sign "Saxonburg station 2 miles, West Winfield 3 miles," 40 feet southwest to northeast corner of Grange Hall.....	° ' " 40 46 28.0	° ' " 79 44 54.8
Saxonburg, 1.5 miles east of station, 3 miles west of Leasureville, in sandstone post (6 by 6 by 36 inches) 24 inches in ground in southeast corner of intersection of roads, iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	40 45 31.0	79 44 40.2

SEWICKLEY QUADRANGLE.

Magnetic declination: North border, 3° 57' west.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Callery, 1 mile east of; T road east of store, 300 feet northeast of brick church, center of triangle, 40 feet west to store door, 15 feet south to black locust tree.....	° ' " 40 44 13.0	° ' " 80 00 37.9
Callery, 0.75 mile southeast of station, 3 corners at Myoma, T road east, 50 feet northwest to store door.....	40 43 46.6	80 01 34.8
Callery, 100 feet southwest of station, center between main west tracks at street crossing the Baltimore and Ohio Railroad.....	40 44 13.9	80 02 07.3
Callery, 1 mile northwest of station, T road west, center of north-south road, 20 feet east to oak, 20 feet west to post painted "1064".....	40 44 10.4	80 02 53.5
Callery, 1.5 miles northwest of station, T road west, 10 feet north to mail box, 20 feet south to corner wire-fence post.....	40 44 52.0	80 03 06.2
Callery, 3 miles northwest of station; 4 corners, 15 feet northwest to telephone pole and sign "Callery 3 miles, Evans City 1.5 miles".....	40 44 56.4	80 04 24.7
Road forks east and north, 25 feet north to telephone pole, 20 feet southwest to rail fence.....	40 44 50.4	80 05 35.2
Three corners, T road east, 20 feet northeast to locust tree, 30 feet southwest to buggy shed.....	40 44 54.9	80 08 25.8
Big Knob triangulation station, 2 miles northeast of 4 corners, center of north-south road, 10 feet northwest to Adam Teets's mail box, painted "989," 50 feet southeast to dead tree.....	40 44 39.4	80 10 45.2
Big Knob triangulation station, 0.75 mile northeast of; 100 feet northeast of church, road forks west and southwest, 10 feet south to oak, 40 feet east to oak.....	40 43 40.5	80 11 13.3
Big Knob triangulation station.....	40 43 15.73	80 12 02.87

SHARPSBURG QUADRANGLE.

Magnetic declination: North border, 3° 53' west.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Highway forks north and east, 40 feet east to center of bridge over small stream, 35 feet south to gate and second-class road southeast.....	° ' " 40 44 42.0	° ' " 79 54 04.8
Two-story white house and barn with cupola, 500 feet south of; road fork northeast and second-class road north, 10 feet east to board fence.....	40 43 44.8	79 54 56.9
Glade Mills, junction of plank road with highway southeast 20 feet south to northeast corner of old mill, 50 feet northwest to corner of store and post-office.....	40 43 28.1	79 55 28.4
Glade Mills, 0.5 mile north of; T road northeast at tollgate, 20 feet east to corner of tollhouse, 40 feet north to corner of yard fence.....	40 43 45.8	79 55 24.9
Glade Mills, 1.6 miles northwest of; 4 corners, 800 feet east of church, center of triangle, 30 feet southwest to sign-board, 40 feet southeast to tree in front yard.....	40 44 17.9	79 56 40.6
Callery station, 3 miles east of; 4 corners near trolley road crossing, 10 feet south to telephone pole and sign "Pittsburg 24 miles," 80 feet northwest to sign "Brownsdale 2.5 miles," 40 feet east to oak.....	40 44 28.6	79 58 21.7
Callery, 2.2 miles east of station, at top of hill, road forks west and southwest, 25 feet northwest to tollgate, painted "1145"	40 44 28.5	79 59 33.5

ZELIENOPLE QUADRANGLE.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
McCaslin, 0.8 mile east of; 4 corners, 70 feet north to oak, 20 feet southwest to mail box painted "1104".....	° ' " 41 00 48.9	° ' " 80 14 39.4
McCaslin, 1.5 miles southeast of; T road north, center of small grass triangle.....	40 59 57.6	80 14 38.2
T road south, 15 feet southwest to J. A. Book's mail box.....	40 59 58.1	80 13 33.5
Slippery Rock Creek, 600 feet west of; T road west, J. M. Curdy's mail box.....	41 00 01.0	80 11 19.9
Slippery Rock Creek bridge, 0.25 mile west of; 4 corners near pumping station, 50 feet northeast to a three-pronged fir tree, 25 feet southeast to J. E. Fork's mail box.....	40 59 27.7	80 11 27.1
Grantboro, 4 corners, at schoolhouse and store, 40 feet southwest to northeast corner of store, 90 feet east to large oak tree.....	40 59 17.4	80 10 16.3
Grantboro, 0.9 mile east of; T road east, center of north-south road, 40 feet north to oak tree.....	40 59 17.3	80 09 16.4
Grantboro, 1.6 miles east of; T road south, center of east-west road, 30 feet southwest to oak tree and sign "Portersfield 5 miles".....	40 59 18.0	80 08 27.5

Geographic positions near highways—Continued.

NEAR NORTH BORDER—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Grantboro, 2.1 miles east of; T road west, oak tree.....	40 59 19.0	80 07 39.8
Jacksville, 1 mile south of; in forks of road, at southwest corner of schoolhouse No. 6, Worth Township, iron post stamped "Prim. Trav. Sta. No. 1, 1906".....	41 00 09.7	80 37 17.4
West Liberty, 2.5 miles west of; 4 corners, 20 feet northwest to signboards "West Liberty 2.5 miles and Rockville 4.5 miles" "Prospect 9 miles and Jacksville 1 mile".....	41 00 27.1	80 05 45.1
West Liberty, 1.6 miles west of; T road north, center of triangle, 20 feet northwest to signboard "Slippery Rock 5 miles".....	41 00 21.2	80 05 01.6
West Liberty, center of bridge over small stream, 50 feet east of road forks west and southwest.....	41 00 22.7	80 03 15.9
West Liberty, 0.75 mile southeast of; 4 corners, 60 feet southeast to small bridge, 60 feet northwest to oak tree and sign "Sunbury 8 miles, Butler 15 miles".....	41 00 09.3	80 02 42.5
West Liberty, 1.75 miles southeast of; at northwest corner of intersection of cross-roads, large oak.....	40 59 13.0	80 01 23.6
Elora, 0.7 mile west of; T road south, 20 feet south to oak tree and sign "County Bridge 2 miles".....	40 59 07.4	80 00 01.9

NEAR SOUTH BORDER.

Zelienople, 3 miles southeast of; 3 corners, north-south telephone road, T road west, center of triangle, 15 feet southwest to sign "Zelienople 3 miles," 40 feet north to telephone pole.....	40 45 13.7	80 07 03.4
Schoolhouse, 0.5 mile east of; second-class road forks south center of triangle, Beaver-Butler county line.....	40 45 23.2	80 09 12.9
Schoolhouse, 0.5 mile west of; Beaver-Butler county line, T road east, in east face at southeast corner of stone foundation, aluminum tablet stamped "Prim. Trav. Sta. No. 10, 1906".....	40 45 22.2	80 09 47.6

NEAR EAST BORDER.

Petersville, 0.5 mile south of; 4 corners, 15 feet southeast to signboard, 40 feet southwest to telephone pole.....	40 48 23.1	80 00 54.1
Petersville, 1 mile north of; T road south just west of church, 30 feet west to telephone pole and sign "Harmony 9 miles, Evans City 6 miles, Franklin road 2 miles," 15 feet north to corner of wire fence.....	40 50 02.8	80 00 36.0
Little Connoquenessing Creek, center of bridge over, 500 feet south of road forks.....	40 51 06.5	80 00 51.8
Petersville, 4 miles north of; 2 miles east of Whitestown, in west wall at southwest corner of stone foundation to Martin schoolhouse No. 2, Connoquenessing Township, aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1906".....	40 52 10.0	80 01 03.2

Geographic positions near highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
Schoolhouse, 0.25 mile north of; 4 corners, 20 feet north-west to sign "Oak Spring 2 miles, State road 2 miles," 30 feet northeast to oak.....	40 52 21.6	80 01 04.4
Mount Chestnut, about 2 miles west of; T road east, 25 feet southeast to sign "Mount Chestnut 2 miles," 15 feet north west to mail box, 30 feet northeast to telephone pole....	40 53 13.4	80 00 57.2
Prospect, 1.25 miles east of; T road south, 40 feet west to telephone pole, 25 feet southeast to telephone pole, 400 feet west to T road north.....	40 54 18.5	80 00 58.8
Prospect, 2 miles northeast of; 4 corners, 40 feet southwest to sign "Prospect 2 miles," 30 feet east to mail box.	40 55 04.9	80 01 07.0
Schoolhouse, 0.6 mile south of; 4 corners, 20 feet southeast to oak, 30 feet southwest to corner rail fence.....	40 55 23.4	80 00 14.8

Bellefonte, Philipsburg, and Snowshoe quadrangles.

CENTER AND CLEARFIELD COUNTIES.

In cooperation with the State, the following geographic positions were determined by C. B. Kendall, in October, 1907. The line starts at Morrisdale triangulation station and follows the Mountain division of the Pennsylvania Railroad south to Gardner; thence east along highways via Hannah to Gatesburg; thence north along highways via Martha to the summit of the Allegheny Mountains; thence north across the plateau, following trails to a point on the New York Central and Hudson River Railroad about 2 miles east of Gorton; thence west along the New York Central and Hudson River Railroad to Peale, along highways via Kylertown to Pardee triangulation station.

For the control of the Bellefonte quadrangle the line starts at the point 2 miles east of Gorton and follows the New York Central and Hudson River Railroad to Gillintown; thence east along highways via Snowshoe, Rhoads, and Yarnell, to Curtin; thence south along the Pennsylvania Railroad via Milesburg and Bellefonte to Peru, and along highways to a point 1.5 miles south of Linden Hall; thence west along highways via Bloomsdorf to adjusted position at Gatesburg.

Two additional lines were run: One starts at Philipsburg and runs east along highways via Beaver mills to tie point at summit of Allegheny Mountains; the other starts at Milesburg and follows the Bald Eagle Valley division of the Pennsylvania Railroad southwest via Unionville and Martha to Hannah, tying with the main circuits at the last two points.

PHILIPSBURG QUADRANGLE.

Magnetic declination: West border, $5^{\circ} 04'$ west; south border, $5^{\circ} 26'$ west; east border, $5^{\circ} 53'$ west; north border, $5^{\circ} 39'$ west; center, $5^{\circ} 32'$ west.

Geographic positions.

ALONG PENNSYLVANIA RAILROAD, MORRISDALE TO GARDNER.

Station.	Latitude.	Longitude.
Morrisdale triangulation station, center of tower of large brick school building at Morrisdale, 4 miles north of Philipsburg.....	$40^{\circ} 56' 51.88''$	$78^{\circ} 13' 26.61''$
Morrisdale, junction of streets southeast and southwest at John W. Howe's store, 35 feet south to telephone pole, 10 feet east to trolley track.....	$40 56 40.0$	$78 13 40.6$
Loch Lomond Junction, at the "R U" tower, crossing of the New York Central and Hudson River and the Pennsylvania railroads.....	$40 55 04.3$	$78 12 39.8$
Philipsburg, 0.75 mile northeast of; road crossing 75 feet southwest of trestle No. 208, center of track.....	$40 54 18.5$	$78 13 14.8$
Philipsburg station, 75 feet south of; west Presque Isle street crossing, center of main track.....	$40 53 43.1$	$78 13 24.3$
Steiners, 75 feet northeast of station, road crossing center of main track.....	$40 53 21.9$	$78 13 30.0$
Moshannon Creek, Pennsylvania Railroad bridge over; center of pier.....	$40 52 50.1$	$78 14 10.5$
Boynton, 0.25 mile southwest of station, road crossing, east main (center) track.....	$40 51 57.7$	$78 14 52.0$
Osceola Mills, 200 feet northwest of station, in west edge of grass plot lying between the Tyrone-Clearfield and the Moshannon branches of the Pennsylvania Railroad, about 50 feet southeast of the triangle at junction of the Osceola-Sandy Ridge road with Curtin street, iron post stamped "Prim. Trav. Sta. No. 1, 1907, Pennsylvania".....	$40 50 58.3$	$78 15 47.6$
Osceola Mills, 1 mile southeast of station, road crossing at switch to coal mine, north rail of south track.....	$40 50 11.0$	$78 15 45.3$
Powelton, 1,100 feet north of station, road crossing on curve near row of 6 houses, west rail of west track.....	$40 49 44.1$	$78 14 38.2$
Retort, 30 feet south of station, road crossing, center between main tracks.....	$40 48 59.3$	$78 14 08.2$
Sandy Ridge, 200 feet south of station, road crossing, east rail of west track.....	$40 48 29.9$	$78 13 37.4$
Summit station, opposite operator's tower, center of east track.....	$40 47 20.2$	$78 14 22.4$
Milepost 12, center of track opposite.....	$40 46 31.2$	$78 14 42.6$
Mount Pleasant station, center of track opposite water tank.....	$40 45 32.7$	$78 14 49.5$
Milepost 9, center of track opposite.....	$40 45 16.1$	$78 13 32.1$
Gardner, 210 feet west of station, 95 feet south of milepost 8, on north edge of road at bend to southwest, top of milepost 8 bears N. 61° W. 94.6 feet; southwest corner of waiting shed bears N. $86^{\circ} 15'$ E. 211.4 feet, iron post stamped "Prim. Trav. Sta. No. 2, 1907, Pennsylvania".....	$40 44 36.3$	$78 13 46.2$

Geographic positions—Continued.

EAST ALONG HIGHWAYS, GARDNER VIA HANNAH TO GATESBURG.

Station.	Latitude.	Longitude.
Gardner, 1.25 miles northeast of; T road west, 70 feet northeast to bridge over Arneigh Run, 30 feet southwest to corner of fence.....	° ' " 40 44 50.5	° ' " 78 12 25.4
Gardner, 2.5 miles northeast of; 4 corners, Gardner-Hannah road crossing Philipsburg-Tyrone pike, 25 feet southeast to W. H. Beigle's mail box, 25 feet northeast to chestnut tree.....	40 45 55.6	78 11 42.7
Second-class road southeast, center of main road, 15 feet southeast to double chestnut oak, 40 feet northeast to boulder.....	40 46 42.9	78 10 56.1
Fowler, about 2.5 miles northwest of station, road forks northeast and southeast, point of triangle, 30 feet west to bridge over Vaughns Run, 20 feet southwest to double oak.....	40 47 12.9	78 09 34.4
Fowler, 2 miles northwest of station, 4 corners roads southeast, northeast, and southwest, second-class road west, forked oak.....	40 46 45.7	78 08 45.8
Fowler, 1.5 miles northwest of station, road forks, center of triangle, signpost marked "Fowler 1.5 miles, Sandy Ridge 8 miles, Hannah 2 miles".....	40 46 28.5	78 08 19.8
Fowler, 800 feet northeast of station, on north edge of the Tyrone-Bellefonte old plank road, in northwest corner of intersection with the Sandy Ridge road, iron post stamped "Prim. Trav. Sta. No. 3, 1907, Pennsylvania".....	40 45 26.5	78 06 45.5
Hannah, road crossing Pennsylvania Railroad, center between tracks at station.....	40 45 58.4	78 05 45.4
Hannah, 1.5 miles east of station, road forks on top of ridge, road south, second-class road west, center of triangle, 40 feet southeast and 35 feet southwest to chestnut oaks.....	40 45 56.1	78 04 29.0
Loveville, 1 mile north of; 4 corners, intersection of Half-moon Valley pike and Loveville-Hannah road.....	40 45 45.4	78 03 44.1
Loveville, T road north at store, 25 feet northwest to corner store porch, 25 feet east to poplar tree at corner of garden fence.....	40 45 08.0	78 03 25.9
Loveville, 1 mile east of; T road west, center of triangle, 25 feet southwest to signboard "Tyrone 13 miles," 25 feet east to post and rail fence.....	40 45 12.9	78 02 16.3
Gatesburg, 1.25 miles west of; T road north, center of triangle, 25 feet east to signboard "Marengo 1 mile, Loveville 2 miles, Gatesburg 1 mile".....	40 44 39.8	78 01 45.3
Gatesburg, cross streets opposite Lutheran Church, center of intersection.....	40 44 41.0	78 00 18.8
Gatesburg, in southeast corner of cross streets, 125 feet west of Lutheran Church, iron post stamped "Prim. Trav. Sta. No. 4, 1907, Pennsylvania".....	40 44 41.0	78 00 18.4

Geographic positions—Continued.

ALONG HIGHWAYS NORTH FROM GATESBURG.

Station.	Latitude.	Longitude.
Stormstown, 0.7 mile southeast of; road forks east and southeast, 35 feet south to oak tree, 30 feet north to sign-post "State College 9 miles, Pinegrove 8 miles".....	40 47 11.0	78 00 23.4
Stormstown, T road southeast, center of Halfmoon pike, 140 feet west to T road north, 40 feet southeast to northwest corner of Burket's store.....	40 47 36.8	78 00 59.5
Martha, 300 feet west of station, road crossing the Bald Eagle Valley Railroad, center of main track.....	40 49 59.7	78 00 27.8
Martha, 1.5 miles north of; road forks north and northwest, southeast point of triangle, 20 feet east to small thorn tree, 12 feet south to wire fence.....	40 51 17.6	78 00 47.2
Black Oak School, 0.25 mile east of; on top of hill, road forks south, east, and west, center of triangle.....	40 52 20.9	78 00 35.7
Black Oak School, on south edge of road about 3 miles north of Martha and 0.75 mile south of summit of Allegheny Mountains, at northeast corner of schoolhouse, iron post stamped "Prim. Trav. Sta. No. 5, 1907, Pennsylvania".....	40 52 17.7	78 00 47.1
Black Oak School, 0.7 mile north of, on mountain side, junction of Philipsburg-Bellefonte pike with road south to Martha, 25 feet south to chestnut oak and sign "Martha 5 miles, Julian 5 miles".....	40 52 50.2	78 00 39.8
Black Oak School, 1 mile northwest of; at summit of the Allegheny Mountains, center of Philipsburg-Bellefonte pike, 25 feet north to oak-tree stump, 40 feet east to old road north.....	40 52 57.4	78 01 14.4

ALONG OLD ROADS AND TRAILS.

Allegheny summit, 1 mile northeast of; road forks east and northeast, 30 feet south to slim dead pine, 50 feet northeast to chestnut.....	40 53 30.3	78 00 16.7
Rattlesnake pike, 2 miles northwest of; 0.5 mile north of Benner Run, on east edge of road, cross on highest point of large granite boulder.....	40 56 16.6	78 00 02.8
Benner Run, top of ridge north of; at junction of the Lober & Beacher (old "dinkey") Railroad grade leading south from mouth of Rock Run, with old timber trail leading north from the Rattlesnake pike via Benner Run, rock cairn 3 feet high.....	40 56 43.9	78 00 10.6
New York Central and Hudson River Railroad, 3 miles south of; in Lober & Beacher old "dinkey" grade at east-west road crossing about 800 feet east of head of hollows, 30 feet east to cross cut on pine tree, 40 feet north to oak tree blazed and scribed thus: "X P→→→," rock cairn 3 feet high.....	40 57 24.9	78 00 06.9
Lober & Beacher old camp grounds, old road crossing the "dinkey" railroad grade, center of old grade, 35 feet west to cross cut on oak tree.....	40 57 48.5	78 00 15.2
New York Central and Hudson River Railroad, 0.9 mile south of; center of old "dinkey" bridge over Rock Run.....	40 59 10.7	78 00 17.2

Geographic positions—Continued.

ALONG NEW YORK CENTRAL AND HUDSON RIVER RAILROAD, GORTON TO PEALE.

Station.	Latitude.	Longitude.
Gorton, 1.5 miles east of; center of girder bridge over Little Moshannon Creek.....	° ' " 40 59 48.5	° ' " 78 00 24.8
Gorton, 1,000 feet east of station; at west end of coke ovens, road crossing, south rail of main track.....	40 59 37.6	78 02 06.4
Gorton, 70 feet east of operator's office at station, 30 feet north of center of main track, southeast corner of operator's office bears N. 69° W. 66.6 feet, southwest corner of section foreman's house bears N. 87½° E. 60.5 feet, southwest corner in front yard of section foreman's house, iron post stamped "Prim. Trav. Sta. No. 6, 1907, Pennsylvania".....	40 59 42.6	78 02 91.2
Peale, 0.75 mile northeast of station, southeast entrance to Peale tunnel, center of track.....	40 59 16.1	78 04 01.0
Peale station, road crossing, center of main track.....	40 59 27.5	78 04 50.3

ALONG HIGHWAYS, PEALE TO PARDEE TRIANGULATION STATION.

Peale, 300 feet southeast of hotel, center of road on fill over small stream at 5 corners.....	40 59 53.5	78 04 52.9
Grass Flat, 0.6 mile east of; at watering trough, T road north, 60 feet east to watering trough, 15 feet north to sign "Drifting 3 miles".....	41 00 10.0	78 06 05.2
Grass Flat, cross streets at Swedish Church, 50 feet southeast to cupola of church, 30 feet northeast to stump and telephone pole, 35 feet northwest to sign "Kylertown 4 miles".....	41 00 09.9	78 06 42.9
Grass Flat, 1 mile west of; T road to east at Pleasant Hill School, 60 feet west to schoolhouse door, 40 feet north to pine tree.....	41 00 08.9	78 07 53.7
Grass Flat, 1 mile west of; in east face at northeast corner of foundation of Pleasant Hill schoolhouse, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907, Pennsylvania".....	41 00 08.8	78 07 54.5
Kylertown, 1.5 miles southeast of; 4 corners, crossroads, 20 feet south to signpost "Kylertown 1.5 miles, Viaduct 4.5 miles, Grass Flat 2.75 miles, Winburn 1.5 miles," 30 feet west to telephone pole.....	40 59 10.1	78 08 29.7
Kylertown, cross streets at hotels, 35 feet northeast to corner of Commercial Hotel, 35 feet southwest to corner of old Kyler House.....	40 59 36.7	78 10 03.2
Kylertown, 1 mile southwest of; about 400 feet north of Pardee triangulation station, 5 corners, center of triangle, 60 feet southwest to sign "Grahamtown road 1 mile".....	40 58 58.6	78 10 36.0
Pardee triangulation station, in Morris Township, 1 mile south of Kylertown, 2 miles north of Munson, on property of the Pardee Coal Company, 20 feet east of road at a point 150 yards south of road forks, 10 feet east of north-south fence, 2 feet south of east-west fence, oak tree trimmed up.....	40 58 54.96	78 10 34.43

Geographic positions—Continued.

ALONG HIGHWAYS EAST FROM PHILIPSBURG.

Station.	Latitude.	Longitude.
Philipsburg, 1 mile northeast of station, 450 feet east of bridge over Cold Stream, T road to west, center of triangle.....	° ' " 40 54 06.5	° ' " 78 12 31.1
Philipsburg, 2 miles northeast of station, 4 corners at Onemile Run, 400 feet south of coal mine, 30 feet west of center of bridge over Onemile Run, 80 feet southeast to telephone pole.....	40 54 19.8	78 11 50.3
Ridge between Cold Stream and Black Bear Run, 500 feet west of top, road fork northeast, 25 feet east to forked chestnut, 60 feet northwest to 2 chestnut trees.....	40 53 59.4	78 09 54.8
Black Bear Run, center of highway bridge over.....	40 54 04.3	78 09 13.9
Black Bear and Sixmile runs, at summit between; old north-south second-class road crossing pike, 30 feet southeast to clump of 3 chestnut trees, 25 feet southwest to oak.....	40 54 09.3	78 07 45.4
Arctic Springs, center of pike at entrance to grounds, 25 feet south to gateway, 50 feet northwest to clump of 3 pines.	40 54 23.2	78 07 08.5
Sixmile Run, center of highway bridge over.....	40 54 33.0	78 06 16.4
Sixmile Run, 1.25 miles east of, 4 corners at northeast edge of clearing, T road to north, second-class fork of road southeast, 15 feet southwest to corner of wire fence, 25 feet north to corner of wire fence.....	40 54 34.5	78 04 44.6
Black Moshannon schoolhouse, 420 feet east of; 260 feet west of bridge over Little Moshannon Creek, in sandstone ledge on north edge of Philipsburg-Bellefonte pike 30 feet north of its junction with highway northwest to Peale, bronze tablet stamped "Prim. Trav. Sta. No. 15, 1907, Pennsylvania".....	40 54 55.1	78 03 39.7
Old Beaver Mills Company store, 1,200 feet south of; pike forks at bend to east, second-class road south, 25 feet south to gate, 65 feet east to corner of stone foundation to old house, 40 feet north to corner of cemetery fence..	40 53 20.4	78 02 25.1

ALONG PENNSYLVANIA RAILROAD, MARTHA TO HANNAH.

Milepost 16-39, 100 feet west of; second-class road crossing, center of track.....	40 49 16.5	78 01 31.1
Port Matilda, 50 feet west of station, public road crossing, center of main track.....	40 47 51.0	78 03 05.0
Port Matilda, 250 feet northwest of station, in top of west wing wall to south abutment of highway bridge over Bald Eagle Creek, aluminum tablet stamped "Prim. Trav. Sta. No. 16, 1907, Pennsylvania".....	40 47 52.8	78 03 07.5
Port Matilda, 1 mile southwest of; 1,000 feet west of milepost 13, second-class road crossing, center of track.....	40 47 14.9	78 03 55.8
Hannah, 1 mile northeast of; 500 feet west of milepost 12, second-class crossing, center of track.....	40 46 45.9	78 04 45.7

SNOWSHOE QUADRANGLE.

Magnetic declination: South border, 5° 59' west.

Geographic positions.

ALONG NEW YORK CENTRAL AND HUDSON RIVER RAILROAD.

Station.	Latitude.	Longitude.
Milepost J S 52, center of track opposite.....	41 00 14.2	77 59 03.2
Milepost J S 51, center of track opposite.....	41 00 52.5	77 58 47.3

ALONG HIGHWAYS.

Gillintown, 0.5 mile east of station, T road east, 30 feet southwest to apple tree, 25 feet southeast to telephone pole at corner of fence.....	41 01 49.8	77 59 07.8
Snowshoe, 0.8 mile northwest of; T road north, 40 feet northeast to large oak by fence, 60 feet west to telephone pole.....	41 01 48.2	77 57 49.0
Snowshoe, 1,200 feet south of station, 100 feet north of Methodist Church, crossing of Gillintown-Snowshoe pike and state road, 15 feet southeast to drain abutment, 20 feet northeast to drain abutment.....	41 01 37.5	77 57 05.5
Snowshoe, 0.9 mile east of; T road south, 15 feet north to oak, 25 feet south to farm gate.....	41 01 37.5	77 56 09.1
Snowshoe, 1.7 miles east of; 0.75 mile south of Fountain station, T road north to Clarence, 20 feet north to center of triangle, 40 feet northwest to signpost "Clarence 2 miles".....	41 01 39.9	77 55 12.3
South Fork of Beech Creek, center of stone-arch bridge over.....	41 01 25.6	77 54 17.1
Rhoads, 0.7 mile northwest of station, summit of ridge, center of pike.....	41 00 56.3	77 53 12.2
Rhoads, 1,000 feet south of station, on east edge Snowshoe-Bellefonte pike, 550 feet north of railroad crossing, in northwest corner of front yard to residence of Joseph Reese, northwest corner of Reese's residence bears S. 69° W. 43.4 feet, southwest corner of stone foundation to cellar bears N. 39° 15' E. 71 feet, iron post stamped "Prim. Trav. Sta. No. 8, 1907, Pennsylvania".....	41 00 34.8	77 52 32.2
Rhoads, 0.25 mile south of station, T road east, center of 3-plank bridge.....	41 00 27.8	77 52 20.7
Rhoads, 1 mile southeast of station, at bend in main road near old sawmill site (commonly known as the "Devils Elbow"), second-class T road up hill to east, 40 feet southeast to oak, 12 feet northeast to oak.....	41 00 30.2	77 51 25.0
"Devils Elbow," 0.75 mile southeast of; second-class road fork north, road northwest, 10 feet east to small oak, 70 feet northwest to forked oak.....	41 00 01.5	77 50 52.0
Yarnell, 0.5 mile northwest of; road forks northeast and northwest at sawmill, point of triangle, 20 feet east to oak, 20 feet west to hickory, 35 feet north to sign "Cato 7 miles, Snowshoe 8 miles".....	41 00 14.3	77 49 00.0
Yarnell, 1 mile northeast of; road forks west and south, signpost in center of triangle.....	41 00 12.2	77 47 42.7
Fairview Church, 0.25 mile north of; near top of ridge, roads north and northeast, 40 feet north to sign "Yarnell 1.5 miles," 10 feet east to oak.....	41 00 08.3	77 46 57.4

BELLEFONTE QUADRANGLE.

Magnetic declination: West border, $5^{\circ} 53'$ west; north border, $5^{\circ} 59'$ west; east border, $5^{\circ} 57'$ west; south border, $5^{\circ} 37'$ west; center, $5^{\circ} 37'$ west.

Geographic positions.

ALONG HIGHWAYS NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Yarnell, 1.25 miles northwest of; on top of ridge, road fork southeast, second-class road south, 25 feet east to chestnut tree, 15 feet southwest to 2 chestnuts by fence.....	$40^{\circ} 59' 48.0''$	$77^{\circ} 50' 07.4''$
Yarnell, T road north at store, center of triangle, 30 feet southeast to corner of blacksmith shop, 25 feet northeast to corner of store (post-office) porch.....	$40 59 53.5$	$77 48 43.4$
Fairview Church and School, road forks north and east, center of triangle, 30 feet north to sign "Mount Eagle 4 miles, Marsh Creek 2 miles," 35 feet southwest to front door of church.....	$40 59 50.7$	$77 46 56.0$
Fairview Church, 1 mile southeast of; road fork 150 feet south of small log cabin, second-class road north, center of 2-plank bridge, 60 feet northwest to forked sycamore, 25 feet east to birch.....	$40 59 24.4$	$77 45 54.0$
Curtin School, 40 feet west of; at northeast corner of wire fence opposite the junction of the Bald Eagle pike with T road north to Yarnell, northeast corner of public schoolhouse bears N. $85^{\circ} 30'$ E. 40.6 feet, iron post stamped "Prim. Trav. Sta. No. 9, 1907, Pennsylvania".....	$40 58 33.0$	$77 44 43.7$
Curtin School, 1 mile southwest of; second-class T road north up valley, center of pike.....	$40 57 54.6$	$77 45 30.3$

ALONG PENNSYLVANIA RAILROAD, MILESBURG VIA BELLEFONTE TO PERU.

Milesburg, 0.8 mile northeast of station, Bellefonte-Lockhaven pike crossing, center of track.....	$40 57 08.1$	$77 46 42.0$
Milesburg, 350 feet east of station, street crossing, center of main track.....	$40 56 41.5$	$77 47 34.4$
Highway bridge over Buffalo Run, road crossing, center of main track.....	$40 55 19.8$	$77 47 08.8$
Bellefonte, 125 feet north of station, High Street crossing, center of main track, 60 feet northwest to corner of Potter-Hay Hardware Co.'s warehouse, 125 feet south to north end of station.....	$40 54 42.6$	$77 46 54.1$
Bellefonte, 1.25 miles southeast of station, 600 feet north of milepost 2, road crossing, center of track.....	$40 53 47.7$	$77 46 20.0$
Axemann, 0.5 mile south of; on east edge of Bellefonte-Lewiston pike, in northwest corner of Logans Branch School grounds at junction of pike with road southwest to Lemont, iron post stamped "Prim. Trav. Sta. No. 10, 1907, Pennsylvania".....	$40 53 08.9$	$77 45 49.0$
Pleasant Gap station, road crossing, center of track.....	$40 52 18.5$	$77 45 35.3$
Peru, T road south to Linden Hall, 30 feet southwest to beech tree, 10 feet north to wire fence, 30 feet southeast to sign "Linden Hall 4 miles, Lemont 4 miles".....	$40 51 13.0$	$77 46 05.1$

Geographic positions—Continued.

ALONG HIGHWAYS, PERU TO LINDEN HALL.

Station.	Latitude.	Longitude.
Peru, 1 mile south of; second-class road fork southwest, 10 feet west to old stump, 60 feet south to hickory.....	40° 50' 22.7"	77° 45' 43.4"
Peru, 1.5 miles south of; road forks at junction of two valleys.....	40 49 57.6	77 45 17.6
Old sawmill site, 600 feet southwest of; road forks, center of bridge over stream.....	40 49 32.4	77 45 20.2
Linden Hall, 1 mile northwest of; on side of mountain, 0.5 mile south of summit, road fork northeast up mountain, 25 feet west to pine, 30 feet northwest to pine.....	40 48 48.1	77 46 03.6
Linden Hall, at northwest edge of; 550 feet west of church, T road north to Peru, 40 feet northeast to old log shop, 30 feet northwest to corner fence post.....	40 47 58.0	77 45 51.5
Linden Hall, 200 feet east of station, road crossing Pennsylvania Railroad, center of track.....	40 47 49.4	77 45 38.8
Linden Hall, 1.25 miles south of; 1.5 miles east of Boalsburg, in center of triangle at T road north, iron post stamped "Prim. Trav. Sta. No. 11, 1907, Pennsylvania".	40 46 46.2	77 45 34.1

ALONG HIGHWAYS NEAR SOUTH BORDER.

Boalsburg, east edge of; 250 feet west of bridge over Spring Creek, 3 corners known as "Boalsburg Diamond," center of triangle, 20 feet south to sign "Old Fort 8 miles, Tusseyville 5 miles".....	40 46 33.7	77 47 19.8
Boalsburg, 1 mile west of; 4 corners, crossroads, 25 feet southeast and 25 feet northeast to fence corners.....	40 46 30.6	77 48 25.7
Shingletown, 0.25 mile east of; T road north, 60 feet east to telephone pole, 15 feet southeast to J. F. Lohr's mail box.....	40 46 00.1	77 49 25.7
Shingletown, 1 mile southwest of; road forks east and northeast, signpost in center of triangle, sign reads "Pinegrove 3 miles, Lemont 3 miles".....	40 45 34.3	77 50 40.4
Pinegrove Mills, 2 miles northeast of; 1.5 miles southeast of Bloomsdorf, T road to north, center of triangle.....	40 44 57.1	77 52 00.5
Bloomsdorf, 0.5 mile east of station; 4 miles south of State College, 6 miles west of Lemont, at corner of garden in northeast corner of intersection of crossroads, iron post stamped "Prim. Trav. Sta. No. 12, 1907, Pennsylvania".	40 45 35.9	77 52 39.9
Bloomsdorf, 0.5 mile west of; 1.25 miles northwest of Pinegrove, 4 corners, crossroads, 20 feet southeast to mail box at corner of fence, 20 feet southwest to corner of board fence.....	40 44 57.5	77 53 46.0
Stone dwelling on north edge of road, 4 corners, crossroads, 20 feet northwest to corner fence post, 25 feet northeast to corner of front yard fence.....	40 44 33.5	77 54 30.1
Stone dwelling, 0.9 mile northwest of; second-class T road west, center of triangle.....	40 45 13.0	77 55 09.9
Stone dwelling, 1.75 miles northwest of; 4.5 miles southwest of State College, T road south, 15 feet south to center of triangle, 50 feet southeast to pine, 10 feet north to fence.....	40 45 44.5	77 55 30.3
Old sawmill site, road forks east and southeast, 120 feet northwest to pump, 60 feet southeast to small pine.....	40 45 13.2	77 56 46.2

Geographic positions—Continued.

ALONG SCOTIA BRANCH OF PENNSYLVANIA RAILROAD.

Station.	Latitude.	Longitude.
Fairbrook, 0.5 mile north of station; road crossing to field at stub end of siding, center of track.....	° ' " 40 44 56.5	° ' " 77 57 34.9

ALONG HIGHWAYS AND TRAILS, GATESBURG TO RATTLESNAKE PIKE.

Gatesburg, 1.75 miles northeast of; 3 corners at railroad junction, center of triangle, 110 feet north to road crossing spur track, 25 feet north to post, 100 feet east to center of railroad.....	40 45 27.4	77 58 32.1
Gatesburg, 1 mile northeast of; 4 corners, second-class crossroads, 80 feet north to farm gate, 50 feet east to leaning oak.....	40 45 10.5	77 59 23.6
Road crossing spur railroad to mine, 1 mile northwest of junction, center of track.....	40 46 03.2	77 59 09.2
Summit between junction and Stormstown, center of road.....	40 46 49.0	77 59 43.4
Stormstown, 1.5 miles northeast of; 4 corners, crossroads, second-class road northwest, 25 feet north and 25 feet west to fence corner.....	40 48 37.3	77 59 36.0
Brick church, 40 feet northeast of; T road to southeast, 30 feet southeast to signpost "Stormstown 3 miles, Scotia 3 miles, State College 7 miles," 25 feet southwest to fence corner.....	40 49 12.4	77 58 29.6
Stony Point schoolhouse, 700 feet north of; at south edge of Mattern, T road north, center of triangle, 40 feet south to signpost "Bellefonte 12 miles, Stormstown 4 miles, Port Matilda 70 miles," 40 feet west to stone wall.....	40 49 42.4	77 57 57.6
Mattern (Buffalo Run post-office), 0.5 mile northwest of; center of road in gap at summit of Bald Eagle Ridge....	40 50 03.8	77 58 25.4
Martha, 1 mile southeast of; crossroads on side of mountain, 25 feet north to clump of maples, 40 feet northwest to double maple.....	40 49 49.5	77 59 25.0
Rattlesnake pike, 1.5 miles southwest of; road forks east and northeast, 10 feet northwest to pine stump, 40 feet southwest to small leaning pine.....	40 54 07.4	77 59 36.9
Rattlesnake pike, 0.75 mile southwest of; road forks southwest and west, tall dead pine tree in angle.....	40 54 37.4	77 59 06.9
Rattlesnake pike, fork to northwest, 150 feet east of T road southeast, 40 feet north to three-pronged oak (notched), 60 feet northwest to oak.....	40 55 01.1	77 58 38.4
Rattlesnake pike, 1 mile northwest of; center of old pole bridge over southeast fork of Benner Run.....	40 55 47.9	77 59 29.6

Geographic positions—Continued.

ALONG PENNSYLVANIA RAILROAD, MILESBURG TO MARTHA.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Snowshoe, center of main track opposite water tank.....	40 55 58.1	77 48 52.6
White schoolhouse, 1,000 feet south of; 200 feet east of milepost 28, second-class road crossing, center of track..	40 55 22.6	77 50 22.5
Unionville, 1 mile northeast of station, second-class road crossing, center of track.....	40 54 58.8	77 51 16.3
Unionville, 1,210 feet east of station, crossing, center of main track.....	40 54 30.8	77 52 13.5
Unionville, 50 feet east of station, street crossing, center of main track.....	40 54 23.7	77 52 25.0
Unionville, 850 feet west of station, set in north end of wing wall to east abutment of Pennsylvania Railroad bridge No. 26 over De Witt River, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1907, Pennsylvania"	40 54 18.2	77 52 34.1
Unionville, 1 mile southwest of station, 150 feet west of Clines siding, 160 feet east of bridge No. 25, road crossing, center of track.....	40 53 43.0	77 53 30.8
Julian, 1.5 miles northeast of; second-class road crossing, center of track.....	40 53 04.9	77 54 28.0
Bridge No. 24, 400 feet west of; 200 feet south of second-class road crossing, corner of cemetery, center of track..	40 52 31.9	77 55 28.3
Julian, 140 feet east of station, in south end of wing wall at east abutment of bridge No. 23 over Laurel Run, aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1907, Pennsylvania"	40 51 54.1	77 56 19.2
Julian, 0.8 mile west of; 100 feet west of signal tower, road crossing, center of track.....	40 51 30.1	77 57 05.1
Bridge No. 21, center of; 50 feet north to T road north....	40 50 58.4	77 58 12.1
Martha, 1.5 miles northeast of; road crossing, center of track, 40 feet north to 4 corners.....	40 50 37.6	77 59 00.0

McCall Ferry and Quarryville quadrangles.**CHESTER AND YORK COUNTIES.**

In cooperation with the State, the following geographic positions for the control of the McCall Ferry and Quarryville quadrangles were determined by F. J. McMaugh in 1907. The lines were run as follows:

Line 1 begins at adjusted position at Columbia and follows highways east via Creswell and Millersville to a point near Willow street; thence south via Herrville and Truce to Rawlinsville triangulation station; thence south via Liberty Square to Dunmore; thence along the Philadelphia, Baltimore and Washington Railroad to Peters Creek, where the line crosses the Susquehanna River to Peach Bottom; thence southeast along highways, tying to Pennsylvania-Maryland state-line boundary post at Delta.

Line 2 begins at Peters Creek and follows highways east via Wakefield and Oak Hill to adjusted position at Oxford.

Line 3 begins at adjusted position at Octoraro and follows highways west via Collins and Buck, and is tied to line 1 near Rawlinsville triangulation station, Coast and Geodetic Survey.

M'CALL FERRY QUADRANGLE.

Magnetic declination: North border, $6^{\circ} 44'$ west; east border, $6^{\circ} 31'$ west; south border, $6^{\circ} 16'$ west; west border, $6^{\circ} 24'$ west.

Geographic positions.

ALONG HIGHWAYS NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
	[°] ['] ["]	[°] ['] ["]
Columbia, intersection of Union and Fourth streets.....	40 01 50.3	76 29 56.1
Columbia, 1 mile southeast of; road forks southeast and east.....	40 01 21.0	76 29 32.4
T road to northeast.....	39 59 53.2	76 28 24.7
Bridge over small stream, 600 feet north of; 4 corners.....	39 58 57.2	76 27 49.4
Brick church, 1.75 miles northwest of; T road east.....	39 58 27.6	76 27 28.1
Brick church, 0.25 mile southwest of; T road south.....	39 57 41.3	76 26 16.2
Brick church, center of front door.....	39 57 52.1	76 26 10.3
Brick church, 1 mile northeast of; road forks northeast and northwest.....	39 58 21.0	76 25 15.5
Brick church, 2 miles northeast of; 4 corners.....	39 58 33.8	76 24 24.3
Three corners, T road south, signboard reads "Cresswell 3 miles, Letort 1 mile, Millersville $2\frac{1}{2}$ miles, Safe Harbor $5\frac{1}{2}$ miles".....	39 59 16.4	76 23 37.9
Millersville, 0.25 mile east of; T road south, sign reads "Cresswell 5 miles, Letort 3 miles, Millersville $\frac{1}{4}$ mile, Safe Harbor $5\frac{1}{2}$ miles".....	39 59 37.5	76 22 15.8
Millersville, in south face at southwest corner of laundry and carpenter shop building of the Pennsylvania State Normal School, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1907, Pennsylvania".....	39 59 52.5	76 21 22.2
Millersville, 0.75 mile southeast of; T road west.....	39 59 15.6	76 21 31.3
Covered bridge over Conestoga River, 0.75 mile southeast of; 4 corners, 25 feet northeast to corner of white fence, 22 feet southwest to large sycamore tree.....	39 58 32.9	76 21 00.1
Electric railroad crossing, center of track.....	39 58 52.8	76 19 58.0
Danville, 0.5 mile southwest of; 4 corners, pike crossing east-west road, "Lancaster 5 miles, Safe Harbor 5 miles, West Willow 2 miles".....	39 58 51.7	76 19 04.5
Lancaster, center of track at road crossing of Lancaster, Oxford and Southern Railroad (narrow gauge).....	39 59 01.3	76 17 36.4
Lancaster, 0.75 mile northeast of; pike crossing east-west road (known as Mylins 4 Corners), 44 feet northwest to signboard, 27 feet southeast to telegraph pole, 39 feet northeast to telegraph pole, west rail of trolley track....	39 59 11.2	76 16 53.0

Geographic positions—Continued.

ALONG HIGHWAYS SOUTH, NEAR EAST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Willow Street, 0.75 mile north of; 4 corners.....	39 58 14.0	76 16 24.4
Willow Street, front door of brick church.....	39 57 40.7	76 16 09.4
Herrville, crossroads.....	39 56 47.6	76 15 26.3
Herrville, 1.25 miles south of; 4 corners, 19 feet east to mail box, 57 feet west to sign "Lancaster 10 miles, Port Deposit 25 miles, Providence 2 miles, Martin Forge 5 miles".....	39 55 40.8	76 15 08.3
Smithville, 51.3 feet north of south end of retaining wall under stone-arch bridge over highway and creek, in top stone; aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1907, Pennsylvania".....	39 55 31.8	76 15 05.4
Truce, 0.6 mile west of; crossroads.....	39 53 13.0	76 15 00.4
Rawlinsville triangulation station, on land of Adam Lefevre, in Providence Township, 14 miles from Lancaster, 5 miles from McCall Ferry, 8 miles from Quarryville, station mark ^a	39 53 09.54	76 15 58.37
Rawlinsville, crossroads, 60 feet northeast to corner store, 41 feet northwest to corner of brown fence, 36 feet south to corner of white fence, 8 feet south to trolley track....	39 52 56.6	76 16 08.4
Rawlinsville, 1.7 miles south of; crossroads, 27 feet southwest to post at corner fence, 71 feet southwest to center of grass plot, 16 feet south to signboard "Quarryville 6 miles, McCall Ferry 4 miles, Rawlinsville 1½ miles, Liberty Square 2 miles".....	39 51 31.8	76 16 13.9
Rawlinsville, 2.5 miles south of; T road north.....	39 50 45.3	76 16 21.6
Four corners, signboard reads "Chestnut Level 3 miles, McCall Ferry 5 miles, Rawlinsville 4 miles".....	39 49 50.6	76 16 26.5
Mount Holly School, 0.75 mile north of; crossroads, 27 feet northeast to corner fence, 22 feet northwest to oak, 25 feet southwest to signboard "Fishing Creek 3 miles, Rawlinsville 4 miles, Chestnut Level 3 miles, McCall Ferry 5 miles".....	39 49 10.3	76 16 25.5
Mount Holly School, 0.25 mile south of; road forks west and southwest, sign reads "Fishing Creek 2 miles".....	39 48 20.8	76 16 16.6
Riverside School, 0.6 mile north of; road forks north and west.....	39 47 53.3	76 15 59.0
Fishing Creek, center of wooden bridge over.....	39 47 29.0	76 15 50.0

ALONG PHILADELPHIA, BALTIMORE, AND WASHINGTON RAILROAD, NEAR BENTON.

Benton station, 200 feet north of; T road east.....	39 46 37.1	76 15 08.3
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^a Underground mark is a hewn limestone block, in center of which is an iron foxtail, three-fourths inch in diameter and 6 inches long. Block is 3 feet below surface, under a cut-stone tale slate, straited, 6 inches square and so planted as to project 2 inches above surface with its angles on the meridian and diagonal cuts across.

Geographic positions—Continued.

ALONG HIGHWAYS NEAR SOUTH BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Peach Bottom, T road north, sign reads "York 32 miles" . . .	39 45 22.2	76 16 11.0
Peach Bottom, 2 miles southwest of; crossroads, sign reads "Darlington 10 miles, Delta 2 miles, Peach Bottom 2 miles"	39 44 21.0	76 17 23.0
South Delta, 1.75 miles northeast of; crossroads	39 44 02.5	76 18 31.8
South Delta, Pennsylvania-Maryland state-line boundary post	39 43 16.20	76 20 09.73

SOUTH ALONG HIGHWAYS NEAR WEST BORDER, WRIGHTSVILLE TO LAUREL.

Wrightsville, 3 corners, small triangular grass plot, street to north, 40 feet south of two old cannons, 10 feet north of center of trolley track	40 01 29.9	76 32 03.2
T road west	40 00 55.4	76 31 12.4
Crossroads at top of hill	40 00 05.8	76 30 47.6
East-west road (line turns east)	39 59 32.4	76 30 37.3
T road west to East Prospect	39 58 25.5	76 29 40.2
Fishing Creek, center of bridge over (line turns southwest) .	39 57 08.2	76 28 40.0
T road south to Rockey	39 56 32.6	76 29 14.3
Road forks	39 56 24.5	76 29 10.1
New Bridgeville, crossroads, 1 mile north of Conrads Crossing, 9 miles south of Wrightsville, 2.5 miles west of Bridgeville	39 55 36.0	76 29 22.4
New Bridgeville, 0.5 mile north of; chapel church, front door	39 55 17.3	76 29 16.4
New Bridgeville, crossroads	39 54 45.2	76 29 19.4
New Bridgeville, southeast corner on east face of store building; tablet stamped "Prim. Trav. Sta. No. 1, 1907" .	39 54 45.2	76 29 19.9
Road forks southeast to Bridgeville (line turns southwest) .	39 54 19.5	76 29 42.8
T road south (line turns south)	39 52 52.9	76 29 58.4
Four corners, intersection of road to Laurel station with York road (line turns south)	39 52 33.5	76 30 35.5
Four corners, 2 miles from Brogueville, 1 mile from Laurel, 4 miles from Conrads Crossing	39 50 39.7	76 30 33.2
T road west	39 49 59.6	76 30 59.7
Laurel station, railroad crossing	39 49 33.8	76 30 37.1
Laurel station, east of road fork, north of railroad crossing, 45 feet southwest of small wooden bridge; iron post stamped "Prim. Trav. Sta. No. 2, 1907"	39 49 34.3	76 30 36.8

QUARRYVILLE QUADRANGLE.

Magnetic declination: West border, 6° 31' west; south border, 6° 24' west; north border, 5° 57' west.

Geographic positions.

ALONG HIGHWAYS NEAR WEST BORDER.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Smithville, 0.5 mile southeast of; 4 corners, crossroads....	39 55 02.6	76 14 44.8
Truce, 1 mile northwest of; T road west, 50 feet north of T road east, signboard "Rawlinsville 3 miles".....	39 54 13.8	76 14 31.7
Truce, crossroads, sign "Lancaster 13 miles, Buck 1½ miles, New Providence 3 miles".....	39 53 25.0	76 14 17.6

ALONG PHILADELPHIA, BALTIMORE AND WASHINGTON RAILROAD NEAR PETERS CREEK.

Whitaker, front door of station.....	39 45 53.9	76 14 30.7
Peters Creek, in coping stone at east end of south abutment of railroad bridge over, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1907, Pennsylvania".....	39 45 22.8	76 14 05.7

ALONG HIGHWAYS, PETERS CREEK TO OXFORD.

Peters Creek, 1.75 miles northeast of; crossroads, sign "Fairfield 2 miles, Pleasant Grove 22 miles, Oxford 13 miles, Peach Bottom 2 miles".....	39 45 54.6	76 12 29.7
Westbrook, station, crossing of Lancaster and Oxford Southern Railroad (narrow gauge), center of track at station.....	39 46 31.2	76 11 37.2
Westbrook, 0.8 mile east of station; crossroads at store, 52 feet southeast to corner store, 30 feet northeast to telegraph pole and sign "Lancaster 24 miles, Port Deposit 14 miles, Oxford 12 miles, Peach Bottom 3 miles," 3 feet southwest to fence corner.....	39 46 25.9	76 10 46.2
Four corners, 55 feet southeast to telephone pole, 33 feet southwest to corner of hedge fence.....	39 46 36.0	76 09 11.0
Oak Grove, 4 corners, signboard "Fulton House 2 miles, Fairmont 5 miles, Peach Bottom 7 miles, Oxford 10 miles".....	39 46 35.9	76 08 29.8
Poplar Grove School, T road north, signboard "Conowing Springs 8 miles, Oxford 9 miles".....	39 46 41.0	76 07 12.7
Oak Hill, crossroads, sign "Peach Bottom 9 miles, Oxford 8 miles".....	39 46 56.0	76 05 24.9
Oak Hill, in sandstone boulder in southeast corner of crossroads, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1907, Pennsylvania".....	39 46 55.9	76 05 24.6
Oak Hill, 1 mile southeast of; at Summer Hill School, 4 corners.....	39 46 26.2	76 04 27.6
Octoraro Creek, center of covered bridge over; Lancaster- Chester county line.....	39 46 02.9	76 03 50.5
Glenroy, signboard in center of grass plot at post-office....	39 46 00.5	76 02 59.8
Glenroy, 1.25 miles northeast of; 4 corners, sign "Oxford 3 miles, Oak Hill 4 miles".....	39 46 21.1	76 01 45.2
Hopewell schoolhouse, front door of.....	39 46 44.6	76 01 06.5
Oxford, 0.75 mile southwest of; railroad crossing, center of track.....	39 46 47.7	75 59 25.1
Oxford.....	39 47 05.8	75 58 45.0

Geographic positions—Continued.

WEST ALONG HIGHWAYS, OCTORARO TO BUCK.

Station.	Latitude.	Longitude.
Octoraro, in south face, near southwest corner of brick store and post-office building, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1907, Pennsylvania".....	39 52 18.0	76 00 17.2
Octoraro, 1.5 miles west of; crossroads, sign "Steelville 4 miles, Kirkwood 3 miles, Oxford 6 miles".....	39 52 27.5	76 01 59.2
Pleasant Grove schoolhouse, front door of.....	39 52 39.9	76 02 58.3
Bartville, 0.5 mile southeast of; crossroads, sign "Kirkwood 3 miles, Jackson's mill 2 miles, Steelville 5 miles, Bell road 2 miles".....	39 53 14.9	76 03 45.6
Bartville, crossroads, 60 feet north to southeast corner of post-office, 63 feet west to corner picket fence, 41 feet south to corner wire fence.....	39 53 29.1	76 04 05.4
Bartville, 0.75 mile northwest of; road forks northwest and south.....	39 53 47.7	76 04 48.9
Bartville, 1.5 miles northwest of; T road south.....	39 53 47.4	76 05 37.1
Collins, 1.5 miles northeast of post-office, T road north....	39 53 30.1	76 06 44.4
Collins, crossroads, 42 feet north to corner porch of store and post-office, 58 feet northwest to telegraph pole.....	39 52 48.7	76 07 58.4
Collins, in west face at northwest corner of Harmoner schoolhouse, aluminum tablet stamped "Prim. Trav. Sta. No. 8, 1907, Pennsylvania".....	39 52 49.1	76 07 57.0
Collins, 0.75 mile northwest of post-office, crossroads.....	39 53 17.3	76 08 34.6
Quarryville Cemetery, crossroads.....	39 53 01.6	76 09 38.7
Buck, 1.75 miles northeast of; road forks southwest and west, sign "Hopkins's mill 2 miles, Oak Bottom 2 miles, Buck 2 miles".....	39 52 40.6	76 10 50.0
Buck, 1 mile northeast of; crossroads, sign "Quarryville 2 miles, Buck 1 mile, Hopkins's mill 1.5 miles, Lancaster 14 miles".....	39 52 40.6	76 12 46.8
Buck, crossroads, 50 feet south to telephone pole near large poplar, 66 feet east to corner large white barn.....	39 52 21.4	76 13 44.2

Butler, Franklin, Hilliards, Mercer, Oil City, Stoneboro, and Townville quadrangles.

BUTLER, MERCER, AND VENANGO COUNTIES.

In cooperation with the State, the following geographic positions were determined by C. B. Kendall in the spring of 1908. The lines were run as follows:

Line 1 begins at adjusted position of primary-traverse station No. 2 at Mercer and follows highways east along latitude $41^{\circ} 15'$, via Millbrook, Bullion, Cyrus, and Pittsville, to Beels triangulation station.

Line 2 begins at Pittsville and follows highways north to East Sandy; thence along the Pennsylvania Railroad, via Franklin, to Reno, where it crosses the Allegheny River; thence north along highways to the northeast corner of Franklin quadrangle; thence

west, via Dempseytown and Cooperstown, to Carlton; thence west, via Milledgeville, to Boutner School, tying to adjusted position.

Line 3 begins at Carlton and follows highways south, via Reed Furnace, to the southeast corner of Stoneboro quadrangle.

Line 4 begins at the southeast corner of Stoneboro quadrangle and follows highways south, via Harrisville, Keisters, and Stone House, to primary-traverse station No. 2, 1906, at Elora.

Line 5 begins at adjusted position of primary-traverse station No. 4, 1906, near Karns City and follows highways north via North Washington, Shira, Eau Claire, Sutton's mill, and Big Bend, to Cyrus, where it is tied to line 1.

In the spring of 1909 east-west lines were run by Mr. Kendall through the centers of Franklin and Stoneboro quadrangles.

STONEBORO QUADRANGLE.

Magnetic declination: East border, $3^{\circ} 34'$ west; north border, $3^{\circ} 41'$ west.

Geographic positions along highways.

NEAR NORTH AND EAST BORDERS.

Station.	Latitude.	Longitude.
Boutner School, T road south, 21 feet north to cross on board fence, 35 feet southwest to guidepost.....	41 29 32.5	80 13 08.2
Boutner School, 1 mile east and 0.5 mile south of; crossroads, 30 feet southwest to telephone pole, 70 feet northwest to large chestnut stump.....	41 29 04.7	80 11 52.4
Crossing of the Mercer-Meadville pike and the Crawford-Mercer county-line road, 40 feet southwest to stone at corner of fence, 25 feet northwest to corner of wire fence.....	41 28 55.0	80 11 07.0
T road north, 10 feet north to center of triangle, 30 feet northwest to guideboard "Meadville 12 miles".....	41 28 51.2	80 09 01.2
Sunol, 0.5 mile northeast of; crossroads, 45 feet southeast to corner of building, 25 feet northeast to guideboard "Turnpike 2 miles, Meadville 12 miles".....	41 28 50.5	80 08 22.6
Milledgeville, 3 miles west and 1 mile north of; on west edge of the New Vernon-Cochranton road, at T road east along the Mercer-Crawford county line, iron post stamped "Prim. Trav. Sta. No. 9, Pennsylvania, 1908".....	41 29 12.1	80 06 53.7
Center of T road east on Mercer-Crawford county line, 20 feet east to mail box in center of triangle.....	41 29 12.1	80 06 53.5
Milledgeville, 1.33 miles west and 1.2 miles north of; T road south, 25 feet north to small apple tree, 30 feet northwest to guideboard "Cochranton 4 miles, Mercer pike 5 miles, New Lebanon 5 miles, Meadville 12 miles," 60 feet west to T road north.....	41 29 14.8	80 05 18.8
Milledgeville, 1.25 miles north of; on Mercer-Crawford county line, center of crossroads, 25 feet southwest to telephone pole, 30 feet northwest to oak tree and guideboard "Cochranton 3 miles, Milledgeville 1 mile, Mercer pike 6 miles".....	41 29 17.3	80 03 44.3
Carlton, 1.25 miles northwest of; T road east of county line, large oak in center of triangle.....	41 29 22.2	80 01 18.1

Geographic positions along highways—Continued.

NEAR NORTH AND EAST BORDERS—continued.

Station.	Latitude.	Longitude.
Carlton, 75 feet northwest of station, highway bridge over French Creek, 90 feet north of road crossing the Erie Railroad, center of track.....	41 28 20.0	80 01 05.4
Milledgeville, 300 feet southwest of schoolhouse, crossroads, 40 feet southwest to corner of old store, 40 feet northeast to guidepost "New Lebanon 4 miles, Cochran 4 miles, Sheakleyville 8 miles, Carlton 3 miles," 40 feet northeast to telephone pole.....	41 28 13.5	80 03 46.5
Carlton, 1 mile west of; T road north, 40 feet northeast to large cherry tree, 20 feet south to maple tree.....	41 28 05.4	80 02 09.8
Carlton, 0.5 mile southwest of; T road west, 20 feet southwest to large apple tree in triangle, 30 feet northwest to large maple tree.....	41 28 03.3	80 01 13.9
Schoolhouse No. 6, crossroads at; 25 feet southwest to telephone pole, 25 feet northeast to guidepost "Milledgeville 3 miles, Utica 3 miles, North Sandy 4 miles, Carlton 2 miles".....	41 26 39.1	80 00 45.0
Utica, 3 miles west of; crossroads, 35 feet northwest to telephone pole, 25 feet southwest to guidepost "Utica 3 miles, New Lebanon 4 miles".....	41 25 53.1	80 00 45.6
Mill Creek bridge, 300 feet south of; crossroads, 200 feet southwest to schoolhouse, 45 feet southeast to cherry tree, 50 feet northeast to telephone pole.....	41 25 26.4	80 00 21.0
Mill Creek, 1 mile south of; crossroads at windmill, 60 feet to southeast corner of windmill, 25 feet southeast to guidepost "Carlton 4 miles, Sandy Lake 5 miles, Utica 3.5 miles".....	41 24 34.6	80 00 29.9
Crossroads at old store, 35 feet north to corner of store, 35 feet to telephone pole.....	41 24 19.4	80 01 11.6
White schoolhouse, 150 feet northwest of; crossroads, 45 feet southeast to large oak tree and guideboard "Utica 7 miles, Sandy Lake 4 miles," 30 feet northwest to oak tree.....	41 23 12.1	80 01 08.6
Crossroads at watering trough, 35 feet southeast to guideboard "Five Points 3 miles, Reeds Furnace 2 miles, Sandy Lake 4 miles, Franklin 12 miles," 35 feet southwest to corner of rail fence.....	41 22 20.3	80 01 06.0
Reeds Furnace, 1.5 miles north of; in the southeast corner of intersection of the Polk-Sandy Lake road and the Carlton-Reeds Furnace road, 4 miles west to Sandy Lake, 5 miles east to Polk, 0.4 mile north to schoolhouse No. 1, by side of guidepost, iron post stamped "Prim. Trav. Sta. No. 10, Pennsylvania, 1908".....	41 21 33.0	80 01 04.0
Reeds Furnace, 1 mile north of; crossroads, 30 feet southwest to guideboard at maple tree "Five Points 4 miles, Reeds Furnace 1 mile, Franklin 11 miles, Polk 5 miles, Sandy Lake 4 miles.....	41 20 52.0	80 01 03.0
Lake Shore and Michigan Southern Railway crossing over center of public road.....	41 20 02.7	80 00 18.7
Center of triangle at 4 corners, highway west, second-class road east, 25 feet north to maple tree, 45 feet southwest to apple tree.....	41 19 19.3	80 00 46.0

Geographic positions along highways—Continued.

NEAR NORTH AND EAST BORDERS—continued.

Station.	Latitude.	Longitude.
Reeds Furnace, 2 miles south of; T road north, 15 feet north to two-plank bridge, 35 feet northeast to telephone pole and guideboard "Reeds Furnace 2 miles".....	41 18 30.5	80 00 49.0
Henderson, 0.8 mile east of; highways west and southwest, center of triangle, 30 feet east to guideboard "Taylor road 1 mile".....	41 18 21.7	80 01 22.6
Henderson, 1 mile southeast of; T road north, 10 feet north to center of triangle, 35 feet northeast to guideboard "Henderson 1 mile, Franklin road 1 mile".....	41 17 30.4	80 01 24.4
Road forks south and southeast, 25 feet southeast to center of triangle, 25 feet southwest to guideboard "Freeport road 1 mile".....	41 17 08.9	80 00 40.7

EAST-WEST LINE THROUGH CENTER.

Schoolhouse, 150 feet north of; T road south, 30 feet southwest to J. A. Bond's mail box, 40 feet northeast to oak near fence line.....	41 20 51.3	80 01 44.9
T road north, center of east-west road, 20 feet north to center of triangle.....	41 20 53.8	80 02 26.3
T road north, center of east-west road, 20 feet north to center of triangle, 20 feet northwest to sign "Milledgeville 9 miles".....	41 20 50.0	80 03 01.6
Iron bridge over small stream, center of; near T road.....	41 20 53.9	80 03 31.0
Sandy Lake, crossing Lake Shore Railway and Main street, 500 feet east of station.....	41 20 55.1	80 04 56.1
Stoneboro, 500 feet east of station, crossing Lake Shore Railway and Main street.....	41 20 31.8	80 06 19.6
Stoneboro, at northeast corner of Lake and Walnut streets, in foundation stone 1.7 feet above step at left side of entrance to First National Bank, aluminum tablet stamped "Prim. Trav. Sta. No. 2, Pennsylvania, 1909".....	41 20 20.9	80 06 25.0
Stoneboro, 1.5 miles west of; crossing of Lake Shore Railway.....	41 20 53.2	80 07 46.9
T road north, center of east-west road, 10 feet north to center of triangle.....	41 21 06.0	80 08 26.2
Coulson, 0.5 mile west of; 4 corners, 10 feet north to center of triangle, 25 feet northwest to fence post painted "1280".....	41 21 05.5	80 09 13.8
Coulson, 2.0 miles west of; crossroads, 20 feet north to John E. Vernon's mail box, 35 feet northwest to sign "Clarks Mill 3 miles, Mercer 10 miles, Stoneboro 3 miles".....	41 21 03.2	80 10 31.3
Store and schoolhouse, 4 corners, 25 feet northwest to sign "Stoneboro 5 miles, Greenville 11 miles, Clarks Mill 4.5 miles, Mercer 8.5 miles," 25 feet east to telephone pole.....	41 20 59.8	80 12 27.1
Pittsburg-Erie pike and district line road, crossing of; 20 feet northwest to sign "Sandy Lake 8 miles, Greenville 10 miles, Mercer 8.5 miles," 20 feet south to small bridge, 28 feet east to small bridge.....	41 20 58.1	80 13 30.9
St. Paul School, 300 feet east of; center of crossroads.....	41 15 00.1	80 01 14.3
T road north, 5 feet north to center of triangle, 30 feet northeast to guideboard "Kilgore 1 mile".....	41 15 01.1	80 00 17.7

FRANKLIN QUADRANGLE.

Magnetic declination: West border, $3^{\circ} 34'$ west; south border, $4^{\circ} 46'$ west.

Geographic positions.

ALONG HIGHWAYS NEAR WEST BORDER.

Station.	Latitude.	Longitude.
Mercer-Venango county line, large elm tree on south side of road, 870 feet west of T road north.....	41 16 55.4	79 59 56.9
T road, east at barn, 5 feet east to center of triangle, 20 feet northeast to sign.....	41 16 13.2	79 59 38.2
Crossroads, 10 feet south to small bridge, 20 feet northeast to guideboard "Sandy Lake 9 miles, Mechanicsville 3.5 miles, Raymilton 6 miles, Mercer Road 1.5 miles"...	41 15 31.7	79 59 29.7
Mechanicsville, 1.5 miles northwest of; T road southwest at brick house, center of triangle.....	41 15 08.8	79 58 19.4
Millbrook, 4 miles east of; south edge of Millbrook-Kennerdell road, opposite junction with T road north, 1.5 miles northwest to Kilgore, 500 feet west to T road south; iron post stamped "Prim. Trav. Sta. No. 2, Pennsylvania, 1908".....	41 15 02.0	79 59 28.5
St. George, 1.5 miles east of; public crossroads, 25 feet northwest to post, 30 feet southeast to two mail boxes...	41 15 12.5	79 46 14.8
Pittsville, 1.5 miles west of; 4 corners, public road south, second-class road north, 10 feet south to three-plank bridge.....	41 15 05.3	79 45 24.4
Floyd, 1 mile southeast of post-office, T road northeast, 35 feet north to sign "Franklin road 1 mile," 25 feet south to rail fence.....	41 17 41.5	79 45 27.0
Floyd, crossroads at post-office, 15 feet south to telephone pole, 30 feet north to telephone pole and sign "East Sandy 3 miles, Scrubgrass 5 miles, Brandon's ferry 5 miles, Davis Corners 2.5 miles".....	41 17 57.6	79 46 22.4
East Sandy, 1 mile south of; second-class east-west crossroad, 25 feet east to leaning oak tree, 80 feet northwest to corner of old log stable, 75 feet east to corner of buggy house.....	41 19 08.6	79 46 18.0

ALONG PENNSYLVANIA RAILROAD.

East Sandy, 650 feet north of station, in coping of west wing wall of south abutment of Pennsylvania Railroad two-span bridge over Sandy Creek, bronze tablet stamped "970, Pittsburg".....	41 19 57.6	79 46 08.0
Astral, center of track at road crossing 70 feet south of station board.....	41 20 37.2	79 46 21.4
Milepost 12, center of track opposite.....	41 21 01.0	79 47 14.6
Yard limit sign, 75 feet south of; center of track opposite second-class road leading uphill to northeast, 50 feet east to small house, 30 feet north to oil well.....	41 21 48.7	79 47 15.2
Franklin, 1 mile southeast of; center of Pennsylvania Railroad main track at road crossing, at north end of highway and electric railroad bridge over Allegheny River..	41 22 31.2	79 48 46.6

Geographic positions—Continued.

ALONG PENNSYLVANIA RAILROAD—continued.

Station.	Latitude.	Longitude.
Franklin, 100 feet northwest of the northwest corner of Pennsylvania Railroad freight and passenger station, on bank of Allegheny River, 68 feet west of center of main track, 40 feet southeast of south end of shore pier to highway bridge over river, iron post stamped "Prim. Trav. Sta. No. 5, Pennsylvania".....	41° 23' 23.0"	79° 49' 05.6"
Prentice, 120 feet northeast of station board, south rail of main track at road crossing.....	41° 24' 32.2"	79° 47' 18.9"
Milepost 5, center of track opposite.....	41° 24' 48.7"	79° 46' 08.9"

ALONG HIGHWAYS, RENO TO NEAR CARLTON.

Reno, T road north, 350 feet south of electric street railway, 50 feet north and 50 feet northeast to corners of front yard fence.....	41° 24' 41.8"	79° 45' 20.9"
Hazeltown School, 200 feet southeast of, T road west, 25 feet east to oak, 30 feet southwest to hickory and sign "Cooperstown 2.5 miles, Sunville 3 miles".....	41° 29' 45.7"	79° 49' 32.0"
Cooperstown, 1.25 miles east of; second-class T road southwest, center of east-west road.....	41° 29' 53.1"	79° 50' 33.1"
Cooperstown, 2 miles west of; crossroads, 25 feet southwest to sign "Cochranston 8 miles, Cooperstown 2 miles, Sugar Creek 5 miles, Donation 2 miles," 15 feet north to small drain.....	41° 29' 44.3"	79° 54' 08.4"
Carlton, 1.5 miles northeast of; public crossroads, 30 feet northwest to large chestnut tree, 30 feet southeast to sign "Turnpike road 1 mile, Cochranston 4 miles".....	41° 29' 25.5"	79° 59' 38.3"

ALONG HIGHWAYS, EAST-WEST LINE THROUGH CENTER.

Franklin, city monument in center of street-car track, at crossing of Thirteenth and Elk streets.....	41° 23' 56.9"	79° 49' 53.4"
Franklin, 1.5 miles west of; small apple tree in center of triangle at road forks on top of hill.....	41° 23' 13.4"	79° 50' 55.3"
Franklin, 2.5 miles west of; T road north, 35 feet northeast to signpost, 110 feet west to T road south.....	41° 22' 59.1"	79° 52' 08.3"
Blacks School, 4 corners, 15 feet west to telephone pole painted "1508".....	41° 22' 45.0"	79° 53' 17.8"
T road north, 15 feet north to small bridge, 25 feet southwest to telephone pole painted "1091".....	41° 22' 32.5"	79° 54' 55.4"
Polk, north edge of; road forks 400 feet northwest to iron bridge, 35 feet north to sign "Utica 6 miles".....	41° 22' 17.1"	79° 55' 26.7"
Polk, in south face of southeast corner of administration building of State Institution for Feeble-minded, aluminum plate stamped "Prim. Trav. Sta. No. 1, 1909, Pennsylvania".....	41° 22' 16.8"	79° 55' 48.7"
Polk, 300 feet north of station, Lake Shore Railway at street crossing.....	41° 22' 05.8"	79° 55' 38.4"
Polk, 1.5 miles southwest of; road forks, 35 feet west to signpost, 25 feet northeast to small oak.....	41° 21' 17.7"	79° 56' 26.2"

Geographic positions—Continued.

ALONG HIGHWAYS, EAST-WEST LINE THROUGH CENTER—continued.

Station.	Latitude.	Longitude.
Bridge over small stream, 40 feet east to second-class cross-road.....	° ' " 41 21 10.4	° ' " 79 58 22.5
Raymilton, 1 mile north of; crossroads, 20 feet west to signpost "Polk 4 miles, Sandy Lake 5 miles, Raymilton 1 mile, Utica 8 miles".....	41 21 05.0	79 59 16.0

BUTLER QUADRANGLE.

Geographic positions near north border.

Station.	Latitude.	Longitude.
Haysville, in center of triangle at 3 corners, guidepost "Trautman 1 mile, Fairview 1 mile, Butler 14 miles".....	° ' " 40 59 53.6	° ' " 79 45 21.4
Elora, 0.5 mile north of Grange Hall, crossroads, 40 feet northwest to forked maple tree, 45 feet northeast to maple at corner of front yard.....	40 59 37.9	79 59 21.7
Elora, at junction of Butler-Mercer pike with road leading west to West Liberty, 25 feet south of southeast corner of Grange Hall, iron post stamped "Prim. Trav. Sta. No. 2, 1906".....	40 59 13.6	79 59 14.3

HILLIARDS QUADRANGLE.

Magnetic declination: West border, 4° 19' west; north border, 4° 46' west.

Geographic positions along highways.

NEAR WEST BORDER.

Station.	Latitude.	Longitude.
Wesley, 1.5 miles west of; 10 feet south of east-west road, in center of north-south road, large maple tree at four corners.....	° ' " 41 14 06.2	° ' " 79 59 32.9
Center of north-south road at T road west, 35 feet northwest to guideboard "Grove City 5 miles," 35 feet southwest to guideboard "Henderson road 1 mile".....	41 09 58.7	79 59 59.9
Keister, 150 feet west of station, center of north track of Bessemer and Lake Erie Railroad at pike crossing.....	41 02 53.1	79 59 51.1
Keister, 1 mile south of; T road west, 20 feet west to center of triangle, 30 feet east to stump, 35 feet east to telephone pole.....	41 01 57.0	79 59 52.4
Halston, 0.5 mile west of; T road east, 35 feet west to corner of buggy house, 35 feet southeast to telephone pole..	41 01 08.9	79 59 58.7

Geographic positions along highways—Continued.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Mechanicsville, 1.5 miles north of; crossroads, 30 feet southeast to oak tree, 10 feet west to two-plank bridge ..	41 14 49.0	79 57 37.1
Mechanicsville, 1.25 miles northeast of; center of crossroads, 30 feet southwest to guideboard "Raymilton road 1 mile," 20 feet east to three-plank bridge.....	41 14 38.1	79 57 00.3
Mechanicsville, 2 miles northeast of; center of crossroads, 20 feet southeast to corner post of wire fence, 20 feet northeast to corner rail fence.....	41 14 37.0	79 56 01.3
Bullion, T road east at store; 15 feet south to small bridge, 35 feet northeast to telephone pole.....	41 14 47.3	79 53 53.1
Bullion, 1.4 miles east of; T road south, 30 feet southeast corner fence.....	41 14 48.6	79 52 17.3
Kennerdell, in stone coping to north wing wall at west end of highway bridge over Scrubgrass Creek, aluminum tabletstamped "Prim.Trav. Sta. No. 3, Pennsylvania, 1908"	41 14 18.0	79 51 16.0
Cyrus, 2 miles west of; large oak tree in east-west road at T road south	41 14 22.8	79 49 45.2
Cyrus, crossroads, 30 feet southwest to guideboard "Kennerdell 4 miles, Emlenton 9 miles," 25 feet south to center of bridge.....	41 14 23.4	79 48 35.6

NEAR WEST BORDER.

Schoolhouse, 300 feet northwest of; T road east.....	41 13 12.8	79 48 07.1
Cyrus, 1.5 miles south of; 300 feet southwest of school, T road west, 30 feet northwest to guidepost "Kennerdell 3 miles, Emlenton 7 miles, Scrubgrass 5 miles"	41 13 07.6	79 48 04.9
Lisbon, 0.5 mile north of; R. T. Atwell's mail box at T road east.....	41 12 15.0	79 47 41.0
Lisbon Church, 125 feet southeast of; road forks, 35 feet southeast to telephone pole, 20 feet southwest to stump, 55 feet northwest to post in angle.....	41 11 46.2	79 47 35.5
Sutton's mill, T road southwest, 25 feet southeast to guideboard "Eau Claire 4 miles," 90 feet northeast to front door of mill, 110 feet east to west end of bridge over Little Scrubgrass Creek.....	41 11 27.4	79 47 04.2
East Unity Church, 1,700 feet northeast of; center of road at Butler-Venango county-line crossing, 10 feet east to small bridge, 40 feet west to stone on county line, 15 feet south to mail box, 70 feet northwest to barn door.....	41 10 22.9	79 47 37.9
East Unity Church, 100 feet west of; center of triangle at road forks, 30 feet southwest to guidepost "Farmington 3 miles, Clintonville 5 miles".....	41 10 09.7	79 47 51.7
Cherry Valley School, crossroads, 50 feet southwest to watering trough, 40 feet northwest to large oak tree, 60 feet northeast to corner of schoolhouse.....	41 09 26.2	79 47 56.7
Farmington (Eau Claire post-office), in north face at northwest corner of foundation of A. O. Miller's store at southeast corner of Main and Washington streets, aluminum tabletstamped "Prim. Trav. Sta. No. 12, Pennsylvania, 1908"	41 08 10.0	79 47 54.6

Geographic positions along highways—Continued.

NEAR WEST BORDER—continued.

Station.	Latitude.	Longitude.
Farmington (Eau Claire post-office), center of intersection of Main and Washington streets, 40 feet northeast to corner of store, 35 feet northwest to corner of hotel porch.	° ' " 41 08 10.3	° ' " 79 47 55.1
Farmington (Eau Claire post-office), 1 mile south of; crossroads, 25 feet northeast to telephone pole, 30 feet northwest to guidepost "Eau Claire 1 mile, Washington 6 miles, Parker 7 miles"	41 07 23.0	79 48 07.2
Telephone pole in center of triangle at road forks north and northeast guideboard "New Hope 4 miles, Eau Claire 3 miles"	41 06 26.5	79 47 14.1
Shira, crossroads, 12 feet to center of bridge, 40 feet northwest to company store, 30 feet southeast to locust tree and guideboard "Parker 7 miles, Hilliards 2.5 miles, Eau Claire 4.5 miles, New Hope 2.5 miles"	41 04 56.8	79 47 51.5
Parsonville, 0.8 mile north of; T road east, 40 feet west to large oak tree, 15 feet east to center of triangle, 40 feet southeast to telephone pole.	41 04 23.0	79 48 08.3
North Washington, 1 mile north of; crossroads, 10 feet east to two-plank bridge, 40 feet southwest to three-pronged maple.	41 03 34.5	79 48 30.0
North Washington (New Hope post-office), crossroads, 30 feet northwest to southeast corner of brick house, 40 feet northeast to southwest corner of store.	41 02 52.5	79 48 49.1
North Washington, about 1 mile southeast of; crossroads, 300 feet west of Emery schoolhouse, 20 feet southwest to guidepost "Bruin 6 miles, Butler road 1 mile, Fairview 5 miles, New Hope 1 mile," 70 feet northwest to telephone pole.	41 02 28.8	79 47 58.9
North Washington, 2 miles southeast of; large chestnut tree on south edge of east-west road at 4 corners.	41 02 05.0	79 47 03.6
Ray Run School, 0.33 miles north of; crossroads, 40 feet west to center of bridge, 30 feet southwest to S. R. McRocken's mail box.	41 01 05.0	79 46 24.5
Fairview, 0.8 mile southwest of; T road west, 12 feet east to walnut tree, 35 feet southwest to corner of fence and guideboard "Fairview 0.8 mile, Washington 4.5 miles," fence painted "U.S.1354"	41 00 37.4	79 45 33.9
Cyrus, 1.25 miles southeast of post-office; large tree in triangle at forks of old roads near old house place, about 0.5 mile west of Allegheny River.	41 14 09.9	79 47 26.1
St. George station, center of Pennsylvania railroad main track at crossing, 1,200 feet north of milepost 30.	41 14 57.1	79 47 31.8

OIL CITY QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Pittsville, 150 feet north of hotel; public T road east, 30 feet northeast to telephone pole painted "G.S.1312," 30 feet west to northwest corner of shop.....	41 15 23.3	79 44 26.7
Pittsville, in northeast corner of front yard of Bishop's Hotel, 60 feet southwest of T road east, iron post stamped "Prim. Trav. Sta. No. 4, 1908, Pennsylvania".....	41 15 22.7	79 44 26.8
Pittsville, 1.4 miles east of; T road west, center of north-south road, 10 feet west to center of triangle, 25 feet southwest to sign "Freedom 1 mile, Salina 7 miles, Dotter station 3 miles".....	41 15 19.9	79 42 59.3
Three corners, second-class T road north, 75 feet east of small bridge over stream.....	41 15 22.2	79 42 09.0
Beels triangulation station, 2 miles west of; crossroads, 15 feet south to sign "Emlenton 7 miles," 10 feet north to water trough.....	41 15 22.8	79 41 09.4
Beels triangulation station, 1.25 miles west of; T road east, 5 feet west to center of north-south road, 30 feet north to telephone pole painted "G.S.1447," 20 feet north to sign "Edenburg 7 miles".....	41 15 13.6	79 40 08.9
Beels triangulation station, 0.5 mile west of; crossroads at schoolhouse, center of triangle.....	41 15 13.9	79 39 13.5
Beels triangulation station, about 3 miles north of Salem, in Salem Township, on a bare knob with timber on north side, east-west line fence, Clarion-Venango county line, in center of top of stone post 36 by 8 by 8 inches set 30 inches in ground, bronze tablet stamped "U.S.G.S., Pennsylvania".....	41 15 14.00	79 38 47.07
Rockland, 0.5 mile south of post-office; crossroads; 20 feet southwest to sign "St. George 3 miles," 30 feet north to telephone pole.....	41 16 18.8	79 44 57.2
Rockland, crossroads at post-office; 25 feet southwest to telephone pole and sign "Nickleville 6 miles, Scrubgrass 6 miles," 30 feet northwest to telephone pole and sign "Franklin 12 miles, Emlenton 9 miles".....	41 16 39.2	79 44 56.8
Reno, 1.8 miles northeast of; 3 corners, at bend of main road to west, second-class road east, 40 feet south to stream crossing, 50 feet east to willow.....	41 25 51.7	79 44 40.7
Reno, 2.25 miles northeast of; 3 corners, T road west, center of triangle, 30 feet south to oak and sign "Two-mile Run road 1.5 miles, Reno 2 miles, Dempseytown 7 miles".....	41 26 31.3	79 44 44.9
Oil City, 2 miles northwest of; road forks southwest and southeast, center of triangle, 35 feet southwest to oak tree and sign "Oil City 2 miles, Reno 3.5 miles".....	41 27 27.8	79 44 16.4
Rynd farm, 2 miles west of; crossroads, 35 feet northwest to front-yard fence, 25 feet northeast to sign "Oil City 3 miles, Cherrytree 4 miles, Franklin 8 miles, Rynd farm 2 miles".....	41 28 29.8	79 44 06.0
White church, 600 feet northwest of; T road southwest, 15 feet south to sign "Franklin road 1 mile".....	41 29 24.9	79 44 40.5

TOWNVILLE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Dempseytown, 2 miles southeast of; at southeast corner 30 feet south of intersection of the Franklin-Titusville road with the Oil City-Dempseytown road, about 6 miles northwest of Oil City, iron post stamped "Prim. Trav. Sta. No. 61, 1908, Pennsylvania".....	41 30 08.9	79 45 06.4
Dempseytown, 2 miles southeast of; intersection of the Franklin-Titusville road with the Oil City-Dempseytown road, 30 feet south to primary-traverse station No. 6.	41 30 09.2	79.45 06.4
Dempseytown, 1.5 miles southeast of; T road north, center of small bridge.....	41 30 24.1	79 45 31.1
Dempseytown, crossroads, 50 feet northwest to corner of store, 30 feet east to sign "Franklin 9 miles, Titusville 10 miles, Twomile Run 2 miles, Sunville 4 miles".....	41 30 41.5	79 46 48.3
Dempseytown, 1 mile west of; 4 corners, 110 feet northwest to oak, 12 feet southwest to corner of fence, 80 feet southeast to sign "Franklin road 1 mile".....	41 30 39.7	79 47 58.4
Dempseytown, 2 miles west of; guidepost in angle of road forks "Sunville road 0.5 mile".....	41 30 20.8	79 49 20.5
Cooperstown, in north corner of yard to hotel in the southwest corner of intersection of Main and Mill streets, 22 feet west of center of Main street and 25 feet south of intersection of streets, iron post stamped "Prim. Trav. Sta. No. 7, 1908, Pennsylvania".....	41 30 04.8	79 52 26.1
Cooperstown, 0.8 mile west of; T road south, center of triangle, 35 feet west to sign "Hannaville 6 miles, Cochran- ton 10 miles".....	41 30 06.9	79 53 10.6
Schoolhouse, 150 feet northeast of; T road northeast, center of triangle, 15 feet west to two mail boxes, 30 feet south to sign "Deckard 3 miles, Cooperstown 3 miles".....	41 30 14.0	79 55 19.0
Four corners at top of small hill, crossroads, stone in center of intersection, 60 feet southeast to oak, 15 feet northeast to sign "Cochran- ton 6 miles, Cooperstown 4 miles, Deckard 2 miles, Hannaville 1.5 miles".....	41 30 05.8	79 57 01.4
Schoolhouse, 1,500 feet east of; T road south, north edge of east-west road, 20 feet northwest to chestnut tree, 15 feet south to center of triangle.....	41 30 00.9	79 58 22.9
Cochran- ton, about 4 miles southeast of; on east edge of Franklin-Meadeville turnpike, 20 feet south of junction with road east to Cooperstown, near Crawford-Venango county line, iron post stamped "Prim. Trav. Sta. No. 8, Pennsylvania, 1908".....	41 30 03.6	79 59 35.4
Cochran- ton, about 4 miles southeast of; junction of Frank- lin-Meadeville turnpike with road east to Cooperstown, on or near county line.....	41 30 03.8	79 59 35.4

MERCER QUADRANGLE.

Magnetic declination: North border, $3^{\circ} 16'$ west; east border, $4^{\circ} 19'$ west.

Geographic positions along highways.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Mercer, 300 feet east of station, center of street crossing Pennsylvania Railroad.....	41 13 33.1	80 13 32.8
Crossing of the Bessemer and Lake Erie and the Pennsylvania railroads, center of Pennsylvania track, between Bessemer double tracks.....	41 13 54.1	80 12 31.3
Turner, 50 feet west of station, road crossing.....	41 14 28.3	80 11 12.8
Turner, 1 mile east of station, center of triangle at T road west.....	41 14 39.6	80 10 20.2
Turner, 2 miles east of station, crossroads, 30 feet to guidepost "Pardoe 2 miles, Millbrook 5 miles".....	41 14 31.5	80 09 02.0
Barnes crossroads, 35 feet southeast to guideboard "Sandy Lake 8 miles, Grove City 7 miles".....	41 14 54.0	80 07 29.5
Hazzard schoolhouse, at southwest corner of; at T road north, 4 miles east of Turner station, 400 feet to T road south, iron post stamped "Prim. Trav. Sta. No. 1, Pennsylvania, 1908".....	41 14 55.6	80 06 26.4
Hazzard School, at T road north, center of triangle.....	41 14 55.3	80 06 25.4
Hazzard School, 1.2 miles east of; center of T road north, 10 feet north to center of triangle, 25 feet northeast to guideboard "Bradley road 1 mile".....	41 14 56.1	80 05 04.5
Millbrook, 0.8 mile west of; 4 corners, 40 feet northwest to guideboard "Millbrook 0.8 mile, Mercer 10.25 miles, Sandy Lake 8 miles, Grove City 7 miles".....	41 14 56.5	80 04 29.8
Millbrook, center of iron bridge over Wolf Creek.....	41 14 57.4	80 03 42.0
Millbrook, 0.8 mile east of; crossroads, 35 feet northeast to guidepost "Henderson 3.8 miles, Harris 7 miles, Wesley 6 miles, Millbrook 0.8 miles".....	41 14 58.2	80 02 43.4

NEAR EAST BORDER.

Mercer-Venango county line, fence row, 1,600 feet east of T road south.....	41 13 54.0	80 00 00.7
Bridge over stream, 400 feet east of; north edge of east-west road at T road north, 20 feet southeast to center of triangle, 15 feet north to wire fence.....	41 13 11.1	80 00 13.5
Crossroads, 30 feet southeast to corner of rail fence, 20 feet northeast to corner of rail and wire fence.....	41 11 49.3	80 00 13.6
Crossroads, 15 feet south to small bridge, 25 feet southeast to signboard "Grove City 4.8 miles," 20 feet northwest to peach tree.....	41 11 17.0	80 00 18.6
Crossroads, 35 feet northwest to two mail boxes, 20 feet east to gate.....	41 10 37.2	80 00 24.1
Harrisville, 1.5 miles north of; center of Pittsburg pike at T road west, 20 feet west to center of small bridge, 40 feet southwest to guideboard "Hendersonville road 0.5 mile".....	41 09 14.0	80 00 15.6

Geographic positions along highways—Continued.

NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
Harrisville, intersection of the Pittsburg-Franklin and the Mercer-Roseburn pikes, 45 feet southwest to front door of store, 45 feet northwest to southeast corner of Central House.....	41 08 12.3	80 00 34.2
Harrisville, in the northeast corner of high-school grounds, 25 feet northeast to school building and 420 feet west of the Pittsburg pike, iron post stamped "Prim. Trav. Sta. No. 11, Pennsylvania, 1908".....	41 08 08.4	80 00 39.3
Forestville, 4 corners at blacksmith shop, 40 feet northeast to corner of shop, 30 feet southeast to guidepost "Harrisville 2 miles, Butler 18 miles, Courtneys Mills 3.5 miles, Murrinsville 7 miles".....	41 06 21.6	80 00 21.9
Center of pike at Mercer-Slippery Rock township line crossing, T road east to barn at end of macadam road...	41 05 59.6	80 00 16.3
Forestville, 1 mile south of; center of triangle at roads southeast and southwest, 35 feet southeast to center of bridge, 60 feet south to guideboard "Harrisville 3 miles," 70 feet north to center of bridge.....	41 05 37.9	80 00 09.5
East edge of pike at T road east, 25 feet south to corner plank fence and guideboard "New Hope 2 miles, Harrisville 4 miles, Keister 2 miles".....	41 05 03.4	80 00 04.2
Keister, 1 mile north of; crossroads, 35 feet northeast to double elm and guideboard "Slippery Rock 3 miles, Branchton 1 mile, Keister 1 mile, Harrisville 6 miles," 30 feet southwest to corner rail fence.....	41 04 28.2	80 00 08.3
Stone house, crossing of Mercer-Butler pike and Pittsburg pike, 40 feet southeast to J. J. Gill's mail box, 60 feet southwest to large stone on west side of pike.....	41 00 40.8	80 00 08.7

PENNSYLVANIA-MARYLAND.

TRIANGULATION STATIONS.

Accident, Berlin, Confluence, Frostburg, Grantsdale, Hyndman, and Meyersdale quadrangles.

BEDFORD, FAYETTE, AND SOMERSET COUNTIES, PA.; ALLEGANY AND GARRETT COUNTIES, MD.

In cooperation with the States, during the season of 1908 George T. Hawkins extended triangulation control over the quadrangles mentioned above, from stations Meadow and Sampson, which are situated in Maryland just south of the Pennsylvania line. In addition to the reoccupation of these two old stations, 11 new stations were occupied and two points were located by intersections.

MEADOW, GARRETT COUNTY, MD.

On the highest part of Meadow Mountain, about 12 miles northwest of Frostburg, 1 mile north of New Germany post-office. The summit was cleared of timber with the exception of one tree, which was trimmed up and left for a signal.

Signal and station mark: Trimmed tree, only one on summit.

Reference mark: Copper bolt cemented in solid rock; distance from signal tree 15 feet, azimuth $346^{\circ} 43'$.

[Latitude $39^{\circ} 39' 16.25''$. Longitude $79^{\circ} 06' 20.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Accident.....	78 43 55.90	258 36 42.49	4. 2180560
Negro.....	134 05 59.85	314 02 20.27	4. 0570135
Sampson.....	248 27 35.75	68 34 20.31	4. 2102258
Dan.....	294 15 18.02	114 23 15.43	4. 2921995
High Rock.....	356 34 45.72	176 35 05.20	4. 0873862
Peck.....	160 29 14.36	340 26 42.26	4. 2291922
Bear.....	212 13 55.77	32 19 34.37	4. 3731153

RICH, GARRETT COUNTY, MD.

On Rich Ridge, on south side of cleared field near woods, on top of hill, on land owned by Si Turney, about 0.75 mile southwest of the State Line Hotel at Strawn, 3 miles southeast of Addison, Pa.

Signal: White flag in top of locust tree.

Station mark: Aluminum tablet cemented in large boulder 22.5 feet northwest of signal.

[Latitude $39^{\circ} 42' 35.15''$. Longitude $79^{\circ} 18' 40.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shipley.....	138 05 55	318 00 53	4. 22561
Steyer.....	164 45 31	344 42 34	4. 39696
Peck.....	230 29 07	50 34 28	4. 18980

SAMPSON, ALLEGANY COUNTY, MD.

On a high point of Savage Mountain, about 100 feet east of Sampson Rock, about 7 miles north of Frostburg. The timber is low on the top of the mountain, the backbone of the ridge being rocky.

Station mark: Bronze tablet cemented in solid rock.

[Latitude 39° 42' 28.94". Longitude 78° 55' 46.56'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Evitts.....	268 19 36.78	88 29 45.78	4.3562999
Warrior.....	289 54 51.30	110 06 41.28	4.4505251
Dan.....	348 54 39.03	168 55 52.46	4.1547327
Meadow.....	68 34 20.31	248 27 35.75	4.2102258
Negro.....	94 58 04.81	274 47 40.23	4.3685814
Peck.....	115 52 54.69	295 43 37.31	4.3626170
Bear.....	169 59 49.52	349 58 42.99	4.1533913

HYNDMAN, BEDFORD COUNTY, PA.

On highest point on Mill Creek Mountain about 3 miles northeast of Hyndman, Pa. From Hyndman follow mail trail to top of mountain; thence follow blazed trail on top to point. Lines of sight to other points were chopped out.

Signal: White flag in 6-inch chestnut tree.

Station mark: Aluminum tablet in solid rock 6.5 feet west of signal tree.

[Latitude 39° 50' 45.46". Longitude 78° 40' 56.53'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bear.....	86 57 21	266 46 44	4.37418
Hostetter.....	117 08 22	297 01 15	4.24993
Wills.....	215 56 47	35 59 01	3.92752
Martin.....	266 28 17	86 32 28	3.96968

MARTIN, BEDFORD COUNTY, PA.

On Martin Mountain in Cumberland Township in Pennsylvania Forest Reserve, about 3 miles southwest of Rainsburg, about 1.5 miles nearly south of D. N. Rawlings's house.

Signal: Flag in tree on west slope of mountain.

Station mark: Aluminum tablet cemented in rock 9 feet square and 3 feet high.

[Latitude 39° 51' 03.88" Longitude 78° 34' 25.00'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hyndman.....	86 32 28	266 28 17	3.96968
Wills.....	145 24 37	325 22 40	3.88261

WILLS, BEDFORD COUNTY, PA.

A peak on Wills Mountain, about 2 miles southeast of Buffalo Mills, about 200 yards north of where the road crosses Wills Mountain, known as Valley Crossing of Wills Mountain.

Signal: White flag on trimmed red-oak tree 8 inches in diameter: distance from station 15.8 feet, azimuth $54^{\circ} 21'$.

Station mark: Aluminum tablet cemented in solid rock 15.8 feet northeast of tree.

[Latitude $39^{\circ} 54' 27.54''$. Longitude $78^{\circ} 37' 27.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hyndman.....	35 59 01	215 56 47	3.92752
Savage.....	90 50 23	270 43 41	4.16345
Hostetter.....	93 30 12	273 20 50	4.31866
Martin.....	325 22 40	145 24 37	3.88261

SHIPLEY, FAYETTE COUNTY, PA.

On a gravel ridge, about 5 miles northwest of Confluence, on top of cleared hill which has a few trees on summit, about 200 yards west of Mr. Shipley's house.

Signal: White flag in top of locust tree 10 inches in diameter.

Station mark: Aluminum tablet cemented in solid rock 42.5 feet northeast of signal tree; azimuth $225^{\circ} 01'$.

[Latitude $39^{\circ} 49' 20.60''$. Longitude $79^{\circ} 26' 32.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peck.....	276 28 16	96 38 40	4.36779
Rich.....	318 00 53	138 05 55	4.22561

STEYER, NEAR LINE OF SOMERSET AND FAYETTE COUNTIES, PA.

In old field on south end of ridge on Laurel Mountain on land owned by Miss Sarah Steyer, 9 miles north of Confluence, 5 miles southwest of Scullton, and 0.5 mile west of sawmill.

Signal: Tripod made of sawed lumber.

Station mark: Aluminum tablet in sandstone 30 by 8 by 12 inches.

[Latitude 39° 55' 35.37". Longitude 79° 23' 16.28'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Somerset.....	250 36 04	70 48 16	4. 44745
Berlin.....	265 20 48.11	85 35 23.72	4. 5116915
Bear.....	285 26 00.13	105 42 31.22	4. 5812618
Peck.....	307 29 21.94	127 37 40.69	4. 3679374
Rich.....	344 42 34	164 45 31	4. 39696

BEAR, SOMERSET COUNTY, PA.

On a high part of the main Allegheny ridge on land owned by P. D. Bear and about 0.75 mile east of his house, about 5 miles northeast of Meyersdale and 2.5 miles from Sandpatch. Top is heavily timbered.

Signal: A red and white target fastened to corner of platform which is built of sawed lumber, having for two of its legs red-oak trees. Instrument elevated about 50 feet.

Station mark: Bronze tablet in rock under center of platform.

[Latitude 39° 50' 03.51". Longitude 78° 57' 30.56'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Meadow.....	32 19 34.37	212 13 55.77	4. 3731153
Peck.....	77 44 58.30	257 36 46.80	4. 2715364
Steyer.....	105 42 31.22	285 26 00.13	4. 5812618
Berlin.....	161 22 35.82	341 20 39.26	4. 1306763
Hostetter.....	219 39 11	39 42 41	4. 08629
Savage.....	239 10 27	59 16 45	4. 21241
Hyndman.....	266 46 44	86 57 21	4. 37418
Sampson.....	349 58 42.99	169 59 49.52	4. 1533913

BERLIN, SOMERSET COUNTY, PA.

On top of partly cleared hill about 3 miles nearly west of Berlin, about 6 miles southeast of Somerset, on land owned by Corneal Cover and 300 yards southwest of his house on line with rail fence.

Signal: Flag in top of trimmed wild-cherry tree which is about 0.5 mile south of road between Somerset and Berlin.

Station mark: Aluminum tablet in top of marble post, 26 by 6 by 6 inches, set in ground 20 inches.

[Latitude 39° 56' 58.59". Longitude 79° 00' 32.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Peck.....	39 43 09.13	219 36 53.56	4.3386610
Steyer.....	85 35 23.72	265 20 48.11	4.5116915
Somerset.....	138 29 24	318 26 44	3.95116
Highland.....	149 45 31	329 42 47	4.07933
Hostetter.....	285 42 59	105 48 26	4.09935
Bear.....	341 20 39.26	161 22 35.82	4.1306763

HIGHLAND, SOMERSET COUNTY, PA.

On knob in orchard owned by Peter Haffley and 500 feet north of his house, 2 miles north of Somerset.

Signal: Double tripod made of sawed lumber. Instrument elevated 20 feet.

Station mark: Marble post, 30 by 6 by 6 inches, set in ground 28 inches.

[Latitude 40° 02' 34.78". Longitude 79° 04' 47.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Peck.....	16 09 50	196 06 18	4.45134
Berlin.....	329 42 47	149 45 31	4.07933
Somerset.....	358 01 40	178 01 40	3.56597

HOSTETTER, SOMERSET COUNTY, PA.

On main ridge of Allegheny Mountain about 5 miles nearly east of Berlin, 0.25 mile east of Mud Pike, on land owned by Mr. Hostetter, 0.25 mile northeast of his house.

Signal: On tripod above instrument support 18 feet in height, built of sawed timber and guyed with four wires.

Station mark: Aluminum tablet in center of top of a sandstone post, 30 by 10 by 8 inches, set in ground 26 inches under center of signal.

[Latitude 39° 55' 07.88". Longitude 78° 52' 02.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bear.....	39 42 41	219 39 11	4.08629
Berlin.....	105 48 26	285 42 59	4.09935
Wills.....	273 20 50	93 30 12	4.31866
Savage.....	279 30 14	99 33 02	3.79992
Hyndman.....	297 01 15	117 08 22	4.24993

PECK, SOMERSET COUNTY, PA.

On Negro Mountain about 10 miles west of Meyersdale, on land owned by a coal company; 0.5 mile north of where Meyersdale-Confluence road crosses the mountain and 1.5 miles northeast of Howard Peck's house. The mountain is timbered and flat on top, and lines of sight to other points have been chopped out. The station is about 100 feet southwest of highest part upon which no high tree for signal was available. Instrument elevated 22 feet.

Signal: A white flag on top of 15-inch pine tree.

Station mark: Bronze "Penna." tablet in large rock 12 feet east of signal tree.

[Latitude $39^{\circ} 47' 54.24''$. Longitude $79^{\circ} 10' 18.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rich.....	50 34 28	230 29 07	4. 18980
Shipley.....	96 38 40	276 28 16	4. 36779
Steyer.....	127 37 40.69	307 29 21.94	4. 3679374
Highland.....	196 06 18	16 09 50	4. 45134
Somerset.....	198 45 42	18 49 18	4. 39447
Berlin.....	219 36 53.56	39 43 09.13	4. 3386610
Bear.....	257 36 46.80	77 44 58.30	4. 2715364
Sampson.....	295 43 37.31	115 52 54.69	4. 3626170
Meadow.....	340 26 42.26	160 29 14.36	4. 2291922

SAVAGE, SOMERSET COUNTY, PA.

(Not occupied.)

On land owned by Mr. Hubbard, about 0.5 mile west of Glen Savage. The point sighted is the southernmost of three tall locust trees which stand in cleared field west of Mr. Hubbard's house.

[Latitude $39^{\circ} 54' 34.04''$. Longitude $78^{\circ} 47' 40.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bear.....	59 16 45	239 10 27	4. 21241
Hostetter.....	99 33 02	279 30 14	3. 79992
Wills.....	270 43 41	90 50 23	4. 16345

SOMERSET, SOMERSET COUNTY, PA.

(Not occupied.)

Dome of the county court-house in town of Somerset.

Signal and station mark: Center of dome.

[Latitude 40° 00' 35.52". Longitude 79° 04' 41.92'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peck.....	18 49 18	198 45 42	4.39447
Steyer.....	70 48 16	250 36 04	4.44745
Highland.....	178 01 40	358 01 40	3.56597
Berlin.....	318 26 44	138 29 24	3.95116

TENNESSEE.

PRIMARY TRAVERSE.

Franklin quadrangle.

WILLIAMSON COUNTY.

The following geographic positions were determined in 1906 by C. B. Kendall. The line starts from adjusted position at Callender station and follows highways to near the northwest corner of the quadrangle; thence south to southwest corner of quadrangle, connecting with adjusted position at Ewell station; thence east to near southeast corner of the quadrangle; thence north to Bonbrook and west to Callender, connecting with original position.

Magnetic declination: North border, 4° 07' east; east border, 3° 35' east; south border, 4° 09' east; west border, 3° 57' east.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Callender, opposite south end of station; center of main line Louisville and Nashville Railroad.....	° ' " 35 59 34.2	° ' " 86 48 08.3
Callender, road crossing 1,800 feet north of station.....	35 59 51.2	86 48 02.9
Callender, 3 corners at tollgate on Nashville-Franklin pike, 0.5 mile west of station.....	35 59 55.1	86 48 35.2
Callender, 1.5 miles northwest of station, T road west, 30 feet southwest to corner wire and rail fence, 30 feet northwest to corner stone wall.....	36 00 45.7	86 48 04.8
T road north, 0.8 mile west of Nashville-Franklin pike, 15 feet south to farm gate, 30 feet north to maple tree.....	36 00 53.3	86 48 56.2
Road forks north and northwest, 5 feet northwest to center of plank bridge.....	36 00 43.9	86 49 51.6
Two-story red house, 3 corners opposite, 25 feet southwest to Mrs. Lazenly's mail box, 15 feet east to two large gateposts.....	36 01 02.9	86 50 49.2
Top of ridge, gatepost in gap.....	36 00 28.0	86 51 14.5
Beachville, 2.5 miles south of; T road east, 20 feet south to Stewart & Mare's mail box, 30 feet west to oak.....	36 00 27.0	86 51 45.3
T road east, 1,060 feet south of J. B. Hughes's store, 30 feet east to field gate, 25 feet west to front-yard gate.....	36 00 38.6	86 53 22.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Grassland, about 2 miles south of Beachville, on Nashville pike, 300 feet north of the 12-mile post from Nashville, at northeast corner of store of J. B. Hughes, iron post stamped "Prim. Trav. Sta. No. 8, 1906".....	° ' " 36 00 49.1	° ' " 86 53 20.2
Big Harpeth River, center of iron bridge over.....	36 00 59.6	86 53 59.8
Second-class T road south, 10 feet south to gate, 40 feet west to broken-top oak.....	36 00 46.7	86 54 59.5
Forest Home, 3 miles north of; T road east, large elm tree..	36 00 47.1	86 55 48.2
Forest Home, 2.5 miles north of; T road northwest.....	36 00 16.2	86 55 57.1
Forest Home, 2.5 miles north of; on south edge, between road and Big Harpeth River, opposite T road northwest to Pasquo, iron post stamped "Prim. Trav. Sta. No. 16, 1906".....	36 00 15.9	86 55 56.8
Second-class road fork east, 20 feet east to walnut, 15 feet south to J. L. Bradley's mail box.....	35 59 23.3	86 55 58.5
Forest Home, 3 corners, 150 feet northwest of store, 35 feet southeast to corner blacksmith shop, 20 feet north to corner post of wire fence.....	35 58 32.3	86 55 39.0
Forest Home, 1 mile southwest of; T road northwest, center of Hillsboro pike at junction.....	35 57 50.3	86 56 16.5
Crossing of Hillsboro pike and Charlotte-Franklin road, 30 feet southwest to four mail boxes, 50 feet north to gate....	35 57 09.1	86 56 43.3
Second-class road crossing near top of hill, 30 feet south to E. Brown's mail box, 20 feet east to stone fence.....	35 56 18.2	86 57 37.0
Bingham, 0.25 mile southwest of; junction of Hillsboro pike with Boyd's mill road, 3 corners, 20 feet south to corner post picket fence.....	35 55 30.8	86 58 18.3
Front door of church at T road northwest, up small stream to Ferndale.....	35 55 06.7	86 58 44.0
Hillsboro, 0.5 mile northeast of; junction of Nashville-Hillsboro and Franklin-Hillsboro pikes.....	35 53 51.9	86 59 32.4
Hillsboro, 0.5 mile northeast of; at junction of Nashville-Hillsboro and Franklin-Hillsboro pikes, at southwest corner of front yard, residence of Tom Johnson, iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	35 53 52.1	86 59 32.0
Hillsboro, 1.5 miles east of; center of Franklin-Hillsboro pike at T road south.....	35 53 53.8	86 58 27.3
Second-class T road east, center of small stream.....	35 53 07.5	86 58 33.8
Center of ford of small stream.....	35 52 47.4	86 57 41.0
Three corners, junction of Carters Creek pike and Cook road north to Hillsboro, center of pike.....	35 52 25.1	86 56 53.1
Center of triangle at forks, pike south, road southwest, 15 feet northwest to sycamore.....	35 52 00.9	86 57 22.8
Covered bridge over Leipers Fork, 200 feet south of; T road west, 40 feet southwest to telephone pole, 220 feet north to center of bridge.....	35 50 38.2	86 57 41.3
Burwood, 1.1 miles north of; center of small bridge at 4 corners.....	35 49 40.5	86 58 09.2
Burwood, center of Carters Creek pike, in front of Aikin Brothers' store.....	35 48 44.3	86 59 01.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Burwood, 0.8 mile south of ; center of pike at second-class T road east.....	35 48 17.8	86 59 36.7
Duck River Ridge, center of pike at top of Burnis Hill.....	35 47 43.6	87 00 06.8
Maury-Williamson county line, center of Carters Creek pike, 100 feet south to T road west.....	35 46 59.5	87 00 17.3
Loco, 0.25 mile north of; 3 corners	35 46 31.2	87 00 21.4
Jameson, center of crossroads.....	35 45 10.9	87 00 33.5
Jameson, northeast corner of intersection of the Carters Creek pike and the Gravelhill-Springhill road, at southwest corner of Jameson & Gary's store, iron post stamped "Prim. Trav. Sta. No. 10, 1906".....	35 45 11.1	87 00 33.1
Road crossing of spur track of Louisville and Nashville Railroad to Phosphate mine.....	35, 45 09.5	86 59 48.5
Center of spur track, Louisville and Nashville Railroad, at T road north	35 45 09.3	86 58 34.8
Ewell, road crossing Louisville and Nashville Railroad 1 mile south of station.....	35 45 09.0	86 57 05.4
Ewell station, opposite telegraph window, center of Louisville and Nashville Railroad track.....	35 45 38.94	86 56 26.07
Springhill Bank, cross streets, 12 feet southeast to stone at corner street, 30 feet west to corner bank building	35 45 02.5	86 55 50.5
Springhill, 1 mile east of; Springhill-Duplex road, crossing of Maury-Williamson county line, at 2 farm gates....	35 45 07.9	86 54 45.3
Springhill, 1.5 miles east of; T road south, 15 feet north to oak, 25 feet southeast to cedar.....	35 45 08.0	86 54 09.1
T road north, about 200 feet east of T road south, center of east-west road.....	35 45 08.6	86 53 03.2
Enon Creek, 1,500 feet east of; road forks, 10 feet northeast to cedar stump, 30 feet southeast to cedar bush.....	35 45 08.0	86 52 12.3
Top of hill, 4 corners near; public road south, second-class road north, 20 feet southeast to elm tree, 20 feet southwest to elm tree.....	35 44 47.9	86 51 16.7
Duplex, center of junction of the Franklin-Louisburg pike with Duplex-Springhill road.....	35 44 46.2	86 50 16.2
Duplex, at northeast corner of J. T. Wiley's store, 125 feet west of junction of the Franklin-Louisburg pike with Duplex-Springhill road, iron post stamped "Prim. Trav. Sta. No. 11, 1906, Tenn".....	35 44 46.1	86 50 17.6
Old water mill, 400 feet south of; middle of creek at road forks east and northeast, 70 feet northwest to beech tree..	35 44 55.9	86 49 08.2
Second-class road fork to northwest, 20 feet north to beech, 15 feet east to small bridge.....	35 44 31.7	86 48 17.0
Ashe Hill Church, 0.5 mile west of; T road north, center of east-west road at junction, 35 feet west to oak tree, 40 feet east to hickory tree.....	35 43 54.1	86 48 17.2
Center of triangle at T road west, 20 feet southeast to hackberry tree, 20 feet southwest to D. E. Comstock's mail box.....	35 43 35.2	86 46 59.2
T road north, center of east-west road, 25 feet north to stump, 12 feet southeast to telegraph pole.....	35 42 49.8	86 47 03.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Reed's store, 1.25 miles west of; center of crossroads, 35 feet east to mail box 13.....	35 42 45.1	86 46 20.1
Reed's store, 1.25 miles west of; in southwest corner at intersection of crossroads on Murfreesboro-Columbia road, iron post stamped "Prim. Trav. Sta. No. 12, 1906, Tenn".....	35 42 44.9	86 46 20.4
T road east, center of road northeast.....	35 43 43.2	86 46 14.9
Second-class T road west, 25 feet east to wire fence, 75 feet north to dead oak.....	35 43 55.8	86 45 46.4
Choctaw School, 300 feet west of; 3 corners, center of north-south road at junction, 35 feet north to corner fence.....	35 44 30.5	86 45 30.5
Cross Keys, locust tree at 3 corners.....	35 45 11.3	86 45 53.1
Center of road in gap at top of ridge.....	35 46 26.8	86 45 52.3
Beech tree at bend of road to west, 350 feet north to second-class road fork south.....	35 46 52.3	86 45 11.0
Arno, 1.1 miles south of; T road east, center of Duck River ridge pike.....	35 47 20.0	86 44 53.3
Arno, T road west, 20 feet northwest and 40 feet southeast to corners of store porch.....	35 48 10.2	86 44 31.0
Arno, about 0.75 mile north of; second-class T road east, center of pike.....	35 48 49.0	86 44 12.4
Arno, about 1.75 miles north of; T road east, 15 feet northeast to corner rail fence.....	35 49 36.9	86 44 16.3
Rudderville, 0.25 mile south of; 4 corners, 40 feet southeast to locust tree, 60 feet northwest to large dead oak....	35 50 24.4	86 44 30.3
Big Harpeth River, center of covered bridge over.....	35 51 06.1	86 44 03.8
Arrington, 0.75 mile west of; crossroads 500 feet east of Bellevue Church, 27 feet northwest to Prim. Trav. Sta. No. 13, 30 feet to corner wire fence.....	35 52 15.6	86 43 36.5
Arrington, 0.75 mile west of; 500 feet east of Bellevue Church, northwest corner crossroads, iron post stamped "Prim. Trav. Sta. No. 13, 1906, Tenn.".....	35 52 15.9	86 43 36.7
Arrington, 1 mile north of; telephone post at junction of Wilson pike and road west.....	35 52 53.7	86 43 21.6
Rockhill, 1,000 feet northwest of; T road northeast, center of Wilson pike, 80 feet southeast to bridge over small stream.....	35 53 49.6	86 44 04.8
Rockhill, 1,000 feet southeast of; T road north, 1.5 miles northwest of Trinity Church, 60 feet northwest to small bridge, 10 feet south to stone fence.....	35 54 30.6	86 44 58.3
Center of east-west road at T road south, 20 feet north to beech tree, 15 feet northwest to old stump.....	35 55 38.2	86 44 37.3
Pleasant Hill School, 400 feet east of; center of triangle at T road south, 40 feet southwest to 5 mail boxes, 130 feet west to second-class road west.....	35 55 59.7	86 43 03.4
Center of east-west road at T road north.....	35 56 20.2	86 43 45.5
Large oak tree at rear of split-log schoolhouse.....	35 57 06.1	86 43 51.1
Road forks southeast and south, 35 feet northeast to oak tree, 40 feet southwest to hickory tree.....	35 57 27.9	86 43 21.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Old sawmill site, road forks southeast and southwest, 25 feet east to elm tree, 50 feet northwest to center of Owl Creek.....	35 58 14.3	86 43 37.8
Bonbrook store, 150 feet south of; south edge of east-west road at T road north, 20 feet northeast to corner of blacksmith shop, 56 feet southeast to Prim. Trav. Sta. 14.....	35 59 05.6	86 43 42.6
Bonbrook, 200 feet south of store; south edge of Franklin-Nolensville road at junction with Bonbrook-Brentwood road, northwest corner front yard to house of Mrs. M. L. Primm, iron post stamped "Prim. Trav. Sta. No. 14, 1906, Tenn.".....	35 59 05.3	86 43.42 1
Bonbrook, 1 mile northwest of; road forks southeast and east, 10 feet southeast to Mrs. G. W. Curren's mail box, 20 feet north to rail fence.....	35 59 22.0	86 44 36.1
Blacksmith shop, 0.5 mile east of; road forks east and northeast, 30 feet northeast to J. O. Allen's mail box...	35 59 39.8	86 46 12.1
Callender, 4 corners at blacksmith shop 1 mile east of station, 15 feet northeast to corner of fence, 40 feet southwest to corner shop.....	35 59 42.4	86 46 45.5
Callender, in southeast angle between the east wall and operator's window of Louisville and Nashville Railroad station, iron post stamped "Prim. Trav. Sta. No. 15, 1906".....	35 59 34.4	86 48 08.6

Beech Bluff, Bolivar, Camden, Decaturville, Dickson, Henderson, Hollow Rock, Jackson, Lexington, McEwen, McLemoresville, Trenton, and Waverly quadrangles.

BENTON, CARROLL, CROCKETT, DECATUR, GIBSON, HENDERSON, AND MADISON COUNTIES.

The following geographic positions, except those in Dickson, McEwen, and Waverly quadrangles, were determined by C. B. Kendall during the season of 1906.

The line begins with the position of the railway station at Johnsonville as located by W. J. Peters, in 1896, and follows the Nashville, Chattanooga and St. Louis Railway to Huntington; thence west along highways to Trezevant; thence southwest along the Louisville and Nashville Railroad to Milan; thence south along the Illinois Central Railroad to Oakfield station, at the northeast corner of Jackson quadrangle.

For the control of Jackson quadrangle the line begins with the position at Oakfield and follows highways west to 1 mile south of Gadsden; thence south to 1 mile south of Denmark; thence east to Pinson; thence north along the Mobile and Ohio Railroad 4 miles; thence along highways to a point 2 miles east of Jackson; thence west along pike to Jackson; thence northeast along highways to the northeast corner of the quadrangle, where it turns west and is tied back at Oakfield.

A checked spur line was also run from Jackson northeast along the Claybrook pike to the bridge over Wallick Creek. From a point 2 miles east of Jackson a line was run east along the Nashville, Chattanooga and St. Louis Railway, via Lexington, to Perryville; thence south along highways up the west bank of Tennessee River to East Cedar Creek, where the line crosses the river; thence up the east bank of river to Kellys Landing, where it is tied to the adjusted position of the south azimuth mark as determined by George T. Hawkins in 1897.

Positions in Dickson, McEwen, and Waverly quadrangles were located by W. J. Peters in 1896 along the Nashville, Chattanooga and St. Louis Railroad from Dickson station to Johnsonville station, disregarding the previous astronomic correction at Waverly as applied to line from Dickson; also changed by recomputation of line from Box station to Johnsonville.

DICKSON QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dickson station.....	36 04 31.5	87 23 22.6
Road crossing.....	36 06 00.1	87 27 58.4

M'EWEN QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tennessee City, southwest corner of station.....	36 05 32.8	87 31 01.0
Road crossing.....	36 06 17.3	87 33 59.2
McEwen station.....	36 06 36.0	87 38 05.7
Briggs station.....	36 06 24.9	87 41 05.2
Gorman station.....	36 06 16.7	87 42 36.4

WAVERLY QUADRANGLE.

Geographic positions.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	36 05 10.1	87 45 29.8
Waverly station.....	36 05 13.9	87 47 34.5
Waverly astronomic pier, court-house grounds (U. S. standard)	36 04 58.7	87 47 43.5
Waverly astronomic pier, court-house grounds (by astronomic observations).....	36 04 59.5	87 47 36.9
Waverly Presbyterian Church spire.....	36 05 03.5	87 47 41.8
Frank station.....	36 04 08.7	87 52 59.1
Box station.....	36 02 57.9	87 55 26.2
Johnsonville station.....	36 03 47.3	87 57 59.4
Jacksonville, U. S. Engineer Corps bench mark on railroad bridge over Tennessee River	36 03 54.3	87 58 09.6

CAMDEN QUADRANGLE.

Magnetic declination: South border, 3° 18' east.

Geographic positions along Nashville, Chattanooga and St. Louis Railway, Johnsonville to Oakfield.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Johnsonville, 350 feet southeast of station, at northwest corner of store of E. E. Martin, 90 feet south of center of main track, iron post stamped "Prim. Trav. Sta. No. 17, 1906, Tenn".....	36 03 45.0	87 57 56.9
Johnsonville, center of track opposite operator's window at station.....	36 03 47.3	87 57 59.4
Johnsonville, 1,000 feet northwest of station, U. S. Engineer Corps bench mark on east abutment of railroad bridge over Tennessee River.....	36 03 54.3	87 58 09.6
Johnsonville; Nashville, Chattanooga and St. Louis Railway bridge over Tennessee River in northwest quadrant of round pier at draw, copper bolt.....	36 04 02.0	87 58 21.3
Eva station, center of main track at road crossing.....	36 03 35.3	87 59 59.3
Eva, 1 mile west of station, center of trestle over road fork northwest.....	36 03 02.0	88 00 38.6
Eva, 1.7 miles west of station, road crossing center of track.....	36 02 31.4	88 01 15.7
Second-class road crossing under trestle 821, center of track over road.....	36 02 24.4	88 02 01.7
Center of trestle 832 over small creek.....	36 02 35.7	88 03 14.7
Milepost "N 85," 80 feet east of; road crossing, center of track.....	36 02 52.9	88 05 05.8
Camden, road crossing at east end of station, center of main track.....	36 03 01.9	88 06 06.9

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Geographic positions along Nashville, Chattanooga and St. Louis Railway, Johnsonville to Oakfield—Continued.

Station.	Latitude.	Longitude.
Camden, opposite east end of station, on east edge of road at southwest corner of store of H. H. Anderson, iron post stamped "Prim. Trav. Sta. No. 18, 1906, Tennessee".....	° ' " 36 03 02.3	° ' " 88 06 06.6
Camden, 1.4 miles west of station, road crossing, center of track.....	36 02 50.3	88 07 32.0
Milepost "N 89," center of track opposite.....	36 02 40.8	88 09 20.0
Lipe station, road crossing at sawmill, center of main track.....	36 02 27.3	88 10 49.1
Sawyers Mill station (Zach post-office), road crossing, center of main track.....	36 02 07.0	88 11 31.9
Carroll-Benton county line crossing Nashville, Chattanooga and St. Louis Railway, center of track.....	36 02 20.2	88 12 56.3
Milepost "N 93," 200 feet east of; road crossing, center of track.....	36 02 26.8	88 13 15.3
Hollow Rock Junction, 300 feet west of station, railroad crossing, center of main track between two switch points.....	36 02 34.5	88 14 55.6

HOLLOW ROCK QUADRANGLE.

Magnetic declination: South border, 4° 34' east.

Geographic positions.

ALONG NASHVILLE, CHATTANOOGA AND ST. LOUIS RAILWAY, HOLLOW ROCK TO HUNTINGTON.

Station.	Latitude.	Longitude.
Hollow Rock, road crossing at west end of station, center of track.....	° ' " 36 02 16.0	° ' " 88 16 27.8
Hollow Rock, 100 feet north of west end of station, at southwest corner of store east of street, iron post stamped "Prim. Trav. Sta. No. 19, 1906, Tenn.".....	36 02 16.6	88 16 27.7
Hollow Rock, 1.4 miles west of station, road crossing, center of track.....	36 02 25.8	88 17 54.9
Milepost N 99, 600 feet east of; road crossing, center of track.....	36 02 19.2	88 19 15.6
Rosser station, 0.8 mile east of; second-class road crossing, center of track.....	36 02 12.1	88 20 33.5
Rosser station, 50 feet west of mail crane, road crossing, center of track.....	36 01 53.2	88 21 17.2
Rosser, 1.7 miles west of station, road crossing, center of track.....	36 01 04.0	88 22 45.5
Huntington, 0.8 mile east of station, road crossing, center of track.....	36 00 26.7	88 24 29.5
Huntington, 150 feet west of station, center of main track at street crossing.....	36 00 15.2	88 25 17.2

Geographic positions—Continued.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Huntington, center of court-house cupola.....	° ' " 36 00 02.9	° ' " 88 25 44.7
Huntington, at northwest corner of court-house, iron post stamped "Prim. Trav. Sta. No. 20, 1906, Tenn.".....	36 00 03.3	88 25 44.3
Huntington, 0.7 mile south of; T road west, center of north-south road.....	35 59 41.2	88 26 16.3
Huntington, 2.1 miles west of; road fork west, second-class road northwest, 15 feet southwest to telephone pole, 10 feet north west to small plank bridge.....	35 59 59.5	88 27 45.2
McCollum schoolhouse, 500 feet west of; road forks east and southeast, 40 feet east to oak, 50 feet southwest to corner front-yard fence.....	36 00 04.0	88 28 28.3
Schoolhouse, 1 mile west of; at top of hill, road forks northwest and southwest.....	36 00 23.8	88 29 23.3
Ready Creek, 0.8 mile east of; telephone pole in triangle at second-class road fork north.....	36 00 27.1	88 30 23.1
Ready Creek, west end bridge over.....	36 00 15.2	88 31 19.0
Ready Creek, 0.5 mile west of; at Ready Creek School, top hill at second-class road fork south.....	36 00 05.4	88 31 46.0

M'LEMORESVILLE QUADRANGLE.

Magnetic declination: North border, 4° 24' east; east border, 4° 40' east.

Geographic positions.

ALONG HIGHWAYS, FROM NEAR READY CREEK TO 0.75 MILE SOUTHEAST OF TREZEVANT.

Station.	Latitude.	Longitude.
Road forks east and southeast, double oak.....	° ' " 35 59 41.6	° ' " 88 32 33.5
McLemoresville, 0.9 mile east of; T road north, center of east-west road, 40 feet northwest to signpost "Huntington 8 miles," 70 feet northeast to oak tree.....	35 59 18.8	88 33 38.9
McLemoresville, on south edge of Huntington-Trenton road, center of east side of public square, at northwest corner of J. H. Hailey's store, iron post stamped "Prim. Trav. Sta. No. 21, 1906, Tenn.".....	35 59 15.0	88 34 30.2
McLemoresville, 1.4 miles northwest of; second-class T road north, center of small bridge.....	35 59 55.3	88 35 35.0
Trezevant, 0.75 mile southeast of; T road east, 30 feet southwest to cedar, 35 feet southeast to telephone pole..	36 00 12.0	88 36 58.5

Geographic positions—Continued.

ALONG LOUISVILLE AND NASHVILLE RAILROAD, TREZEVANT TO MILAN.

Station.	Latitude.	Longitude.
Trezevant, 250 feet south of station, street crossing Louisville and Nashville Railroad, center of main track.....	° ' " 36 00 42.8	° ' " 88 37 26.6
Trezevant, 150 feet west of station, in southeast corner of front yard to Blanks Hotel, iron post stamped "Prim. Trav. Sta. No. 22, 1906, Tenn.".....	36 00 46.3	88 37 24.3
Trezevant, 0.75 mile south of; road crossing, center of track.....	36 00 15.3	88 38 04.9
Trezevant, 2 miles south of; road crossing, center of track.....	35 59 36.3	88 39 04.0
Atwood, 125 feet north of station, street crossing, center of main track.....	35 58 24.1	88 40 53.5
Atwood, 1.2 miles south of station, road crossing, center of main track.....	35 57 54.6	88 41 38.2
Rutherford, center of fork of Obion River, at trestle 146..	35 56 57.9	88 43 04.0
Milan, 1.7 miles northeast of; road crossing, center of track.....	35 56 06.9	88 44 21.2

TRENTON QUADRANGLE.

Magnetic declination: West border, $4^{\circ} 40'$ east; south border, $5^{\circ} 07'$ east; east border, $4^{\circ} 40'$ east.

Geographic positions.

ALONG ILLINOIS CENTRAL RAILROAD.

Station.	Latitude.	Longitude.
Milan station, crossing of the Louisville and Nashville and the Illinois Central railroads.....	° ' " 35 55 11.9	° ' " 88 45 44.3
Milan station, 130 feet southwest of crossing of the Louisville and Nashville and the Illinois Central railroads, at northeast corner of Southern Pacific Hotel, iron post stamped "Prim. Trav. Sta. No. 23, 1906, Tenn.".....	35 55 10.6	88 45 44.9
Milan, 1.7 miles south of; 150 feet south of milepost C 450, road crossing, center of track.....	35 53 43.1	88 45 45.8
Sitka, 1.4 miles north of station, 230 feet south of milepost C 451, road crossing.....	35 52 50.9	88 45 36.6
Sitka station, road crossing, center of main track.....	35 51 40.6	88 45 16.9
Sitka, 1 mile south of; road crossing, center of track.....	35 50 45.8	88 45 01.6
West, 125 feet south of station, road crossing, center of track.....	35 50 24.6	88 45 01.7
West, 1.3 miles south of; 500 feet south of milepost C 455, road crossing, center of track.....	35 49 24.2	88 45 19.5
Center of trestle 455-97, over road, 70 feet north of milepost 456.....	35 48 49.3	88 45 51.7
Medina, 600 feet north of station, road crossing, center of track.....	35 48 15.5	88 46 28.7

Geographic positions—Continued.

ALONG ILLINOIS CENTRAL RAILROAD—continued.

Station.	Latitude.	Longitude.
Medina, 150 feet west of station, in east wall of brick building owned by I. M. Nelson, aluminum tablet stamped "Prim. Trav. Sta. No. 24, 1906, Tenn.".....	° ' " 35 48 10.7	° ' " 88 46 34.7
Medina, 0.75 mile south of station, Gibson-Madison county line, crossing Illinois Central Railroad, center of track..	35 47 34.7	88 47 00.6
Medina, 1.3 miles south of station, road crossing, center of track.....	35 47 06.5	88 47 22.6
Milepost 452, 700 feet south of; road crossing, center of track.....	35 45 53.9	88 47 48.0

ALONG HIGHWAYS.

Hall Beech Creek, 600 feet east of bridge over; second-class T road south, 10 feet north to mail box, 20 feet southwest to corner of fence.....	35 45 01.7	88 55 46.1
Mason Grove, 1.2 miles east of; T road north, center east-west road.....	35 45 31.9	88 56 26.6
Mason Grove, 0.8 mile east of; road forks south and east, center of triangle.....	35 45 32.4	88 56 49.4
Mason Grove, 0.25 mile west of; T road south, 60 feet northwest to corner of old shop, 50 feet north to corner of vacant store.....	35 45 54.1	88 57 50.2
Gadsden, 1 mile southeast of; 5 corners (roads northwest, southwest, and east, second-class roads north and south), 20 feet southeast to oak snag, 50 feet west to bench mark No. 26.....	35 45 58.7	88 58 30.8
Gadsden, 1 mile southeast of; 1 mile west of Mason Grove, in angle of forks at 5 corners; iron post stamped "Prim. Trav. Sta. No. 26, 1906, Tenn.".....	35 45 58.7	88 58 31.4
Gadsden, 0.75 mile south of; second-class T road to east, center of Gadsden-Poplar Corners road, 10 feet southeast to corner pale fence, 20 feet north to oak.....	35 45 59.4	88 59 26.2
St. Paul's Church, 300 feet north of; oak tree at road forks south and southeast.....	35 45 11.3	88 59 42.0

JACKSON QUADRANGLE.

Magnetic declination: North border, 5° 07' east; west border, 5° 05' east; south border, 5° 01' east; east border, 5° 08' east.

Geographic positions.

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Trestle over Middle Fork of Forked Deer River, 260 feet north of; road crossing, center of track.....	° ' " 35 44 33.5	° ' " 88 47 37.1
Oakfield, 0.5 mile north of station, road crossing, center of track.....	35 43 13.26	88 47 40.5

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Oakfield, 1.5 miles northwest of; road forks west and southwest, 25 feet north to walnut tree, 35 feet southwest to telephone pole.....	35 43 12.8	88 48 43.8
Carroll, 150 feet north of station, road crossing, center of main track Mobile and Ohio Railroad.....	35 43 10.2	88 49 03.1
Carroll, 1.2 miles west of station; T road south, north edge of east-west road.....	35 43 05.2	88 50 17.9
Carroll, 2.5 miles west of; junction of Jackson-Trenton road with road east to Carroll and Oakfield.....	35 43 05.6	88 51 41.3
Carroll, 2.5 miles west of station, at junction of lower Jackson-Trenton road with road east to Carroll and Oakfield, west of north-south road, iron post stamped "Prim. Trav. Sta. No. 25, 1906, Tenn."	35 43 05.7	88 51 41.6
Three corners, T road west, at large spreading oak, center of north-south road, 15 feet west to two mail boxes.....	35 44 27.7	88 52 20.6
Cotton gin, T road south, center of north-south road.....	35 44 28.9	88 53 09.5
Hartleysville, T road north opposite Hartley's store, center of east-west road, 25 feet north to elm, 20 feet south to store door.....	35 44 31.6	88 54 29.9
Gadsden, 2.2 miles south of; T road south, 340 feet west of bend of main road to west, center of east-west road.....	35 44 16.1	89 00 05.3
Crossroads schoolhouse, 200 feet south of; four corners, crossing of Jackson-Bells and Gadsden-Poplar Corners roads.....	35 42 53.3	88 59 59.3
Crossroads schoolhouse, 0.9 mile south of; second-class T road west, 10 feet west to gate, 50 feet south to maple....	35 42 09.9	88 59 54.4
Mason's store, 1,000 feet north of; hollow beech tree, at T road west, 120 feet south of second-class T road to east ..	35 41 32.2	88 59 46.7
Mason's store, 1,000 feet south of; 4 corners, 25 feet south to small bridge.....	35 41 15.2	88 59 42.6
Poplar Corners bridge, 0.4 mile northeast of; T road north, beech tree.....	35 40 35.7	88 59 43.5
South Fork Deer River, center of Poplar Corners bridge over.	35 40 26.1	89 00 02.6
Poplar Corners bridge, 1.8 miles south of; center of east-west road, junction with T road north produced	35 39 01.4	89 00 12.0
Three corners, second-class T road north, 50 feet east to large oak, 15 feet southwest to large oak.....	35 38 28.0	88 59 29.9
Centerpoint School, 150 feet south of; mail box at road forks east and northeast.....	35 38 03.4	88 59 07.0
Huntersville, at east edge of; T road north, 10 feet north to plank bridge.....	35 36 55.4	88 59 00.2
Huntersville, at east border of quadrangle, 450 feet west of T road north, at northeast corner of store of F. W. Heming, iron post stamped "Prim. Trav. Sta. No. 27, 1906, Tennessee"	35 36 54.3	88 59 03.5
Huntersville, 0.5 mile west of; road forks southwest and west, center of triangle.....	35 36 49.9	88 59 44.6
Huntersville, 1.5 miles south of; T road east, center of north-south road, 20 feet southeast to hickory, 90 feet southwest to corner small new house.....	35 35 48.6	88 59 58.8

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Second-class T road west, double oak	35 34 57.9	89 00 15.6
Denmark, 1.7 miles north of; T road east at negro cabin, 10 feet northwest to corner of garden, 20 feet northeast to corner fence post.....	35 34 00.2	89 00 00.6
Denmark, 1.4 miles north of; T road west, 200 feet north of store, center of north-south road.....	35 33 06.8	89 00 06.8
Denmark, at northwest edge of; T road north, 15 feet northeast to sycamore at corner of fence, 50 feet northwest to center of small pond.....	35 31 59.4	89 00 17.1
Denmark, 0.25 mile northeast of; road crossing Nashville, Chattanooga and St. Louis Railway, center of track.....	35 31 14.6	88 59 53.2
Denmark, 0.5 mile southeast of; 1,600 feet south of Nashville, Chattanooga and St. Louis Railway, on west edge of the Denmark-Bolivar road at junction with Denmark-Medon road, near large oak tree, iron post stamped "Prim. Trav. Sta. No. 28, 1906, Tenn."	35 31 00.0	88 59 46.9
Denmark, 0.5 mile southeast of; large oak 80 feet northwest of road forks south and southeast.....	35 31 00.3	88 59 47.3
Denmark, 2 miles southeast of; second-class road fork to south at bend of main road to east, oak tree.....	35 30 22.3	88 58 24.4
Mount Tabor Church, 4 corners, center of triangle, 40 feet east to center of bridge, 30 feet west to oak.....	35 30 01.6	88 52 20.8
Mount Tabor, 0.8 mile east of; road forks west and northwest, 40 feet south to north end of barn, 40 feet east to telephone pole.....	35 30 18.6	88 51 53.2
Mount Tabor, 1.7 miles east of; road crossing Illinois Central Railroad, center of track.....	35 30 41.9	88 50 56.3
Illinois Central Railroad, 1.3 miles east of; junction of Jackson-Medon road and T road west, center of triangle, 40 feet southwest to walnut, 30 feet northwest to maple.....	35 30 43.9	88 49 31.3
White Church, 400 feet south of; road 100 feet southeast of green schoolhouse, road fork south and southeast, center of triangle.....	35 30 10.9	88 49 35.9
Church and schoolhouse, 1 mile east of; second-class T road north, 10 feet southwest to oak, 30 feet northeast to rail fence.....	35 30 11.7	88 48 31.0
Middle Fork of Forked Deer River, center of bridge over.....	35 35 35.7	88 45 12.9
Jackson, 2.5 miles east of; junction of Jackson-Jacks Creek road with Jackson-Beech Bluff road, 31 feet southwest to primary traverse station 31, at corner of store, 20 feet north to center of Beech Bluff road.....	35 36 28.26	88 46 03.21
Jackson, 2.5 miles east of; at northeast corner of new store at junction of Jackson-Jacks Creek road with Jackson-Beech Bluff road, iron post stamped "Prim. Trav. Sta. No. 31, 1906, Tenn."	35 36 28.0	88 46 03.4
Jackson, 1.5 miles east of; T road south, 300 feet west of store, center of pike, 110 feet west to center of bridge over Jones Creek.....	35 36 32.7	88 47 00.0
Jackson, 1 mile east of; second-class T road south.....	35 36 42.8	88 47 41.2
Jackson, East Chester street crossing of Mobile and Ohio Railroad, center main track.....	35 36 45.0	88 48 46.6

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jackson, junction of Lexington avenue and Stoddert street.	35 37 01.0	88 48 39.6
Bridge over small stream, 250 feet north of; second-class road fork to northwest, center of pike.....	35 37 57.1	88 47 23.8
Jackson, 3 miles northeast of; T road to northeast, 25 feet northeast to center of small bridge, 15 feet southeast to telegraph pole.....	35 38 27.5	88 46 46.6
Jackson, 4 miles northeast of; road fork north, center of pike, 10 feet northwest to A. H. Nelson's mail box.....	35 39 03.5	88 46 12.5
Jackson, 5 miles northeast of; road fork north, center of pike.....	35 40 04.4	88 45 27.9
Oakfield, 1.9 miles east of station; T road west, junction of Jackson-Crestmasville and Ashport roads, center of triangle.....	35 43 26.0	88 46 00.2
Oakfield, 0.6 mile east of; T road west, 75 feet south of schoolhouse door, large oak.....	35 43 12.1	88 47 02.2

CHECKED SPUR LINE NORTHEAST ALONG CLAYBROOK ROAD, JACKSON TO BRIDGE OVER WALLICK CREEK.

Jackson, 1.7 miles northeast of; second-class T road north, center of Lexington pike, 25 feet north to gate.....	35 37 34.2	88 46 59.2
Jackson, 2.4 miles northeast of; center of bridge over Browns Creek.....	35 37 32.8	88 46 12.6
Malone Creek, center of bridge over.....	35 38 05.4	88 45 11.0
Wallick Creek, spike in center of bridge over.....	35 38 31.0	88 43 43.0

BEECH BLUFF QUADRANGLE.

Magnetic declination: West border, 5° 08' east; center, 4° 43' east.

Geographic positions.

ALONG MOBILE AND OHIO RAILROAD NEAR PINSON.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pinson, 2.1 miles northwest of; second-class road crossing, 600 feet southeast of milepost 377, center of track.....	35 30 54.6	88 44 37.9
Pinson, 4 miles northwest of; road crossing, center of track.	35 32 22.4	88 44 44.8

ALONG HIGHWAYS.

South Fork Deer River, 1 mile east of; T road south, 5 feet northwest to oak, 15 feet south to oak.....	35 32 11.1	88 43 32.9
Three corners, T road north, 200 feet west of T road south, 20 feet southwest to corner garden, 15 feet northeast to rail fence.....	35 32 19.2	88 43 02.3

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Middle Fork Deer River, 3.3 miles southeast of bridge over, T road south, 25 feet south to dead chestnut oak, 25 feet east to oak.....	° ' " 35 33 54.7	° ' " 88 43 02.5
Middle Fork of Deer River bridge, 1.7 miles southeast of; road forks south and southeast, W. J. Henderson's mail box.....	35 34 43.4	88 43 38.9
Middle Fork Deer River bridge, 0.6 mile southeast of; junction of Jackson-Jacks Creek and Jackson-Mefflin roads, 15 feet south to beech, 40 feet east to oak.....	35 35 12.2	88 44 32.0
Rollins, 0.6 mile south of; second-class T road east, 800 feet north of end of gravel road, 40 feet southwest to telephone pole, 40 feet northeast to two oaks.....	35 40 51.0	88 44 38.1
Rollins, 0.6 mile north of; T road east, 10 feet southeast to dead oak.....	35 41 42.3	88 43 57.3
Rollins, 1.4 miles north of; T road east to Browns Church, 20 feet northeast to telephone pole, 30 feet southeast to mail box.....	35 42 41.1	88 43 12.0
Oakfield, 4.7 miles east of; in center of triangle at junction of Jackson-Spring Creek and Ashport roads, near northeast corner of Jackson quadrangle, iron post stamped "Prim. Trav. Sta. No. 32, 1906, Tenn".....	35 43 52.8	88 43 12.3
Oakfield, 3.8 miles east of; second-class T road north, 500 feet east of old gin house, center of east-west road.....	35 43 42.7	88 44 02.5
Poplar Creek, road south, center of bridge over creek.....	35 43 26.7	88 44 53.9

ALONG NASHVILLE, CHATTANOOGA AND ST. LOUIS RAILROAD.

Milepost P 140, 1,150 feet east of; second-class road crossing, center of track, 60 feet north to center of pike.....	35 36 37.4	88 44 21.6
Siding to log yard, second-class road crossing, center of track.....	35 36 26.4	88 42 06.7
Ranger, 900 feet west of station, road crossing, center of track.....	35 36 01.9	88 39 59.8
Beech Bluff, road crossing at west end of station, center of main track.....	35 35 47.0	88 38 02.2
Beech Bluff, 120 feet southeast of; at northeast corner of store of May & Diamond, iron post stamped "Prim. Trav. Sta. No. 33, 1906, Tenn".....	35 35 46.3	88 38 01.4
Beech Bluff, 1 mile east of station, second-class road crossing, center of track.....	35 35 42.2	88 37 03.2
Luray, west end of station, road crossing, center of main track.....	35 35 30.0	88 34 34.9
Luray, 2 miles east of station, second-class road crossing, north rail.....	35 35 25.9	88 32 29.8
Huron, road crossing at east end of station, center of main track.....	35 35 17.7	88 31 58.1
Huron, 1.2 miles east of; second-class road crossing 1,000 feet east of creek, center of track.....	35 36 01.0	88 31 11.8
Huron, 2.3 miles east of; road crossing, center of track....	35 36 53.5	88 30 26.3

BOLIVAR QUADRANGLE.

Magnetic declination: North border, $5^{\circ} 01'$ east.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
Lander's store, 1 mile northwest of; second-class road forks west and south, gate.....	35 29 39.5	88 57 49.6
Lander's store, 0.5 mile northwest of; Confederate monument on Britton Lane battlefield.....	35 29 24.9	88 57 31.1
Lander's store, T road west, oak tree.....	35 29 11.3	88 57 05.4
Lander's store, 1.2 miles east of; T road north, 5 mail boxes.....	35 28 32.3	88 55 58.3
New House, 4 corners, 35 feet northeast to log crib, 35 feet southeast to yard fence.....	35 29 21.7	88 55 28.4
Road forks west and northwest, 20 feet west to stump, 40 feet east to oak.....	35 29 14.5	88 54 35.7
Jackson-Bolivar road, 1.5 miles west of; road forks west and southwest, 50 feet west to oak.....	35 29 11.9	88 53 34.6
Mount Tabor Church, 0.75 mile south of; T road west.....	35 29 17.4	88 52 22.3
Mount Tabor Church, 0.75 mile south of; 3 miles north of Medon road, on east edge of Jackson-Bolivar road and stage road, at T road west, iron post stamped "Prim. Trav. Sta. No. 29, 1906".....	35 29 17.4	88 52 21.9
Road forks west and southwest, center of triangle.....	35 29 51.1	88 47 32.6
Road forks east and southeast, double dogwood and oak...	35 29 44.4	88 46 20.2
Pinson, 2.5 miles west of; second-class road fork northeast, 5 feet southeast to oak stump, 50 feet northeast to oak...	35 29 51.2	88 45 19.7

HENDERSON QUADRANGLE.

Magnetic declination: North border, $5^{\circ} 01'$ east.*Geographic positions.*

ALONG HIGHWAYS.

Station.	Latitude.	Longitude.
Pinson, 2 miles west of; road forks west and south, 15 feet north to small oak, 20 feet west to oak stump.....	35 29 32.4	88 44 57.7

ALONG MOBILE AND OHIO RAILROAD.

Pinson, 200 feet west of station, T street west.....	35 29 24.7	88 43 15.5
Pinson, 400 feet west of station, in angle at signpost at junction of Jackson-Pinson and Pinson-Lexington roads, about 200 feet west of Pinson-Lexington road crossing of the Mobile and Ohio Railroad, iron post stamped "Prim. Trav. Sta. No. 30, 1906, Tenn.".....	35 29 25.5	88 43 16.3
Pinson, 0.7 mile northwest of station; second-class road crossing, center of track.....	35 29 53.1	88 43 42.0

LEXINGTON QUADRANGLE.

Magnetic declination: Center, 4° 20' east.

Geographic positions.

ALONG NASHVILLE, CHATTANOOGA AND ST. LOUIS RAILWAY.

Station.	Latitude.	Longitude.
Life, 100 feet east of station, road crossing, center of main track.....	° ' " 35 36 51.6	° ' " 88 28 44.9
Life, 250 feet south of station, at northeast corner of store of R. M. Jordan, west of Juno-Stegall road, iron post stamped "Prim. Trav. Sta. No. 34, 1906, Tenn".....	35 36 49.5	88 28 45.4
Life, 1.5 miles east of station, road crossing 200 feet east of trestle 122.4, center of track.....	35 37 03.4	88 27 14.4
Milepost P 121, 400 feet west of; second-class road crossing, north rail.....	35 37 14.9	88 25 53.0
Hinson Springs, road crossing at station, center of track...	35 37 32.3	88 25 23.3
Lexington, 1,300 feet west of; road crossing, center of track.	35 38 35.2	88 24 02.6
Lexington, 200 feet north of station, in face of south wall at southeast corner of Enochs-Edenton Company's brick wholesale store, aluminum tablet stamped "Prim. Trav. Sta. No. 35, 1906, Tenn.".....	35 38 37.9	88 23 48.5
Lexington, 1.25 miles southeast of; second-class road crossing, 200 feet east of trestle 1.2, center of track.....	35 37 53.8	88 22 51.2
Warrens Bluff, 1.6 miles west of; road crossing, south rail..	35 37 12.2	88 20 43.6
Warrens Bluff, road crossing, at north end of siding, center of main track.....	35 36 51.8	88 19 21.4
Warrens Bluff, 1 mile east of; second-class road crossing, center of track.....	35 37 04.7	88 18 17.6
Chesterfield, 1.4 miles west of; second-class road crossing, center of track.....	35 37 37.0	88 17 31.3
Chesterfield, at west end of station, road crossing, center of track.....	35 38 04.9	88 16 05.3

DECATURVILLE QUADRANGLE.

Magnetic declination: Center, 5° 10' east; southeast border, 4° 03' east.

Geographic positions.

ALONG THE NASHVILLE, CHATTANOOGA AND ST. LOUIS RAILWAY, 1.25 MILES EAST OF CHESTERFIELD, TO PERRYVILLE.

Station.	Latitude.	Longitude.
Chesterfield, 1.25 miles east of; road crossing 800 feet east of Brown Creek, center of track.....	° ' " 35 37 58.7	° ' " 88 14 55.3
Darden, 0.8 mile west of station, 600 feet west of milepost 11-13, center of track.....	35 38 20.1	88 13 57.3
Darden, at west end of station; road crossing, center of main track.....	35 38 10.0	88 13 08.8

52752°—Bull. 440—10—37

Geographic positions—Continued.

ALONG THE NASHVILLE, CHATTANOOGA AND ST. LOUIS RAILWAY, 1.25 MILES EAST OF CHESTERFIELD, TO PERRYVILLE—continued.

Station.	Latitude.	Longitude.
Darden, 100 feet south of station, at northwest corner of store of C. E. McDaniel, east of Darden-Middlesburg road, iron post stamped "Prim. Trav. Sta. No. 36, 1906, Tenn.".....	35 38 09.5	88 13 08.9
Darden, 0.75 mile east of station, second-class road crossing, center of track.....	35 37 56.8	88 12 29.7
Beacon, 0.5 mile west of station, Henderson-Decatur county-line crossing.....	35 37 51.3	88 11 31.5
Beacon, road crossing, center of main track.....	35 37 42.1	88 11 04.2
Beacon, 0.9 mile east of station, road crossing, center of track.....	35 38 06.8	88 10 15.4
Parsons, 1.3 miles west of station, road crossing at milepost 16-8; center of track.....	35 38 33.7	88 09 04.2
Parsons, east end of station, center of main track.....	35 38 58.6	88 07 39.6
Parsons, 200 feet northeast of station, in south wall at southeast corner of brick store of L. A. Rains & Co. and Pythian Hall, aluminum tablet stamped "Prim. Trav. Sta. No. 37, 1906, Tenn.".....	35 38 59.6	88 07 39.8
Parsons, 0.7 mile east of station, center of trestle 18.1 over road.....	35 38 47.8	88 07 05.5
Parsons, 2 miles southeast of station, road crossing, center of track.....	35 37 46.6	88 06 05.4
Second-class road crossing, center of track.....	35 37 03.8	88 05 28.5
Milepost 22-2, 0.3 mile northwest of; second-class road crossing, center of track.....	35 36 28.8	88 04 50.3
Perryville, 1.25 miles northwest of; second-class road crossing, center of track.....	35 36 56.2	88 03 50.0
Perryville, at east end of station, street crossing opposite the Walnut Hill Hotel, center of track.....	35 37 08.4	88 02 25.5
Perryville, 150 feet southeast of station, at northeast corner of Walnut Hill Hotel, iron post stamped "Prim. Trav. Sta. No. 38, 1906, Tenn.".....	35 37 07.6	88 02 25.0

ALONG HIGHWAYS.

Perryville, 1.25 miles south of; road forks south and west, oak tree in forks.....	35 36 19.4	88 02 26.2
Perryville, 2.25 miles south of; roads at top of hill, 40 feet west to mail box.....	35 35 31.7	88 02 44.2
Perryville, 3.25 miles south of; 30 feet north of east-west road at T road north, oak tree.....	35 34 47.5	88 02 46.8
Three corners, T road north, beech tree in angle.....	35 34 23.6	88 01 58.4
Fishers Landing, about 0.75 mile west of; 500 feet southwest of white house, road forks northeast and northwest, 20 feet northeast to dead walnut, 60 feet southwest to broken-top oak.....	35 34 14.1	88 01 33.6
Four corners, crossroads, 25 feet east to oak, 10 feet west to oak, 15 feet southeast to mail box.....	35 33 32.8	88 00 54.3

Geographic positions—Continued.

ALONG HIGHWAYS—continued.

Station.	Latitude.	Longitude.
Brownsport Landing, 0.25 mile west of; road fork north-west and second-class road north, 20 feet northeast to double oak, 160 feet east to second-class road west.....	° ' " 35 32 59.7	° ' " 88 00 12.8
Cedar Creek Landing, large sweet-gum tree 50 feet west of southwest corner of store, halfway between store and boat landing.....	35 32 48.7	87 59 21.3
Kelleys Landing, south azimuth mark "U.S.W+E.G.S." cut on ledge of rock on east edge of road south, about 250 feet southeast of store, 150 feet south of dwelling, and almost in rear of small barn.....	35 31 50.20	87 58 29.90

Pikeville quadrangle.

BLEDSOE AND RHEA COUNTIES.

The following geographic positions were determined in 1908 by Oscar Jones. The line starts from Hinch triangulation station, follows highways south near east border of quadrangle to point on railroad about 5 miles northeast of Dayton; thence along railroad to Dayton and along highways to point on railroad at Sequatchie College; thence along railroad to Pikeville; thence along highways north and east near borders of quadrangle to starting point.

Magnetic declination: East border, 2° 36' east; south border, 2° 30' east; west border, 2° 24' east; north border, 2° 33' east.

PIKEVILLE QUADRANGLE.

Geographic positions.

ALONG HIGHWAYS NEAR EAST BORDER.

Station.	Latitude.	Longitude.
Hinch triangulation station, 12 miles northwest of Spring City, 3 miles west of Jewett, on narrow-gauge railroad, flat and wooded summit, in rock, Coast and Geodetic Survey mark (+).....	° ' " 35 46 52.67	° ' " 84 58 42.74
Litton fork of Pikeville-Low Gap road, 0.25 mile east of, 110 feet north of fork of road at end of stone wall, in limestone ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 2".....	35 44 12.5	85 01 46.4
Litton, 0.75 mile southeast of; road forks at blacksmith shop.....	35 43 29.6	85 01 22.4
Road fork.....	35 43 17.4	85 01 17.4
Low Gap, road fork on summit of Walden Ridge.....	35 42 42.5	85 00 28.0
Low Gap, 1 mile south of; crossroads.....	35 41 47.7	85 00 07.0
Road fork.....	35 41 09.5	85 00 56.1
Evansville-Frazier Spring, road fork.....	35 40 50.2	85 01 19.2
Frostbite School, center of road in front of schoolhouse...	35 40 00.2	85 01 56.3

Geographic positions—Continued.

ALONG HIGHWAYS NEAR EAST BORDER—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road fork.....	35 39 44.0	85 02 57.5
Beatty Gap-Evansville road forks.....	35 39 11.7	85 03 23.1
Evansville-Gannaway Gap road fork.....	35 38 50.8	85 02 35.9
Piney Creek-Evansville road, creek crossing.....	35 36 38.3	85 01 30.9
Evansville-Haworth road fork.....	35 35 33.4	85 01 16.6
Payne Spring, 0.25 mile north of; road fork at Laurel Creek.....	35 34 32.7	85 00 32.5
Payne Spring, 0.25 mile southeast of; road fork.....	35 33 57.8	85 00 10.3
Evansville-Low Gap road, center of Gooch Creek at old sawmill.....	35 33 45.8	84 59 27.4
Road fork.....	35 33 51.1	84 58 47.0
Evansville-Back Valley road fork.....	35 33 39.9	84 58 28.5
Evansville, 1 mile south of; Cincinnati, New Orleans and Texas Pacific Railway crossing, center of track.....	35 33 06.0	84 57 58.6

ALONG CINCINNATI, NEW ORLEANS AND TEXAS PACIFIC RAILWAY.

Road crossing.....	35 32 41.6	84 58 20.1
Evansville-Morgantown road crossing.....	35 31 06.5	85 00 03.0
North Dayton, center of track opposite center of station...	35 29 37.2	85 00 56.3

ALONG HIGHWAYS, MORGANTOWN TO COLLEGE STATION.

Morgantown, road fork.....	35 30 02.6	85 01 27.4
Morgan Spring-Granmore Cove road, forks.....	35 30 12.6	85 02 25.1
Road fork, signboard "0.13 mile to Cumberland Springs".....	35 31 22.7	85 02 25.2
Morgan Springs, forks of Ogden-Frazier road.....	35 31 51.4	85 03 08.0
Morgan Springs, forks of Ogden-Frazier Spring road, top of mountain, in sandstone ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 3".....	35 31 51.8	85 03 08.7
Road forks.....	35 31 24.9	85 03 52.4
Ogden-Loyd Gap road forks.....	35 31 01.9	85 05 18.4
Bethel Church, road fork.....	35 31 32.0	85 06 17.3
Road forks.....	35 32 13.1	85 06 44.4
Crossroads, 100 feet north of 12 mail boxes.....	35 31 57.6	85 08 12.4
Loyd Spring, 0.25 mile east of; crossroads.....	35 32 46.2	85 09 20.9
Loyd Gap-Brayton road forks.....	35 32 57.5	85 09 54.3
Loyd Gap-Pikeville road forks, foot of mountain.....	35 33 17.5	85 11 23.7
T road east, signboard "Dayton 15 miles, Pikeville 3 miles".....	35 33 42.6	85 12 15.7
T road west.....	35 32 26.3	85 12 43.5
T road west.....	35 31 42.9	85 13 50.3

Geographic positions—Continued.

ALONG HIGHWAYS, MORGANTOWN TO COLLEGE STATION—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Walker's store, 1 mile northeast of; crossroads at creek....	35 31 06.7	85 14 21.3
Walker's store, T road west.....	35 29 59.2	85 15 15.0
Crossroads at top of ridge between Walker's store and College station.....	35 30 31.1	85 16 10.2
College station, 150 feet southeast of; in limestone ledge under large oak tree, aluminum tablet stamped "Prim. Trav. Sta. No. 4".....	35 30 35.4	85 17 05.0

ALONG NASHVILLE, CHATTANOOGA AND ST. LOUIS RAILWAY.

College station, center of track opposite signal post.....	35 30 36.3	85 17 04.8
Sequatchie College, road crossing.....	35 31 20.3	85 16 32.4
Road crossing.....	35 31 44.7	85 16 12.3
Let station, 400 feet south of; road crossing.....	35 33 12.3	85 15 10.2
Schoolhouse, road crossing.....	35 34 06.4	85 14 20.8
Pikeville, center of track opposite telegraph window at station.....	35 36 28.4	85 11 45.4
Pikeville, 943 feet east of station, Spencer road crossing...	35 36 35.3	85 11 37.7

ALONG HIGHWAYS NEAR BORDERS.

Pikeville-Spencer road forks.....	35 37 24.3	85 12 32.6
Spencer, forks of Pikeville-Tiptop roads.....	35 37 51.2	85 12 29.8
Road fork.....	35 38 00.7	85 13 09.6
Glade Creek, road forks.....	35 38 56.4	85 14 12.8
Schoolhouse, 21 feet west to corner of; road to Pikeville...	35 39 32.5	85 13 30.5
Second-class road forks.....	35 40 40.4	85 14 44.0
Second-class road forks.....	35 42 31.3	85 15 01.2
Second-class road forks.....	35 43 55.2	85 14 43.9
Second-class road forks.....	35 44 21.7	85 14 41.3
Herbert, 0.3 mile south of; 2 miles north of Saratoga Springs, 35 feet east of bridge over branch, in limestone ledge, aluminum tablet stamped "Prim. Trav. Sta. No. 1".....	35 44 50.6	85 14 15.9
Road forks.....	35 43 44.6	85 12 51.1
Road forks.....	35 43 47.0	85 12 24.8
Beaverdam Creek, road forks.....	35 43 45.5	85 11 32.7
Pikeville-Winesap road forks.....	35 44 05.0	85 10 52.3
Farmingdale, 300 feet south of post-office, road forks.....	35 44 40.3	85 10 42.4
Road forks.....	35 44 25.2	85 09 55.6
Road forks.....	35 44 34.5	85 09 14.4
Crossroads to Big Springs and Grapevine.....	35 44 28.4	85 08 17.7
Road forks.....	35 43 56.1	85 07 23.5

Geographic positions—Continued.

ALONG HIGHWAYS NEAR BORDERS—continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Brown Gap-Grapevine road forks	35 44 13.2	85 06 18.8
Road fork	35 44 17.3	85 05 47.9
Pikeville, forks of Litton-Brown Gap road	35 43 29.2	85 05 11.7
T road east.....	35 43 30.9	85 04 28.9
Melvine, center of road, 75 feet west of church, 30 feet east of store.....	35 43 58.0	85 03 24.7
Tollett mill, 0.13 mile east of; crossroads.....	35 44 46.6	85 01 39.4

Hollow Springs, McMinnville, Manchester, and Wartrace quadrangles.**BEDFORD AND COFFEE COUNTIES.**

The following geographic positions were determined by Oscar Jones in 1908. The line starts at adjusted position near southwest corner of Woodbury quadrangle and follows highways near west and south borders of Hollow Springs quadrangle to Manchester; thence north through middle of Hollow Springs quadrangle back to starting point. Starting again at Manchester the line follows the Nashville, Chattanooga and St. Louis Railway northeast to border of quadrangle; thence north near east border, tying to adjusted position near southeast corner of Woodbury quadrangle.

HOLLOW SPRINGS QUADRANGLE.*Geographic positions along highways.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks.....	35 30 32.2	86 13 47.0
Road forks, 6 miles to Fairfield.....	35 30 44.7	86 13 32.0
Bancom schoolhouse, road forks.....	35 32 06.4	86 13 37.6
Road forks.....	35 32 47.4	86 14 44.0
Road forks.....	35 36 29.4	86 14 42.5
Murfreesboro and Manchester pikes, junction of.....	35 37 13.8	86 14 13.7
Road forks.....	35 44 04.1	86 14 15.0
Donnell Chapel, 0.5 mile west of; junction of Murfreesboro and Bradyville pikes.....	35 44 54.3	86 13 52.4
Donnell Chapel, crossroads.....	35 44 47.1	86 13 15.2
Murfreesboro, 50 feet north of center of Hollow Springs pike, 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
Bradyville, road forks.....	35 44 22.5	86 09 56.0
Bradyville, 0.8 mile southeast of; road forks.....	35 43 47.4	86 09 28.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Hopewell Church, 0.5 mile east of; road forks.....	35 41 57.6	86 09 37.3
Road forks on Dickins Ridge.....	35 41 10.1	86 08 44.0
Hollow Springs, 1.5 miles northwest of; road forks.....	35 40 53.8	86 08 23.7
Hollow Springs, forks of Manchester-Woodbury road.....	35 40 30.4	86 07 04.1
Cannon-Coffee road forks, at blacksmith shop, county line..	35 36 46.5	86 07 12.5
Hollow Springs, 3.5 miles south of; McMinnville, Shelbyville, Woodbury, and Manchester crossroads.....	35 37 35.3	86 05 51.8
Gooseneck Church, 1.3 miles north of; crossroads.....	35 36 24.6	86 05 26.9
Gooseneck Church, 300 feet east of; road forks, signboard to Noah.....	35 35 13.3	86 05 21.6
Sawmill, 400 feet north of; road forks.....	35 33 48.8	86 05 22.0
T road east.....	35 33 23.2	86 05 15.5
Crossroads, signboard to Woodbury.....	35 32 00.7	86 05 27.8
Road forks.....	35 31 01.5	86 05 15.8
Manchester, 2.5 miles northeast of; railroad and highway crossing.....	35 30 36.2	86 03 16.8
Sawmill, road crossing Forest Lumber Co. Railroad.....	35 31 13.1	86 02 26.8
Summitville, 0.8 mile southwest of; road crossing railroad..	35 33 00.8	86 00 01.5
Summitville, 1 mile northwest of; T road north.....	35 34 04.7	86 00 12.4
Road forks.....	35 34 08.4	86 00 49.7
T road south.....	35 34 49.7	86 01 03.2
Manchester-Jackson road forks.....	35 35 09.3	86 01 07.9
T road west.....	35 35 54.8	86 01 15.2
Crossroads.....	35 36 54.7	86 01 57.9
T road south.....	35 37 26.0	86 02 06.3
Road forks.....	35 38 06.9	86 02 20.9
Pocahontas log schoolhouse, crossroads.....	35 38 13.3	86 02 42.2
Road forks.....	35 39 06.7	86 02 33.5
Ivy Bluff churches, 50 feet east of well, crossroads.....	35 39 39.3	86 01 51.9
T road south.....	35 40 06.7	86 01 12.8
Creek crossing at mill.....	35 40 28.4	86 01 15.5
McMahan School, crossroads.....	35 41 01.7	86 00 52.0
Crossroads.....	35 43 21.5	86 01 08.7
Road forks.....	35 43 53.0	86 01 37.7
T road east.....	35 44 28.5	86 03 05.1

WOODBURY QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Doublestep schoolhouse, 300 feet north of; Woodbury, Manchester, and Short Mountain roads, 4 corners.....	35 45 04.1	86 03 19.6

MANCHESTER QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Duck River Bridge, east end of; ledge of limestone 15 feet north of abutment, tablet stamped "Prim. Trav. Sta. No. 1".....	35 29 40.8	86 06 12.4
Beech Grove-Wartrace road forks.....	35 29 54.3	86 06 36.8
T road east.....	35 29 50.9	86 07 35.9
Blanton store, crossroads.....	35 29 38.4	86 08 42.5
Blanton store, 1 mile west of; crossroads.....	35 29 46.6	86 09 41.8
Road forks.....	35 29 51.8	86 10 46.7
Riley Creek-Manchester road forks 5 feet north of R. D. Merton's mail box, in limestone ledge, tablet stamped "Prim. Trav. Sta. No. 2".....	35 29 29.9	86 12 55.2
Riley Creek Church, 1.3 miles west of; crossroads.....	35 29 50.2	86 14 04.0
T road east.....	35 29 54.3	86 05 19.4
Manchester, 0.25 mile from, road forks at north end of bridge over Little Duck River.....	35 29 11.6	86 05 25.6
Manchester, in front of signal tower at station, center of track of Nashville, Chattanooga and St. Louis Railway..	35 28 57.1	86 05 04.7
Manchester, 1 mile northeast of; road forks.....	35 29 46.2	86 04 24.3

WARTRACE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road fork.....	35 32 59.6	86 15 49.6
Road fork.....	35 33 37.2	86 16 24.5
Iron bridge over Garrison Fork, 250 feet west of west abutment, south of road, in limestone ledge, tablet stamped "Prim. Trav. Sta. No. 3".....	35 33 58.8	86 17 04.2
Fairfield, crossroads.....	35 33 59.9	86 17 07.6
Fairfield, 0.8 mile northeast of; road forks.....	35 34 22.7	86 16 38.6
Fairfield, 1.3 mile northeast of; road forks at creek.....	35 34 47.1	86 16 10.1
Road fork.....	35 35 04.2	86 15 42.2
Road fork.....	35 38 40.9	86 15 04.4
Road fork.....	35 39 13.2	86 15 33.4
Hoovers Gap, road forks.....	35 39 39.3	86 16 08.3
Hoover, road forks.....	35 40 06.9	86 16 32.5
Murfreesboro pike and Big Springs road, at D. F. Tubble's mail box.....	35 41 37.1	86 17 32.0
Carlocksville, 0.8 mile southwest of; crossroads.....	35 42 17.4	86 17 06.4
Carlocksville, road fork.....	35 42 37.4	86 16 23.0
Road fork.....	35 43 17.8	86 15 06.5

M' MINNVILLE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Summitville, 30 feet southwest of station, center of track and road crossing.....	° ' " 35 33 25.8	° ' " 85 59 27.6

TENNESSEE-GEORGIA-NORTH CAROLINA.

TRIANGULATION STATIONS.

Ducktown special quadrangle.

POLK COUNTY, TENN.; FANNIN COUNTY, GA.; CHEROKEE COUNTY, N. C.

In August, 1907, Oscar Jones extended triangulation from stations Pack and Cowpen so as to control the Ducktown special quadrangle. Besides reoccupying these two old stations, three new stations were selected, permanently marked and occupied.

COWPEN, FANNIN COUNTY, GA.

A station of the Coast and Geodetic Survey on the highest summit of the Cohutta Mountains. It is best reached from the east, as a buggy can be taken within 0.25 mile of station. The summit is covered (1907) with second-growth timber. Theodolite elevated 12 feet.

Station mark: A large flat rock marked "U.S.C.S.," with a hole 1 inch in diameter drilled in center.

[Latitude 34° 53' 23.21". Longitude 84° 34' 26.35'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rocky face.....	79 41 05.8	259 26 13.3	4. 605691
Chilhowee (4).....	170 35 24.7	350 33 47.4	4. 419569
Little Frog.....	211 46 25.9	31 51 43.7	4. 425864
Ducktown.....	223 56 10.9	44 02 21.6	4. 373478
Pack.....	235 49 52.6	55 59 46.7	4. 501706
Isabella.....	242 31 46.1	62 40 15.0	4. 404784
Blood.....	285 45 33.7	106 07 23.0	4. 782577

PACK, CHEROKEE COUNTY, N. C.

A station of the U. S. Geological Survey first established in 1883, on summit of Pack Mountain, 5 miles east northeast of Isabella mine.

Station mark: Dead signal tree.

586 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $35^{\circ} 03' 00.63''$. Longitude $84^{\circ} 17' 09.88''$].

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cowpen.....	55 59 46.7	235 49 52.6	4.501706
Ducktown.....	85 27 03.6	265 23 19.9	3.995827
Chilhowee (4).....	104 59 45.6	284 48 12.3	4.499915
Little Frog.....	111 44 04.8	291 39 27.7	4.118922
Haw Knob.....	219 21 31.9	39 30 30.4	4.570986
Tusquittah.....	258 10 54.9	78 30 13.4	4.716895
Blood.....	317 05 02.1	137 17 01.1	4.671646

DUCKTOWN, POLK COUNTY, TENN.

A high cleared knob 0.5 mile east of Ducktown station and 2 miles northwest of Ducktown Village. A good view can be had in all directions.

Signal: A tripod.

Station mark: Aluminum tablet cemented in center of top of marble post 30 by 8 by 8 inches set in ground.

[Latitude $35^{\circ} 02' 34.94''$. Longitude $84^{\circ} 23' 39.44''$].

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cowpen.....	44 02 21.6	223 56 10.9	4.373478
Little Frog.....	157 26 13.8	337 25 23.0	3.786808
Pack.....	265 23 19.9	85 27 03.6	3.995827
Isabella.....	310 55 39.7	130 57 51.4	3.908964

ISABELLA, POLK COUNTY, TENN.

On a round cleared knob 2 miles southeast of Isabella mine and 0.25 mile northwest of corners of Tennessee and North Carolina at Georgia state line. A good view can be had in all directions.

Signal: Trimmed tree with flag and target.

Station mark: Aluminum tablet cemented in a marble post set in ground.

[Latitude $34^{\circ} 59' 42.50''$. Longitude $84^{\circ} 19' 37.80''$].

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cowpen.....	62 40 15.0	242 31 46.1	4.404784
Ducktown.....	130 57 51.4	310 55 39.7	3.908964
Little Frog.....	142 20 06.9	322 16 54.9	4.141680

LITTLE FROG, POLK COUNTY, TENN.

On the flat, timbered, highest summit of Little Frog Mountain, 8 miles northwest of Ducktown.

Signal: A flag in one of two tall chestnut trees left standing after cutting timber on summit.

Station mark: Aluminum tablet cemented in a large boulder top flush with surface of ground, 2.8 feet north of signal tree.

[Latitude 35° 05' 38.36". Longitude 84° 25' 12.12"]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cowpen.....	31 51 43.7	211 46 25.9	4.425864
Pack.....	291 39 27.7	111 44 04.8	4.118922
Isabella.....	322 16 54.9	142 20 06.9	4.141709
Ducktown.....	337 25 23.0	157 26 13.8	3.786808

TEXAS.

PRIMARY TRAVERSE.

Boxelder, Daingerfield, Linden, and Mount Pleasant quadrangles.

BOWIE, MORRIS, RED RIVER, AND TITUS COUNTIES.

The following geographic positions on approximate United States standard datum were determined by F. J. McMaugh in 1908. The line starts at adjusted position at Greenhill and follows highways east along north border of Mount Pleasant quadrangle to Motley's gin, thence south along east border of Mount Pleasant quadrangle to Daingerfield, where it is tied to point at court-house.

For the control of the Daingerfield quadrangle the line starts at a bench mark set in T. B. Keaster's store building at Hughes Spring and follows highways east and northeast to primary traverse station No. 341, about 3.5 miles south of Cusseta on the Linden-Cusseta road. The line starts again at primary traverse station No. 248, 0.25 mile northwest of Bryans Mill post-office and follows highways west via Dalton and Naples to Motley's gin, where it ties to bench mark; thence north along highways to Avery, where it is tied to railroad crossing located in 1904 and 1905.

MOUNT PLEASANT QUADRANGLE.

Magnetic declination: North border, $7^{\circ} 55'$ east; east border, $7^{\circ} 53'$ east.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
Green Hill, at T road east near Paynes store, iron post stamped "Sta. 178".....	$33^{\circ} 14' 58.8''$	$94^{\circ} 59' 49.5''$
Green Hill, 1.3 miles east of; railroad crossing.....	$33^{\circ} 14' 28.4''$	$94^{\circ} 58' 42.1''$
Green Hill, 2.5 miles east of; road forks east and southeast..	$33^{\circ} 14' 00.0''$	$94^{\circ} 57' 35.3''$
Green Hill, 3.3 miles east of; intersection of Green Hill road with Mount Pleasant-Harts Bluff road, 33 feet north to northwest corner of fence, 22 feet southeast to southwest corner of fence, 45 feet east to north-south fence.....	$33^{\circ} 13' 51.6''$	$94^{\circ} 56' 49.9''$
Argo, 2.5 miles west of; intersection of T road with north-south road, 21 feet west of north-south wire fence, 32 feet north of southwest corner fence.....	$33^{\circ} 14' 20.7''$	$94^{\circ} 55' 40.4''$
Argo, 0.75 mile west of; intersection of T lane north with east-west road.....	$33^{\circ} 15' 03.1''$	$94^{\circ} 54' 31.5''$
Argo, in west face of brick chimney on west side of Bill Brown's house, aluminum tablet stamped "Prim. Trav. Sta. No. 1, 1908, Texas".....	$33^{\circ} 15' 13.9''$	$94^{\circ} 53' 34.8''$
Argo, 1.5 miles southeast of; T road north.....	$33^{\circ} 14' 31.3''$	$94^{\circ} 52' 58.9''$
Argo, 3 miles east of; crossroads north and south.....	$33^{\circ} 14' 36.9''$	$94^{\circ} 51' 32.7''$
Argo, 4.75 miles east of; T lane south.....	$33^{\circ} 14' 03.3''$	$94^{\circ} 50' 29.2''$
Mount Moriah Church, 3 miles west of; center of Bear Creek Bridge.....	$33^{\circ} 13' 59.3''$	$94^{\circ} 49' 15.9''$
Mount Moriah Church, 1.75 miles west of; road forks north-west and southwest.....	$33^{\circ} 13' 32.5''$	$94^{\circ} 48' 17.0''$
Mount Moriah Church, 0.5 mile west of; road forks south-west and west.....	$33^{\circ} 13' 32.4''$	$94^{\circ} 47' 14.3''$
Mount Moriah Church, 0.75 mile east of; 12 feet south of Mount Moriah-Naples and Omaha-Rocky Branch road crossing, 4 miles north of Omaha, iron post stamped "Prim. Trav. Sta. No. 2, 1908, Texas".....	$33^{\circ} 13' 32.9''$	$94^{\circ} 45' 54.0''$
Omaha, 2.4 miles north of; intersection of east-west and north-southeast roads, 13 feet southwest to northwest corner fence, 37 feet north to mail box 23, 47 feet southeast to stunted black-oak tree.....	$33^{\circ} 12' 19.5''$	$94^{\circ} 45' 44.1''$

DAINGERFIELD QUADRANGLE.

Magnetic declination: North border, $8^{\circ} 02'$ east; south border, $7^{\circ} 57'$ east; east border, $7^{\circ} 45'$ east; west border, $7^{\circ} 53'$ east.

Geographic positions along highways.

NEAR WEST BORDER.

Station.	Latitude.	Longitude.
Omaha, 1.1 miles north of; road forks north and northeast..	33 11 36.2	94 44 53.8
Omaha, railroad crossing, 60 feet west of station.....	33 10 48.1	94 44 44.0
Omaha, 1.4 miles southeast of; T lane north.....	33 09 52.7	94 43 46.7
Omaha, 2.5 miles southeast of; road forks south and southeast..	33 09 24.8	94 43 15.8
Omaha, 4 miles south of; 50 feet northeast of intersection of Omaha-Daingerfield and Naples roads, 500 feet south of Tom Everett's house, 0.25 mile north of J. M. Everett's house, iron post stamped "Prim. Trav. Sta. No. 3, 1908".....	33 08 23.6	94 42 29.0
Rocky Branch, 0.33 mile north of; road forks south and southeast.....	33 07 06.5	94 42 01.2
Rocky Branch, 1.5 miles south of; east of road, iron post..	33 05 24.0	94 42 36.4
Daingerfield, 3.5 miles north of; east-west crossroads.....	33 04 31.6	94 42 58.2
Daingerfield, 1.7 miles north of; road forks north and northwest.....	33 03 27.5	94 43 31.2
Daingerfield, 0.4 mile north of; east-west crossroad.....	33 02 26.9	94 43 31.6
Daingerfield, in west side of county court-house, center of fourth brick from northwest corner of building, 4 feet from ground, midway between window and northwest corner, Coast and Geodetic Survey bench mark, copper bolt.....	33 01 53.3	94 43 19.4

NEAR SOUTH BORDER.

Hughes Spring, Coast and Geodetic Survey bench mark, in west face of new part of brick building owned by T. B. Keaster, in double column where old and new parts join, 11 paces from northwest corner of building, in twenty-first tier of brick above concrete side walls, copper bolt..	32 59 51.4	94 37 52.5
Hughes Spring, 1.8 miles east of; road forks east and southeast.....	32 59 38.1	94 36 10.5
Hughes Spring, 2.8 miles east of; road forks north and east.....	32 59 37.5	94 35 10.3
Sardis, 0.8 mile west of; road forks east and southeast.....	32 59 50.0	94 33 11.0
Sardis, T road south.....	33 00 14.2	94 32 36.4
Sardis, 50 feet northwest of intersection of crossroads, on east side of old store, 20 feet east of north road, 45 feet north of east-west road, iron post stamped "Prim. Trav. Sta. No. 4, 1908".....	33 00 15.1	94 32 30.0
Sardis, 1.25 miles north of; fork to southeast in north-south road.....	33 01 23.8	94 32 38.1
Sardis, 2.75 miles northeast of; center of wooden bridge....	33 01 50.3	94 31 25.6
Jaybart, 15 feet southeast of; road forks east and northeast..	33 02 12.8	94 30 14.8
Jaybart, intersection of north-south road with T road east..	33 02 58.3	94 30 05.7
Jaybart, 1 mile north of; T lane west.....	33 03 38.7	94 30 18.4

Geographic positions along highways—Continued.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
Bryans Mill post-office, 0.25 mile northwest of; at intersection of T lane east, iron post stamped "Prim. Trav. Sta. No. 248".....	° ' " 33 14 15.2	° ' " 94 30 05.4
Bryans Mill, 1 mile west of; T lane north.....	33 13 42.7	94 30 48.4
Dalton, 3.5 miles east of; mail box 41.....	33 13 50.4	94 33 02.6
Dalton, 2.7 miles east of; road forks southwest and west...	33 13 36.7	94 33 38.5
Dalton, 0.86 mile east of; center of bridge over creek.....	33 12 36.1	94 34 58.6
Dalton, 0.4 mile east of; road forks east and northeast.....	33 12 19.2	94 35 13.7
Dalton, 1.4 miles west of; T lane north.....	33 12 12.4	94 36 59.3
Naples, 2.5 miles east of; T lane south.....	33 12 18.4	94 38 42.4
Naples, in front of station.....	33 12 11.2	94 40 48.2
Naples, 0.25 mile west of; 40 feet north of main track St. Louis Southwestern Railway, opposite switch stand, iron post stamped "Prim. Trav. Sta. No. 6, 1908".....	33 12 01.1	94 40 59.6
Naples, 1.5 miles northwest of; T road west.....	33 12 39.9	94 41 25.6
Naples, 2.8 miles west of; road forks west, northwest, and north.....	33 13 16.0	94 42 34.2
Naples, 3.75 miles northwest of; T lane north.....	33 13 45.3	94 43 03.9
Naples, 5.1 miles northwest of; center of bridge over Village Creek.....	33 14 18.8	94 43 51.7
Motley's gin, 1.5 miles east of; T road south.....	33 14 07.1	94 44 45.3
Motley's gin, bench mark 2.....	33 13 32.88	94 45 54.05

BOXELDER QUADRANGLE.

Magnetic declination: South border, 7° 55' east; east border, 7° 59' east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
Omaha, 6 miles north of; iron post stamped "Elev. 295 ft.".....	° ' " 33 15 15.0	° ' " 94 45 47.4
White Oak Creek, center of bridge over, opposite tree painted "255.7".....	33 16 25.8	94 45 33.2
Road forks north and west.....	33 16 59.0	94 45 24.2
Center of railroad right of way, road crossing.....	33 18 02.6	94 45 33.3
Sulphur Creek, 0.25 mile south of; 40 feet north of road forks, iron post stamped "Prim. Trav. Sta. No. 7, 1908, Texas".....	33 19 08.2	94 45 05.2
Sulphur Creek, rock crossing.....	33 19 22.1	94 45 03.8
Rock crossing, 1.7 miles northeast of; 25 feet east of north-south road, iron post stamped "Elev. 301".....	33 20 23.7	94 43 58.4
Sharp bend in road west, in front of white house.....	33 20 56.4	94 44 15.2
Road forks east and southeast, near twin mail-box stand..	33 21 33.6	94 44 47.0

Geographic positions along highways near east border—Continued.

Station.	Latitude.	Longitude.
Fifty feet north of road forks northeast and northwest, iron post.....	33 22 14.0	94 45 28.0
Road forks south and southwest.....	33 23 09.5	94 45 10.8
Cedar Creek, center of bridge over.....	33 23 30.6	94 45 20.2
Lydia, 3 miles south of; 40 feet north of road forks, at southwest edge of clearing, iron post stamped "Elev. 329".....	33 24 23.9	94 45 28.2
South edge of clearing, center of road, opposite telephone pole painted "Elev. 355 ft.".....	33 25 31.9	94 45 06.8
Lydia, 0.25 mile east of; 160 feet east of road forks northeast, east, and southeast, iron post stamped "Prim. Trav. Sta. No. 8, 1908".....	33 26 44.6	94 45 01.9
Road forks north and northwest.....	33 27 31.6	94 45 56.5
T lane, 70 feet south of small bridge.....	33 28 28.8	94 46 05.2
Church and schoolhouse, center of front of.....	33 29 37.2	94 46 02.4
Center of bridge over creek.....	33 30 42.2	94 46 02.4
T road south, 18 feet east to southeast corner fence, 18 feet northwest to clump of trees.....	33 31 40.4	94 46 00.1
Road forks southwest and south.....	33 32 18.1	94 46 49.0
Avery, 50 feet west of station, railroad crossing.....	33 32 58.1	94 46 50.2

LINDEN QUADRANGLE.

Magnetic declination: West border, 7° 45' east.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
Almira, 3.5 miles southwest of; intersection of T road south with Mount Pleasant-Linden road.....	33 04 30.9	94 29 24.8
Almira, 2.5 miles southwest of; center of railroad right of way at road crossing.....	33 04 33.6	94 28 22.0
Crossroads near old mill store, mail box 84.....	33 05 01.4	94 27 21.1
Almira, 50 feet west of intersection of T road south with east-west road, iron post stamped "Prim. Trav. Sta. No. 5, 1908. Elev. 357 ADJ '03".....	33 05 56.0	94 26 48.8
Almira, 0.75 mile northeast of; road forks east and northeast.....	33 06 23.4	94 26 09.2
Almira, 1.75 miles northeast of; intersection of Almira-Atlanta road with Linden-Cusseta road.....	33 06 33.2	94 25 23.0
Cusseta, 4 miles south of; at northeast corner of intersection of roads near Hickory Grove Cemetery, iron post stamped "Prim. Trav. Sta. No. 341. Elev. 400 ft.".....	33 07 08.8	94 25 18.6

UTAH.

TRIANGULATION STATIONS.

Iron Springs special quadrangle.

BEAVER AND IRON COUNTIES.

In the fall of 1905 Fred McLaughlin occupied seven new triangulation stations, based on Pioche and Tushar stations of the Coast and Geodetic Survey. The results of this work as heretofore published ^a are not correct and are superseded by the positions given herewith.

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: Triangulation tablet cemented in solid rock.

[Latitude $38^{\circ} 10' 33.57''$. Longitude $113^{\circ} 23' 28.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tushar.....			4. 9534284
Hot.....	302 40 35. 47	122 48 31. 30	4. 3487240
Peak.....	340 04 30. 49	160 11 29. 36	4. 6893173
Springs.....	358 02 38. 81	178 03 16. 27	4. 6399762
Iron.....			4. 7707540
Frisco.....	193 24 01. 31	13 27 54. 73	4. 5946790

FRISCO, BEAVER COUNTY, UTAH.

On Quartzite Hill, a high timbered peak 4 miles north of Frisco post-office.

Station mark: Triangulation tablet cemented in solid rock.

[Latitude $38^{\circ} 31' 14.10''$. Longitude $113^{\circ} 17' 12.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue.....	13 27 54. 73	193 24 01. 31	4. 5946788
Hot.....	349 10 42. 73	169 14 47. 24	4. 7095103
Tushar.....	278 05 10. 42	98 37 49. 63	4. 8874153
Granite.....			4. 6432764

^a Gannett, S. S., Results of primary triangulation and primary traverse, 1905-6, pp. 226-228.

GRANITE, BEAVER COUNTY, UTAH.

On the highest part of a 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 Coast and Geodetic Survey, called Milford Needle.

Station mark: Triangulation tablet cemented in solid rock.

[Latitude $38^{\circ} 22' 59.24''$. Longitude $112^{\circ} 48' 51.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tushar.....	263 18 49.83	83 33 49.33	4.5486284
Hot.....	42 18 04.51	222 04 36.02	4.6750857
Frisco.....			4.6432765

HOT, IRON COUNTY, UTAH.

On the southernmost and most prominent peak of the Hot Springs Mountains, about 15 miles northeast of Lund railroad station.

Station mark: Triangulation tablet set in stone and covered by a cairn 4 feet high.

[Latitude $38^{\circ} 04' 02.00''$. Longitude $113^{\circ} 10' 37.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Springs.....	28 51 02.76	208 43 46.43	4.5563142
Iron.....	20 17 23.34	200 10 09.53	4.6987596
Blue.....	122 48 31.30	302 40 35.47	4.3487240
Frisco.....	169 14 47.24	349 10 42.73	4.7095103
Granite.....	222 04 36.02	42 18 04.51	4.6750857
Tushar.....	239 29 18.03	59 57 43.25	4.8896770
Pioche.....	83 36 00.93	263 03 42.20	4.8880691
Peak.....	3 42 52.15	183 41 56.87	4.5313362

IRON, IRON COUNTY, UTAH.

On Iron Mountain, a prominent peak about 16 miles west-south-west from 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.

52752°—Bull. 440—10—38

[Latitude 37° 38' 41.01". Longitude 113° 22' 24.57'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Peak.....			4. 2992595
Springs.....			4. 1858920
Hot.....	200 10 09. 53	20 17 23. 34	4. 6987596
Pioche.....	122 38 03. 47	302 13 07. 29	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, under cairn.

[Latitude 37° 45' 41.89". Longitude 113° 12' 07.64'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Iron.....			4. 2992595
Hot.....	183 41 56. 87	3 42 52. 15	4. 5313362
Blue.....	160 11 29. 36	340 04 30. 49	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, under a cairn 4 feet high.

[Latitude 37° 46' 58.66". Longitude 113° 22' 27.58'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hot.....	208 43 46. 43	28 51 02. 76	4. 5563142
Iron.....			4. 1858920
Blue.....	178 03 16. 27	358 02 38. 81	4. 6399761
Peak.....			4. 1862739

WEST VIRGINIA.

TRIANGULATION STATIONS.

Elkins and Horton quadrangles.

RANDOLPH COUNTY.

In cooperation with the State the following geodetic positions were determined by primary triangulation in 1906-7, based on the old United States Geological Survey stations Rich and Bickles. Three new stations were added in the spring of 1906 by E. L. McNair, for the control of Elkins quadrangle, and one new station in Elkins quadrangle, two in Horton quadrangle, and one just south of Horton quadrangle were added in the fall of 1907 by D. H. Baldwin for the control of Horton quadrangle.

BICKLES, RANDOLPH COUNTY, W. VA.

On Bickles Knob on the southeast side of Cheat River, about 9 miles east of Elkins; summit of mountain well cleared.

Station mark: Bronze tablet cemented in a flat sandstone which was placed as near as could be in the position of old oak signal tree which has fallen down. A pile of stone was erected over the tablet.

[Latitude 38° 56' 03.4". Longitude 79° 43' 54.4".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wildell.....	11 10 32	191 08 35	4. 36616
Chenoweth.....	18 18 35	198 17 35	3. 86977
Rich No. 2.....	57 49 44	237 41 57	4. 32661
Rich.....	58 20 19	238 12 29	4. 326353
Bear Knob.....	105 54 26. 0	285 33 21. 6	4. 701012
Bolton.....	123 56 17	303 50 36	4. 19641
Laurel.....	161 31 35. 4	341 27 56. 0	4. 421288
Felton.....	187 44 59. 8	7 48 01. 3	4. 707488
Green.....	279 12 02. 4	99 22 54. 7	4. 403926
Brier Patch.....	284 16 12	104 24 12	4. 27893
Haines.....	300 23 21	120 29 08	4. 18823
Spruce.....	326 25 45. 0	146 33 13. 1	4. 494699
Pharis.....	337 07 26	157 11 21	4. 36681

BOLTON, RANDOLPH COUNTY, W. VA.

On a sharp bare knob of Rich Mountain, about 1 mile north of Elkins-Belington road across mountain. An excellent view east and west.

Station mark: Bronze tablet cemented in solid rock.

[Latitude $39^{\circ} 00' 47.6''$. Longitude $79^{\circ} 52' 56.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rich No. 2.....	13 40 16	193 38 08	4.31524
Rich.....	14 01 07	193 58 57	4.31225
Bickles.....	303 50 36	123 56 17	4.19641

BRIER PATCH, RANDOLPH COUNTY, W. VA.

(Not occupied.)

On summit of Brier Patch Mountain, which is covered with spruce-pine trees and loose rocks overgrown with moss. From Reynolds (Hazelwood station), Dry Fork Railroad, follow wagon road 2 miles east to clearing near divide; thence north 1 mile on foot through brier patch to summit.

Station mark: Bronze triangulation tablet cemented in triangular rock 4 feet on a side and over 2 feet deep lying just over northeast edge of summit level and 4 feet below summit.

Reference mark: A 60-penny nail driven in east side near base of large spruce-pine tree supporting the signal and 0.2 foot east of vertical under signal; distance 32.4 feet, true azimuth $55^{\circ} 15'$ from station.

[Latitude $38^{\circ} 53' 30.8''$. Longitude $79^{\circ} 31' 10.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pharis.....	29 21 39	209 17 35	4.28330
Wildell.....	51 49 29	231 39 33	4.46560
Haines.....	58 46 14	238 44 01	3.77746
Chenoweth.....	83 40 28	263 31 30	4.31976
Bickles.....	104 24 12	284 16 12	4.27893

CHENOWETH, RANDOLPH COUNTY, W. VA.

On bare summit of Chenoweth Mountain, and best reached by public road from Elkins via Chenoweth Creek 7.5 miles to Eli Taylor's; thence to second house beyond to gate swung on maple tree;

thence via private road and over sod south to summit. View toward the south is intercepted by a high woody mountain, known as Hawflat Knob.

Station mark: A bronze tablet set in small stone post.

Reference marks: (1) Center of trunk of prominent live-oak tree, 2.5 feet in diameter; distance 213.65 feet, true azimuth $92^{\circ} 25'$ from station. (2) Center of trunk of prominent dead oak tree, 1.4 feet in diameter, distance 261.93 feet, true azimuth $121^{\circ} 18'$ from station.

[Latitude $38^{\circ} 52' 15.3''$. Longitude $79^{\circ} 45' 31.0''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rich No. 2.....	74 43 58	254 37 12	4. 20949
Bickles.....	198 17 35	18 18 35	3. 86977
Brier Patch.....	263 31 30	83 40 28	4. 31976
Haines.....	272 47 58	92 54 42	4. 19458
Pharis.....	321 41 32	141 46 25	4. 26376

HAINES KNOB, RANDOLPH COUNTY, W. VA.

On the higher of two summits of Haines Knob, sparsely timbered, the one formerly published as Greggs Knob; reached by following Dry Fork Railroad south from Job one-half mile to iron highway bridge; thence west up small creek 1 mile to saddle; thence north to summit.

Station mark: Bronze triangulation tablet cemented in bed rock lying 1 foot below normal surface of ground, an area 2 feet square being exposed.

Reference mark: A $\frac{3}{4}$ -inch drill hole 2 inches deep in large boulder 4 by 7 by 3 feet on west edge of summit; distance 71.9 feet, true azimuth $64^{\circ} 9'$ from station.

[Latitude $38^{\circ} 51' 50.0''$. Longitude $79^{\circ} 34' 42.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pharis.....	17 26 27	197 24 35	4. 15495
Wildell.....	50 00 18	229 52 34	4. 36697
Chenoweth.....	92 54 42	272 47 58	4. 19458
Bickles.....	120 29 08	300 23 21	4. 18823
Brier Patch.....	238 44 01	58 46 14	3. 77746

PHARIS, RANDOLPH COUNTY, W. VA.

On a high knob (formerly known as High Knob) between Dry Fork and Gandy Creek, about 2 miles north of Osceola post-office, on land owned by P. H. & B. Pharis. Knob is covered with scattered, mostly dead, spruce trees; and station is about the center of highest level but near south edge of summit.

Station mark: Bronze triangulation tablet cemented in top of large embedded boulder 4 by 7 feet.

[Latitude $38^{\circ} 44' 27.9''$. Longitude $79^{\circ} 37' 39.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wildell.....	84 21 19	264 15 28	4. 13409
Chenoweth.....	141 46 25	321 41 32	4. 26376
Bickles.....	157 11 21	337 07 26	4. 36681
Haines.....	197 24 35	17 26 27	4. 15495
Brier Patch.....	209 17 35	29 21 39	4. 28330

RICH, RANDOLPH COUNTY, W. VA.

On a knob of Rich Mountain, the summit of which is partly cleared, about 3.5 miles (air line) a little south of west from Beverly, and about 2.5 miles south of the Beverly-Buckhannon road crossing the mountain.

Station mark: Tall dead oak stub.

Reference mark: A piece of iron gas pipe 2 feet long driven 18 inches in ground; distance 8.4 feet, azimuth $252^{\circ} 39'$.

[Latitude $38^{\circ} 50' 01.85''$. Longitude $79^{\circ} 56' 22.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Big Run.....	81 14 19	261 02 20	4. 447491
Bear.....	129 18 34	309 05 21	4. 593183
Bolton.....	193 58 57	14 01 07	4. 31225
Bickles.....	238 12 29	58 20 19	4. 326353
Wildell.....	310 36 57	130 42 49	4. 25224

RICH NO. 2, RANDOLPH COUNTY, W. VA.

On same knob, as former Rich station but farther southeast on a point from which the view toward the south and east is much better.

Station mark: Bronze tablet cemented in solid rock.

[Latitude 38° 49' 56.5". Longitude 79° 56' 18.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bolton.....	193 38 08	13 40 16	4. 31524
Bickles.....	237 41 57	57 49 44	4. 32661
Chenoweth.....	254 37 12	74 43 58	4. 20949
Wildell.....	310 23 44	130 29 34	4. 24793

WILDELL, RANDOLPH COUNTY, W. VA.

On a spur of Shavers Mountain on the east side of Cheat River, at the head of West Fork Greenbrier River, and about 1.5 miles north of Wildell station on Western Maryland Railroad. The summit commands views in all directions except toward north and west and intervening points.

Station mark: Bronze tablet cemented in solid rock.

[Latitude 38° 43' 44.1". Longitude 79° 47' 00.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rich No. 2.....	130 29 34	310 23 44	4. 24793
Rich.....	130 42 49	310 36 57	4. 25224
Bickles.....	191 08 35	11 10 32	4. 36616
Haines.....	229 52 34	50 00 18	4. 36697
Briar Patch.....	231 39 33	51 49 29	4. 46560
Pharis.....	264 15 28	84 21 19	4. 13409

Charleston, Clay, and Clendennin quadrangles.

CLAY AND KANAWHA COUNTIES.

In cooperation with the State, during the summer of 1907, D. H. Baldwin extended triangulation eastward from Coast and Geodetic Survey stations Holmes and Table Rock. Seven stations were occupied and three points were located by intersections.

BIG KNOB, KANAWHA COUNTY, W. VA.

On summit of a sharp knob cleared of timber, owned by Holley & Stevenson, of Charleston, W. Va., at head of Left Fork of Leatherwood Creek; reached best by level trail 2 miles along ridge northwest from Apgah post-office, at the head of Morris Creek. Station is about one-half mile directly west of the Lucas Ray Coal and Coke Company's plant on Morris Creek.

Station mark: Bronze triangulation tablet cemented in top of native sandstone about 3 feet in diameter.

Reference mark: A drill hole in top and near west edge of a native sandstone 4 by 6 feet; distance 13.55 feet, true azimuth $353^{\circ} 01'$ from station.

Signal: Trunk of tall lone chestnut-oak tree, 1 foot in diameter, at point 20 feet above ground; distance 24.50 feet, azimuth $92^{\circ} 10'$ from station.

[Latitude $38^{\circ} 26' 15.86''$. Longitude $81^{\circ} 19' 02.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Putney.....	17 17 24	197 15 13	4. 236430
Hickory.....	62 59 29	242 56 22	3. 913914
Holmes.....	87 30 58	267 20 41	4. 381783
Pilot.....	238 22 52	58 29 47	4. 278627
Pisgah.....	267 27 30	87 36 51	4. 340560
Schoonover.....	272 13 32	92 20 11	4. 191878
Vaughan.....	312 37 01	132 45 16	4. 420600
Bird.....	331 48 28	151 51 36	4. 192351
Apgah.....	316 33	.....	.....

HICKORY, KANAWHA COUNTY, W. VA.

Near the south end of the level summit of a timbered hill, east of Blue Creek and north of Laurel Fork, about 0.8 mile directly east of Coco post-office, on land belonging to Mr. Goshorn, of Charleston, W. Va. Station is reached from Coco by trail directly east.

Station mark: A sandstone post 33 inches long set 30 inches in ground, dressed about 9 inches square on top, in center of top of which is set a bronze triangulation tablet.

Reference marks: (1) Nail in west base of walnut stump 12.6 feet north. (2) Nail in north base of hickory signal tree 7.2 feet east.

[Latitude $38^{\circ} 24' 14.96''$. Longitude $81^{\circ} 24' 03.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Holmes.....	99 02 14	278 55 04	4. 229684
Big Knob.....	242 56 22	62 59 29	3. 913913
Bird.....	304 14 24	124 20 39	4. 249185

PISGAH, CLAY COUNTY, W. VA.

On the summit of Mount Pisgah, 3 miles south of court-house at Clay, on land owned by Holley & Stevenson, Charleston, W. Va. A first-class wagon road leads all the way to station. Summit is covered with small locusts about 20 feet high.

Station mark: Aluminum triangulation tablet cemented in top of sandstone post, 10 by 10 by 33 inches, dressed 8 inches square on top and sunk 30 inches in ground.

Signal: A tower for observer supporting signal pole and targets 1 foot east of mark, about 20 feet to platform; an inner tripod for instrument support about 24 feet high; all built of locust cut at station. A growing tree forms one leg of tower.

[Latitude 38° 26' 46.41". Longitude 81° 03' 59.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Vaughan.....	7 43 59	187 42 53	4. 278090
Bird.....	44 49 30	224 43 17	4. 315227
Schoonover.....	76 12 10	256 09 28	3. 815144
Big Knob.....	87 36 51	267 27 30	4. 340560
Pilot.....	147 43 38	327 41 12	4. 027230

SCHOONOVER, CLAY COUNTY, W. VA.

(Not occupied.)

On Schoonover Knob, 2 miles south of Yankeedam post-office, on land owned by J. F. Vanbibber. Summit is cleared except for scattered locusts and a timber lot on northwest end of summit level.

Station mark: A sandstone post, 10 by 10 by 33 inches, dressed 8 inches square on top; in the center of top is cemented a bronze triangulation tablet.

Signal: Ordinary tetrapod of rough locust.

[Latitude 38° 25' 55.78". Longitude 81° 08' 21.56".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bird.....	32 04 22	212 00 52	4. 189360
Big Knob.....	92 20 11	272 13 32	4. 191878
Pisgah.....	256 09 28	76 12 10	3. 815144
Vaughan.....	347 32 58	167 34 34	4. 246805

Fayetteville, Madison, Montgomery, and Peytona quadrangles.

BOONE, CLAY, FAYETTE, KANAWHA, LINCOLN, AND NICHOLAS COUNTIES.

In cooperation with the State, during the season of 1908 triangulation for control of quadrangles specified above was extended from stations Bird, Table Rock, Putney, and Vaughan, by R. H. Chapman, George T. Hawkins, C. B. Kendall, and P. W. McMillen. Besides reoccupying four old stations, thirteen new stations were occupied and permanently marked and one point was located by intersections.

COAL, BOONE COUNTY, W. VA.

Highest point on timbered ridge between Hopkins Fork and Coal River, 1.5 miles southwest of John Rippe's house, about 3 miles southeast of Orange post-office. Is best reached by trail up Gidds Branch to top of ridge between Coal River and Hopkins Fork; thence west along top of ridge.

Signal and station mark: White flag and targets in large chestnut tree about 80 feet from ground; over center of bronze tablet in sandstone 8 by 10 by 24 inches.

[Latitude $38^{\circ} 01' 30.30''$. Longitude $81^{\circ} 35' 43.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Whiteoak.....	130 56 20	310 52 46	4. 05014
Table Rock.....	174 38 18	354 37 35	4. 26047
Flynn.....	214 10 27	34 13 39	4. 13072

FOSTER, BOONE COUNTY, W. VA.

About 2 miles east of Foster post-office and about 6 miles nearly east of Danville, on top of sharp timbered peak about 2,000 feet south of where the Danville-Peytona road crosses divide between Rock and Drawdy creeks.

Signal: White and red targets in tree; distance 28.5 feet; true azimuth $334^{\circ} 42'$ from station mark.

Station mark: Bronze tablet cemented in large rock in place on north point of peak. Instrument set over tablet.

[Latitude $38^{\circ} 05' 45.17''$. Longitude $81^{\circ} 45' 06.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lick.....	88 37 12	268 32 46	4. 02238
Sugar Camp.....	135 58 47	315 53 07	4. 30946
Holly.....	181 49 20	1 49 27	3. 96206
Table Rock.....	229 22 46	49 27 50	4. 19868
Whiteoak.....	275 31 18	95 33 20	3. 72084

HOLLY, BOONE COUNTY, W. VA.

On timbered ridge at the headwaters of Whiteoak Branch of Coal River, River Fork, and Jimmy Fork of Fork Creek; 2.75 miles southwest of Cobbs post-office. On land owned by Thomas S. Braun, of Charleston, W. Va.

Signal and station mark: A white flag and target in small oak tree 4.5 feet north of aluminum tablet cemented in center of top of sandstone post 8 by 10 by 24 inches, set 20 inches in the ground.

[Latitude $38^{\circ} 10' 42.22''$. Longitude $81^{\circ} 44' 54.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Foster.....	1 49 27	181 49 20	3.96206
Lick.....	48 58 46	228 54 12	4.15664
Sugar Camp.....	110 50 26	290 44 18	4.18972
Table Rock.....	264 29 30	84 34 27	4.07024
Whiteoak.....	332 55 08	152 57 11	4.03565

LICK, BOONE COUNTY, W. VA.

On northeast end of heavily timbered ridge about 2 miles northwest of Danville on divide between Lick Creek and Lavender Fork.

Signal: Target on pole above large rock-oak tree.

Station mark: Bronze tablet in top of sandstone, 30 by 10 by 6 inches, set 24 inches in ground. Instrument set over tablet.

[Latitude $38^{\circ} 05' 36.70''$. Longitude $81^{\circ} 52' 18.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sugar Camp.....	166 12 32	346 10 59	4.18642
Holly.....	228 54 12	48 58 46	4.15664
Foster.....	268 32 46	88 37 12	4.02238

WHITEOAK, BOONE COUNTY, W. VA.

On high timbered ridge at the headwaters of Indian Creek, Orchard Branch, Mudlick Fork, and Burnside Branch, one-half mile east of trail leading from head of Indian Creek to Burnside Branch, about 1.75 miles southeast of Lewis. Land is owned by Stephenson & Holly, Charleston, W. Va., and is under lease to the Peytona Lumber Company.

Signal: Flag and targets in large rock-oak tree, 7 feet south of center of instrument, which was elevated 53 feet.

Station mark: Bronze "W. Va." tablet in sandstone, 8 by 10 by 24 inches, 46 feet west of signal.

[Latitude 38° 05' 28.69''. Longitude 81° 41' 31.36''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Foster.....	95 33 20	275 31 18	3. 72084
Holly.....	152 57 11	332 55 08	4. 03565
Table Rock.....	212 05 18	32 08 10	4. 10500
Flynn.....	256 33 04	76 39 54	4. 21793
Coal.....	310 52 46	130 56 20	4. 05014

BIRD, CLAY COUNTY, W. VA.

On summit of rocky knob known as Bird Knob on land of J. F. Brown, of Charleston, W. Va.; adjoining to east is property of J. R. Bird, who lives on Adonijah Fork of Big Sycamore Creek, about 0.8 mile northeast of station. Reached by a road and trail leading from Mr. Bird's residence.

High signal: A pole with targets and flag attached in top of tall red-oak tree 70 feet high, the signal tree of former survey; distance 62.5 feet, azimuth 250° 48' from station.

Low signal: A pole with targets and flag attached nailed against north side of trunk of dead chestnut tree, 35 feet high, which forms south leg of tower; distance 5.8 feet, azimuth 253° 00' from station.

Station mark: Bronze triangulation tablet cemented in 3-foot rock.

Reference marks: (1) A $\frac{3}{4}$ -inch hole drilled in top of large boulder on southeast slope of summit; distance 45.80 feet, true azimuth 322° 42'. (2) A $\frac{3}{4}$ -inch hole on top of another large boulder distant 37.28 feet, true azimuth 19° 23'.

[Latitude 38° 18' 50.63''. Longitude 81° 13' 59.59''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Evans.....	14 29 02	194 26 32	4. 39261
Table Rock.....	67 28 01	247 13 50	4. 558645
Putney.....	77 42 15	257 36 56	4. 106360
Holmes.....	112 01 49	291 48 24	4. 529989
Hickory.....	124 20 39	304 14 24	4. 249185
Big Knob.....	151 51.36	331 48 28	4. 192351
Schoonover.....	212 00 53	32 04 22	4. 189360
Pisgah.....	224 43 17	44 49 30	4. 315227
Vaughan.....	288 55 02	109 00 09	4. 104093
Page.....	329 48 38	149 53 02	4. 31500
Ford.....	353 27 43	173 29 23	4. 46258

EVANS, FAYETTE COUNTY, W. VA.

Knob on divide between Powellton Fork of Armstrong Creek and Big Right Fork of Loop Creek at head of Little Stop Hollow, 1.5 miles northeast of Powellton.

Signal: White flag and targets in top of 30-inch oak tree, 70 feet above ground, flags 4 feet northwest of center. Instrument on center, elevated 52 feet.

Station mark: Bronze triangulation tablet in sandstone, 8 by 10 by 24 inches, set 20 inches in ground, just south of signal tree.

[Latitude $38^{\circ} 05' 55.07''$. Longitude $81^{\circ} 18' 13.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Payne.....	6 41 26	186 40 57	3.98617
Graves.....	64 59 38	244 55 24	4.04440
Flynn.....	99 33 54	279 26 18	4.26103
Putney.....	163 22 52	343 20 11	4.34452
Bird.....	194 26 32	14 29 02	4.39261
Page.....	249 51 25	69 58 25	4.24636
Ford.....	297 20 42	117 24 42	4.02832

FAYETTEVILLE COURT-HOUSE, FAYETTE COUNTY, W. VA.

(Not occupied.)

Center of cupola of court-house at Fayetteville.

[Latitude $38^{\circ} 03' 12.53''$. Longitude $81^{\circ} 06' 14.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Page.....	175 08 35	355 08 11	4.04549
Rogers.....	267 26 28	87 30 09	3.94120

FORD, FAYETTE COUNTY, W. VA.

Highest point on divide between Loop and Laurel creeks, locally known as Ford Knob; about 1.5 miles due west of Mr. Amick's house, sawmill and gristmill at Dempsey, and 2 miles west of post-office at Dempsey. Land is owned by the Loop Creek Estates Company. Easily reached by road to coal mine; thence northwest along trail to old Ford farm. Signal is visible from Mr. Amick's house.

Signal: White flag and targets in trimmed hickory tree, about 30 feet above ground; distance 4 feet, true azimuth 238° from station mark.

Station mark: Bronze "W. Va." tablet cemented in sandstone, 24 by 8 by 8 inches, set 20 inches in ground.

[Latitude $38^{\circ} 03' 15.78''$. Longitude $81^{\circ} 11' 44.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Evans.....	117 24 42	297 20 42	4. 02832
Bird.....	173 29 23	353 27 43	4. 46258
Page.....	212 51 38	32 54 38	4. 11594
Rogers.....	268 57 58	89 05 02	4. 22446

PAGE, FAYETTE COUNTY, W. VA.

The highest point in region on ridge 1.5 miles a little west of north of town of Ansted, on ground owned by the Gauley Mountain Coal Company, under lease to Miles Scagg. It is about 200 feet north of highest point in cornfield and 0.25 mile west of Miles Scagg's house.

Signal: Pole with targets 2.5 feet south of center. Instrument elevated 59.5 feet over center, in tree tower and support for same.

Station mark: Bronze tablet in block of sandstone, 24 by 8 by 8 inches, set 20 inches in ground.

[Latitude $38^{\circ} 09' 11.40''$. Longitude $81^{\circ} 06' 53.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ford.....	32 54 38	212 51 38	4. 11594
Payne.....	48 31 21	228 23 53	4. 37378
Evans.....	69 58 25	249 51 25	4. 24636
Putney.....	123 33 58	303 24 16	4. 43806
Bird.....	149 53 02	329 48 38	4. 31500
Vaughan.....	186 51 04	6 51 46	4. 14082
Rogers.....	317 50 06	137 54 11	4. 15847
Fayetteville Court-house.....	355 08 11	175 08 35	4. 04549

PAYNE, FAYETTE COUNTY, W. VA.

Highest point of summit locally known as Payne Knob, on divide between waters of Paint and Armstrong creeks. It is 5 miles southwest of Page post-office, 4 miles southwest of Kincaid post-office, and 4 miles southeast of Mahan. Can be reached by trail from Kincaid.

Signal: White flag and targets in small chestnut tree 18 feet above ground and 3.5 feet southwest from center.

Station mark: One-inch drill hole 3 inches deep in sandstone 24 by 8 by 8 inches. Instrument not elevated.

Reference marks: (1) Spike in butt of target signal tree, 2.5 feet southwest from center. (2) Spike in locust stump 3 feet in diameter and 14 inches above ground, 2.8 feet north by west of center. (3) Spike in top of stump 4 inches in diameter and 10 inches above ground, 2.5 feet northwest of center.

[Latitude 38° 00' 42.92''. Longitude 81° 18' 59.32'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Graves.....	118 58 13	298 53 54	4. 00801
Evans.....	186 40 57	6 41 26	3. 98617
Page.....	228 23 53	48 31 21	4. 37378

ROGERS, FAYETTE COUNTY, W. VA.

On bare hill on ridge 1.5 miles east of Edmond post-office, and about 1.5 miles west of Winona post-office; on highest part of ridge directly in front of C. P. Rogers's house, 250 feet southwest of cemetery, on land owned by J. G. Rogers.

Signal: Tripod 9 feet high with white cloth and flag on center. Instrument on center.

Station mark: Sandstone block, 24 by 9 by 8 inches, set 18 inches in ground.

[Latitude 38° 03' 24.99''. Longitude 81° 00' 16.48'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fayetteville Court-house.....	87 30 09	267 26 28	3. 94120
Ford.....	89 05 02	268 57 58	4. 22446
Page.....	137 54 11	317 50 06	4. 15847

FLYNN, KANAWHA COUNTY, W. VA.

A high, timbered, flat-top knob on divide between Slaughter Creek and Laurel Fork of Long Bottom Creek, and 0.5 mile south of head of Wet Branch of Cabin Creek and 3.5 miles west of Eventon post-office, Fairfield station of Cabin Creek Branch of Chesapeake and Ohio Railway.

Signal: White flag and targets in oak tree about 75 feet above ground. Instrument elevated about 70 feet.

Station mark: Bronze tablet in sandstone, 24 by 10 by 6 inches, set 20 inches in ground, 8 feet south of middle of base of signal tree.

[Latitude 38° 07' 32.80''. Longitude 81° 30' 31.78'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coal.....	34 13 39	214 10 27	4. 13072
Whiteoak.....	76 39 54	256 33 04	4. 21793
Table Rock.....	126 52 44	306 48 48	4. 06474
Putney.....	212 36 36	32 41 32	4. 33403
Evans.....	279 26 18	99 33 54	4. 26103
Graves.....	314 01 40	134 04 02	4. 04433

GRAVES, KANAWHA COUNTY, W. VA.

Flat-top knob on spur of ridge between Cabin Creek and Paint Creek, 3 miles almost due west of Burnwell post-office and also 0.5 mile west of watershed and near head of Holly Hollow. It is just north of Burnwell-Cabin Creek trail and 0.5 mile west of two graves on ridge. Land is owned by William A. Ohley and others, Charleston, W. Va.

Signal: White flag and targets in chestnut-oak tree, 80 feet above ground, 4 feet south of instrument stand, which is on center and 64 feet above ground.

Station mark: Bronze "W. Va." tablet in sandstone, 30 by 8 by 8 inches, set 24 inches in ground about 5 feet west of base of signal tree.

[Latitude 38° 03' 23.05''. Longitude 81° 25' 04.79'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Table Rock.....	130 24 26	310 17 42	4. 35488
Flynn.....	134 04 02	314 01 40	4. 04433
Putney.....	188 06 15	8 07 49	4. 41715
Evans.....	244 55 24	64 59 38	4. 04440
Payne.....	298 53 54	118 58 13	4. 00801

PUTNEY, KANAWHA COUNTY, W. VA.

On highest point of a long, narrow, heavily timbered ridge locally known as Pack Ridge, between headwaters of Campbell Creek and Kelley Creek, 0.7 mile south of Putney and about 540 yards southwest along ridge trail from divide where ridge trail and trail to Mammoth intersect, on land of C. C. Lewis, of Charleston.

Reference mark: Center of base of tall white-oak signal tree; distance 117 feet, azimuth 9° from station.

Station mark: Bronze triangulation tablet in center of top of a sandstone post 33 inches long set 30 inches in ground, dressed 10 inches square.

[Latitude $38^{\circ} 17' 22.08''$. Longitude $81^{\circ} 22' 33.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Graves.....	8 07 49	188 06 15	4. 41715
Signal Target ^a	9 37 00	.....	1. 55737
Flynn.....	32 41 32	212 36 36	4. 33404.
Table Rock.....	61 53 19	241 44 26	4. 375333
Holmes.....	129 05 56	308 57 51	4. 387750
Big Knob.....	197 15 13	17 17 24	4. 236430
Bird.....	257 36 56	77 42 15	4. 106360
Vaughan.....	273 10 46	93 21 11	4. 389945
Page.....	303 24 16	123 33 58	4. 43806
Evans.....	343 20 11	163 22 52	4. 34452

^a Distance, 118.4 feet.

TABLE ROCK, KANAWHA COUNTY, W. VA.

A triangulation station of the Coast and Geodetic Survey, on the range of hills lying between two forks of Lens Creek, which flows into the Kanawha River at Brownstown; near the headwaters of the creek, about 7 miles from Brownstown station, on a long, very narrow, and steep ridge, cleared of trees.

Station mark: A small bottle set in cement 30 inches below surface beneath a sandstone block 6 by 6 by 30 inches, top marked "U.S.G.S." Four other blocks; each 30 inches long, are placed north, south, east, and west, in top of each of which is cut a cross and an arrow pointing to center. North block, distance 7.01 feet; south block, distance 6.97 feet; east block, distance 7.05 feet; west block, distance 6.98 feet.

[Latitude $38^{\circ} 11' 18.53''$. Longitude $81^{\circ} 36' 53.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Whiteoak.....	32 08 10	212 05 18	4. 10500
Foster.....	49 27 50	229 22 46	4. 19868
Holly.....	84 34 27	264 29 30	4. 07024
Sugar Camp.....	99 34 51	279 23 46	4. 42375
Holmes.....	184 06 48. 4	4 07 37. 3	4. 4258038
Creed.....	191 18 19. 0	11 20 22. 0	4. 3886600
Flynn.....	306 48 48	126 52 44	4. 06474
Graves.....	310 17 42	130 24 26	4. 35488
Ivy.....	346 14 43. 14	166 19 17. 01	4. 6607832
Coal.....	354 37 35	174 38 18	4. 26047

SUGAR CAMP, LINCOLN COUNTY, W. VA.

On bald knob about 6 miles nearly west of McCorkle, about 0.25 mile southwest of Train post-office, on land owned by J. A. Alley and about 300 yards southwest of his house.

Signal: Tripod of poles with white and red target.

Station mark: Bronze tablet in top of sandstone post, 30 by 12 by 16 inches, set 24 inches in ground. Instrument set under center of signal and over tablet.

[Latitude $38^{\circ} 13' 40.42''$. Longitude $81^{\circ} 54' 48.87''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Table Rock.....	279 23 46	99 34 51	4.42375
Holly.....	290 44 18	110 50 26	4.18972
Foster.....	315 53 07	135 58 47	4.30946
Lick.....	346 10 59	166 12 32	4.18642

VAUGHAN, NICHOLAS COUNTY, W. VA.

On a high ridge 4 miles east of Vaughan at head of Otter and Elk creeks and Lilly Branch and 2 miles south of Twentymile Creek. Reached best by trail up Road Fork to trail summit west of Sand Branch; thence south along crest to station.

Signal: Tower built against chestnut tree, platform 50 feet above mark; pole with targets and black and white flag rises to about 65 feet above and 1.5 feet northwest of mark.

Station mark: Bronze triangulation tablet cemented in top of sandstone post, 10 by 10 by 30 inches, dressed 8 inches square on top and sunk 26 inches in ground.

Reference mark: A $\frac{7}{8}$ -inch drill hole and letters "U S" cut in large boulder on west edge of summit, east of a spring; distance 169.72 feet, true azimuth from station 85° .

[Latitude $38^{\circ} 16' 36.71''$. Longitude $81^{\circ} 05' 44.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Page.....	6 52 17	186 51 35	4.14082
Putney.....	93 21 15	273 10 50	4.389945
Bird.....	109 00 09	288 55 02	4.104093
Big Knob.....	132 45 16	312 37 01	4.420600
Schoonover.....	167 34 34	347 32 58	4.246805
Pisgah.....	187 42 53	7 43 59	4.278090

WISCONSIN.

PRIMARY TRAVERSE.

Appleton, Chilton, Elo, Fond du Lac, Marblehead, Menasha, Oshkosh, St. Cloud, and Waupun quadrangles.

CALUMET, OUTAGAMIE, FOND DU LAC, AND WINNEBAGO COUNTIES.

The following geographic positions were determined in 1908 by J. R. Ellis. The line starts at Oshkosh and follows highways north and east to Appleton; thence east and south to Stockbridge triangulation station of the United States Lake Survey; thence along the east border of Menasha and Fond du Lac quadrangles and west along the south border of Fond du Lac quadrangle to Fond du Lac (East Base triangulation station); thence north to tie point at Oshkosh High School triangulation station.

OSKOSH QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
South Oshkosh, second track east of station.....	44 00 32.8	88 32 04.3
Oshkosh, center of draw, Chicago and Northwestern Railway bridge over Fox River.....	44 00 41.4	88 32 00.7
Oshkosh, track nearest to station.....	44 01 06.5	88 31 53.0
Oshkosh High School triangulation station, iron screw set in upper end of the shaft forming the axis of the winding stairway ^a	44 01 13.76	88 32 27.34
T. 18 N., R. 16 E., northeast corner sec. 14, T street east at southwest corner of ball park.....	44 02 22.0	88 32 33.0
T. 18 N., R. 16 E., corner sec. 2, crossroads.....	44 04 06.4	88 32 34.5
Winnebago County Insane Asylum, center of water tower..	44 04 41.6	88 31 41.0
T. 19 N., R. 16 E., northeast corner sec. 35, crossroads....	44 04 58.7	88 32 35.5
Vineland, T. 19 N., R. 16 E., northeast corner sec. 26, crossroads.....	44 05 51.2	88 32 35.6
Winnebago, 2.25 miles north of post-office, near Faber's creamery, iron post stamped "Prim. Trav. Sta. No. 7, 1908".....	44 06 41.8	88 31 22.9
T. 19 N., R. 16 E., northeast corner sec. 12, crossroads....	44 08 28.4	88 31 24.0
T. 19 N., R. 16 E., northeast corner sec. 1, crossroads.....	44 09 22.8	88 31 24.5
T. 20 N., R. 16 E., northeast corner sec. 36, dressed stone..	44 10 15.1	88 31 24.6
T. 20 N., R. 16 E., northeast corner sec. 25, T road north..	44 11 07.3	88 31 24.5
T. 20 N., R. 16 E., northeast corner sec. 24, crossroads at schoolhouse and creamery.....	44 11 59.6	88 31 24.8
T. 20 N., R. 16 E., northeast corner sec. 13, T road west....	44 12 52.0	88 31 25.6
T. 20 N., R. 16 E., northeast corner sec. 12, crossroads....	44 13 44.3	88 31 27.3
T. 20 N., R. 16 E., northeast corner sec. 1, T road south....	44 14 38.8	88 31 28.4

^a Height of tower about 80 feet. Reference marks: Two stones near corners of school yard on northeast side. One of these is N. 5° 57' E., and is 246.65 feet distant; the other is N. 52° 14' E., distant 238.02 feet.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 20 N., R. 17 E., northwest corner sec. 6, at corner of fence, 33.3 feet southeast of center of road, at T road south, iron post stamped "Prim. Trav. Sta. No. 8, 1908".	° ' " 44 14 38.5	° ' " 88 31 28.1
T. 21 N., R. 17 E., quarter corner south side of sec. 31, T road north.....	44 14 38.9	88 30 24.1

APPLETON QUADRANGLE.

Geographic positions, southwest corner of quadrangle east to Appleton.

Station.	Latitude.	Longitude.
	° ' " 44 15 31.2	° ' " 88 29 47.1
T. 21 N., R. 17 E., northeast corner sec. 31, crossroads....	44 15 30.9	88 28 32.4
T. 21 N., R. 17 E., northeast corner sec. 32, crossroads....	44 15 31.6	88 27 20.5
Appleton, in west part of; Spencer street crossing Chicago and Northwestern Railway.....	44 15 30.8	88 25 20.1
Appleton, St. Lawrence College triangulation station.....	44 15 39.30	88 23 58.0
Appleton, east line city limits, square stone in center of road.....	44 15 03.1	88 22 29.9

MENASHA QUADRANGLE.

Magnetic declination: West and north borders, 2° 50' east; east border, 2° 45' east.

Geographic positions along highways near borders.

Station.	Latitude.	Longitude.
Stockbridge triangulation station, about 2 miles northwest of town of Stockbridge, and 1,000 feet back from shore of Lake Winnebago, nearly due east of a brick manufactory on the lake shore, drill hole ^a	° ' " 44 06 16.28	° ' " 88 19 25.31
Stockbridge, 2 miles north of; T road east.....	44 05 58.2	88 17 56.4
Berkenmeyer cheese factory, 0.25 mile west of; at crossroads.....	44.06 02.3	88 16 16.5
T. 20 N., R. 18 E., northeast corner sec. 5, T road at blacksmith shop.....	44 14 38.2	88 21 46.6
T. 21 N., R. 18 E., southeast corner sec. 31, T road north, Outagamie-Calumet county line.....	44 14 38.0	88 21 15.6
T. 21 N., R. 18 E., southeast cornerstone sec. 32, T road north.....	44 14 37.2	88 20 02.9
T. 21 N., R. 18 E., southeast corner sec. 33, T road north..	44 14 36.6	88 18 50.2
T. 20 N., R. 18 E., northeast corner sec. 2.....	44 14 36.2	88 18 10.5
T. 21 N., R. 18 E., southeast corner sec. 34.....	44 14 35.9	88 17 37.6
T. 20 N., R. 18 E., northeast corner sec. 1, T road south...	44 14 35.5	88 16 59.2
T. 21 N., R. 18 E., southeast corner sec. 35, T road north..	44 14 35.2	88 16 24.6

^a Station mark: A hole drilled in a large fragment of limestone rock which lies 1½ feet below surface. In the bottom of hole in rock two copper cents are placed; directly above was placed a rough stone with a hole drilled in its upper surface, and a pile of small stones was laid around it. A granite boulder bears N. 34° 15' E., and is 99.85 feet distant from geodetic point.

CHILTON QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T road west.....	° ' " 44 06 03.5	° ' " 88 14 11.0
T road north.....	44 03 32.0	88 13 41.6
T. 18 N., R. 19 E., northeast corner sec. 16, T road north..	44 02 13.0	88 13 23.1
T. 18 N., R. 19 E., quarter corner north side of sec. 15, T road south.....	44 02 13.3	88 12 47.0
T. 18 N., R. 19 E., northeast corner sec. 21, T road south..	44 01 20.8	88 13 22.4
T. 18 N., R. 19 E., southeast corner sec. 21, at cheese factory, iron post stamped "Prim. Trav. Sta. 10, 1908"....	44 00 28.9	88 13 22.2
T. 18 N., R. 19 E., northeast corner sec. 28.....	44 00 28.6	88 13 21.8
T road south.....	44 00 01.4	88 13 51.1
T. 20 N., R. 19 E., 25 feet south and 25 feet east of northeast corner sec. 5, T road south, iron post stamped "Prim. Trav. Sta. No. 9, 1908".....	44 14 33.9	88 14 36.0
T. 20 N., R. 19 E., northeast corner sec. 8, crossroads.....	44 13 38.6	88 14 37.3
T. 20 N., R. 19 E., northeast corner sec. 17, crossroads....	44 12 46.8	88 14 37.5
T. 20 N., R. 19 E., northeast corner sec. 20, crossroads at school.....	44 11 54.9	88 14 37.5
Sherwood, 60 feet east of station, road crossing of Chicago, Milwaukee and St. Paul Railway.....	44 10 52.2	88 15 11.3
Sherwood, 1 mile east of station; north-south road crossing Chicago, Milwaukee and St. Paul Railway.....	44 10 35.4	88 14 02.7
T. 20 N., R. 19 E., northeast corner sec. 32, T road north..	44 10 11.8	88 14 39.7
T. 19 N., R. 19 E., northeast corner sec. 5, T road east.....	44 09 19.3	88 14 39.6
T. 19 N., R. 19 E., northeast corner sec. 8, crossroads.....	44 08 27.3	88 14 40.4
T road north at creamery.....	44 07 19.7	88 14 42.2
T road west.....	44 06 03.5	88 14 11.0

ST. CLOUD QUADRANGLE.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
Chas. and H. Wagner's mail box, T road west.....	° ' " 43 58 45.8	° ' " 88 14 07.7
Brothertown township house, T road north.....	43 58 12.6	88 14 07.6
Center of bridge over creek north.....	43 57 43.4	88 13 17.3
T road north.....	43 57 07.5	88 12 40.1
Crossroads 870 feet south of county line.....	43 56 07.6	88 13 19.0
Marytown, 1 mile west of; crossroads, northeast corner sec. 28, T. 17 N., R. 19 E.....	43 55 15.6	88 13 19.8
St. Mary's Catholic Church.....	43 54 42.3	88 12 12.6
T. 17 N., R. 19 E., northeast corner sec. 33, crossroads.....	43 54 23.8	88 13 19.6
T. 17 N., R. 19 E., southeast corner sec. 33, T road north....	43 53 31.8	88 13 20.4

Geographic positions along highways near west border—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south.....	43 53 31.6	88 12 44.6
T. 16 N., R. 19 E., near northeast corner sec. 9, 64 feet northeast of barn, east of north-south road, in top of mound, iron post stamped "Prim. Trav. Sta. No. 11, 1908".....	43 52 36.3	88 13 21.3
Wolf Lake to Spruce Lake, bridge over branch connecting..	43 51 53.8	88 13 10.6
St. Joseph Catholic Church, spire.....	43 51 16.6	88 11 13.6
T road east.....	43 51 33.5	88 12 44.0
T. 16 N., R. 19 E., northeast corner sec. 21.....	43 50 54.3	88 13 18.8
T. 16 N., R. 19 E., northeast corner sec. 28, crossroads....	43 50 02.1	88 13 18.4
T 16 N., R. 19 E., quarter corner east side of sec. 29, T road north at Mount Calvary.....	43 49 36.2	88 14 29.5

FOND DU LAC QUADRANGLE.

Magnetic declination: East and west borders, $2^{\circ} 55'$ east; south border, $3^{\circ} 05'$ east.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road west.....	43 48 44.0	88 15 04.1
T. 15 N., R. 19 E., quarter corner north side of sec. 5, T road south.....	43 48 18.0	88 15 04.8
Crossing of north-south and northwest-southeast roads.....	43 46 57.1	88 15 03.7
T. 15 N., R. 19 E., northeast corner sec. 18, church and cheese factory, crossroads.....	43 46 34.1	88 15 39.0
T. 15 N., R. 19 E., northeast corner sec. 19, T road east.....	43 46 41.6	88 15 38.4
Dotyville, T road west at hotel.....	43 45 15.4	88 15 38.6

MARBLEHEAD QUADRANGLE.

Geographic positions along highways near north border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dotyville, east of T road west, just north of Catholic church, iron bench mark post.....	43 44 56.4	88 15 38.5
T. 15 N., R. 18 E., northeast corner sec. 25, T road south..	43 44 48.7	88 16 50.5
T. 15 N., R. 18 E., northeast corner sec. 26.....	43 44 49.3	88 18 03.6
T. 15 N., R. 18 E., northeast corner sec. 27.....	43 44 49.4	88 19 14.5
T. 15 N., R. 18 E., northeast corner sec. 28, T road east...	43 44 50.2	88 20 27.0
T. 15 N., R. 18 E., northeast corner sec. 33, T road north..	43 43 58.1	88 20 26.7
T. 15 N., R. 18 E., northeast corner sec. 32.....	43 43 58.6	88 21 38.4
T. 15 N., R. 18 E., northeast corner sec. 31.....	43 43 58.9	88 22 51.3

Geographic positions along highways near north border—Continued.

Station.	Latitude.	Longitude.
Lake Derryville, just east of; 450 feet south of road forks, 8 feet east of fence line, west of north-south road, in concrete post 26 by 7 by 5 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 13, 1908".....	° ' " 43 43 58.8	° ' " 88 23 22.2
Road forks.....	43 43 24.9	88 23 13.4
T road east.....	43 43 07.1	88 24 05.9
T. 14 N., R. 17 E., northeast corner sec. 2, T road east.....	43 43 07.4	88 25 18.4
T. 14 N., R. 17 E., quarter corner east side of sec. 2, T road west.....	43 42 41.2	88 25 18.2
Hamilton, 1.33 miles north of station; east-west road crossing, Wisconsin Central Railway.....	43 42 42.4	88 27 26.4
Fond du Lac, East Base triangulation station, NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 4, Byron township, station mark ^a	43 42 39.76	88 28 41.27
North-south road crossing, Chicago and Northwestern Railway.....	43 43 41.8	88 29 32.4
Center of T road east.....	43 44 27.3	88 29 32.3

^a Station mark: Intersection of two lines cut in the upper surface of a brass frustum leaded in the upper end of a stone post, 8 inches square by 5 feet long, its upper end 4 feet below surface. Two similar stones are set, one north and one south of the geodetic point, each 4.4 meters distant and 4 feet below surface. Directly over the stone marking the geodetic point is a stone of the usual form rising to within a foot of the surface of the ground. A stone in the road north of the station bears N. 11° 45' W., and is 99.59 meters distant. A second stone bears N. 78° 02' E., and is 27.5 meters distant from the geodetic point.

WAUPUN QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 15 N., R. 17 E., northeast corner sec. 30, crossroads. . . .	° ' " 43 44 54.0	° ' " 88 30 08.8
T. 15 N., R. 16 E., near northeast corner sec. 25, iron post stamped "Prim. Trav. Sta. No. 5, 1908".....	43 44 53.9	88 31 25.0
T. 15 N., R. 16 E., northeast corner sec. 25, crossroads.....	43 44 54.1	88 31 24.7

ELO QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 15 N., R. 16 E., northeast corner sec. 24, crossroads. . . .	° ' " 43 45 46.4	° ' " 88 31 25.2
T. 15 N., R. 16 E., northeast corner sec. 13, crossroads. . . .	43 46 38.3	88 31 25.5
T. 15 N., R. 16 E., northeast corner sec. 12, crossroads.....	43 47 30.5	88 31 26.2
T. 15 N., R. 16 E., northeast corner sec. 1, T road.....	43 48 23.8	88 31 27.3
T. 16 N., R. 16 E., northeast corner sec. 36, T road east	43 49 15.8	88 31 27.4
T. 16 N., R. 16 E., northeast corner sec. 25, T road east. . . .	43 50 07.8	88 31 27.6
T. 16 N., R. 16 E., northeast corner sec. 24, crossroads. . . .	43 50 59.8	88 31 27.4
T. 16 N., R. 16 E., northeast corner sec. 13, crossroads. . . .	43 51 52.3	88 31 26.7

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Van Dyne, 1 mile west and 0.33 mile south of station; in southwest retaining wall of bridge at crossroads, aluminum tablet stamped "Prim. Trav. Sta. No. 6, 1908" . . .	° ' " 43 52 44.8	° ' " 88 31 26.0
T. 16 N., R. 16 E., northeast corner sec. 12.	43 52 44.6	88 31 25.8
T. 16 N., R. 16 E., northeast corner sec. 1, crossroads.	43 53 37.4	88 31 26.2
T. 17 N., R. 16 E., northeast corner sec. 36, crossroads.	43 54 29.5	88 31 25.8
T. 17 N., R. 16 E., northeast corner sec. 25.	43 55 21.9	88 31 25.3
T. 17 N., R. 16 E., northeast corner sec. 24, crossroads at school.	43 56 14.0	88 31 25.4
T. 17 N., R. 16 E., northeast corner sec. 13, crossroads.	43 57 06.2	88 31 24.8
T. 17 N., R. 16 E., northeast corner stone sec. 12, T road north.	43 57 58.6	88 31 24.2
T road east on township line.	43 58 52.1	88 31 50.9
Electric railroad at road crossing.	43 59 15.5	88 32 04.4

Juneau, Stoughton, Waterloo, and Watertown quadrangles.**DANE, DODGE, JEFFERSON, AND ROCK COUNTIES.**

The following geographic positions were determined by J. R. Ellis in 1908. The line for Juneau and Watertown quadrangles starts at adjusted position of primary-traverse station No. 18, 1904, and follows highways south near borders of quadrangles, tying to church spire at Watertown and to primary-traverse station No. 11, 1904, near southwest corner of Watertown quadrangle.

The positions in Stoughton and Waterloo quadrangles result from a continuation of the line from Janesville northward to Elba.

JUNEAU QUADRANGLE.

Magnetic declination: West border, 3° 30' east; north border, 3° 52' east.

*Geographic positions along highways.***NEAR SOUTHWEST BORDER.**

Station.	Latitude.	Longitude.
Clyman, Prim. Trav. Sta. No. 18, 1904.	° ' " 43 18 50.5	° ' " 88 43 07.3
T. 10 N., R. 15 E., northeast corner sec. 29, crossroads.	43 18 50.5	88 44 04.1
T. 10 N., R. 15 E., northeast corner sec. 32, T road west.	43 17 58.1	88 44 05.8
T. 9 N., R. 15 E., northeast corner sec. 5, T road west, 35 feet east to corner fence post.	43 17 05.7	88 44 07.3
T. 10 N., R. 15 E., quarter corner east side of sec. 8, east of T road west, 0.25 mile south of schoolhouse No. 7, in limestone 36 by 12 by 8 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 15, 1908".	43 15 46.1	88 44 03.8
T. 9 N., R. 15 E., northeast corner sec. 17.	43 15 19.9	88 43 59.2

Geographic positions along highways—Continued.

NEAR NORTH BORDER.

Station.	Latitude.	Longitude.
T. 12 N., R. 15 E., northeast corner sec. 33, center of crossroads.....	° ' " 43 28 24.5	° ' " 88 42 12.8
T. 12 N., R. 15 E., northeast corner stone, sec. 34.....	43 28 24.8	88 41 00.9
T. 11 N., R. 15 E., northeast corner sec. 2.....	43 27 32.1	88 39 50.9
East-west road crossing, Chicago, Milwaukee and St. Paul Railway.....	43 27 11.9	88 38 48.1
Horicon, center of crossing of Main and Hobart streets, at New York Hotel.....	43 27 05.9	88 37 47.3
T. 11 N., R. 16 E., northeast corner sec. 5.....	43 27 29.9	88 36 05.8
Horicon, 2 miles east by 0.5 mile north of; near southwest corner sec. 33, 25 feet west and 35 feet south to center of crossroads, in top of limestone 32 by 10 by 9 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1908".....	43 27 30.0	88 35 45.9
T. 11 N., R. 16 E., northeast corner sec. 4.....	43 27 29.2	88 34 55.2
T. 12 N., R. 16 E., southeast corner sec. 33.....	43 27 29.2	84 34 52.8
Center of T road north.....	43 27 28.8	88 34 16.7
T. 12 N., R. 16 E., quarter corner north side of sec. 34....	43 28 21.0	88 34 16.1
Mayville, 1 mile south and 1 mile west of; T road south, 10 feet northeast to white-oak tree.....	43 28 42.2	88 34 15.9
Mayville, 1 mile south of; east-west road crossing Chicago, Milwaukee and St. Paul Railway.....	43 28 46.7	84 33 18.4
T. 12 N., R. 16 E., quarter corner east side of sec. 25, center of crossroads.....	43 28 44.3	88 31 17.0

WATERTOWN QUADRANGLE.

Magnetic declination: West border, 3° 3' east.

Geographic positions along highways near west border.

Station.	Latitude.	Longitude.
Section line crossing Chicago and Northwestern Railway at north side of cemetery.....	° ' " 43 12 43.5	° ' " 88 44 02.8
Watertown, in west part of; Catholic Church spire.....	43 11 40.6	88 43 43.4
T. 8 N., R. 15 E., northeast corner sec. 5, Dodge-Jefferson county line.....	43 11 51.5	88 44 00.8
East-west road crossing, 860 feet south of bridge.....	43 09 46.2	88 44 43.0
Ebenezer Lutheran Church; center of crossroads.....	43 08 18.6	88 44 15.4
T. 8 N., R. 15 E., northeast corner sec. 29.....	43 08 18.6	88 44 04.8
Johnson Creek, 2.5 miles north and 2 miles east of post-office, 10 feet east and 20 feet south of crossroads, in concrete post 40 by 8 by 6 inches; aluminum tablet stamped "Prim. Trav. Sta. No. 16, 1908".....	43 06 59.4	88 43 52.1
T. 7 N., R. 15 E., northeast corner sec. 8.....	43 05 39.2	88 44 10.2

Geographic positions along highways near west border—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 7 N., R. 15 E., northeast corner sec. 17.....	43 04 46.6	88 44 12.8
T. 7 N., R. 15 E., northeast corner sec. 20.....	43 03 53.8	88 44 14.5
T. 7 N., R. 15 E., northeast corner sec. 29.....	43 03 01.2	88 44 16.3
T. 7 N., R. 15 E., northeast corner sec. 32, center of T road west.....	43 02 08.7	88 44 19.2
T. 7 N., R. 15 E., southeast corner sec. 32.....	43 01 14.9	88 44 20.8
T. 6 N., R. 15 E., northeast corner sec. 5.....	43 01 14.9	88 44 21.6
Center of T road north.....	43 00 39.9	88 45 50.4
Prim. Trav. Sta. No. 11, 1904.....	43 00 16.5	88 46 57.2

STOUGHTON QUADRANGLE.

Geographic positions along highways near east border.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Janesville, 2.75 miles northeast of; crossroads.....	42 43 12.2	88 59 47.6
T. 3 N., R. 12 E., northeast corner of sec. 13.....	42 43 48.0	89 00 46.8
T. 3 N., R. 12 E., northeast corner of sec. 12.....	42 44 40.3	89 00 47.6
T. 3 N., R. 12 E., northeast corner sec. 1, center of crossroads.....	42 45 36.7	89 00 48.6
T. 4 N., R. 12 E., northeast corner sec. 36, crossroads.....	42 46 29.2	89 00 48.3
T. 4 N., R. 12 E., northeast corner sec. 25, crossroads at school No. 2.....	42 47 21.8	89 00 48.0
T. 4 N., R. 12 E., northeast corner sec. 24.....	42 48 14.4	89 00 47.4
Newberg, center of center span of bridge over Rock River.	42 49 47.4	89 01 17.0
T. 4 N., R. 12 E., northeast corner sec. 1, Rock-Dane county line.....	42 50 51.3	89 00 48.0
T. 5 N., R. 12 E., near center sec. 23, 35 feet west and 57 feet north of crossing of gravel roads, iron post stamped "Prim. Trav. Sta. 1, 1908".....	42 53 02.0	89 02 21.5
North line sec. 23, center of north-south road.....	42 53 27.6	89 02 24.1
T. 5 N., R. 12 E., quarter corner north side of sec. 14, crossroads.....	42 54 20.2	89 02 33.2
T. 5 N., R. 12 E., northeast corner sec. 14.....	42 54 20.7	89 01 57.7
T. 5 N., R. 12 E., quarter corner north side of sec. 11, crossroads.....	42 55 12.6	89 02 33.4
Hillside Creamery, crossroads.....	42 56 05.5	89 02 33.7
Schmidt's Church, just east of; center of T road west.....	42 57 07.4	89 02 32.6
T. 6 N., R. 12 E., quarter corner north side of sec. 23, T road south.....	42 57 49.9	89 02 32.8
Rockdale, tall steel weather-vane tower.....	42 58 20.2	89 01 52.8
Rockdale, 1.3 miles northwest of; T road west.....	42 58 41.7	89 02 07.0

WATERLOO QUADRANGLE.

Geographic positions along highways.

Stations.	Latitude.	Longitude.
Cambridge, in west part of; at northeast corner of T road north, iron bench mark post stamped "Prim. Trav. Sta. No. 2, 1908".....	43 00 08.9	89 01 14.7
T. 6 N., R. 12 E., quarter corner north side of sec. 1, T road west.....	43 01 24.3	89 01 19.3
T. 7 N., R. 13 E., northwest corner sec. 31, Dane-Jefferson county line, T road east.....	43 02 16.7	89 00 42.1
T. 7 N., R. 12 E., northeast corner sec. 25, Dane-Jefferson county line.....	43 03 09.3	89 00 40.8
T. 7 N., R. 12 E., northeast corner stone sec. 24, at southeast corner of cemetery.....	43 04 01.6	89 00 40.2
T. 7 N., R. 12 E., northeast corner sec. 13, crossroads, county line.....	43 04 54.0	89 00 40.4
T road north, "Waterloo, 7 miles, Lake Mills 5 miles"....	43 05 00.3	88 59 32.7
T. 7 N., R. 13 E., northeast corner sec. 18.....	43 04 54.9	88 59 32.7
T. 7 N., R. 13 E., northeast corner sec. 6, square-dressed stone.....	43 06 38.8	88 59 33.6
T. 8 N., R. 13 E., northeast corner sec. 31, T road west....	43 07 31.5	88 59 32.4
T road west, at east side of north-south road, iron post stamped "Prim. Trav. Sta. No. 3, 1908".....	43 08 10.7	88 59 31.0
T. 8 N., R. 13 E., northeast corner sec. 30.....	43 08 23.8	88 59 30.6
T. 8 N., R. 13 E., northeast corner sec. 18, T road west....	43 10 08.9	88 59 26.5
Waterloo, northeast corner sec. 7, T. 8 N., R. 13 E., center of crossing of Maine and an east-west street.....	43 11 01.4	88 59 24.8
T. 8 N., R. 13 E., northeast corner sec. 6, crossroads, Jefferson-Dodge county line.....	43 11 51.7	88 59 24.2
T. 9 N., R. 13 E., northeast corner sec. 31, crossroads....	43 12 44.2	88 59 24.5
Crossroads in northeast part of sec. 20.....	43 14 20.9	88 58 30.4
T. 9 N., R. 13 E., northeast corner sec. 18, 60 feet north and 20 feet west of T road north, iron post stamped "Prim. Trav. Sta. No. 4, 1908".....	43 15 21.5	88 59 24.4
T. 9 N., R. 13 E., northeast corner sec. 5.....	43 17 06.0	88 58 13.9
Danville, center of iron bridge over creek.....	43 19 09.7	88 57 14.0
Elba, 500 feet east of station, road crossing of south track Chicago, Milwaukee and St. Paul Railway.....	43 19 58.4	88 56 11.5
Elba, track opposite telegraph window.....	43 19 59.3	88 56 18.1

WYOMING.

TRIANGULATION STATIONS.

Arvada, Fort McKinney, and Sheridan quadrangles.

JOHNSON AND SHERIDAN COUNTIES.

In the fall of 1908 R. B. Robertson extended triangulation eastward from stations Prairiedog and Buffalo for the purpose of locating a point on the one hundred and sixth meridian, the boundary line between Crook and Sheridan counties. Twelve stations were occupied, and one point was located by intersections.

Positions are given on approximate United States standard datum as derived through a belt of triangulation extending from Morrison and Table Mound stations of the Coast and Geodetic Survey near Denver, Colo. Distances depend on the nearest measured base at Ranchester, Wyo., and azimuths on the meridian line established with an astronomic transit at Sheridan. A check azimuth was observed at Rail station and differs from that computed through the triangulation by 5.6 seconds. By referring to the following list it will be noted that Wildhorse is 12.3 feet west, Sand 539.7 feet west, and Rail 1,526 feet west of the one hundred and sixth meridian.

BERRY, JOHNSON COUNTY, WYO.

On the divide between Clear Creek and Crazy Woman Creek, about 1.5 miles southwest of Berry's place. Road from Clearmont to Josh Berry's ranch passes about 0.5 mile east of station, which is in sight from this road after its descent on Crazy Woman side.

Signal: Lumber tripod 7 feet high.

Station mark: Stone with a $\frac{1}{2}$ -inch drill hole for center placed in ground level with surface.

[Latitude $44^{\circ} 30' 38.25''$. Longitude $106^{\circ} 21' 35.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Haley.....	48 10 51.66	228 07 55.62	3. 8722239
Prairiedog.....	108 05 22.90	287 48 41.84	4. 5198596
Clear.....	151 55 36.78	331 50 30.89	4. 3095028
Cadiz.....	209 12 28.36	29 18 13.35	4. 3458454
White.....	235 43 28.89	55 48 30.05	4. 0593945

BUFFALO, JOHNSON COUNTY, WYO.

On a grassy point on east-west ridge, about 4 miles north of Buffalo and 3 miles south of Lake De Smet; $2\frac{1}{2}$ miles east of Sheridan-Buffalo stage road.

Station mark: Standard iron bench-mark post.

[Latitude $44^{\circ} 24' 53.25''$. Longitude $106^{\circ} 41' 33.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Azimuth.....	5 04 27.74	185 04 05.30	3.9049104
McKinney.....	$\left\{ \begin{array}{l} a \ 34 \ 57 \ 34.36 \\ b \ 34 \ 58 \ 02.87 \end{array} \right.$	$\left\{ \begin{array}{l} a \ 214 \ 53 \ 40.64 \\ b \ 214 \ 54 \ 09.10 \end{array} \right.$	$\left\{ \begin{array}{l} 4.1114789 \\ 4.1114584 \end{array} \right.$
Tensleep.....	b 61 46 22.30	b 241 29 00.70	4.5743590
Cloud Peak.....	b 84 45 13.80	b 264 25 02.95	4.5851407
Shell.....	b 123 47 10.45	b 303 41 39.91	4.0987021
Banner.....	b 137 58 13.68	b 317 48 15.32	4.4489394
Prairiedog.....	b 166 21 40.71	b 346 18 59.87	4.3315864
Accident.....	a 325 54 38.70	a 145 58 31.65	4.1196789
Cross H.....	$\left\{ \begin{array}{l} b \ 354 \ 21 \ 26.45 \\ a \ 354 \ 21 \ 03.57 \end{array} \right.$	$\left\{ \begin{array}{l} b \ 174 \ 22 \ 17.18 \\ a \ 174 \ 21 \ 52.97 \end{array} \right.$	$\left\{ \begin{array}{l} 4.2141446 \\ 4.2141414 \end{array} \right.$
Clear.....	210 20 47.29	30 29 41.56	4.5212404
Haley.....	254 43 33.36	74 54 35.84	4.3360828

^a Fort Steele azimuth.

^b Sheridan azimuth.

HALEY, JOHNSON COUNTY, WYO.

On a prominent peak at the head of one fork of Double Crossing Draw, about 0.5 mile north of the divide between Clear and Crazy Woman creeks. A road leaves the Buffalo-Clearmont road between the two crossings of Clear Creek, about 6 miles from Clearmont. This road leads to Crazy Woman Creek, passes about 0.75 mile east of station and again about 0.75 mile south of station, from which passing points signal is in sight.

Signal: A tripod 7 feet high made of poles.

Station mark: Aluminum triangulation tablet cemented in a stone and placed in ground level with surface.

[Latitude $44^{\circ} 27' 57.21''$. Longitude $106^{\circ} 25' 46.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buffalo.....	74 54 35.84	254 43 33.36	4.3360828
Prairiedog.....	120 25 21.47	300 11 36.97	4.4780738
Clear.....	169 57 43.92	349 55 34.44	4.3676602
Berry.....	228 07 55.62	48 10 51.66	3.8722239

CADIZ, SHERIDAN COUNTY, WYO.

About 4 miles southeast of Cadiz and about 5 miles northwest of Arvada; on the highest point of range of hills lying between Cadiz and Arvada, around the foot of which the railway between these two stations is built.

Signal: A tripod made of poles.

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude $44^{\circ} 41' 04.98''$. Longitude $106^{\circ} 13' 24.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White.....	6 03 13.78	186 02 30.24	4.1128644
Berry.....	29 18 13.35	209 12 28.36	4.3458454
Clear.....	86 17 05.42	266 06 13.58	4.3109714
Leiter.....	108 33 30	288 20 58	4.39478
Powder.....	259 18 00.07	79 24 37.69	4.1018658
Wildhorse.....	279 49 59.03	99 59 24.45	4.2548869
Tincom.....	294 23 56.01	114 31 23.55	4.1878821

CLEAR, SHERIDAN COUNTY, WYO.

On a rocky peak on the divide between Town Draw and Pinhead Gulch. Follow road up Town Draw from Clearmont about 4 miles; thence cross the creek and ascend divide to station on the most prominent point in the vicinity. North and west from here the country is higher.

Signal: A tripod about 7 feet high covered with black and white cloth.

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude $44^{\circ} 40' 20.98''$. Longitude $106^{\circ} 28' 51.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buffalo.....	30 29 41.56	210 20 47.29	4.5212404
Prairiedog.....	70 28 49.92	250 17 13.55	4.3653034
Leiter.....	161 11 52	341 10 11	3.98834
Cadiz.....	266 06 13.58	86 17 05.42	4.3109714
White.....	301 05 13.03	121 15 20.67	4.3481125
Berry.....	331 50 30.89	151 55 36.78	4.3095028
Haley.....	349 55 34.44	169 57 43.92	4.3676602

LEITER, SHERIDAN COUNTY, WYO.

(Not occupied.)

On a high peak near the head of Whitmeyer Draw; not the best point in the vicinity, but a 10-foot monument already in place was utilized. Take road from Clearmont up Whitmeyer Draw into the "U+" pasture, belonging to the Joe Leiter estate, at or a little above the corral, follow dim right-hand road until station is seen a little to right of road.

Signal and station mark: A cairn 10 feet high.

Reference mark: Aluminum triangulation tablet cemented in stone in place, compass bearing S. 80° E. 10 feet from station.

[Latitude 44° 45' 19.48". Longitude 106° 31' 14.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Prairiedog.....	47 47 19	227 37 22	4.40248
Cadiz.....	288 20 58	108 33 30	4.39478
Clear.....	341 10 11	161 11 52	3.98834

POWDER, SHERIDAN COUNTY, WYO.

On a sharp peak about 5 miles northeast of Arvada, on peak nearest Powder River in range of hills lying between the river and North Fork, Wildhorse Creek.

Signal: A lumber tripod 7 feet high.

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude 44° 42' 20.64". Longitude 106° 04' 00.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White.....	42 14 52.78	222 07 32.72	4.3129353
Cadiz.....	79 24 37.69	259 18 00.77	4.1018658
Wildhorse.....	315 45 54.84	135 48 43.53	3.8795013
Sand.....	331 36 35.45	151 39 18.96	4.0328491
Rail.....	342 33 07.47	162 35 41.33	4.2072733
Tincom.....	349 37 31.60	169 38 22.49	3.9475425

PRAIRIEDOG, SHERIDAN COUNTY, WYO.

On south end of high point on divide between Prairiedog and Piney creeks, at head of Murphy Gulch. A road from Prairiedog Creek and Big Red (former post-office) crosses ridge 0.5 mile north of station.

Station mark: Bronze triangulation tablet cemented in solid rock.

[Latitude 44° 36' 08.76''. Longitude 106° 45' 22.57'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McKinney.....	4 13 33.92	184 12 20.47	4.4987622
Banner.....	90 05 05.62	269 57 47.37	4.1387356
Beckton.....	124 29 27.56	304 17 11.73	4.4461406
McCormick.....	131 23 21.52	311 17 06.05	4.1953394
George.....	152 28 45.96	322 23 31.18	4.3283742
Buffalo.....	346 18 59.87	166 21 40.71	4.3315864
Clear.....	250 17 13.55	70 28 49.92	4.3653034
Berry.....	287 48 41.84	108 05 22.90	4.5198596
Haley.....	300 11 36.97	120 25 21.47	4.4780738
Buffalo.....	346 18 59.87	166 21 40.71	4.3315864

RAIL, SHERIDAN COUNTY, WYO.

About 2 miles southeast of Lariat (Chicago, Burlington and Quincy Railroad), about 5½ feet inside of right-of-way fence east of track, 49.5 feet north (or east) of the east rail of railway (at right angles to the rail). This station is 1,526 feet west of the one hundred and sixth meridian.

Signal: A pole with two targets (wired to nearest fence post to station as a finder).

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

Reference marks: A wooden post marked on northwest side "Sheridan Co." and on southeast side "Crook Co.," 4.4 feet from station, true azimuth 232° 51', surrounded by a small pile of red rock, about 1 foot inside of fence east of railroad.

[Latitude 44° 34' 02.49''. Longitude 106° 00' 21.08'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tincom.....	154 07 02.85	334 05 19.92	3.8693904
Tincom (observed).....	154 07 08.5		
Powder.....	162 35 41.33	342 33 07.47	4.2072733
Sand.....	182 55 14.74	2 55 24.30	3.7704086

SAND, SHERIDAN COUNTY, WYO.

About 7 miles from Arvada, on the ridge between Wildhorse Creek and Middle Fork of Wildhorse Creek, 1 mile north of house in gulch on south side of ridge, about 1 mile S. 15° W. of the first house up Middle Fork from where the two creeks join. The main

road up Wildhorse Creek on the north side of railway passes about 0.75 mile southwest of station, which is 539.7 feet west of the one hundred and sixth meridian.

Signal: A 4 by 4 inch pole, braced.

Station mark: Aluminum bench-mark tablet cemented in flat solid sandstone in a patch of sand.

[Latitude 44° 37' 13.19". Longitude 106° 00' 07.46''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rail.....	2 55 24.30	182 55 14.74	3.7704086
Tincom.....	102 21 39.34	282 19 46.80	3.5581793
Powder.....	151 39 18.96	331 36 35.45	4.0328491
Wildhorse.....	182 15 59.05	2 16 04.17	3.6088148

TINCOM, SHERIDAN COUNTY, WYO.

About 3 miles S. 65° E. from Arvada, on a flat knob overlooking the Chicago, Burlington and Quincy Railroad where the railroad curves around the point of hill, about 0.5 mile southwest of railroad. Tincom Butte bears N. 76° W. about 1 mile. This station was established for special work, and the view from it is limited, especially southward.

Signal: Lumber tripod.

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude 44° 37' 38.23". Longitude 106° 02' 47.67''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White.....	67 09 20.70	247 01 10.11	4.2235042
Cadiz.....	114 31 23.55	294 23 56.01	4.1878821
Powder.....	169 38 22.49	349 37 31.60	3.9475425
Wildhorse.....	228 18 21.73	48 20 19.43	3.6939515
Sand.....	282 19 46.80	102 21 39.34	3.5581793
Rail.....	334 05 19.92	154 07 02.85	3.8693904

WHITE, NEAR LINE OF JOHNSON AND SHERIDAN COUNTIES, WYO.

On a sharp badland peak, with white sand bluff to the southwest; at the head of one prong of Cottonwood Creek, but with drainage all to Cottonwood or Crazy Woman creeks (not to Clear Creek). A dim road leads from Clearmont up No. 2 Draw to divide between

Clear Creek and Crazy Woman Creek. Station is about 2 miles south of point where this road reaches said divide and about the same distance from the head of No. 2 Draw. Road from Clearmont to Donald Thomson's ranch and thence east along the summit passes close to station, but is several miles longer than the first-mentioned road.

Signal: Lumber tripod 7 feet high.

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude $44^{\circ} 34' 07.21''$. Longitude $106^{\circ} 14' 26.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Berry.....	55 48 30.05	235 43 28.89	4. 0593945
Clear.....	121 15 20.67	301 05 13.03	4. 3481125
Cadiz.....	186 02 30.24	6 03 13.78	4. 1128644
Powder.....	222 07 32.72	42 14 52.78	4. 3129353
Wildhorse.....	242 45 12.58	62 55 20.94	4. 3317770
Tincom.....	247 01 10.11	67 09 20.70	4. 2235042

WILDHORSE, SHERIDAN COUNTY, WYO.

About 6 miles nearly N. 2° E. of Arvada and about 5 miles N. 20° E. of Lariat; on a three-pointed peak overlooking Wildhorse Creek, between Middle and North forks of Wildhorse Creek, close to the Crook-Sheridan county line; 12.3 feet west of the one hundred and sixth meridian.

Signal: Lumber tripod 7 feet high.

Station mark: Aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude $44^{\circ} 39' 24.70''$. Longitude $106^{\circ} 00' 00.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sand.....	2 16 04.17	182 15 59.05	3. 6088148
Tincom.....	48 20 19.43	228 18 21.73	3. 6939515
White.....	62 55 20.94	242 45 12.58	4. 3317770
Cadiz.....	99 59 24.45	279 49 59.03	4. 2548869
Powder.....	135 48 43.53	315 45 54.84	3. 8795013

WYOMING-IDAHO.

TRIANGULATION STATIONS.

Cora, Crowheart, Fremont Peak, Grand Teton, Greys River, Gros Ventre, Hoback, Mount Leidy, Younts Peak, and adjacent quadrangles.

FREMONT AND UINTA COUNTIES, WYO.; BINGHAM COUNTY, IDAHO.

Triangulation control was extended over the above-mentioned quadrangles in western-central Wyoming by T. M. Bannon in 1905 and by R. B. Robertson in 1907. Positions are given on approximate United States standard datum, as computed through the belt of triangulation extending northward and westward from Coast and Geodetic Survey stations Morrison and Table Mound, near Denver, Colo.

CARIBOU, BINGHAM COUNTY, IDAHO.

(Not occupied.)

A small rock pile or similar object on a very prominent mountain (undoubtedly Hayden's station Caribou).

Station mark: Small cairn on highest point. No mark was set by United States Geological Survey.

[Latitude $43^{\circ} 05' 36.72''$. Longitude $111^{\circ} 18' 38.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Victor.....	208 46 21	28 59 56	4.74452
Indian.....	234 06 48	54 21 39	4.55901
Star.....	286 15 05	106 31 20	4.52760

ALEXANDER, FREMONT COUNTY, WYO.

(Secondary.)

On a grassy ridge east of New Fork of Green River, about 2 miles east of Alexander's ranch (old Pearl post-office) on the main Cora-Wells wagon road, 12 miles north of Cora. A road from Alexander's east passes a little north of the station.

Station mark: Bronze tablet cemented in large boulder, over which a small pile of stones was placed and a tetrapod signal was erected.

Reference mark: Small hole drilled in large boulder, 31.65 feet north of station.

[Latitude $43^{\circ} 03' 16.38''$. Longitude $109^{\circ} 58' 37.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cora.....	11 28 27	191 26 55	4. 18605
Beaver.....	105 52 51	285 46 36	4. 11111
Wells.....	155 42 05	335 36 25	4. 45727

BIG BEND, FREMONT COUNTY, WYO.

On the highest point of a low, clear-topped, timbered ridge that lies in the big bend of Green River, about 4 miles northeast of Wells and 3 miles southeast of Hill's ranch. Station is easily reached from all sides, but to avoid fallen timber follow the main backbone of ridge from Hill's ranch.

Station mark: Bronze tablet cemented in a big boulder, over which a large rock monument was centered.

[Latitude $43^{\circ} 19' 24.96''$. Longitude $109^{\circ} 56' 27.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cora.....	7 35 47.53	187 32 46.94	4. 6563587
Beaver.....	30 13 43.71	210 05 59.00	4. 4842606
Wells.....	75 39 32	255 32 16	4. 18154
Tosi.....	78 51 05.42	258 39 14.42	4. 3769973
Bacon.....	124 50 29.61	304 43 40.23	4. 2133818
Fish Lake.....	175 51 35	355 50 36	4. 40012
Union.....	220 24 09.99	40 30 30.93	4. 2841046
Fremont.....	303 26 46	123 38 02	4. 44772
Green River.....	316 11 06	136 13 43	4. 87184

BULL LAKE, FREMONT COUNTY, WYO.

(Not occupied, but adjusted by least squares.)

On the highest point of a rocky bluff-top butte which is very prominent from Fort Washakie and the east. The main branch of Sage Creek heads at the hill. Fort Washakie is about 20 miles southeast and the south end of Bull Lake 6 miles north. Wagon roads lead up Sage Creek to within 3 miles of station and up Bull Lake Creek to the head of lake. The only water close to station is a spring on the old Indian and stock trail near top of ridge about 2 miles east of station.

[Latitude 43° 07' 11.71". Longitude 109° 15' 41.57".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Circle.....	139 36 01.41	319 23 51.48	4.5682941
Forks.....	160 58 04	340 51 42	4.58623
Crowheart.....	212 32 35.91	32 39 26.13	4.3996561
Sage.....	258 57 59.91	79 11 54.13	4.4483332

CIRCLE, FREMONT COUNTY, WYO.

On a grassy hill at the heads of Red Creek and a prong of Toveys Fork. About 10 miles south of Circle post-office, 6 miles south of the Blue Holes at the junction of Wind River and North Fork Wind River. The station is best reached from the north; a good cattle trail starts from Dubois. Follow Fort Washakie stage road up the first creek west of Red Creek about a mile (or until the creek makes the turn to the west) and then follow the old Indian trail to point.

Station mark: Bronze tablet cemented in solid rock, over which a large monument was built.

[Latitude 43° 22' 23.59". Longitude 109° 33' 26.95".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fremont.....	20 22 31	200 18 03	4.34941
Downs.....	52 50 50	232 46 08	4.06488
Union.....	116 13 37.12	296 04 09.41	4.3160391
Fish Lake.....	120 53 32.15	300 36 46.92	4.5823888
Dubois.....	158 30 10	338 26 12	4.32608
Wind River.....	189 34 17.20	9 35 50.70	4.2638148
Forks.....	233 50 39.91	53 56 27.73	4.1490662
Crowheart.....	280 24 39.66	100 43 42.07	4.5813748
Bull Lake.....	319 23 51.48	139 36 01.41	4.5682941

CORA, FREMONT COUNTY, WYO.

On the east end of a grassy mesa about 4 miles southwest of Cora post-office, whence station is easily reached by Cora-Burns wagon road, which passes about 2 miles east. A small bunch of aspen trees grows near the east top of mesa.

Station mark: Bronze tablet cemented in a bowlder, which is buried under a small pile of stones over which a tetrapod signal was erected.

Reference mark: Chiseled cross on a rock buried flush with ground 27.72 feet west.

[Latitude 42° 55' 08.94''. Longitude 110° 00' 51.73''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wyoming.....	55 08 43.74	234 43 56.24	4. 7843280
Triple.....	73 15 20.57	252 52 19.26	4. 6830340
Horse.....	98 23 42	278 02 23	4. 63846
Hoback.....	112 16 57.49	291 54 14.40	4. 6889183
Beaver.....	153 12 23.56	333 07 40.79	4. 3181559
Big Bend.....	187 32 46.94	7 35 47.53	4. 6563587
Alexander.....	191 26 55	11 28 27	4. 18605
Fremont.....	224 49 54	45 04 41	4. 61933

CROWHEART, FREMONT COUNTY, WYO.

On the west end of the prominent and well-known Crowheart Butte, north of Wind River, about 10 miles east of the mouth of Crow Creek. The J K ranch and stage station on the Fort Washakie-Dubois road, 30 miles west of Fort Washakie is visible, 5 miles south-west of station.

Station mark: Bronze tablet cemented in a large rock centered under a very large monument.

[Latitude 43° 18' 36.90''. Longitude 109° 05' 42.47''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bull Lake.....	32 39 26.13	212 32 35.91	4. 3996561
Circle.....	100 43 42.07	280 24 39.66	4. 5813748
Forks.....	120 30 58.60	300 17 43.01	4. 4804987
Coulee.....	147 34 44.34	327 25 55.74	4. 5143480
Muddy.....	168 20 20.76	348 16 15.62	4. 6106600
Sage.....	318 25 52.06	138 32 57.35	4. 3250131

COULEE, FREMONT COUNTY, WYO.

On a sharp rocky peak at the lower end of a spur from the divide between Crow Creek and Sand Coulee, not far from head of Sand Coulee. Peak is covered with timber toward the top and is easily reached from any side.

Station mark: Bronze tablet set in stone in place, over which a cairn 8 feet high was erected.

Reference marks: "R Δ P" cut in two stones firm in ground, one distant 14.9 feet and the other 15.2 feet from station mark.

[Latitude 43° 33' 30.16''^a; 43° 33' 32.42''^b. Longitude 109° 18' 43.30''^a; 109° 18' 40.81''^b.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wind River.....	81 42 09.32	261 33 34.32	4. 2296220
Round.....	125 33 20.14	305 14 56.08	4. 6428727
Wiggin.....	163 40 09.89	343 35 45.83	4. 4826008
Muddy.....	216 43 38.24	36 48 22.90	4. 1892120
Forks.....	34 42 26.11	214 37 57.96	4. 1735705
Crowheart.....	327 25 55.77	147 34 44.34	4. 5143480

^a United States standard.

^b Ranchester base.

DOWNS, FREMONT COUNTY, WYO.

(Not occupied.)

On a high snow-topped peak on the Continental Divide. About 12 miles southeast of Union Peak and 8 miles north of Fremont Peak. The station can be reached only on foot.

Station mark: Bronze tablet cemented in solid rock centered under a small rock monument.

[Latitude 43° 18' 36.12''. Longitude 109° 40' 17.62''.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Union.....	149 57 57	329 53 12	4. 27084
Wind River.....	206 01 32	26 07 52	4. 44668
Circle.....	232 46 08	52 50 50	4. 06488

DUBOIS, FREMONT COUNTY, WYO.

On a prominent low square-topped hill between Horse Creek and Wind River about 1 mile west of Dubois post-office, 0.25 mile north of the Dubois-Union wagon road, 1 mile east of Green's ranch on Wind River.

Station mark: Chiseled cross on big rock buried flush with the ground under center of a 5-foot monument.

Reference marks: Chiseled crosses on two stones east and west of monument.

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[Latitude 43° 33' 02.23". Longitude 109° 39' 12.81'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Union.....	45 35 15	225 29 44	4. 17936
Kisingers.....	146 34 57	326 26 19	4. 48118
Wind River.....	278 24 31	98 30 03	4. 03884
Forks.....	300 42 08	120 51 56	4. 34795
Circle.....	338 26 14	158 30 16	4. 32609

FISH LAKE, FREMONT COUNTY, WYO.

On a prominent scattering-tree hill about half a mile east of Fish Lake and at the north end of grassy ridge that forms the Conbuet Divide. A good trail leads from Hinton's ranch at the head of Crooked Creek to Fish Lake. The wagon road from Wind River through Union Pass to Green River passes about 5 miles east of station.

Station mark: Bronze tablet cemented in solid rock under a small pile of stones.

Reference mark: Chiseled cross on boulder.

[Latitude 43° 32' 57.00". Longitude 109° 57' 48.34'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wells.....	24 05 49	203 59 29	4. 49927
Bacon.....	36 24 23.21	216 18 28.58	4. 2909076
Darwin.....	57 35 59	237 21 56	4. 51959
Burnt.....	79 04 18.26	258 57 23.67	4. 1388125
Kisingers.....	198 00 54	18 05 09	4. 42705
Round.....	212 11 29	32 20 04	4. 49576
Wind River.....	272 09 24.33	92 27 44.72	4. 5549751
Circle.....	300 36 46.92	120 53 32.15	4. 5823888
Union.....	306 04 48.33	126 12 05.69	4. 2473436
Green River.....	347 05 09	167 08 45	4. 49442
Big Bend.....	355 50 36	175 51 35	4. 40012

FORKS, FREMONT COUNTY, WYO.

On a prominent, low, square-topped hill at the east side of the grassy mesa that lies east of North Fork Wind River and north of Wind River, about 3 miles east of their junction; 5 miles southeast of Circle post-office and 2 miles north of the mouth of Red Creek tributary to the river from the south side. Station is visible from the Wind River Valley on the east.

Station mark: Bronze tablet cemented in large boulder buried flush with ground, over which a large monument was built.

Reference mark: Chiseled cross on boulder buried flush with ground.

[Latitude 43° 26' 52.74''. Longitude 109° 25' 00.82''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Circle.....	53 56 27.73	233 50 39.91	4. 1490662
Dubois.....	120 51 56	300 42 08	4. 34795
Wind River.....	139 41 55.22	319 37 40.44	4. 1089099
Coulee.....	214 37 57.96	34 42 26.11	4. 1735705
Crowheart.....	300 17 43.01	120 30 58.60	4. 4804987
Bull Lake.....	340 51 42	160 58 04	4. 58623

FREMONT, FREMONT COUNTY, WYO.

(Not occupied.)

The highest and inaccessible point of Fremont Peak of Wind River Mountains, about 5 miles north of Hayden's Fremont Peak station.

Station mark: Highest point of summit.

[Latitude 43° 11' 03.50''. Longitude 109° 39' 12.30''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cora.....	45 04 41	224 49 54	4. 61933
Beaver.....	74 27 23	254 07 51	4. 60470
Tosi.....	103 14 09	282 50 29	4. 68111
Big Bend.....	123 38 02	303 26 46	4. 44772
Union.....	160 12 42	340 07 47	4. 50530
Circle.....	200 18 03	20 22 31	4. 34941

GREEN RIVER, FREMONT COUNTY, WYO.

(Not occupied.)

On the highest point of the big bluff ridges south of Green River Lakes, about 8 miles east of Wells post-office and the big bend of Green River. The station can be reached on horseback by following up Green River from the big bend to the old timber camp; thence take old timber roads to the backbone and follow same to summit.

Station mark: Chiseled cross under a rock monument.

Reference mark: Bronze tablet cemented in solid rock ledge south of station.

[Latitude 43° 16' 30.84". Longitude 109° 52' 38.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Big Bend.....	136 13 43	316 11 06	3.87184
Fish Lake.....	167 08 45	347 05 09	4.49442
Union.....	200 06 50	20 10 34	4.32864

KENDALL, FREMONT COUNTY, WYO.

(Not occupied.)

On the high north end of a rocky ridge at the head of New Fork of Green River; about 6 miles east of Hardin's ranch on Green River. On account of fallen trees and steep rocky slopes the station is difficult to reach.

Station mark: Bronze tablet cemented in large boulder, over which a rock monument was built.

[Latitude 43° 11' 06.31". Longitude 109° 54' 29.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Beaver.....	58 41 42	238 32 37	4.32403
Wells.....	123 48 30	303 39 42	4.32028

KISINGERS, FREMONT COUNTY, WYO.

(Not occupied.)

[Latitude 43° 46' 40.56". Longitude 109° 51' 38.62".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fish Lake.....	18 05 09	198 00 54	4.42705
Wind River.....	314 12 07	134 26 14	4.58488
Dubois.....	326 26 19	146 34 57	4.48118

MUDDY, FREMONT COUNTY, WYO.

On the highest peak at the heads of Muddy Creek, South Fork Owl Creek, and Crow Creek; 5 miles nearly due south of the Washakie Needles and across South Fork Owl Creek from them. Wagon road from Embar post-office up South Fork Owl Creek leads to within a few miles of station. Wagon may also be taken up South Fork Owl Creek from the Wind River side to a point directly under the peak.

Station mark: Bronze tablet set in the soft rock, of which peak is composed, under center of cairn 7 feet high.

Reference marks: Two boulders marked "R \triangle P;" distances from signal, 11.1 feet and 30 feet.

[Latitude $43^{\circ} 40' 11.45''^a$; $43^{\circ} 40' 13.71''^b$. Longitude $109^{\circ} 11' 50.61''^a$; $109^{\circ} 11' 48.12''^a$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coulee.....	36 48 22.90	216 43 38.24	4. 1892120
Wiggins.....	133 22 56.30	313 13 46.63	4. 3881458
Cottonwood.....	212 35 40.93	32 41 13.68	4. 3002287
Putney.....	249 57 06.67	70 16 13.00	4. 5962388
Owl.....	281 43 16.98	102 03 42.10	4. 6093288
Sage.....	338 09 49.37	158 21 01.89	4. 7785327
Crowheart.....	348 16 15.62	168 20 20.76	4. 6106600

^a United States standard.

^b Ranchester base.

ROUND, FREMONT COUNTY, WYO.

On the highest part of a round hill on top of a high mesa forming the divide between Horse Creek and Du Noir River; about 5 miles N. 20° W. from Ramshorn Mountain.

Station mark: Bronze tablet set in a piece of red lava rock placed in ground, over which a cairn 8 feet high was erected.

[Latitude $43^{\circ} 47' 14.97''$. Longitude $109^{\circ} 45' 22.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peak.....	229 07 12.17	49 17 20.19	4. 4129986
Wiggins.....	262 08 51.96	82 22 54.06	4. 4384404
Coulee.....	305 14 56.08	125 33 20.14	4. 6428727
Union.....	3 51 49	183 50 33	4. 56806
Fish Lake.....	32 20 04	212 11 29	4. 49576
Burnt.....	46 11 45	225 56 13	4. 62267

SAGE, FREMONT COUNTY, WYO.

On the east end of the highest mesa over which the Fort Washakie-Dubois road passes in crossing from Sage Creek to Wind River; about 0.5 mile east of road, 4 miles south of Wind River, and 19 miles northwest of Fort Washakie. The station is visible from the road.

Signal and station mark: A tetrapod centered over bronze tablet cemented in boulder.

Reference mark: Chiseled cross on a large rock.

[Latitude 43° 10' 04.03''. Longitude 108° 55' 21.65'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bull Lake.....	79 11 54.13	258 57 59.91	4.4483332
Crowheart.....	138 32 57.35	318 25 52.06	4.3250131
Muddy.....	158 21 01.89	338 09 49.37	4.7785327

UNION, FREMONT COUNTY, WYO.

On Union Peak, a high, rocky mountain on the Continental Divide at the northwest end of the rough, rocky ridge that forms the Wind River Range; about 10 miles northwest of Dubois, 5 miles east of the wagon road at Union Pass, and 3 miles east of the old Mills cabin near the head of Warm Spring Creek. The mountain is accessible from Dubois either by the Union trail, Little Warm Springs Creek trail, or the Green River wagon road to Mills cabin. Horses can be easily taken to the top from the west.

Station mark: A hole drilled in a big boulder, over which a monument was built.

[Latitude 43° 27' 19.23''. Longitude 109° 47' 13.00'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Green River.....	20 10 34	200 06 50	4.32864
Big Bend.....	40 30 30.93	220 24 09.99	4.2841046
Wells.....	56 02 08	235 46 16	4.51620
Bacon.....	78 30 43.37	258 17 32.26	4.4219582
Burnt.....	105 47 32	285 33 14	4.46050
Fish Lake.....	126 12 05.69	306 04 48.33	4.2473436
Round.....	183 50 33	3 51 49	4.56806
Dubois.....	225 29 44	45 35 15	4.17936
Wind River.....	247 21 08.14	67 32 10.28	4.3692953
Circle.....	296 04 09.41	116 13 37.12	4.3160391
Downs.....	329 53 12	149 57 57	4.27084
Fremont.....	340 07 42	160 12 42	4.50530

WIND RIVER, FREMONT COUNTY, WYO.

On a sharp prairie peak at the Wind River side of a flat prairie ridge lying between and close to the junctions of Wind River, Horse Creek, West Fork of North Fork, and North Fork of Wind River; down Wind River from Dubois post-office, about 2 miles north from Wind River; and can be easily reached from the stage road where it crosses West Fork of North Fork.

Station mark: Bronze tablet cemented in stone in place, over which a cairn 7 feet high was erected.

Reference marks: "R△P" cut in two firmly embedded stones; distances from station, 8.6 feet and 30 feet.

[Latitude 43° 32' 10.12". Longitude 109° 31' 11.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Circle.....	9 35 50.70	189 34 17.20	4. 2638148
Downs.....	26 07 52	206 01 32	4. 44668
Union.....	67 32 10.28	247 21 08.14	4. 3692953
Fish Lake.....	92 27 44.72	272 09 24.33	4. 5549751
Dubois.....	98 30 03	278 24 31	4. 03884
Kisingers.....	134 26 14	314 12 07	4. 58488
Forks.....	319 37 40.44	139 41 55.22	4. 1089099
Wiggins.....	194 28 58.28	14 33 10.28	4. 5140463
Coulee.....	261 33 34.32	81 42 09.32	4. 2296220

BACON, UINTA COUNTY, WYO.

On the highest point of clear reddish-topped timbered ridge at the head of tributaries of Wagon and Teepee creeks (Green River drainage) and tributaries of Bacon Creek and Gros Ventre River (Snake River drainage). The wagon road from Green River to Jackson Hole via Wagon and Bacon creeks passes 2 miles north of signal, and the road via Teepee Creek and Gros Ventre River passes about the same distance south. Wells post-office, on Green River, is about 10 miles east and Darwin's ranch on Gros Ventre River is 3 miles west.

Station mark: Tablet cemented in solid rock, over which a tetrapod signal and rock monument were built.

[Latitude 43° 24' 27.12". Longitude 110° 06' 23.73".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wells.....	5 33 23	185 32 44	4. 11947
Tosi.....	35 25 12.18	215 20 09.86	4. 2338898
Darwin.....	82 55 16.82	262 46 58.25	4. 2163793
Sheep.....	114 19 44	294 02 03	4. 56775
Burnt.....	171 34 27.06	351 33 27.54	4. 1224016
Fish Lake.....	216 18 28.58	36 24 23.21	4. 2909076
Union.....	258 17 32.26	78 30 43.37	4. 4219582
Big Bend.....	304 43 40.23	124 50 29.61	4. 2133818

BEAVER, UINTA COUNTY, WYO.

On a flat-topped grassy hill on the divide west side of Green River, about 15 miles northwest of Cora. The Kendall-Bondurant wagon road crosses the divide about 2 miles north of station, and wagon can be driven to the summit.

Station mark: Bronze tablet cemented in large boulder, over which a tetrapod signal was erected.

Reference mark: Chiseled cross on rock 91.65 feet southeast of station.

[Latitude $43^{\circ} 05' 10.53''$. Longitude $110^{\circ} 07' 46.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wyoming.....	37 10 04	216 49 55	4. 82621
Triple.....	48 29 34	228 11 09	4. 69066
Horse.....	69 57 54	249 41 16	4. 55394
Hoback.....	89 50 54. 88	269 32 52. 88	4. 5542413
Clause.....	102 30 03	282 11 44	4. 57432
Tosi.....	159 37 33. 82	339 33 28. 92	4. 3650330
Wells.....	181 29 20	1 30 02	4. 35402
Big Bend.....	210 05 59	30 13 43. 71	4. 4842606
Kendall.....	238 32 37	58 41 42	4. 32403
Fremont.....	254 07 51	74 27 23	4. 60470
Alexander.....	285 46 36	105 52 51	4. 11111
Cora.....	333 07 40. 79	153 12 23. 56	4. 3181559

BURNT, UINTA COUNTY, WYO.

High point of timbered ridge south of Gros Ventre River, about 6 miles above mouth of Indian Creek. Peak is partly covered with burnt timber.

Station mark: Cross cut in quartz boulder set level with surface of ground.

[Latitude 43° 31' 31.98". Longitude 110° 07' 50.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tosi.....	16 25 23	196 21 08	4.45071
Darwin.....	43 31 40.26	223 24 20.64	4.3199029
Round.....	225 56 13	46 11 45	4.62267
Fish Lake.....	258 57 23.67	79 04 18.26	4.1388125
Union.....	285 33 14	105 47 32	4.46050
Bacon.....	351 33 27.54	171 34 27.06	4.1224016
Wells.....	358 31 26	178 32 11	4.41870
Sheep.....	93 47 42.33	273 31 28.44	4.5025522
Mount Leidy.....	135 07 20.70	314 55 58.61	4.4963469
Breccia.....	188 50 49.52	8 53 09.73	4.4707739

CLAUSE, UINTA COUNTY, WYO.

(Not occupied.)

On divide between Fall River and Willow Creek and overlooking both of those streams. It is the most prominent point north of Hoback Peak between that peak and Fall River. The summit is composed of light-red rock and earth and can probably be reached best from about halfway down Cliff Creek. The station is about 4 miles north of Cliff Creek Pass and can be reached by following the divide from pass. Horses can be taken to about 2 miles from pass.

Signal and station mark: A cairn 7 feet high centered over aluminum tablet cemented in stone and placed in ground level with surface.

[Latitude 43° 09' 30.60". Longitude 110° 34' 48.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Star.....	58 31 25	238 17 40	4.50405
Greys.....	70 39 44	250 30 57	4.28678
Indian.....	115 05 10	294 50 00	4.51939
Munger.....	141 45 33	321 37 13	4.41656
Jackson.....	173 44 19	353 42 26	4.53107
Darwin.....	220 39 06	40 50 18	4.52913
Tosi.....	244 13 46	64 28 02	4.50021
Beaver.....	282 11 44	102 30 03	4.57432
Hoback.....	354 04 35	174 05 00	3.91684

DARWIN, UINTA COUNTY, WYO..

On a big high square-topped peak in the Sawtooth Range and at the head of two forks of the Gros Ventre River; about 6 miles south of Darwin's ranch on the Green River-Jackson Hole wagon road. The station is easily reached on horseback by following trail from Darwin's ranch up Gros Ventre River for several miles, thence along ridge to station. The monument is visible from Darwin's ranch.

Station mark: Tablet cemented in a large rock buried flush with ground under a large monument.

[Latitude 43° 23' 20.76". Longitude 110° 18' 29.38'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hoback.....	32 11 56.15	212 01 11.59	4.6014377
Clause.....	40 50 18	220 39 06	4.52913
Indian.....	77 34 05.51	257 07 42.27	4.7264135
Pinnacle.....	89 21 54	269 12 52	4.25046
Jackson.....	107 40 42.61	287 27 36.47	4.4310877
Sheep.....	134 42 24.27	314 33 31.39	4.3886085
Burnt.....	223 24 20.64	43 31 40.26	4.3199029
Fish Lake.....	237 21 56	57 35 59	4.51959
Bacon.....	262 46 58.25	82 55 16.82	4.2163793
Wells.....	306 11 31	126 19 44	4.27167
Tosi.....	331 39 18.29	151 42 34.02	4.1317506

FERRY, UINTA COUNTY, WYO.

(Not occupied.)

A brown rock or earth point, seemingly overlooking Snake River at the point of the big bend that river makes at about the mouth of Greys River and Salt River. There is a ferry across Snake River at the mouth of Greys River, not far from this point, which is a prominent summit about 6 miles south and a little west of and in the same range as Indian triangulation station.

Station mark: The highest point of brown peak, which is fairly sharp.

[Latitude 43° 12' 43.10". Longitude 110° 58' 55.08'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian.....	198 48 01	18 49 07	3.91937
Hoback.....	292 57 23	113 14 18	4.56197
Star.....	346 19 09	166 21 57	4.37071

FOURTH OF JULY, UINTA COUNTY, WYO.

(Not occupied.)

A grassy hill between the two Beaver creeks and not far from their junction; about the most prominent hill in vicinity.

Signal: A tripod covered with white cloth.

[Latitude $42^{\circ} 59' 38.94''$. Longitude $110^{\circ} 09' 35.58''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wyoming.....	41 20 36	221 01 42	4.75986
Triple.....	56 56 48	236 39 42	4.61133
Hoback.....	106 53 05	286 36 18	4.54235

GREYS, UINTA COUNTY, WYO.

(A secondary station.)

On the divide known as the Middle Ridge between Greys River and Little Greys River and about 3 miles from their junction; on a brown rock peak, the second of any prominence from the mouth of Little Greys River. A trail crosses the ridge a little east of the station, and another crosses about 2 miles east (up the ridge) from station. Comparing it with the surrounding country, this is a low point.

Signal: Tetrapod made of poles, 8 feet high.

Station mark: Aluminum tablet cemented in stone and placed in ground level with surface.

[Latitude $43^{\circ} 06' 02.18''$. Longitude $110^{\circ} 48' 15.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Star.....	40 58 06	220 53 25	4.13416
Indian.....	150 04 26	329 58 30	4.37166
Munger.....	184 20 21	4 20 49	4.43109
Jackson.....	199 45 48	19 53 09	4.63071
Clause.....	250 30 57	70 39 44	4.28678
Hoback.....	275 14 50	95 23 49	4.28328
Horse.....	303 00 57	123 11 58	4.42707
Greyfall.....	312 54 28	133 00 26	4.19177

GREYFALL, UINTA COUNTY, WYO.

(Not occupied.)

A lone mountain and the first prominent point on the divide between Fall River and Greys River south of Hoback Peak. In shape the mountain has a short ridge at the north and a peak at the south, with saddle between; ridge and peak have about same elevation. At headwaters of one of the main prongs of Fall River, of Deadman Creek (tributary to Greys River), and of the south prong of Little Greys River; and the headwaters of one prong of Horse Creek of Green River come up close to this point on south side. This is one of the best points in Hoback and Greys River quadrangles.

Station mark: The sharp peak at south end.

[Latitude $43^{\circ} 00' 18.71''$. Longitude $110^{\circ} 39' 52.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rock Lake.....	24 36 57	204 31.03	4. 42997
Star.....	90 57 17	270 47 05	4. 30802
Greys.....	133 00 26	312 54 28	4. 19177
Indian.....	143 21 24	323 09 29	4. 58736
Munger.....	166 05 31	346 00 27	4. 58709
Hoback.....	221 16 30	41 20 24	4. 06956
Triple.....	343 22 25	163 25 45	4. 39136

GREYSALT, UINTA COUNTY, WYO.

(Not occupied.)

A high, prominent, sharp, peak on the Greys River-Salt River divide as high or higher than any summit in the vicinity.

Station mark: Highest point of peak.

[Latitude $42^{\circ} 36' 68.66''$. Longitude $110^{\circ} 45' 41.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Redtop.....	130 26 23	310 22 57	3. 95903
Triple.....	215 17 52	35 25 16	4. 41372
Wyoming.....	268 49 07	88 54 45	4. 05610

HALFWAY SCHOOL, UINTA COUNTY, WYO.

(Not occupied.)

A small schoolhouse on ridge between Kilpecker Creek and South Cottonwood Creek and near Halfway post-office.

Station mark: White flag nailed over door at south end of school-house.

[Latitude 42° 47' 26.70". Longitude 110° 17' 35.03'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wyoming.....	52 40 09	232 26 44	4. 53203
Triple.....	90 38 38	270 27 00	4. 36838
Hoback.....	145 25 53	325 14 35	4. 59861

HAYSTACK, UINTA COUNTY, WYO.

(Not occupied.)

A sharp peak seemingly on the divide between Greys River and Salt River. A high point, not bluffy but very steep; about 7 miles southeast of Star triangulation station.

Station mark: Highest point of peak.

[Latitude 42° 55' 31.65". Longitude 110° 51' 38.08'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Star.....	154 39 12	334 37 09	4. 00627
Hoback.....	233 13 11	53 25 05	4. 47114
Triple.....	302 29 58	122 41 29	4. 43718
Rock Lake.....	342 49 18	162 51 42	4. 21339
Redtop.....	357 43 26	177 44 06	4. 47727

HOBACK, UINTA COUNTY, WYO.

On the highest point of Hoback Peak, a prominent peak at the heads of Cliff Creek (tributary to Fall River) and of Little Greys River (tributary to Greys River). The main fork of Fall River goes through a canyon several miles south of station. The peak is about 2 miles south of the pass at the head of Cliff Creek; horses can be taken to station.

Signal and station mark: A pile of stones 6 feet high, with center pole centered over aluminum tablet, cemented in stone, and placed in ground level with surface.

[Latitude 43° 05' 04.42". Longitude 110° 34' 10.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Triple.....	1 17 45.23	181 17 23.25	4.5108750
Rock Lake.....	29 43 03.39	209 33 34.35	4.5832465
Greyfall.....	41 20 24	221 16 30	4.06956
Haystack.....	53 25 05	233 13 11	4.47114
Star.....	73 14 51.54	253 00 45.42	4.4671395
Greys.....	95 23 49	275 14 50	4.28328
Ferry.....	113 14 18	292 57 23	4.56197
Indian.....	125 49 47.90	305 34 13.07	4.5796385
Munger.....	149 21 52	329 13 15	4.52333
Jackson.....	173 48 21.00	353 46 02.08	4.6255804
Clause.....	174 05 00	354 04 35	3.91684
Pinnacle.....	185 45 27	5 47 13	4.52873
Darwin.....	212 01 11.59	32 11 56.15	4.6014377
Tosi.....	231 31 52.60	51 45 51.68	4.5478981
Wells.....	237 46 55	58 05 44	4.63251
Beaver.....	269 32 52.88	89 50 54.88	4.5542413
Fourth of July.....	286 36 18	106 53 05	4.54235
Cora.....	291 54 14.40	112 16 57.49	4.6889183
Halfway School.....	325 14 35	145 25 53	4.59861
Horse.....	349 30 09	169 31 13	4.09220

HORSE, UINTA COUNTY, WYO.

(Not occupied.)

A prominent grassy point at the head of South Beaver Creek and at the head of the southernmost prong of Fall River. Station also sheds water to Horse Creek, which is west of it. This point is prominent from Green River Valley. There is higher country not far west, but a fair view can be had from station in all directions. It is easily reached with horses from South Beaver Creek or from Horse Creek from nearly all sides.

Signal and station mark: A cairn 7 feet high centered over aluminum tablet cemented in round boulder and placed in ground level with surface.

[Latitude 42° 58' 30.34". Longitude 110° 32' 30.88'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Triple.....	8 24 20	188 22 50	4. 31120
Rock Lake.....	45 12 09	225 01 33	4. 47633
Star.....	96 59 16	276 44 05	4. 48507
Horse.....	123 11 58	303 00 57	4. 42707
Hoback.....	169 31 13	349 30 09	4. 09220
Beaver.....	249 41 16	69 57 54	4. 55394
Cora.....	278 02 23	98 23 42	4. 63846

INDIAN, UINTA COUNTY, WYO.

On a high peak at the head of Little Fall River, which runs east into Snake River, and the head of a creek which runs southwest into Snake River. There is another peak about same elevation with a cairn slightly off the summit, about 1.5 miles southwest of station. There is a dim hunter's trail up Little Fall River to summit of range. Station is about 1.5 miles south along summit from the highest point of trail. Probably a good way to go to station would be up Indian Creek from the west.

Signal: Small spruce pine tree braced with four poles.

Station mark: A stone with a drill hole 2 inches deep marking center, placed in ground level with surface.

Reference mark: "U.S. + G.S." cut on solid rock; distance 8.7 feet, true azimuth 48° 45'.

[Latitude 43° 17' 02.74". Longitude 110° 56' 56.34'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ferry.....	18 49 07	198 48 01	3. 91937
Caribou.....	54 21 39	234 06 48	4. 55901
Victor.....	174 46 22. 36	354 45 05. 53	4. 4402364
Phillips.....	186 34 36	.....	4. 50066
Jackson.....	232 47 06. 69	53 00 25. 62	4. 5163936
Munger.....	244 36 18	64 42 42	4. 18267
Pinnacle.....	251 19 58	71 37 19	4. 55662
Darwin.....	257 07 42. 27	77 34 05. 51	4. 7264135
Clause.....	294 50 00	115 05 10	4. 51939
Hoback.....	305 34 13. 07	125 49 47. 90	4. 5796385
Greyfall.....	323 09 29	143 21 24	4. 58736
Greys.....	329 58 30	150 04 26	4. 37166
Star.....	354 40 01. 95	174 41 28. 41	4. 4886670

JACKSON, UINTA COUNTY, WYO.

A high and very prominent white rocky peak near the head of Sheep Creek, about 6 miles southeast of Nolan's ranch, about 10 miles east of Jackson post-office. This peak was occupied by the Hayden Survey, and is known to some of the settlers as Goodwin Peak.

Station mark: Copper bolt sunk into rock and buried under a 9-foot rock monument.

Reference mark: "U.S. + G.S." cut on rock 22.40 feet southeast of station.

[Latitude 43° 27' 44.68". Longitude 110° 37' 33.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Victor.....	105 02 15.35	284 47 37.57	4. 4720027
Buck.....	148 23 06.71	328 15 08.68	4. 4716683
Phillips.....	117 28 09.09	297 16 39.30	4. 4037480
Blacktail.....	164 31 14.52	344 28 30.74	4. 3002202
Sheep.....	222 28 02.08	42 32 16.11	4. 0888234
Greys.....	19 53 09	199 45 48	4. 63071
Star.....	24 57 46	204 46 05	4. 74543
Munger.....	43 08 12	223 01 27	4. 25993
Indian.....	53 00 25.62	232 47 06.69	4. 5163936
Darwin.....	287 27 36.47	107 40 42.61	4. 4310877
Tosi.....	301 49 24	122 05 42	4. 57877
Pinnacle.....	316 28 49	136 32 52	4. 06193
Clause.....	353 42 26	173 44 19	4. 53107
Hoback.....	353 46 02.08	173 48 21.00	4. 6255804

MUNGER, UINTA COUNTY, WYO.

On the highest point of a grassy hill, known as Munger Mountain, north of Little Fall River, about 3 miles from its mouth, and south of Snake River; about 4 miles a little west of north from Warm Springs on Snake River, and 3 miles about northeast of R. W. Coburn's ranch on Little Fall River. Signal can be seen from vicinity of Jackson and can be easily got to from the north or northwest, or from Little Fall River side. Trail from Wilson post-office to Warm Springs passes west and south of station. This is a low point for this country and snow ought to leave it early.

Signal: Tetrapod 9 feet high made of poles, covered with white and black cloth.

Station mark: Aluminum tablet cemented in stone and placed in ground level with surface.

[Latitude 43° 20' 34.08". Longitude 110° 46' 45.20".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Greys.....	4 20 49	184 20 21	4. 43109
Star.....	16 26 46	196 21 14	4. 58855
Indian.....	64 42 42	244 36 18	4. 18267
Victor.....	142 12 53	322 04 53	4. 42319
Jackson.....	223 01 27	43 08 12	4. 25993
Pinnacle.....	256 20 13	76 30 43	4. 32167
Clause.....	321 37 13	141 45 33	4. 41656
Hoback.....	329 13 15	149 21 52	4. 52333
Greyfall.....	346 00 27	166 05 31	4. 58709

PINNACLE, UINTA COUNTY, WYO.

(Not occupied.)

A prominent point in the Granite Range of mountains, probably between Granite Creek and the head of Little Granite Creek. It is not the highest point in the vicinity, but is a bluffy rock with two natural rock signals visible to the naked eye some miles distant. It may be what is known to some people as Weavers Needle.

Station mark: The southern one of two rock pinnacles, about the same elevation and probably a few yards apart.

[Latitude 43° 23' 13.58". Longitude 110° 31' 40.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hoback.....	5 47 13	185 45 27	4. 52873
Star.....	36 49 33	216 33 42	4. 72043
Indian.....	71 37 19	251 19 58	4. 55662
Munger.....	76 30 43	256 20 13	4. 32167
Jackson.....	136 32 52	316 28 49	4. 06193
Darwin.....	269 12 52	89 21 54	4. 25046

REDTOP, UINTA COUNTY, WYO.

On a red peak about 3 or 4 miles west of the divide between Greys River and Salt River, 3 miles north of Cottonwood Creek tributary to Salt River. A good pack trail leads from Smoot post-office up Cottonwood Creek to summit and down Corral Hollow to Greys River. From Smoot follow trail to a point on Cottonwood Creek below the lake; thence up the easiest looking ridge to northeast. This ridge is traveled considerably by sheep. Another seemingly

good ridge trail leaves Cottonwood Creek about the lake and leads to station, but is steep toward summit; about 6 miles from Smoot. Signal can be seen from Star Valley, especially from the middle of valley and western side.

Signal and station mark: A cairn 7 feet high centered over triangulation tablet with a drill hole cut on stone and placed in ground level with surface.

[Latitude 42° 39' 19.86". Longitude 110° 50' 45.75".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Preuss.....	61 49 34	.....	4. 57382
Caribou.....	142 11 13	.....	4. 79036
Star.....	171 57 41. 49	351 54 55. 50	4. 5970861
Haystack.....	177 44 06	357 43 26	4. 47727
Rock Lake.....	194 12 16. 46	14 14 05. 03	4. 1709497
Triple.....	235 04 57. 72	55 15 51. 20	4. 4264345
Wyoming.....	287 09 07. 29	107 18 11. 25	4. 2824208
Greysalt.....	310 22 57	130 26 23	3. 95903
Smoot.....	336 24 06	156 25 42	3. 90900

ROCK LAKE, UINTA COUNTY, WYO.

On a rocky peak on the summit of the divide between Greys River and Salt River, at the heads of a tributary (probably Willow Creek) of Salt River and of the first big creek that runs into Greys River above Bear Creek. A small deep lake lies at the foot of the peak on the northeast side, about 700 or 800 feet down. A trail from Salt River to Greys River crosses above-mentioned creeks, and station is about 0.8 mile south of where trail crosses summit; trail is not much traveled, but can be followed. Signal can be seen from Star Valley and from the mouth of the creek tributary to Greys River. Station is about 9 miles northeast of Afton.

Signal and station mark: A cairn 7 feet high, centered over aluminum tablet cemented in stone and placed in ground level with surface.

[Latitude 42° 47' 05.53''. Longitude 110° 48' 05.72''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Redtop.....	14 14 05. 03	194 12 16. 46	4. 1709496
Star.....	159 43 58. 08	339 39 22. 96	4. 4220427
Haystack.....	162 51 42	342 49 18	4. 21339
Greyfall.....	204 31 03	24 36 57	4. 42997
Hoback.....	209 33 34. 35	29 43 03. 39	4. 5832465
Horse.....	225 01 33	45 12 09	4. 47633
Triple.....	267 10 33. 27	87 19 38. 84	4. 2618520
Wyoming.....	323 47 45. 33	143 55 01. 44	4. 3948231

SHEEP, UINTA COUNTY, WYO.

A high, flat-topped peak known as Sheep Mountain, between Gros Ventre and Little Gros Ventre rivers, and 12 miles due east of mouth of former.

Station mark: Copper bolt in limestone set level with surface of ground under rock cairn 5 feet high.

[Latitude 43° 32' 37.78''^a; 43° 32' 40.04''^b. Longitude 110° 31' 24.00''^a; 110° 31' 21.51''^b.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jackson.....	42 32 16. 11	222 28 02. 08	4. 0898234
Signal Mountain.....	174 10 04. 85	354 08 17. 73	4. 5325416
Leidy.....	205 16 23. 51	25 21 16. 98	4. 3481951
Burnt.....	273 31 28. 44	93 47 42. 33	4. 5025522
Antelope.....	165 15 25. 00	345 12 54. 17	4. 2839823
Blacktail.....	126 53 03. 32	306 46 04. 99	4. 2305043
Buck.....	124 15 41. 37	304 03 28. 42	4. 4592345
Victor.....	87 57 48. 76	267 38 56. 14	4. 5675215
Bacon.....	294 02 03	114 19 44	4. 56775
Darwin.....	314 33 31. 39	134 42 24. 27	4. 3886085

^a United States standard.^b Ranchester base.

SMITHS HOUSE, UINTA COUNTY, WYO.

(Not occupied; located from two points only; no check on position.)

Middle of Amos Smith's house, seemingly in shape of an L and painted white, near Big Piney post-office. A good-sized barn, unpainted, is just east of house.

650 TRIANGULATION AND PRIMARY TRAVERSE FOR 1906, 1907, AND 1908.

[Latitude $42^{\circ} 31' 24.76''$. Longitude $110^{\circ} 04' 57.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wyoming.....	101 37 55	281 16 00	4. 65572
Triple.....	126 30 33	306 10 24	4. 70299

SMOOT, UINTA COUNTY, WYO.

(Not occupied.)

A high point on divide between Greys River and Salt River. There are three or more small piles of rock (natural or otherwise) on summit, which is about 6 miles east and a little south of Smoot.

Signal: The higher of the two rock piles closest together.

[Latitude $42^{\circ} 35' 19.03''$. Longitude $110^{\circ} 48' 23.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Redtop.....	156 25 42	336 24 06	3. 90900
Triple.....	219 24 22	39 33 34	4. 46810
Wyoming.....	263 17 30	83 24 57	4. 18093

STAR, UINTA COUNTY, WYO.

On summit of a high sharp peak on divide between Greys and Salt rivers, at the head of Stewart Creek, tributary to Greys River. Signal can be seen from mouth of Stewart Creek and from the greater part of Star Valley. A dim trail leads up Stewart Creek to summit, and station is about 2 miles north of where this trail reaches summit. The Stewart trail from Greys River to Star Valley follows Stewart Creek a short distance, then leads off to right. Route to station is up the creek to right of timber butte, taking left-hand prong at fork. Can also probably be reached from Star Valley with as much ease as from Greys River.

Signal: A cairn 7 feet high.

Station mark: Aluminum tablet in loose rock, 1 foot below surface; stone, with "U. S." and a drill hole marking center, placed level with surface over tablet.

[Latitude 43° 00' 28.70". Longitude 110° 54' 49.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Preuss.....	25 46 43		4. 80046
Caribou.....	106 31 20	286 15 05	4. 52760
Ferry.....	166 21 57	346 19 09	4. 37071
Indian.....	174 41 28.41	354 40 01.95	4. 4886670
Munger.....	196 21 14	16 26 46	4. 58855
Jackson.....	204 46 05	24 57 46	4. 74543
Pinnacle.....	216 33 42	36 49 33	4. 72043
Greys.....	220 53 25	40 58 06	4. 13416
Clause.....	238 17 40	58 31 25	4. 50405
Hoback.....	253 00 45.42	73 14 51.54	4. 4671395
Greyfall.....	270 47 05	90 57 17	4. 30802
Horse.....	276 44 05	96 59 16	4. 48507
Triple.....	311 00 06	131 13 49	4. 56060
Haystack.....	334 37 09	154 39 12	4. 00627
Rock Lake.....	339 39 22.96	159 43 58.08	4. 4220427
Redtop.....	351 54 55.50	171 57 41.49	4. 5970861

TOSI, UINTA COUNTY, WYO.

On the western peak (and steeper) of two high prominent peaks near the east end of the Gros Ventre Range at the heads of Rock and Dell creeks; 10 miles nearly west of Wells. The peak is visible from all directions; can be easily reached by following trail up Tosi Creek, or by following the grassy ridges from old Kendall post-office.

Station mark: Tablet cemented in solid rock under a large rock monument.

[Latitude 43° 16' 54.40". Longitude 110° 13' 44.19".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hoback.....	51 45 51.68	231 31 52.60	4. 5478981
Clause.....	64 28 02	244 13 46	4. 50021
Jackson.....	122 05 42	301 49 24	4. 57877
Darwin.....	151 42 34.02	331 39 18.29	4. 1317506
Burnt.....	196 21 08	16 25 23	4. 45071
Bacon.....	215 20 09.86	35 25 12.18	4. 2338898
Big Bend.....	258 39 14.42	78 51 05.42	4. 3769973
Wells.....	264 14 23	84 18 46	3. 93948
Fremont.....	282 50 29	103 14 09	4. 68111
Beaver.....	339 33 28.92	159 37 33.82	4. 3650330

TRIPLE, UINTA COUNTY, WYO.

On the highest of three peaks on the divide between Green and Grey rivers, at the head of Sheep Creek, tributary to Greys River, and between the headwaters of North Cottonwood and South Cottonwood creeks, both tributary to Green River; about 14 miles west of Halfway post-office; Lander Peak is about 2 miles southeast. A trail leads up South Cottonwood Creek from Halfway. About south of station on this trail a small draw to north, in which there is no creek bed, is to be followed to basin; thence follow up ridge to right. A trail from Halfway leads up North Cottonwood Creek to divide and down Sheep Creek to Greys River, and station is 2 or 3 miles south of where this trail crosses the divide. Station can probably be reached easily from this trail, but horses can certainly be taken from the South Cottonwood trail. It can also be reached from big meadow near head of Sheep Creek. Go up the creek to Smith, take first left-hand timber draw and follow old trail to head of draw in saddle on divide between South Cottonwood and Sheep creeks. From this saddle go up open ridge east to station; about two hours easy ride from Sheep Creek meadow, if no mistakes are made.

Signal: Spruce tree braced with poles and weighted with stone.

Station mark: Aluminum tablet set in stone and placed in ground level with surface.

[Latitude $42^{\circ} 47' 33.93''$. Longitude $110^{\circ} 34' 42.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wyoming.....	9 53 20.24	189 51 31.74	4. 3270523
Greysalt.....	35 25 16	215 17 52	4. 41372
Smoot.....	39 33 34	219 24 22	4. 46810
Redtop.....	55 15 51.20	235 04 57.72	4. 4264345
Rock Lake.....	87 19 38.84	267 10 33.27	4. 2618520
Haystack.....	122 41 29.	302 29 58	4. 43718
Star.....	131 13 49	311 00 06	4. 56060
Greyfall.....	163 25 45	343 22 25	4. 39136
Hoback.....	181 17 23.25	1 17 45.23	4. 5108750
Horse.....	188 22 50	8 24 20	4. 31120
Beaver.....	228 11 09	48 29 34	4. 69065
Fourth of July.....	236 39 42	56 56 48	4. 61133
Cora.....	252 52 19.26	73 15 20.57	4. 6830340
Halfway School.....	270 27 00	90 38 38	4. 36838
Smiths House.....	306 10 24	126 30 33	4. 70299

VICTOR, UINTA COUNTY, WYO.

Near the Idaho line, on a high, bald, red-topped mountain, on divide between Tail and Moose creeks, 10 miles southeast of Victor, Idaho; 1 mile northwest of road ranch on the Victor-Jackson road at the junction of Coal and Tail creeks, 3 miles northeast of Teton Pass.

Station mark: Cross chiseled in a large rock buried under a 6-foot monument.

Reference mark: "U. S." chiseled on solid rock 6.41 feet north of station.

[Latitude 43° 31' 51.96". Longitude 110° 58' 48.22'']

To station—	Azimuth.	Back azimuth.	Log distance.
	° ' "	° ' "	Meters.
Bucks.....	216 31 22.26	36 38 03.54	4.3402694
Phillips.....	236 45 50.81	56 48 59.21	3.8654626
Sheep.....	267 38 56.14	87 57 48.76	4.5675215
Jackson.....	284 47 37.57	105 02 15.35	4.4720027
Caribou.....	28 59 56	208 46 21	4.74452
Munger.....	322 04 53	142 12 53	4.42319
Indian.....	354 45 05.53	174 46 22.36	4.4402364

WELLS, UINTA COUNTY, WYO.

On the high east end of a grassy ridge locally known as Klondike Ridge. About 6 miles nearly west of Wells and 5 miles northwest of old Kendall, the headquarters of the camp. The station is easily reached from the east or north.

Station mark: Bronze tablet cemented in a large rock buried flush with ground, centered under a tetrapod signal.

[Latitude 43° 17' 22.48". Longitude 110° 07' 20.26'']

To station—	Azimuth.	Back azimuth.	Log distance.
	° ' "	° ' "	Meters.
Beaver.....	1 30 02	181 29 20	4.35402
Hoback.....	58 05 44	237 46 55	4.63251
Tosi.....	84 18 46	264 14 23	3.93948
Darwin.....	126 19 44	306 11 31	4.27167
Burnt.....	178 32 11	358 31 26	4.41870
Bacon.....	185 32 44	5 33 23	4.11947
Fish Lake.....	203 59 29	24 05 49	4.49927
Union.....	235 46 16	56 02 08	4.51620
Big Bend.....	255 32 16	75 39 32	4.18154
Kendall.....	303 39 42	123 48 30	4.32028
Alexander.....	335 36 25	155 42 05	4.45727

WYOMING PEAK, UINTA COUNTY, WYO.

On the highest peak toward the head of Greys River and at the head of Middle Piney Creek, tributary to Green River; can be reached from either the Piney Creek or the Greys River side. Signal is in sight from upper Green River country as far up as Beaver triangulation station, and can also be seen from Greys River at the mouth of Corral Hollow. The route taken in 1907 was from Grays River. Trail east up a small creek at a point on Greys River about 7 miles above the mouth of Corral Hollow. This is a triangulation station of the Hayden survey. A small monument found on summit was enlarged in 1907 and centered over original position.

Signal and station mark: A cairn 7 feet high centered over aluminum tablet set in stone and placed in ground level with surface.

[Latitude $42^{\circ} 36' 15.95''$; $42^{\circ} 36' 16.59''$ (from west). Longitude $110^{\circ} 37' 22.57''$; $110^{\circ} 37' 23.74''$ (from west).]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Preuss (from west).....	76 57 50	.....	4. 72212
Preuss.....	76 56 57	.....	4. 72215
Smoot.....	83 24 57	263 17 30	4. 18093
Greysalt.....	88 54 45	268 49 07	4. 05610
Redtop.....	107 18 11. 25	287 09 07. 29	4. 2824208
Rock Lake.....	143 55 01. 44	323 47 45. 33	4. 3948231
Star.....	152 08 12	331 56 13	4. 70544
Triple.....	189 51 31. 74	9 53 20. 24	4. 3270523
Beaver.....	216 49 55	37 10 04	4. 82621
Fourth of July.....	221 01 41	41 20 36	4. 75986
Halfway School.....	232 26 44	52 40 09	4. 53203
Cora.....	234 43 56. 24	55 08 43. 74	4. 7843280
Smiths House.....	281 16 00	101 37 55	4. 65572

WYOMING-UTAH.

TRIANGULATION STATIONS.

Aspen Mountain, Browns Park, and Rock Springs quadrangles.

SWEETWATER COUNTY, WYO.; UINTA COUNTY, UTAH.

In the summer of 1908 R. B. Robertson extended triangulation northward from stations Lena, Richards, and Twin, so as to control the Rock Springs 15-minute quadrangle. Besides occupying the 3 initial stations, 7 primary stations were occupied and 12 points were located by intersections.

LENA, UINTA COUNTY, UTAH.

About 35 miles northwest of Vernal, 8 miles southeast of Lewis Allen horse ranch, on very rough summit of timbered mountain composed of red sandstone. The road from Vernal to the Lewis Allen horse ranch passes about 3 miles west of station, which can be seen from many places on this road.

Signal: A large dead (double) tree 23.1 feet from station mark, true azimuth $31^{\circ} 13'$.

Station mark: Copper bolt cemented in sandstone.

[Latitude $40^{\circ} 47' 13.44''$. Longitude $109^{\circ} 24' 51.94''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Little Mountain.....	41 08 57.10	220 57 50.04	4. 5636299
Marsh Peak.....	76 34 49.24	256 18 37.30	4. 5554878
Leidy Peak.....	86 48 42.36	266 32 16.83	4. 5495441
Phil Pico.....	115 54 08.97	295 34 16.38	4. 6754428
Twin Butte.....	150 49 52.43	330 38 27.65	4. 6983833
Richards Butte.....	200 05 49.86	20 10 09.52	4. 4308414
Brown.....	201 23 25.76	21 29 55.44	4. 5802610

BAXTER, SWEETWATER COUNTY, WYO.

(Not occupied.)

Center of chimney on section house.

[Latitude $41^{\circ} 36' 53.00''$. Longitude $109^{\circ} 06' 10.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South.....	89 52 15	269 50 11	3. 63648
Center.....	140 44 28	320 42 07	3. 88888
North.....	160 52 46	340 48 43	4. 23273

BITTER, SWEETWATER COUNTY, WYO.

(Not occupied.)

A cairn 6 feet high on bare hill 3 miles east by south of Rock Springs.

[Latitude $41^{\circ} 34' 18.70''$. Longitude $109^{\circ} 09' 28.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wilkins.....	61 45 18	241 37 52	4. 24792
Pilot.....	116 23 58	296 16 15	4. 25524
South.....	183 05 39	3 05 52	3. 67728
Quaking Asp.....	347 13 32	167 14 44	4. 19161

BLACK BUTTE, SWEETWATER COUNTY, WYO.

(Not occupied.)

The most prominent of the buttes known locally as the Black Buttes. Point sighted is not on the summit, but is a column of rock, detached, at the north end and nearly as high as summit.

[Latitude $41^{\circ} 33' 32.24''$. Longitude $108^{\circ} 48' 00.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quaking Asp.	62 42 06	242 29 35	4. 47450
South.	101 54 58	281 40 50	4. 48039
Center.	112 07 56	291 53 31	4. 51215
North.	126 02 12	305 46 06	4. 58093

BLACK ROCK, SWEETWATER COUNTY, WYO.

(Not occupied.)

The sharpest of three small hills, the middle one looking from the west, seemingly covered with black boulders.

[Latitude $41^{\circ} 42' 59.80''$. Longitude $108^{\circ} 51' 44.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quaking Asp.	34 16 28	214 06 20	4. 57720
South.	65 08 50	244 57 10	4. 42903
Center.	78 02 37	257 50 41	4. 40575

BOAR TUSK, SWEETWATER COUNTY, WYO.

(Not occupied.)

A well-known sharp column of rock, locally so designated, about 30 miles north of Rock Springs. Point sighted is middle of highest part.

[Latitude $41^{\circ} 57' 47.15''$. Longitude $109^{\circ} 11' 51.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pilot.	19 51 46	199 45 37	4. 57634
North.	354 13 13	174 14 19	4. 35533

BROWN, SWEETWATER COUNTY, WYO.

About 1.5 miles north of Jack Stratton's ranch, about 2 miles west of Brown's ranch (former Maxton post-office), and about 40 miles south of Rock Springs; on a point bare of timber, on what is

locally known as Little Mountain on the divide between Red Creek and Front Creek, tributary to Sage Creek; not on the highest point, but on the second point of prominence, counting from east end of mountain.

Signal: A tripod 12 feet high.

Station mark: Bronze triangulation tablet cemented in a round boulder and placed in ground level with surface.

[Latitude $41^{\circ} 06' 21.29''$. Longitude $109^{\circ} 14' 57.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lena.....	21 29 55.44	201 23 25.76	4.5802610
Richards.....	24 38 33.92	204 36 23.84	4.0452373
Twin.....	102 11 26.85	281 53 28.69	4.5919137
Wilkins.....	169 35 41.12	349 31 54.57	4.6442859
Quaking Asp.....	196 50 03.19	16 55 17.78	4.5824563

CENTER, SWEETWATER COUNTY, WYO.

On the most prominent point about 8 miles northeast of Rock Springs and 2 miles north of the Gunn mine.

Signal and station mark: A cairn 7 feet high centered over aluminum tablet cemented in stone and placed in ground level with surface.

Reference mark: "R + P" cut in solid rock; distance 5.2 feet, true azimuth $104^{\circ} 13'$ from tablet; centered under instrument.

[Latitude $41^{\circ} 40' 07.24''$. Longitude $109^{\circ} 09' 42.19''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rock Springs.....	27 51 07	207 48 53	4.01836
Wilkins.....	38 36 05.89	218 28 48.91	4.3887726
Pilot.....	80 07 35.47	260 00 01.56	4.2052580
House.....	123 45 30	303 42 47	3.83323
North.....	176 00 34.48	356 00 14.08	4.0075060
Steamboat.....	206 03 32	26 11 22	4.56752
Grassy.....	208 44 01	28 48 51	4.32008
Rocky.....	218 15 30	38 21 51	4.32875
Sharp.....	233 04 26	53 13 34	4.37632
Doubletop.....	238 50 27	59 00 35	4.39180
Black Rock.....	257 50 41	78 02 37	4.40575
Black Butte.....	291 53 31	112 07 56	4.51215
Baxter.....	320 42 07	140 44 28	3.88888
South.....	354 32 56.77	174 33 13.21	3.7803420

DOUBLETOP, SWEETWATER COUNTY, WYO.

(Not occupied.)

A prominent butte on the Leucite Hills with a slight double top. Point sighted is the middle of the northmost point.

[Latitude $41^{\circ} 46' 59.80''$. Longitude $109^{\circ} 54' 28.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Quaking Asp.....	24 20 09	204 11 55	4. 62760
South.....	47 43 27	227 33 36	4. 44416
Center.....	59 00 35	238 50 27	4. 39180
North.....	83 18 50	263 07 00	4. 34220

GRASSY, SWEETWATER COUNTY, WYO.

(Not occupied.)

A grassy-looking prominent butte on the Leucite Hills. It has, seemingly, a small cairn on top which serves as station mark.

[Latitude $41^{\circ} 50' 01.16''$. Longitude $109^{\circ} 02' 26.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
South.....	21 22 00	201 17 27	4. 41671
Center.....	28 48 51	208 44 01	4. 32008
Pilot.....		230 40 16	4. 52343
North.....	52 47 40	232 42 29	4. 13140

HOUSE, SWEETWATER COUNTY, WYO.

(Not occupied.)

Center of a lone house 7 miles north of city hall, on east side of Killpecker Creek.

[Latitude $41^{\circ} 42' 09.84''$. Longitude $109^{\circ} 13' 47.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wilkins.....	22 41 33	202 37 32	4. 39532
North.....	217 50 54	37 53 17	3. 90665
Center.....	303 42 47	123 45 30	3. 83323

NORTH, SWEETWATER COUNTY, WYO.

The most prominent point farthest west of several points, about 13 miles N. 8° E. from Rock Springs, in the north-south chain of White Hills east of Killpecker Creek (same height at the north end). Follow Pinedale road east of Killpecker Creek until draw is reached, up which is a railway grade; station is about 3 miles northeast of old camp at upper end of grade. The left-hand wagon road from old grade camp up the canyon probably passes within 100 yards of station.

Signal: A cairn 7 feet high with cedar tree in center.

Station mark: Aluminum triangulation tablet cemented in solid rock.

Reference mark: "R.△P." cut in solid rock; distance 9.6 feet from station, true azimuth 196° 56'.

[Latitude 41° 45' 36.22". Longitude 109° 10' 12.84'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
House.....	37 53 17	217 50 54	3.90665
Pilot.....	49 28 45.17	229 21 31.25	4.2979244
Boar Tusk.....	174 14 19	354 13 13	4.35533
Steamboat.....	216 18 55	36 27 06	4.45635
Grassy.....	232 42 29	52 47 40	4.13140
Rocky.....	244 36 09	64 42 51	4.18786
Doubletop.....	263 07 00	83 18 50	4.34220
Black Butte.....	305 46 06	126 02 12	4.58093
Baxter.....	340 48 43	160 52 46	4.23273
Center.....	356 00 14.08	176 00 34.48	4.0075060

PILOT, SWEETWATER COUNTY, WYO.

On highest point of a very prominent peak on the summit of the table-land lying a few miles northwest of Rock Springs. The peak is known as Pilot Butte and lies about 4 miles west of Sixmile Spring. The summit is bluffly on all sides but can be easily climbed on the east side.

Signal and station mark: A cairn 5 feet high, centered over aluminum triangulation tablet cemented in solid rock.

[Latitude $41^{\circ} 38' 37.52''$. Longitude $109^{\circ} 21' 05.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boar Tusk.....	199 45 37	19 51 46	4. 57634
Steamboat.....	221 35 37	.....	4. 68249
North.....	229 21 31. 25	49 28 45. 17	4. 2979244
Grassy.....	230 40 16	.....	4. 52343
Center.....	260 00 01. 56	80 07 35. 47	4. 2052580
South.....	281 06 21. 63	101 14 11. 73	4. 2226392
Bitter.....	296 16 15	116 23 58	4. 25524
Quaking Asp.....	319 41 30. 56	139 50 50. 72	4. 4816736
Wilkins.....	358 00 41. 31	178 00 57. 58	4. 2145088

QUAKING ASP, SWEETWATER COUNTY, WYO.

On the summit of Quaking Asp Mountain, about 1.5 miles south of Rock Springs. The road from Rock Springs to Willow Springs and Browns Park passes about 1.5 miles west of station, which is on the sharpest point and the third point (at about same elevation) counting from west end of high part of mountain. Kent's ranch is about 3 miles north and Willow Springs about 2 miles south, both places being on the Rock Springs-Browns Park road.

Signal and station mark: A cairn 7 feet high, centered over bronze triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude $41^{\circ} 26' 67.30''$. Longitude $109^{\circ} 07' 00.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brown.....	16 55 17. 78	196 50 03. 19	4. 5824563
Twin.....	60 10 32. 22	239 47 15. 69	4. 7546500
Wilkins.....	109 38 55. 40	289 29 52. 30	4. 3053660
Pilot.....	139 50 50. 72	319 41 30. 56	4. 4816736
Rock Springs.....	152 41 37	332 37 30	4. 27390
Bitter.....	167 14 44	347 13 32	4. 19161
South.....	170 56 43. 15	350 55 12. 30	4. 3045337
Rocky.....	192 31 51	12 36 24	4. 64054
Sharp.....	200 50 30	20 57 51	4. 63400
Doubletop.....	204 11 55	24 20 09	4. 62760
Black Rock.....	214 06 20	34 16 28	4. 57720
Black Butte.....	242 29 35	62 24 06	4. 47450

RICHARDS, SWEETWATER COUNTY, WYO.

On a prominent peak on the divide between Daniels Creek and Spring Creek, and about 2 miles south and a little west of Hanks's (the old Richards) ranch, 50 miles south of Rock Springs. This peak is locally known as Richards Butte. August 4, 1908, the original rock mounment used as a reference point was taken down and rebuilt over center of station. It is less than a mile north of the Utah line.

Signal and station mark: A cairn 7 feet high; bronze triangulation tablet cemented in solid rock.

[Latitude $41^{\circ} 00' 54.25''$. Longitude $109^{\circ} 18' 15.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lena.....	20 10 09.52	200 05 49.86	4.4308414
Marsh Peak.....	52 47 20.28	232 26 46.63	4.7448761
Phil Pico.....	84 57 58.50	264 33 43.03	4.7166557
Twin Buttes.....	118 36 44.26	298 20 57.24	4.5826379
Brown.....	204 36 23.84	24 38 33.92	4.0452373

ROCK SPRINGS, SWEETWATER COUNTY, WYO.

(Not occupied.)

Center of tower of city hall.

[Latitude $41^{\circ} 35' 08.28''$. Longitude $109^{\circ} 13' 12.54''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wilkins.....	46 20 55	226 16 02	4.15729
Center.....	207 48 53	27 51 07	4.01836
South.....	239 22 06	59 24 42	3.80112
Quaking Asp.....	332 37 30	152 41 37	4.27390

ROCKY, SWEETWATER COUNTY, WYO.

(Not occupied.)

Prominent butte in the Leucite Hills. Point sighted is, seemingly, a small cairn, which served as station mark, on summit.

[Latitude $41^{\circ} 49' 09.71''$. Longitude $109^{\circ} 00' 09.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Quaking Asp.....	12 36 24	192 31 51	4. 64054
South.....	29 09 28	209 03 24	4. 41518
Center.....	38 21 51	218 15 30	4. 32875
North.....	64 42 51	244 36 09	4. 18786

SHARP, SWEETWATER COUNTY, WYO.

(Not occupied.)

Sharp, prominent butte in the Leucite Hills, with what seemed to be a small cairn on summit. Point sighted is cairn when visible; when not visible the center of the summit, which is sharp.

[Latitude $41^{\circ} 47' 50.29''$. Longitude $108^{\circ} 55' 57.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Quaking Asp.....	20 57 51	200 50 30	4. 63400
South.....	42 24 57	222 16 05	4. 43852
Center.....	53 13 34	233 04 26	4. 37632

SOUTH, SWEETWATER COUNTY, WYO.

On a prominent point about 2 miles north of Union Pacific Railroad, 4 miles northeast of Rock Springs, and about 2 miles south of Gunn mine. The road from Rock Springs to No. 9 fan passes about 0.75 mile west of station. From No. 9 fan keep east up ridge to highest point.

Signal and station mark: A cairn 7 feet high, centered over aluminum triangulation tablet cemented in stone and placed in ground level with surface.

[Latitude 41° 36' 52.66''. Longitude 109° 09.' 17.45''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bitter.....	3 05 52	183 05 39	3. 67728
Wilkins.....	50 21 52.46	230 14 19.30	4. 3133517
Rock Springs.....	59 24 42.46	239 22 06	3. 80112
Pilot.....	101 14 11.73	281 06 21.63	4. 2226392
Center.....	174 33 13.21	354 32 56.77	3. 7803420
Grassy.....	201 17 27	21 22 00	4. 41671
Steamboat.....	201 46 56	.....	4. 62521
Rocky.....	209 03 24	29 09 28	4. 41518
Sharp.....	222 16 05	42 24 57	4. 43852
Doubletop.....	227 33 36	47 43 27	4. 44416
Black Rock.....	244 57 10	65 08 50	4. 42903
Baxter.....	269 50 11	89 52 15	3. 63648
Black Butte.....	281 40 50	101 54 58	4. 48039
Quaking Asp.....	350 55 12.30	170 56 43.15	4. 3045337

STEAMBOAT, SWEETWATER COUNTY, WYO.

(Not occupied.)

One of the prominent mountains about 35 miles northeast of Rock Springs; well known by the name of Steamboat Mountain. Point sighted is the farther east of 2 points on slight double top on which there may be a small monument. Another point farther north is prominent, but the double top, on south point, herein named Steamboat, seemed the highest and was therefore utilized.

[Latitude 41° 58' 02.41''. Longitude 108° 57' 57.36''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South.....	.....	201 46 56	4. 62521
Center.....	26 11 22	206 03 32	4. 56752
North.....	36 27 06	216 18 55	4. 45635
Pilot.....	.....	221 35 37	4. 68249

TWIN, SWEETWATER COUNTY, WYO.

The northernmost peak of three badland peaks lying between Green River, Black Fork, and Henrys Fork. From Green River City follow road to Buckboard crossing of Green River; thence follow Henrys Fork road for about 3 miles and ascend peak on south side. Station is about 35 miles from Green River City by this route. A good

spring nestles in a grove of fir and aspen a little below the summit of the long, flat, middle peak, on the north side, about 2 miles southwest of station. This grove of fir is the only one in sight from station. July 17, 1908, the stone cairn originally built as a reference point was taken down and rebuilt over aluminum bolt marking center of station.

Station mark: Aluminum bolt cemented in large sandstone.

[Latitude $41^{\circ} 10' 45.54''$. Longitude $109^{\circ} 42' 16.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marsh Peak.....	11 21 39.70	191 16 48.14	4. 7243835
Phil Pico.....	38 22 46.53	218 14 15.28	4. 4668992
Richards Butte.....	298 20 57.24	118 36 44.26	4. 5826379
Lena.....	330 38 27.65	150 49 52.43	4. 6983833
Wilkins.....	220 25 59.70	40 40 15.35	4. 6658736
Quaking Asp.....	239 47 15.69	60 10 32.22	4. 7546500
Brown.....	281 53 28.69	102 11 26.85	4. 5919137

WILKINS, SWEETWATER COUNTY, WYO.

On the highest point of the prominent peak about 9 miles southwest of Rock Springs, about 3 miles south from the pump station near Wilkins siding.

Signal and station mark: A cairn 7 feet high centered over bronze triangulation tablet cemented in solid rock.

[Latitude $41^{\circ} 29' 46.66''$. Longitude $109^{\circ} 20' 40.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Twin.....	40 40 15.35	220 25 59.70	4. 6658736
Pilot.....	178 00 57.58	358 00 41.31	4. 2145088
House.....	202 37 32	22 41 33	4. 39532
North.....	206 19 29.08	26 26 26.09	4. 5145639
Center.....	218 28 48.91	38 36 05.89	4. 3887726
Rock Springs.....	226 16 02	46 20 55	4. 15729
South.....	230 14 19.30	50 21 52.46	4. 3133517
Bitter.....	241 37 52	61 45 18	4. 24792
Quaking Asp.....	289.29 52.30	109 38 55.40	4. 3053660
Brown.....	349 31 54.57	169 35 41.12	4. 6442859

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