

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

RESULTS

OF

PRIMARY TRIANGULATION AND PRIMARY TRAVERSE

FISCAL YEAR 1904-5

BY

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Wyoming

Triangulation stations

Bighorn and Fremont counties

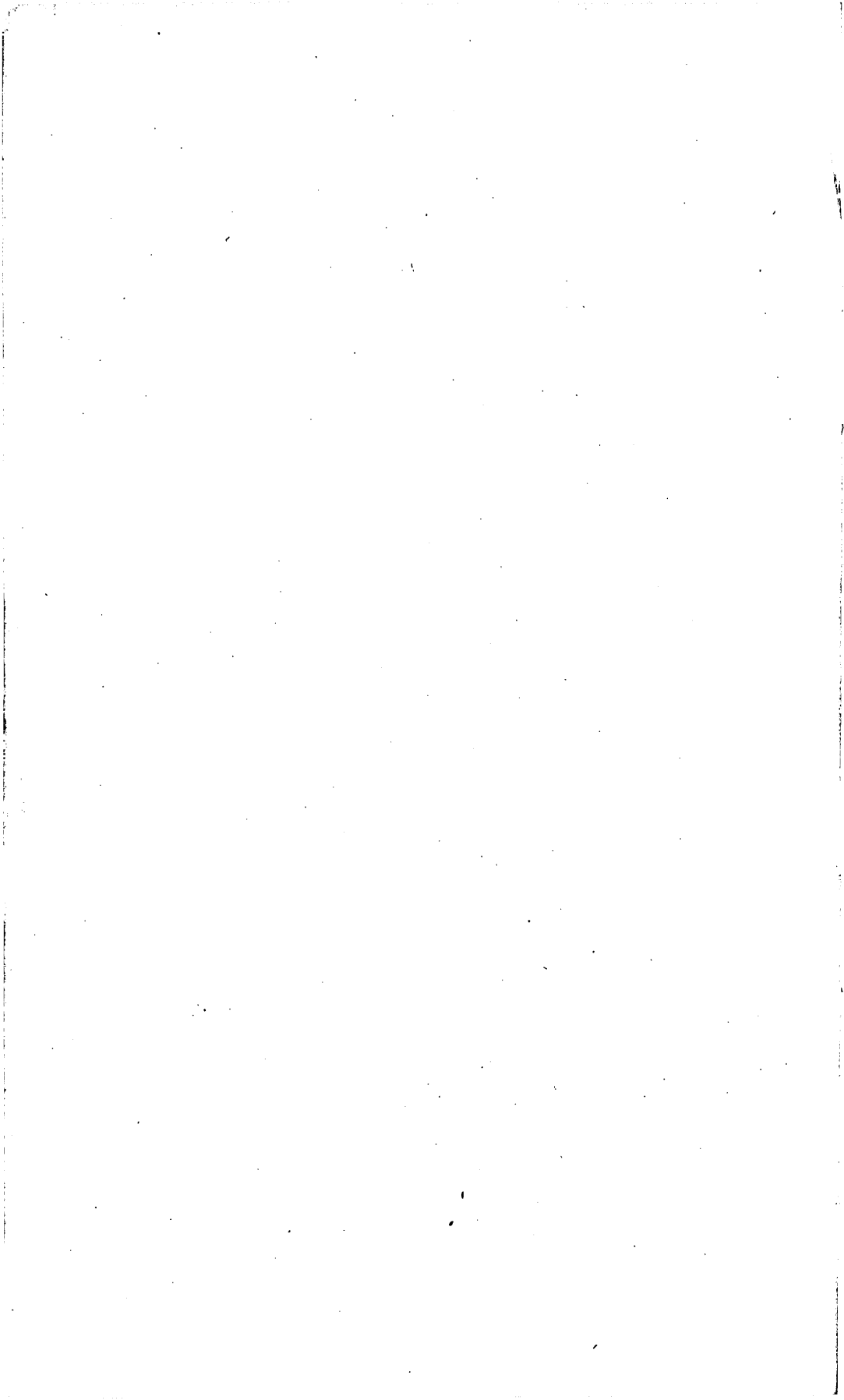
Kirwin and other quadrangles

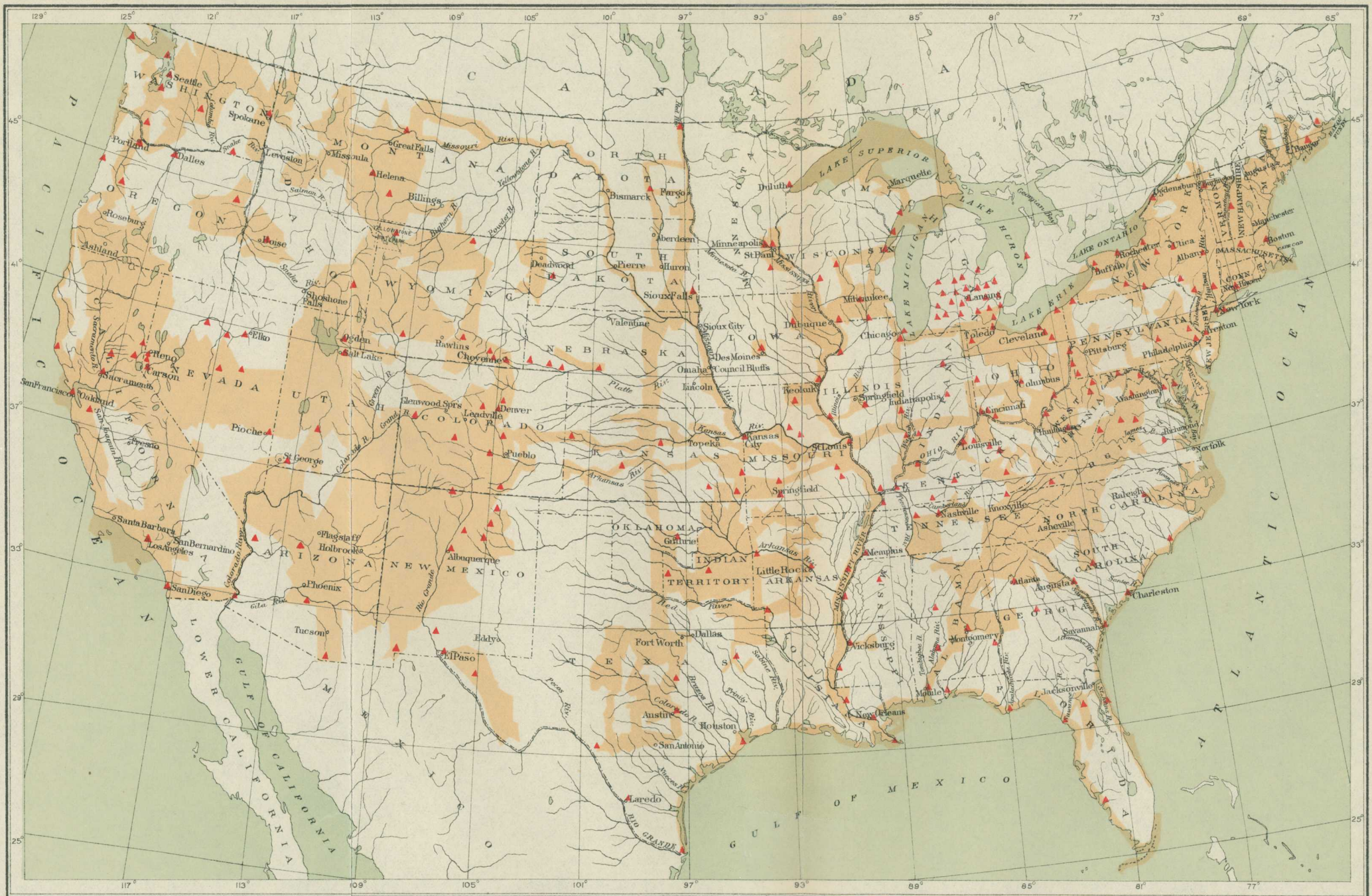
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MAP SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL
to April 30, 1905

A. H. H. & Co. Lith. Bal.

Areas tinted are controlled by triangulation or traverse

▲ Astronomic station

100 0 100 200 300 400 500 600 MILES

RESULTS OF PRIMARY TRIANGULATION AND PRIMARY TRAVERSE, FISCAL YEAR 1904-5.

By SAMUEL S. GANNETT.

SUMMARY.

Summary of published results, 1904-5: Triangulation and primary traverse.

Locality.	Triangulation stations.	Traverse stations.
EASTERN DIVISION.		
Alabama.....		183
Georgia.....		139
Illinois.....		212
Iowa.....		145
Kentucky.....		40
Maine.....	8	
Maryland.....		170
Minnesota.....		100
Nebraska-Iowa.....		53
New Hampshire-Vermont.....	11	
New York.....	8	179
North Carolina.....		432
Ohio.....		426
Pennsylvania.....	13	123
South Carolina.....		106
Tennessee.....		110
Wisconsin.....		161
Minnesota-Wisconsin.....	8	
WESTERN DIVISION.		
Arizona.....	15	
California.....	25	
Colorado.....	49	
Montana.....	26	
Oregon-California.....	9	
South Dakota.....	45	
Texas.....	14	
Wyoming.....	41	
Total.....	272	2,539

EASTERN DIVISION OF TOPOGRAPHY.

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

ALABAMA.

PRIMARY TRAVERSE.

CHILTON AND SHELBY COUNTIES.

BESSEMER 30-MINUTE QUADRANGLE.

The following geographic positions were determined from primary traverse run by Mr. C. B. Kendall in 1904. The line starts from an adjusted position at Generys, follows railroads and wagon roads south, east, and north near the borders of the quadrangle, and is connected with an adjusted position at Leeds. Another line starts from adjusted position at Pelham, follows the Louisville and Nashville Railroad southward near the middle of the quadrangle, and connects with main traverse line along the southern border.

Geographic positions along the Alabama Great Southern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bench mark post No. 173.....	33 18 18.1	86 54 14.5
Generys, 1.25 miles south of; railway crossing	33 17 46.6	86 55 02.7
Bamford, railway crossing	33 16 28.6	86 56 01.3
Trestle No. 217, point over stream.....	33 15 29.4	86 56 44.8
Turner, railway crossing.....	33 14 37.6	86 57 28.8
Trestle No. 189, point over stream.....	33 13 26.2	86 57 39.9
Cababa River, railroad bridge over, in west end of cap- stone to south abutment, tablet stamped "Prim. Trav. Sta. No. 41".....	33 12 50.2	86 57 36.1
Corner stone marked "16, 17, 20, 21".....	33 12 05.7	86 58 09.7
Gurnee Junction, point of switch to west leg of Y	33 11 47.7	86 58 04.6
Gurnee, opposite sign	33 11 20.0	86 58 11.2
Milepost 18, road crossing 300 feet north of.....	33 10 46.5	86 58 33.5
Anita, road crossing.....	33 10 27.7	86 58 50.9
Adin, road crossing.....	33 09 18.8	86 59 52.2
Daly, opposite sign.....	33 08 45.1	87 00 17.0
Gurnsey, point of frog to Gurnsey branch.....	33 07 55.8	87 00 29.0
Seymore, road crossing north of.....	33 06 51.2	87 01 29.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
Coleanor, southwest corner of store; iron post stamped "Prim. Trav. Sta. No. 100".....	33 05 43.7	87 02 11.2
Coleanor, 3 corners 1 mile southeast of; 35 feet north to oak stump.....	33 05 16.7	87 01 45.3
Small stream, bridge over.....	33 05 17.9	87 00 38.4
Hill, forks of road near top of, 25 feet north to pine tree, 35 feet south to oak tree.....	33 05 15.0	86 59 34.1
Four Mile Creek, ford of; 25 feet north to oak tree, 50 feet east to oak tree.....	33 04 34.1	86 58 12.3
Forks of road south and east, 50 feet southeast to sign-board which reads "to Fletchers Bridge," 50 feet north to hickory tree painted "p. t.".....	33 04 36.2	86 57 46.6
Forks of road north and northwest at milepost "Brierfield 4 miles," 30 feet northeast to pine tree, 20 feet south to hickory.....	33 03 45.8	86 57 34.0
Brierfield, forks of road 3 miles southwest of; 25 feet southeast to double oak, 65 feet northwest to oak painted "p. t.".....	33 02 57.7	86 56 47.8
Forks of road south and east at northwest corner of clearing, 70 feet east to locust tree.....	33 02 09.8	86 58 05.0
Crossroads, 25 feet south to pine, 30 feet northeast to double oak.....	33 01 58.8	86 58 39.9
Six Mile village, forks of road 0.66 mile northeast of; 40 feet west to oak, 10 feet southeast to sign "C—U 10 mi.".....	33 00 54.4	86 59 48.5
Six Mile village, south side of east abutment of bridge at; iron post stamped "Prim. Trav. Sta. No. 257".....	33 00 26.3	87 00 15.1
Forks of road 10 feet northeast to pine, 30 feet southwest to pine.....	33 00 31.1	86 58 54.8
Forks of road west and northwest; 30 feet north to clump of oaks; 40 feet south to oak.....	33 00 49.0	86 57 48.7
Ashby, crossroads 1 mile west of; 25 feet southwest to pine stump, 25 feet northwest to pine stump.....	33 00 54.8	86 56 38.0
Ashby, railway crossing 400 feet north of station.....	33 01 12.7	86 55 10.2
Ashby, crossroads 1 mile east of; 30 feet east to bridge, 20 feet west to bridge.....	33 01 00.8	86 54 22.2
Top of hill, second-class road.....	33 00 55.5	86 53 22.2
County line, point in road 100 feet north of.....	33 01 00.3	86 52 52.6
Forks of road west and northwest, 30 feet east to rail fence, painted "P. T.".....	33 01 05.5	86 52 38.3
Currys ford, 0.25 mile south of; at 3 corners, iron post stamped "Prim. Trav. Sta. No. 349".....	33 01 12.4	86 52 08.5
Three corners, 15 feet south to plank fence, 50 feet north to corner of fence, painted "P. T.".....	33 01 26.6	86 51 02.7
Claring, forks of road at northeast corner of.....	33 01 27.6	86 49 28.4
Forks of road south and northeast, 100 feet northeast to pine stump, painted "P. T.".....	33 01 08.2	86 48 29.4
Junction of roads 0.25 mile northeast of Providence Church.....	33 01 15.5	86 47 49.4
Forks of road; 50 feet east to pine stump, 30 feet west to pine tree.....	33 01 01.7	86 47 13.0
Ocampo, overhead crossing 1 mile south of.....	33 01 07.3	86 46 17.4

Geographic positions along Clear Creek Lumber Company's railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Clear Creek, at southeast corner of company store, iron post stamped "Prim. Trav. Sta. No. 432"	33 01 52.8	86 45 43.0
Clear Creek, railway crossing 1.25 miles east of	33 01 24.2	86 44 34.9
Trestle over wagon road	33 01 56.5	86 43 44.5
Trestle over stream (third creek)	33 02 16.3	86 42 30.7
Summit cut, 200 feet east of log landing	33 02 08.1	86 41 26.4
Trestle, north end of, 150 feet west of crossing	33 01 54.2	86 40 10.3
Tom Town, road crossing	33 01 21.1	86 39 36.6
Road crossing, 1 mile southwest of mill, iron post stamped "Prim. Trav. Sta. No. 565"	33 00 21.2	86 38 01.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Junction of roads, 10 feet west to oak marked "P. T." ..	33 00 51.2	86 36 35.3
Forks of road, 10 feet west to fence, 25 feet southeast to northwest corner of stable	33 01 23.9	86 36 08.1
Ford of Crawford Branch	33 02 00.9	86 35 25.6
Bridge, east column of abutment	33 02 22.6	86 35 03.5
Shraders Mill, forks of road	33 02 49.7	86 35 04.0
Shraders Mill, forks of road 1 mile northeast of	33 03 26.8	86 34 12.9
Shraders Mill, 4 corners 1.5 miles northeast of	33 03 53.4	86 33 42.6
Forks of road southwest and south, 45 feet south to corner of fence painted "P. T."	33 04 50.7	86 32 20.4
Church, forks of road 600 feet northeast of	33 05 22.8	86 31 52.1
Forks of road	33 05 36.0	86 31 22.1
Cardous Ferry, west bank of Coosa River, 15 feet south to gum tree, 10 feet northeast to gum tree	33 05 14.4	86 30 50.3
Mastillers station, near railroad crossing, iron post stamped "Prim. Trav. Sta. No. 715"	33 06 17.2	86 30 39.0
Mastillers, railway crossing 2 miles west of	33 06 52.0	86 31 55.1
Kewshatchie, opposite milepost 441	33 07 10.9	86 32 33.3
Railroad crossing	33 07 11.5	86 33 44.2
Shelby, road crossing	33 06 52.1	86 35 00.4
Shelby, 4 corners 1.25 miles northeast of	33 07 53.5	86 34 19.1
Crossroads	33 09 17.4	86 33 34.3
Columbia, 3 miles east of; northeast of junction of roads, iron post stamped "Prim. Trav. Sta. No. 756"	33 09 38.2	86 33 17.6
Beeswax Creek, forks of road 300 feet southwest of; 30 feet west of bridge, 30 feet northeast to oak	33 10 58.5	86 32 36.1
Second class road north	33 11 24.9	86 31 53.6
Wilsonville, 4 corners 3 miles southwest of	33 11 47.1	86 31 09.2
Wilsonville, crossing	33 13 59.9	86 29 01.5
Wilsonville, in angle between spire and east wall of Baptist Church at; iron post stamped "Prim. Trav. Sta. No. 794"	33 14 04.1	86 29 02.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wilsonville, forks of road 1 mile north of	33 14 53.0	86 29 04.0
Forks of road northeast and northwest	33 15 53.4	86 29 59.7
Crossroads, 200 feet north to gate	33 16 31.6	86 30 47.0
Crossroads, 20 feet south to signboard "Columbia 9.25 mi"	33 16 45.8	86 30 59.9
Old sawmill, 4 corners near, 25 feet north to pine, 25 feet south to pine	33 17 31.8	86 31 48.7
Bridge, 4 corners 300 feet north of	33 18 07.1	86 32 43.6
Bridge over Yellow Leaf Creek	33 18 22.9	86 33 06.8
Bridge over Yellow Leaf Creek, forks of road 1 mile north of	33 18 56.6	86 33 10.2
Four corners, 30 feet west to double oak, 20 feet southwest to signboard	33 20 06.2	86 32 48.1
Intersection of roads, at southwest corner of, iron post stamped "Prim. Trav. Sta. No. 908"	33 21 23.5	86 32 04.9
Phillips store, 4 corners 1 mile north of	33 21 25.2	86 33 07.2
Railway crossing	33 21 22.9	86 34 17.9
Forks of roads, 0.25 mile west of road junction, 15 feet north, to oak painted "P. T."	33 22 01.9	86 34 46.6
Gap in stone ridge	33 22 35.0	86 34 44.1
Pine ridge, top of, 500 feet west of crossroad	33 23 11.1	86 34 36.0
Laurel triangulation station, Coast and Geodetic Survey	33 23 50.98	86 34 51.82
Forks of road, 30 feet northeast, to pine painted "P. T."	33 25 10.8	86 34 51.4
Top of hill, opposite milepost "Montevale 31 miles"	33 26 00.8	86 33 52.2
Schoolhouse, well at	33 26 35.0	86 33 08.5
Forks of road, 75 feet northeast, to signboard "Montevale 33 miles," 20 feet south to fence, 10 feet north to oak ...	33 27 12.9	86 32 26.6
Forks of road, 50 feet southwest, to signboard "Montevale 34 miles"	33 27 43.5	86 31 42.0

Geographic positions along the Central of Georgia Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Vandiver, road crossing	33 28 12.2	86 30 52.0
Vandiver, at southwest corner of Whitefield and Boasher's store, iron post stamped "Prim. Trav. Sta. No. 1077"	33 28 13.7	86 30 50.2
Vandiver, road crossing 1 mile north of	33 28 39.8	86 31 24.6
Coosa Mountain Tunnel, south end of	33 28 52.8	86 31 55.8
Dunnivant, road crossing	33 29 37.2	86 32 42.4
Dunnivant, road crossing 0.75 mile north of	33 30 15.4	86 33 05.7
Thompsons Gap Tunnel, south end of	33 30 58.9	86 32 39.2
Second-class crossing near telegraph pole marked "R. R. 752.0"	33 31 30.4	86 32 52.4
Leeds, road crossing west of	33 32 37.8	86 32 23.7

18 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along Louisville and Nashville Railroad between Pelham and Ocampo.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pelham, tablet at.....	33 17 09.8	86 48 52.6
Pelham, road crossing southwest of station.....	33 17 04.3	86 48 49.5
Keystone, road crossing.....	33 16 04.0	86 48 46.8
Keystone, road crossing 0.75 mile south of.....	33 15 36.0	86 48 50.3
Alabaster, road crossing.....	33 14 37.4	86 49 00.7
Section house, road crossing.....	33 13 52.5	86 48 52.3
Newela, road crossing.....	33 13 15.5	86 48 29.9
Saginaw, road crossing.....	33 13 01.9	86 47 57.5
Road crossing.....	33 12 21.0	86 46 59.8
Longview station, at southwest corner of company store, iron post stamped "Prim. Trav. Sta. No. 28".....	33 11 56.9	86 46 46.0
Longview, second-class road crossing 0.75 mile south of ..	33 11 24.2	86 46 29.0
Varnons, road crossing.....	33 09 58.0	86 45 42.3
Dargin, road crossing.....	33 09 08.6	86 45 29.4
Milepost 425, road crossing 400 feet north of.....	33 07 59.2	86 45 19.0
Calera, road crossing 1 mile north of.....	33 07 14.0	86 45 04.7
Calera station, 100 feet north of; 66 feet west of railway, in limestone, aluminum tablet stamped "Prim. Trav. Sta. No. 43".....	33 06 13.3	86 45 06.2
Calera, road crossing 0.33 mile south of.....	33 05 51.4	86 45 05.7
South Calera, on county line, road crossing.....	33 04 26.4	86 44 58.1
South Calera, 0.75 mile south of, road crossing.....	33 03 45.6	86 45 11.4
Minooka station.....	33 02 53.0	86 45 30.5
Minooka, road crossing 0.5 mile south of.....	33 02 29.3	86 45 38.4
Ocampo station.....	33 01 54.9	86 45 49.5

JEFFERSON AND SHELBY COUNTIES.

BESSEMER SPECIAL QUADRANGLE.

The following geographic positions on the United States standard datum were obtained from primary traverse run in 1904 by Mr. C. B. Kendall, field assistant. The line starts from a position at Ensley, established by primary traverse in 1904, and follows highways south to Dolomite post-office; thence south along Alabama Great Southern Railroad through Bessemer to McCalla; thence east along highway to Southern Railway at Morgans station; thence south along Southern Railway to Generys station; thence east along highway to Louisville and Nashville Railroad at Fallston station, thence north and east along Louisville and Nashville Railroad through Helena to Pelham; thence northeast along highways through Highland to Quito; and thence north along highways to Birmingham, closing on position established by primary traverse in 1904.

Geographic positions along highways between Ensley and Dolomite.

Station.	Latitude.	Longitude.
Ensley and Pratt City stations, between, cemented in masonry pedestal of iron bridge over village creek, bronze tablet "No. 8"	° ' " 33 31 14.8	° ' " 86 53 21.4
Ensley, center of 17th street and F avenue.....	33 30 49.7	86 53 40.9
Oakland Church, road junction at, 35 feet northwest to oak tree, 50 feet northeast to corner of church.....	33 29 43.0	86 54 05.2
Forks of road, 40 feet east to oak tree, 30 feet northwest to lot fence	33 28 43.1	86 55 29.9
Center of Louisville and Nashville Railroad at public road crossing, 300 feet east of church and cemetery....	33 27 27.3	86 57 05.7
Dolomite, center of track at Woodward's Railroad at road crossing, 0.25 mile south of.....	33 27 25.8	86 57 38.8

Geographic positions along the Alabama Great Southern Railroad between Dolomite and McCalla.

Station.	Latitude.	Longitude.
Junction of Woodward's Coal and Iron Company's Railroad and Louisville and Nashville Railroad, center of tracks at.....	° ' " 33 26 38.5	° ' " 86 57 55.6
Frisco Railroad at trestle over small creek	33 25 51.3	86 58 13.9
Public road crossing, center of Frisco Railroad, main track.....	33 25 04.4	86 58 05.1
Crossing of Frisco Railroad and B. & B. Electric Railway, center of tracks	33 24 37.2	86 57 48.6
Bessemer, east end of Louisville and Nashville Railroad station at.....	33 24 13.4	86 57 09.3
Bessemer, in top doorstep in south side of east entrance to city hall, aluminum tablet stamped "Prim. Trav. Sta. No. 59".....	33 24 04.4	86 57 16.9
Jonesboro, street crossing 600 feet north of water tank...	33 23 21.8	86 57 34.1
Trestle at point over creek.....	33 22 39.2	86 58 08.6
Junction of Southern Railroad and Alabama Great Southern Railroad, point of switch opposite operator's office..	33 22 08.0	86 58 33.7
McCalla station, road crossing 0.5 mile east of.....	33 20 31.7	87 00 00.8
McCalla station, public road crossing in center of track of Alabama Great Southern Railroad.....	33 20 02.9	87 00 30.4
McCalla station, 135 feet south of center of Alabama Great Southern tracks, on west edge of road to Helena, in top of limestone boulder, bronze tablet	33 20 02.1	87 00 29.1

Geographic positions along highways between McCalla and Morgan.

Station.	Latitude.	Longitude.
Pleasant Hill schoolhouse and church, 4 corners 400 feet west of; 35 feet northeast to milepost, 40 feet east to stump	° ' " 33 19 49.2	° ' " 86 59 56.3
Clear Branch Gap, 4 corners 0.5 mile east of, 20 feet northwest to signpost, 30 feet southeast to corner yard fence	33 19 46.4	86 58 56.1
Forks of road west and north, 15 feet northeast to old pine stump, 20 feet south to small gum tree	33 19 51.7	86 57 42.9
Bynems ford, center of Shade Creek	33 19 32.1	86 56 55.0
Forks of road at Dry Creek bed	33 19 37.5	86 56 07.2
Public road, center of Southern Railroad trestle over	33 20 09.6	86 55 22.1
Morgan station, road crossing 0.5 mile south of	33 19 36.4	86 54 36.2

Geographic positions along Southern Railway near Generys station.

Station.	Latitude.	Longitude.
Public road crossing, center of track at trestle over	° ' " 33 18 55.3	° ' " 86 54 14.8
Generys station, 15 feet east of center of Southern Railroad track, at road crossing at south end of small cut 0.25 mile south of station, iron post stamped "Prim. Trav. Sta. No. 173=0"	33 18 18.1	86 54 14.5
Three corners, mound of earth at	33 17 29.6	86 53 46.7
Cahaba River, forks of road just west of bridge over	33 17 07.8	86 53 16.1
Fallston station, road crossing at center of track of B. & B. Branch L. & N. R. R.	33 17 19.8	86 51 38.2

Geographic positions along the Louisville and Nashville Railroad between Fallston and Pelham.

Station.	Latitude.	Longitude.
Helena, center of Louisville and Nashville main line, opposite agent's office, station	° ' " 33 17 45.3	° ' " 86 50 38.9
Helena, road crossing 0.75 mile south of	33 17 47.1	86 50 00.5
Pelham, in limestone boulder at forks of road, 60 feet east of Louisville and Nashville Railroad main line track at road crossing, and 500 feet north of station, aluminum tablet	33 17 09.8	86 48 52.5
Pelham, forks of road 1 mile northeast of	33 18 02.7	86 48 40.7

Geographic positions along highways between Pelham and Birmingham.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Forks of road	33	18	38.5	86	48	17.1
Denson Creek, 3 corners 200 feet east of ford	33	19	46.3	86	47	30.6
Highland Church, center of road opposite	33	20	28.7	86	46	23.8
Three corners, 30 feet northeast to plank fence, 40 feet west to persimmon tree at fence corner	33	20	55.6	86	45	33.5
Forks of road, 20 feet north to oak tree, 50 feet east to large rock	33	21	17.6	86	44	44.8
Church, forks of road 300 feet west of ford of Denson Creek, 30 feet west to long stone, 35 feet south to oak tree	33	21	38.8	86	44	07.0
Allen's gin, forks of road 0.25 mile east of; 45 feet north to oak tree, 30 feet southwest to milepost	33	22	22.6	86	42	26.8
Forks of road, large oak tree	33	22	18.0	86	43	21.3
Bailey's gap, highest point in center of road	33	22	42.7	86	44	03.7
Forks of road, 15 feet southwest to corner of rail fence, 10 feet east to corner rail fence	33	23	01.0	86	44	19.1
Forks of road, near top of hill, 15 feet east to flat rock in east fork	33	23	37.5	86	44	12.7
Forks of road, 40 feet east to oak tree	33	24	03.4	86	44	24.4
Caldwells ford, forks of road near signboard, 500 feet north of north part of Cahaba River, iron post stamped "Prim. Trav. Sta. No. 433"	33	24	58.7	86	44	23.0
Forks of road; 15 feet west to rail fence, 20 feet east to rail fence	33	25	36.1	86	44	08.2
Little Valley Mountain, forks of road 0.25 mile south of top of, 40 feet north to pine tree	33	26	17.8	86	44	49.7
Forks of road, 25 feet southeast to signboard	33	27	23.3	86	45	15.3
Cahaba reservoir, 3 corners at, 20 feet east to signboard ..	33	27	50.6	86	45	26.6
Shade Creek, 3 corners 300 feet north of	33	28	30.5	86	45	51.4
Birmingham, 4 corners 3 miles south of; 10 feet northwest to signpost "Okmoor 6 mi.", 15 feet east to signpost "Irondale 6 mi."	33	29	00.0	86	46	25.5
Hedena station, center of main track of Birmingham South Mineral Railroad	33	29	44.0	86	46	54.0
Birmingham, center of 24th street and avenue B	33	30	47.7	86	47	52.8
Birmingham, center of 26th street and 8th avenue	33	31	30.8	86	48	08.7

GEORGIA.

PRIMARY TRAVERSE.

LUMPKIN COUNTY.

DAHLONEGA SPECIAL QUADRANGLE.

Geographic positions from primary traverse by Mr. E. L. McNair, topographer, in 1905. The line starts from the tower on Dahlonega Agricultural College located by triangulation of the Coast and Geo-

detic Survey; follows highways north to border of quadrangle; thence west, south, and east to a point nearly south of Dahlongega; thence north to starting point. Beginning again on south border of quadrangle the line runs east, north, and west connecting with point where the original line touched the border of quadrangle, thus making two complete circuits. Positions are given on United States standard datum.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Dahlongega Agricultural College, center of tower.....	34	31	47.95	83	59	13.25
Forks of road	34	32	28.6	83	59	27.6
Forks of road	34	33	27.2	83	59	51.9
Forks of road	34	34	00.7	84	00	28.1
W. H. Wimpy, opposite front gate of	34	34	48.5	84	01	18.5
J. K. Lance, southeast corner of porch of	34	34	35.2	84	01	36.3
Ridge, forks on west side and near top of	34	34	36.1	84	02	16.7
Old mill dam, crossing of brook	34	34	41.9	84	03	30.3
Milepost, reads "Dahlongega 7"	34	33	52.0	84	03	27.8
Henry Johnsons, crossroads at	34	33	25.0	84	03	28.6
Forks of road, signboard reads "Coopers 15 miles, Dahlongega 6 miles"	34	32	39.2	84	03	23.8
Siloam Church, 4 corners	34	31	47.0	83	02	29.6
Forks of roads	34	30	06.6	84	02	38.6
Auraria, junction of roads 1 mile north of	34	29	14.4	84	01	14.8
Chestatee River, bridge over, east end of	34	28	53.9	83	59	40.1
F. S. Packard's house, top of hill 200 feet west of	34	29	14.8	83	58	57.7
Middle road from Dahlongega to Gainesville, junction with	34	29	17.5	83	58	16.6
Hull's mill, west end of bridge over Chestatee River	34	30	06.3	83	58	09.4
Crown Mountain mill, top of hill 0.33 mile south of	34	31	22.0	83	58	34.7
M. M. Loudin's house, opposite, on Long Branch	34	28	15.1	83	57	54.5
Forks of road (settlement road to north)	34	28	14.6	83	57	14.0
Forks of road at top of hill	34	28	02.3	83	56	40.3
St. Pauls Church, 4 corners	34	27	01.7	83	56	11.1
Forks of road, signboard reads "Gainesville 15 miles"	34	27	53.3	83	55	30.3
Forks of road at house of Mr. Griswold	34	28	47.2	83	55	10.5
Forks of road, signboard reads "Newbridge 7 miles"	34	29	50.1	83	54	48.0
Garland, northwest corner Bowen's store	34	30	57.1	83	54	32.7
Garland, forks of road 1 mile northwest of	34	31	33.1	83	55	14.4
Power plant of Crown Mountain Co., end of crib and rock work, on south side of river	34	32	09.5	83	55	37.4
Anderson's store, forks of road 400 feet west of	34	33	20.8	83	55	46.5
Forks of road, signboard reads "Cleveland 9 miles, Blairsville 29 miles"	34	33	43.8	83	54	20.6
Forks of road to Jumbo mine	34	34	30.0	83	54	23.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Forks of road, 3 notches cut in oak tree.....	34 34 47.2	83 55 10.8
Forks of road, signboard reads "Dahlonge 5.5 miles"...	34 34 57.4	83 55 49.9
Anderson (Allen), house of, 300 feet west of cloth penalty notice on persimmon tree.....	34 34 35.2	83 56 33.6
Junction with public road	34 34 46.2	83 57 21.5
Church, forks of road.....	34 34 21.9	83 58 03.6
Anderson (Floyd), house of, in front of.....	34 34 57.5	83 58 48.2
Ridge, top of.....	34 35 02.9	83 59 50.8
Junction of roads, cloth penalty notice on oak tree	34 35 00.9	84 00 21.2

HARRIS, MERIWETHER, MUSCOGEE, AND TALBOT COUNTIES.

TALBOTTON QUADRANGLE.

The following geographic positions were obtained by primary traverse run in 1905 by Mr. E. L. McNair, topographer. The line starts at Columbus from an adjusted position established by Mr. J. R. Ellis in 1902, and follows the Central of Georgia Railway east to Paschal; thence north over the Talbotton Railroad to Talbotton; thence north over highways to Belleview; thence west over highways through Cleola and Hamilton to Westpoint, connecting with an adjusted position at that place.

Another line runs from Belleview north over highways to Woodbury; thence west along the Macon and Birmingham Railway to Harris, and is tied to a traverse position at that place.

Geographic positions along the Central of Georgia Railway between Columbus and Paschal.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Columbus, crossing of First avenue and Central of Georgia Railway	32 28 39.1	84 59 29.8
Columbus, north end of train shed, Central of Georgia Railway station	32 28 09.5	84 59 02.8
Willett, 16 feet north of C. of G. R. R. track, and 10 feet west of crossing sign at road crossing, U. S. Geological Survey bench-mark post; stamped "1905 Prim. Trav. Sta. 1"	32 27 11.9	84 57 46.8
Road crossing	32 27 19.3	84 56 43.5
Milepost 96	32 28 05.7	84 56 02.6
Road crossing	32 29 10.0	84 54 34.0
Road crossing, 2d class.....	32 30 01.2	84 53 44.4
Schatulga station, road crossing	32 30 58.5	84 52 06.0
Road crossing.....	32 31 40.6	84 51 16.6
Milepost 90, 30 feet north of center of track and 1,100 east of; iron post stamped "1905 Sta. 2, Prim. Trav."...	32 31 40.9	84 51 16.8

24 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along the Central of Georgia Railway, etc.—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	32 32 17.9	84 50 25.4
Road crossing.....	32 32 43.0	84 48 40.9
Road crossing.....	32 32 59.7	84 46 41.9
Upatoie station, directly in front of C. of G. R. R. station, iron post stamped "1905 Prim. Trav. Sta. 3".....	32 32 49.6	84 44 25.1
Road crossing.....	32 32 26.9	84 43 15.0
Road crossing.....	32 32 12.3	84 42 01.9
Road crossing.....	32 32 06.8	84 40 17.9
Boxspring station, center of main track opposite.....	32 31 56.1	84 39 36.7
Milepost 76.....	32 32 23.0	84 38 04.7
Juniper station at west end of R. R. station, 25 feet south of track center, iron post stamped "1905 Prim. Trav. Sta. 4".....	32 32 55.2	84 36 11.6
Milepost 73.....	32 33 27.2	84 35 16.9
Road crossing.....	32 34 02.8	84 34 15.2
Geneva station.....	32 34 43.2	84 33 05.1
Road crossing.....	32 34 35.5	84 32 08.8
Road crossing.....	32 35 04.5	84 30 34.2
Milepost 66.....	32 36 05.9	84 29 12.2
Paschal station, road crossing.....	32 36 31.4	84 28 13.4
Paschal station, 86 feet east of R. R. station, iron post stamped "1905 Prim. Trav. Sta. No. 5".....	32 36 31.6	84 28 12.9

Geographic positions along the Talbotton Railway between Paschal and Talbotton.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	32 37 03.0	84 28 20.7
Road crossing.....	32 37 52.0	84 28 40.9
Smithboro station, road crossing.....	32 38 31.3	84 29 57.7
Road crossing.....	32 39 49.4	84 31 03.3
Talbotton, street crossing at station.....	32 40 35.5	84 32 11.4
Talbotton, 15 feet south of main front entrance to Tal- bott County court-house, iron post stamped "1905 Prim. Trav. Sta. 6".....	32 40 36.8	84 32 25.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Forks of road.....	32 42 18.1	84 32 30.7
Four corners at house of W. S. Couch.....	32 43 37.7	84 33 07.1
Lazer Creek, south end of covered bridge over.....	32 44 31.7	84 33 16.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road west, at house of Pete Mahone	32 45 47.6	84 33 28.7
J. H. Bryan's house, inside of yard, 24 feet north of front gate and 33 feet from northeast corner of house, iron post stamped "1905 Prim. Trav. Sta. 7"	32 46 07.0	84 33 28.3
Center of road opposite house of J. W. Jones	32 45 01.5	84 34 35.8
Four corners	32 44 37.3	84 35 58.7
Kellam place, opposite large white house	32 43 54.4	84 37 06.4
Matthews Chapel, road southwest	32 43 34.8	84 37 35.0
G. M. Allen, opposite new house of	32 44 15.8	84 38 23.3
Top of hill, where three roads meet	32 44 47.1	84 39 01.2
Joel Walker's house, road north, south, and west	32 44 18.9	84 40 32.6
Cleola post-office, 4 corners, 1½ miles east of	32 44 30.7	84 42 15.0
Oak Mountain station, 55 feet west of Southern Railway track and 78 feet from southwest corner of station, iron post stamped "1905 Prim. Trav. Sta. 11"	32 44 32.0	84 43 31.6
A. G. Miller, opposite house of	32 44 22.2	84 44 01.6
Cleola post-office, forks of road 2½ miles west of and 200 feet east of 4 corners	32 43 50.2	84 45 37.0
North end of covered bridge	32 44 41.0	84 46 23.1
Forks of road at top of hill near old church	32 44 25.0	84 47 32.3
Four corners	32 43 49.4	84 48 42.6
Four corners	32 44 02.8	84 50 10.5
Hamilton station, forks of road, 1½ miles south of	32 44 33.5	84 52 10.7
Hamilton, in front of Robinson's hotel and 130 feet north of court-house, iron post stamped "1905 Prim. Trav. Sta. 12"	32 45 30.0	84 52 30.3
Hamilton station	32 45 37.3	84 52 37.0

This line starts from Hamilton, Ga., a position determined by Mr. J. R. Ellis in 1902, and follows highways through Whitesville to West Point, connecting with a primary traverse position there.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hamilton, station, Central of Georgia Railway	32 45 37.3	84 52 37.0
Forks of road at foot of mountain	32 46 38.0	84 53 27.4
Forks of road	32 46 39.9	84 54 03.7
W. L. Harris, center of road opposite house of	32 46 45.8	84 55 15.1
Schoolhouse, roads east, west, and south	32 46 50.0	84 57 19.2
Forks of road	32 47 35.1	84 57 50.5
Ira Davis, forks of road at house of	32 47 33.5	84 58 44.5
T. W. Haralson, opposite house of	32 48 23.9	84 56 43.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Four corners, about 250 feet west of house of W. M. Maddox	° ' " 32 48 45.7	° ' " 85 00 24.0
Whitesville, near intersection of roads on south side, 30 feet west of corner of Tyler's store, iron post stamped "Prim. Trav. Sta. 13"	32 49 04.1	85 01 58.7
Forks of road	32 49 50.7	85 03 01.2
J. F. Sands, forks of road at house of	32 50 19.5	85 03 56.1
Forks of road, 110 feet west of G. A. Myhand's house.....	32 50 43.9	85 06 01.3
Pearson's mills, center of Shoal Creek, between piers of new bridge	32 50 20.1	85 07 00.3
J. H. Hawkins, opposite tenement house of.....	32 51 14.9	85 07 54.7
Long Cane Creek crossing.....	32 51 57.1	85 09 34.9
West Point, soldiers' monument.....	32 52 31.7	85 10 40.7
West Point, station, Western Railway of Alabama.....	32 52 31.8	85 11 01.6

Line from Belleview north over highways through Chalybeate to Woodbury, thence west over Macon and Birmingham Railway to Harris.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Road southeast.....	° ' " 32 46 33.5	° ' " 84 32 08.3
Road south	32 47 20.2	84 30 36.8
Pleasant Hill, forks of road	32 48 07.4	84 30 00.9
Forks of road	32 49 20.1	84 30 47.9
Road south	32 49 31.1	84 31 39.7
Chuck's store, forks of road.....	32 49 48.4	84 32 10.7
Forks of road	32 51 26.5	84 32 46.7
Road north	32 51 44.6	84 33 14.6
Chalybeate, in grove of trees just east of road and 262 feet from northwest corner of Nelson's store, iron post stamped "Prim. Trav. Sta. No. 8"	32 51 31.4	84 34 47.3
Forks of road, near Mrs. Doctor Campbell's house.....	32 51 58.1	84 36 10.8
Four corners	32 53 05.4	84 35 53.3
Four corners, at W. B. Johnson's mail box	32 54 03.7	84 35 58.5
Road west	32 55 46.1	84 36 10.8
W. P. Gill, forks of road at house of	32 56 17.6	84 36 07.9
W. J. Wells, forks of road at house of	32 56 51.1	84 35 07.0
Cane Creek crossing, long bridge over	32 57 33.1	84 35 45.2
Woodbury station, 0.33 mile west of, 800 feet west of Macon and Birmingham and Southern Railway, and 50 feet southwest of road crossing, on bank 8 feet above track, iron post stamped "Prim. Trav. Sta. No. 9"	32 58 36.1	84 35 13.2

Geographic positions along the Macon and Birmingham Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	32 58 46.6	84 36 46.1
Road crossing.....	32 58 41.4	84 38 20.3
Negro schoolhouse, road crossing at	32 58 37.0	84 39 05.4
Road crossing.....	32 58 14.6	84 40 46.3
Road crossing.....	32 58 01.4	84 41 26.2
Harris, 63½ feet from crossing of Macon and Birmingham Railway and Central of Georgia Railway, iron post stamped "Prim. Trav. Sta. No. 10"	32 58 05.7	84 42 48.2
Harris, crossing of Macon and Birmingham Railway and Central of Georgia Railway	32 58 05.7	84 42 47.5

ILLINOIS.

PRIMARY TRAVERSE.

MADISON AND ST. CLAIR COUNTIES.

BELLEVILLE QUADRANGLE.

The following geographic positions on the United States standard datum were determined by primary traverse in 1905 by Mr. J. R. Ellis, assistant topographer. The line starts from United States Coast and Geodetic Survey triangulation station, Sugarloaf, follows highways south to Belleville; thence east along the Southern Railway to east edge of quadrangle; thence along highways north to northeast corner of quadrangle, connecting with Berger triangulation station and Parkinson triangulation station; thence west along highways to northwest corner of quadrangle, and south to Sugarloaf triangulation station.

Geographic positions along highways.

Station.	Latitude.	Longitude.																
Sugarloaf triangulation station: Near middle of north line of NE. $\frac{1}{4}$, sec. 20; T. 3 N.; R. 8 W., on bluff overlooking American Bottom, 3 miles northwest of Collinsville on land of C. Witte, on top of prominent mound, which is 50 feet above the ground to the east and 150 to 200 feet above American Bottom on west. Station mark: A marble post 6 by 6 inches by $2\frac{1}{2}$ feet long, top 1 inch above ground and marked thus:																		
<table border="1"><tr><td>U.</td><td>S.</td></tr><tr><td>C. & G.</td><td>S.</td></tr></table>	U.	S.	C. & G.	S.	<table><tr><td>°</td><td>'</td><td>"</td></tr><tr><td>38</td><td>42</td><td>05.3</td></tr></table>	°	'	"	38	42	05.3	<table><tr><td>°</td><td>'</td><td>"</td></tr><tr><td>90</td><td>00</td><td>27.5</td></tr></table>	°	'	"	90	00	27.5
U.	S.																	
C. & G.	S.																	
°	'	"																
38	42	05.3																
°	'	"																
90	00	27.5																
Center of iron bridge near road corner.....	38 41 17.5	90 00 28.0																
Collinsville crossing of Combs avenue and Clay street ...	38 40 05.9	89 59 41.0																
Collinsville and Belleville road crossing Pennsylvania Railroad at electric power house.....	38 39 39.5	89 58 56.4																

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Collinsville, 3 miles southeast of; in southwest corner of stone foundation of Bethel Church, aluminum tablet stamped "Prim. Trav. Sta. No. 14, 1905"	° ' "	° ' "
T. 2 N., R. 8 W., secs. 10, 11, 14, and 15, road crossing near corner	38 38 41.1	89 57 42.1
T. 2 N., R. 8 W., quarter corner between secs. 22 and 23, T road east	38 37 17.9	89 57 58.3
Ridge Prairie saloon, crossroads at	38 36 20.8	89 57 58.2
Hy Pfeifer's saloon and hotel, 1 mile south of road west	38 35 33.4	89 57 58.1
T road west at schoolhouse	38 34 23.8	89 57 57.7
T road west at schoolhouse	38 33 35.9	89 57 56.2
Road crossing, O'Fallon branch Louisville and Nashville Railroad, 100 feet north of milepost 18	38 32 26.6	89 57 52.0
Belleville, street crossing Louisville and Nashville Railroad, main line	38 31 48.6	89 59 00.9
Belleville, in northeast corner of court-house yard, iron post stamped "Prim. Trav. Sta. No. 15, 1905"	38 30 47.3	89 58 50.3

Geographic positions along Southern Railway from Belleville eastward.

Station.	Latitude.	Longitude.
Belleville, crossing of Southern Railway under Louisville and Nashville Railroad, near city reservoir	° ' "	° ' "
Mines, road crossing north and south	38 31 35.6	89 58 50.3
Road crossing north and south	38 32 01.6	89 57 50.0
Road crossing north and south	38 32 00.9	89 56 49.3
T. 1 N., R. 8 W., quarter corner between secs. 13 and 14	38 32 01.4	89 56 49.3
Road crossing, north and south, 760 feet east of telegraph office	38 32 02.3	89 55 43.4
Shiloh station, milepost 22, road crossing north and south	38 32 02.8	89 53 55.7
Road crossing north and south between mileposts 23 and 24	38 32 00.7	89 52 07.6
Grassland on property of Chas. Griffin, northeast corner of post-office, bears S. 85° 40' W., distant 110 feet, iron post stamped "Prim. Trav. Sta. No. 16, 1905"	38 31 57.1	89 50 19.1
Road crossing north and south, 150 feet west of milepost 27	38 31 58.1	89 48 25.0
Road crossing north and south, 170 feet west of milepost 28	38 31 57.1	89 47 18.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
North and south road crossing of Southern Railway, near southwest corner of field of J. B. Freese, iron post stamped "Prim. Trav. Sta. No. 17, 1905"	° ' "	° ' "
T. 1 N., R. 6 W., near quarter corner between secs. 3 and 10, crossroads	38 31 55.6	89 45 38.9
T. 1 N., R. 6 W., near quarter corner between secs. 3 and 10, crossroads	38 33 13.8	89 45 06.6

Geographic positions along highways.—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Truss Bridge.....	38 34 04.0	89 45 07.6
T. 2 N., R. 6 W., quarter corner between secs. 27 and 34, crossroads	38 34 57.5	89 45 07.2
Summerfield, in water table at southeast corner of public school building, aluminum tablet stamped "Prim. Trav. Sta. No. 18, 1905"	38 35 56.3	89 45 09.8
Berger triangulation station, near northwest corner of NE. $\frac{1}{4}$ of NW. $\frac{1}{4}$ sec. 22, T. 2 N., R. 6 W., on property of Doctor Berger, 1 mile north of Summerfield and 3 miles east and $\frac{1}{2}$ mile north of village of Lebanon. Station mark: An earthenware pyramid marked "U. S. C. S.," 36 inches below surface, above which is a marble post 30 inches long and 6 inches square, marked		
its upper surface even with ground.		
Western reference mark is a marble post 32 inches long, 4 inches square, in range with eastern row of trees in Doctor Berger's orchard; it is, as nearly as could be determined, on north boundary of sec. 22, which is boundary of Berger's land. Position of western refer- ence mark	38 36 42.4	89 45 32.1
T. 2 N., R. 6 W., crossroads at 100 feet north to small bridge center	38 37 34.4	89 45 06.6
Crossroads 40 feet southwest to mail box, 36 feet north- west to culvert	38 38 13.8	89 45 09.1
Ts. 2 and 3 N., R. 6 W., quarter corner between secs. 3 and 34, crossroads at; also line between Madison and St. Clair counties.....	38 39 18.8	89 45 11.4
T. 3 N., R. 6 W., quarter corner between secs. 22 and 27, T road south.....	38 41 04.3	89 45 13.3
T road east, 160 feet south of iron bridge.....	38 41 57.5	89 45 47.8
St. Jacobs, crossroads at Nollbaner's hotel, in south part of.	38 42 50.8	89 46 05.6
Crossroads at quarter corner between secs. 11 and 14.....	38 42 49.5	89 44 08.4
Crossroads at quarter corner between secs. 12 and 13.....	38 42 47.9	89 43 01.6
Parkinson triangulation station: On land of M. A. Parkin- son, in middle of NE. $\frac{1}{4}$ sec. 12, T. 3 N., R. 6 W., and 1.5 miles west by south from Highland. Station mark: The vertex of a hollow square earthenware pyramid 3 feet below surface, with letters "U. S. C. S." cut on its sides, over which is a marble post 6 by 6 inches and 2.25 feet long, on top of which letters "U. S. C. & G. S." are cut. Reference marks: Two marble posts 5 inches square, 2.5 feet long, 2 inches above ground with a line diagonally across top terminating in arrowhead, arrow- head pointing to station; northeast reference mark 18 feet $8\frac{1}{2}$ inches to station center; southeast mark 18 feet $8\frac{1}{2}$ inches to station center; from center of northeast mark to southeast mark, 25 feet 8 inches; from station center to surveyors rock, 16 feet $9\frac{1}{2}$ inches	38 43 26.9	89 42 44.3

Geographic positions along highways.—Continued.

Station.	Latitude.	Longitude.
Highland, about 2 miles west of; road crossing north and south, 480 feet east of water tank.....	° ' " 38 44 02.9	° ' " 89 42 48.3
In southwest corner of wood pasture owned by John Regel, iron post stamped "Prim. Trav. Sta. No. 19," corner stone in center of road bears S. 2° W., distant 17 feet.....	38 44 32.5	89 44 24.2
T road north, 16 feet northeast to cross on fence post, 19 feet northwest to west end of culvert.....	38 44 32.9	89 45 47.1
T road west at Marine cemetery.....	38 44 59.7	89 46 54.4
T road east 1.5 miles west of Marine cemetery.....	38 45 00.7	89 48 34.2
Silver Creek, national road over west fork of, center of iron bridge on.....	38 45 18.6	89 49 18.4
Troy, 5.2 miles northeast of; in northwest corner of pasture owned by Henry Wendler, at forks of road, iron post stamped "Prim. Trav. Sta. No. 20, 1905".....	38 44 46.3	89 51 02.1
T. 4 N., R. 7 W., corner secs. 27, 28, 33, and 34, T road south.....	38 45 32.3	89 52 27.7
T. 4 N., R. 7 W., corner secs. 28, 29, 32, and 33, stone.....	38 45 32.1	89 53 35.1
T road west, 12 feet southeast to stone in north and south road.....	38 45 59.0	89 54 43.2

Geographic positions along the Illinois Central Railroad between Mont and Peters.

Station.	Latitude.	Longitude.
Mont, Illinois Central Railroad station.....	° ' " 38 46 02.1	° ' " 89 55 50.0
Suburban electric railroad crossing over Illinois Central Railroad.....	38 45 40.1	89 57 23.4
Glen Carbon, near Illinois Central Railroad station, on property of Madison Coal Co., southeast of Illinois Central Railroad station, iron post stamped "Prim. Trav. Sta. No. 21, 1905".....	38 44 45.4	89 58 59.8
Peters station, road crossing north and south.....	38 44 30.9	90 00 07.3

CHAMPAIGN AND PIATT COUNTIES.

MAHOMET QUADRANGLE.

The following geographic positions were obtained by primary traverse run by Mr. J. R. Ellis in 1905. The line starts from a position near Thomsonboro located by primary traverse, follows highways west, south, and east near borders of quadrangle, and is connected with an adjusted traverse position near Tolono. Positions are given on United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T. 21 N., R. 9 E., corner secs. 29, 30, 31, and 32, at crossroads.....	40 14 19.3	88 12 45.5
T. 21 N., R. 9 E., northeast corner sec. 36, iron post stamped "Prim. Trav. Sta. No. 8 1905".....	40 14 18.5	88 13 54.8
T. 21 N., R. 9 E., corner secs. 25, 26, 35, and 36, at crossroads.....	40 14 18.5	88 15 03.4
T. 21 N., R. 8 E., corner secs. 26, 27, 34, and 35, T road east.....	40 14 18.0	88 16 12.2
T. 21 N., R. 8 E., quarter corner between secs. 27 and 28, crossroads.....	40 14 44.2	88 17 21.2
T. 21 N., R. 8 E., quarter corner between secs. 28 and 29, crossroads.....	40 14 43.8	88 18 29.5
T. 21 N., R. 8 E., quarter corner between secs. 29 and 30, crossroads.....	40 14 43.5	88 19 39.0
T. 21 N., Rs. 7 and 8 E., quarter corner between secs. 25 and 30, T road east.....	40 14 43.7	88 20 47.2
T. 21 N., R. 7 E., quarter corner between secs. 25 and 26, T road east.....	40 14 43.0	88 21 54.0
T. 21 N., R. 7 E., in northeast corner sec. 35, stone to corner secs. 25, 26, 35, and 36 bears N. 41° 50' E., distant 38 feet. Nail in blaze on east side of hickory tree bears S. 39° 20' W., distant 29.4 feet. Iron post stamped "Prim. Trav. Sta. No. 9 1905".....	40 14 16.4	88 21 54.2
T. 21 N., R. 7 E., quarter corner between secs. 27 and 34, crossroads.....	40 14 16.9	88 23 36.6
T. 21 N., R. 7 E., corner secs. 28, 29, 32, and 33, T road north.....	40 14 17.2	88 25 19.8
T. 21 N., R. 7 E., corner secs. 29, 30, 31, and 32, T road north.....	40 14 17.4	88 26 28.6
T. 21 N., R. 7 E., corner secs. 30, 31, west of T road east....	40 14 17.4	88 27 36.9
T. 21 N., R. 6 E., corner secs. 25, 26, 35, and 36, T road north.....	40 14 16.1	88 28 45.8
Mansfield, 1.5 miles north of; T. 21 N., R. 6 E., corner secs. 26, 27, 34, and 35, 0.5 mile west of; in northwest corner of S. J. Trimmer's field at east and west road crossing, in limestone 30 by 10 by 8 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 10".....	40 14 15.9	88 30 08.7
Mansfield, crossing of Wabash Railway and "Big Four" Railway.....	40 12 51.1	88 30 39.6
Mansfield, T road north at Cemetery 1.5 miles south of ..	40 11 34.6	88 30 19.3
T road west.....	40 10 16.0	88 30 02.3
T. 20 N., R. 6 E., corner secs. 26, 27, 34, and 35, crossroads at.....	40 09 23.6	88 30 01.9
T. 20 N., R. 6 E., south corner secs. 34, 35, T road north near.....	40 08 44.1	88 30 01.5
T. 19 N., R. 6 E., quarter corner between secs. 2 and 3, crossroads near.....	40 08 04.5	88 30 04.6
Centerville, 1 mile south of; at T road west, in ground, in pasture owned by W. L. Alexander, 1.5 feet from north and south fence on east side of road, in stone 8 by 9 by 30 inches, alum. tab. stamped "Prim. Trav. Sta. No. 11".....	40 06 19.6	88 30 03.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 19 N., R. 6 E., corner secs. 22, 23, 14, and 15, T road east	40 05 53.6	88 30 03.3
T. 19 N., R. 6 E., corner secs. 22, 23, 26, and 27	40 05 01.5	88 30 03.1
T. 19 N., R. 6 E., corner secs. 26, 27, 34, and 35, T road west	40 04 08.8	88 30 03.3
T. 19 N., R. 6 E., south corner secs. 34, 35	40 03 16.8	88 30 02.9
T. 18 N., R. 6 E., corner secs. 2, 3, 10, and 11, crossroads	40 02 24.1	88 30 02.4
T. 18 N., R. 6 E., corner secs. 10, 11, 14, and 15, crossroads	40 01 31.4	88 30 01.9
T. 18 N., R. 6 E., corner secs. 14, 15, 22, and 23	40 00 38.8	88 30 02.0
T. 18 N., R. 6 E., in northwest corner secs. 36, at crossroads, just inside of field and 3 feet from corner of hedge fence, iron post stamped "Prim. Trav. Sta. No. 12 1905"	39 59 45.8	88 30 01.2
T. 18 N., R. 6 E., corner secs. 23, 24, 25, and 26, crossroads	39 59 46.6	88 28 53.1
T. 18 N., R. 6 E., east corner secs. 24, 25, T road west	39 59 47.0	88 27 44.6
T. 18 N., R. 7 E., corner secs. 19, 20, 29, and 30, crossroads	39 59 46.9	88 26 39.0
T. 18 N., R. 7 E., corner secs. 20, 21, 28, and 29, crossroads	39 59 47.3	88 25 30.4
T. 18 N., R. 7 E., corner secs. 21, 22, 27, and 28, crossroads	39 59 47.5	88 24 22.1
T. 18 N., R. 7 E., corner secs. 22, 23, 26, and 27, crossroads	39 59 47.5	88 23 13.5
T. 18 N., R. 7 E., in southeast corner secs. 23, near southeast corner of L. W. Schrader's barn lot, at crossroads, 15 feet east to maple tree, iron post stamped "Prim. Trav. Sta. No. 13, 1905"	39 59 47.6	88 22 05.6
T. 18 N., R. 7 E., east corner of secs. 24 and 25, crossroads, is 15 feet south of corner	39 59 47.8	88 20 56.6
T. 18 N., R. 8 E., corner secs. 19, 20, 29, and 30, crossroads	39 59 47.2	88 19 53.4
T. 18 N., R. 8 E., corner secs. 20, 21, 28, and 29, crossroads	39 59 46.8	88 18 45.8
T. 18 N., R. 7 E., corner secs. 21, 22, 27, and 28, crossroads	39 59 46.1	88 17 37.7
T. 18 N., R. 7 E., corner secs. 22, 23, 26, and 27, crossroads	39 59 45.2	88 16 29.7

LOGAN, MENARD, AND SANGAMON COUNTIES.

SPRINGFIELD QUADRANGLE.

The following geographic positions were obtained from primary traverse by Mr. E. L. McNair, topographer, in 1905. The line starts from adjusted position at Tice, follows wagon roads east, south, and west near border of quadrangle, and is connected with adjusted position at the crossing of the Wabash and Alton railways in South

Springfield. Starting again from adjusted position at Athens the line follows wagon roads south along west border of quadrangle and is connected to adjusted position at Curran, at the crossing of the Wabash and the Chicago, Peoria and St. Louis railways. Positions are given on the Springfield astronomic datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tice station.....	39 59 07.7	89 47 42.8
Tice, 3 corners 1.25 miles north of.....	40 00 15.7	89 47 41.6
T. 18 N., R. 6 W., quarter corner between secs. 16 and 21.....	40 00 16.0	89 46 50.6
T. 18 N., R. 6 W., in northeast corner sec. 22, road south.....	40 00 02.8	89 45 45.4
T. 18 N., R. 6 W., in northeast corner sec. 23, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	40 00 10.5	89 44 17.5
Indian Point Presbyterian Church, road south, 1,800 feet west of, T. 18 N., R. 6 W., sec. 24, northwest corner of.....	40 00 11.4	89 43 46.4
T. 18 N., R. 5 W., quarter corner northeast quarter sec. 19 and southeast quarter sec. 18, T road west.....	40 00 16.2	89 41 56.6
T. 18 N., R. 5 W., corner secs. 16, 17, 20, and 21, T road east.....	40 00 17.1	89 40 31.8
T. 18 N., R. 5 W., corner secs. 15, 16, 21, and 22.....	40 00 17.4	89 39 23.9
T. 18 N., R. 5 W., corner secs. 14, 15, 22, and 23, 4 corners.....	40 00 17.7	89 38 14.7
T. 18 N., R. 5 W., quarter corner between secs. 23 and 24.....	39 59 51.9	89 37 06.3
T. 18 N., Rs. 4 and 5 W., quarter corner between secs. 19 and 24, Fancy Prairie station, crossing C. & A. Railway just south of.....	39 59 52.2	89 35 58.7
T. 18 N., R. 4 W., quarter corner between secs. 19 and 20, T road west.....	39 59 53.0	89 34 43.8
T. 18 N., R. 4 W., corner secs. 16, 17, 20, and 21.....	40 00 19.7	89 33 35.4
T. 18 N., R. 4 W., corner secs. 15, 16, 21, and 22, T road south.....	40 00 20.2	89 32 27.0
T. 18 N., R. 4 W., corner secs. 14, 15, 22, and 23.....	40 00 20.5	89 31 19.2
C. & A. Railway, crossing of.....	39 59 30.6	89 30 44.5
T. 18 N., R. 4 W., quarter corner between secs. 26 and 35, 4 corners.....	39 58 36.6	89 30 43.6
T. 18 N., Rs. 3 and 4 W., corner secs. 25, 36, 30, and 31, 4 corners.....	39 58 36.7	89 29 01.6
Williams, T. 18 N., Rs. 3 and 4 W., secs. 25, 36, 30, and 31, in northeast corner of town of, 30 feet northeast of intersection of roads, iron post stamped "Prim. Trav. Sta. No. 2".....	39 58 36.9	89 29 01.4
Ts. 17 and 18 N., Rs. 3 and 4 W., corner of, 4 corners.....	39 57 44.4	89 29 01.5
T. 17 N., Rs. 3 and 4 W., quarter corner between secs. 12 and 7, T road north.....	39 56 26.0	89 29 00.6
T. 17 N., R. 4 W., quarter corner between secs. 12 and 13, road west.....	39 55 59.4	89 29 34.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 17 N., R. 4 W., quarter corner between secs. 13 and 24, T road east	° ' " 39 55 07.1	° ' " 89 29 34.3
T. 17 N., R. 4 W., quarter corner between secs. 24 and 25, T road east	39 54 15.2	89 29 33.8
T. 17 N., R. 4 W., quarter corner between secs. 25 and 36, 4 corners	39 53 22.8	89 29 33.3
Ts. 16 and 17 N., R. 4 W., quarter corner secs. 1 and 36, 1.25 miles east of Barclay; 3.5 feet in ground, iron post stamped "Prim. Trav. Sta. No. 3, 1905"	39 52 30.1	89 29 32.7
Ts. 16 and 17 N., R. 4 W., quarter corner secs. 2 and 35, 0.25 mile east of Barclay, 4 corners	39 52 29.4	89 30 41.2
T. 16 N., R. 4 W., quarter corner between secs. 2 and 11, T road north	39 51 37.0	89 30 40.4
Interurban Electric Railway, T. 16 N., R. 4 W., on line of secs. 11 and 14, crossing of	39 50 44.4	89 30 23.0
T. 16 N., R. 4 W., center sec. 23, T road north	39 49 27.6	89 30 42.0
T. 16 N., R. 4 W., near center of sec. 24, 4 corners	39 49 28.4	89 29 48.0
T. 16 N., R. 4 W., on line secs. 25 and 26, T road north ..	39 48 11.9	89 29 13.7
T. 16 N., R. 4 W., corner secs. 25, 26, 35, and 36, T road south	39 48 12.4	89 30 05.8
Ts. 15 and 16 N., quarter corner sec. 2	39 47 19.6	89 30 31.2
T. 15 N., R. 4 W., northeast quarter sec. 11, T road east ..	39 46 13.9	89 30 12.7
T. 15 N., R. 4 W., quarter corner secs. 13 and 14, 1.9 miles east of Rochester; near T road north, iron post stamped "Prim. Trav. Sta. No. 4, 1905"	39 45 01.3	89 29 54.2
Rochester, T. 15 N., R. 4 W., southwest quarter of sec. 15, 4 corners	39 45 00.8	89 32 03.2
T. 15 N., R. 4 W., in northeast corner sec. 17, T road south	39 45 12.4	89 33 35.5
T. 15 N., R. 4 W., in northwest corner sec. 17, T road south	39 45 21.2	89 34 08.5
T. 15 N., R. 4 W., quarter corner between secs. 18 and 19, 4 corners	39 44 39.9	89 34 41.5
T. 15 N., R. 4 W., north part of sec. 30, T road west	39 43 40.0	89 34 57.2
T. 15 N., R. 5 W., in northeast corner sec. 25, center of bridge over Sugar Creek	39 43 40.4	89 35 46.2
T. 15 N., R. 5 W., in southeast corner sec. 23, T road east	39 44 12.8	89 36 57.1
T. 15 N., R. 5 W., corner secs. 14, 15, 22, and 23, Illinois Central Railroad crossing	39 44 37.7	89 37 48.2
T. 15 N., R. 5 W., quarter corner between secs. 15 and 22, 4 corners	39 44 36.6	89 38 38.2
Wabash and Alton railways, crossing of, T. 15 N., R. 5 W., in northeast corner of sec. 12	39 46 19.0	89 39 09.0
THENCE ALONG WEST BORDER OF QUADRANGLE.		
Athens station, T. 18 N., R. 6 W., in sec. 36	39 57 53.1	89 43 27.9
T. 17 N., R. 6 W., quarter corner between secs. 11 and 12, 4 corners	39 56 20.0	89 43 38.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 17 N., R. 6 W., quarter corner between secs. 12 and 13, 4 corners	° ' " 39 55 27.6	° ' " 89 43 37.0
T. 17 N., R. 6 W., center sec. 24, 4 corners	39 54 35.4	89 43 19.0
T. 17 N., R. 6 W., sec. 23, center of pier of bridge over Sangamon River	39 54 27.5	89 44 32.8
T. 17 N., R. 6 W., quarter corner between secs. 27 and 28, T road south	39 53 43.7	89 45 47.3
T. 16 N., R. 6 W., center of southeast quarter sec. 3, T road west	39 51 46.4	89 45 15.4
T. 16 N., R. 6 W., near center sec. 10, in grass triangle near T road west, iron post stamped "Prim. Trav. Sta. No. 5, 1905"	39 51 14.2	89 45 32.3
T. 16 N., R. 6 W., north part sec. 22, 4 corners	39 49 44.7	89 45 30.1
T. 16 N., R. 6 W., north part sec. 27, T road west	39 48 44.5	89 45 30.1
T. 16 N., R. 6 W., center sec. 34, T road north	39 47 39.4	89 45 28.0
Ts. 15 and 16 N., quarter corner sec. 3, T road south	39 47 13.2	89 45 12.1
T. 15 N., R. 6 W., quarter corner between secs. 10 and 15, 1 mile northeast of Curran, near T road north, iron post stamped "Prim. Trav. Sta. No. 6, 1905"	39 45 24.2	89 45 10.3
Wabash and Chicago, Peoria and St. Louis railways, crossing of	39 44 38.1	89 45 43.9

CHAMPAIGN COUNTY.

URBANA QUADRANGLE.

The following geographic positions on the United States standard datum were established from primary traverse run in 1905 by Mr. J. R. Ellis, assistant topographer. The line starts from east tower of Illinois Industrial School at Champaign, located by triangulation of the United States Lake Survey; follows Illinois Central Railroad to Tolono; thence east along Wabash Railroad to Homer, connecting with Lake Survey triangulation station, Lynn Grove, and Lake Survey triangulation station chimney at Sidney; thence by wagon road north along border of quadrangle to Thomasboro; thence southwest along Illinois Central Railroad to starting point.

36 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along the Illinois Central Railroad between Champaign and Tolono.

Station.	Latitude.	Longitude.
Champaign, east tower Industrial School, U. S. Lake Survey triangulation station.....	° ' " 40 06 32.9	° ' " 88 13 37.8
Champaign, near southeast corner of Engineer Building, State University, in ground at cross sidewalks near; said building bears N. 26° 15' W., distant 52.5 feet, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	40 06 38.1	88 13 35.2
Champaign, road crossing 1.25 miles south of (west track)	40 05 40.2	88 14 40.5
Savoy, road crossing, 1 mile north of (west track).....	40 04 08.6	88 14 55.0
Savoy station (west track).....	40 03 14.8	88 15 03.5
Savoy station, road crossing 1 mile south of (west track).....	40 02 22.0	88 15 11.9
T. 18 N., R. 8 E., corner secs. 11, 12, 13, and 14.....	40 01 29.3	88 15 15.6
Tolono, in southeast corner of lot at Commercial Hotel; southeast corner of C. H. Bell's store bears N. 28° 30' E., distant 185 feet; southeast corner of hotel bears N. 4° E., distant 108 feet; iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	39 59 06.4	88 15 39.1

Geographic positions along the Wabash Railway near Tolono.

Station.	Latitude.	Longitude.
	° ' " 39 59 21.5	° ' " 88 14 15.4
Tolono, road crossing north and south, 1.25 miles east of.		
Tolono, road crossing north and south on section line.....	39 59 37.8	88 13 04.9

Geographic positions along the highways between Tolono and Sidney.

Station.	Latitude.	Longitude.
T. 18 N., R. 9 E., corner of secs. 20, 21, 28, 29, at crossroads.....	° ' " 39 59 45.9	° ' " 88 11 56.9
T. 18 N., R. 9 E., corner secs. 21, 22, 27, and 28, at crossroads.....	39 59 46.5	88 10 48.7
T. 18 N., R. 9 E., corner secs. 22, 23, 26, and 27, at crossroads.....	39 59 47.1	88 09 40.9
T. 18 N., R. 9 E., corner secs. 23, 24, 25, and 26, at crossroads.....	39 59 47.6	88 08 32.4
T. 18 N., Rs. 9 and 10 E., corner secs. 19, 24, 25, and 30, at crossroads.....	39 59 48.3	88 07 24.1
T. 18 N., Rs. 9 and 10 E., corner secs. 25, 30, 31, and 36, at crossroads.....	39 58 55.6	88 07 23.7
Ts. 17 and 18 N., Rs. 9 and 10 E., corner secs. 1, 6, 31, and 36, at crossroads.....	39 58 03.3	88 07 23.3
Lynn Grove triangulation station: In SW. $\frac{1}{4}$ of SE. $\frac{1}{4}$ sec. 31, T. 18 N., R. 10 E., 3 miles southeast of Philo Railway station. Station mark: A stone post 3 feet below surface with another directly over it as a surface mark.....	39 58 09.85	88 06 35.90
Black, east and west road crossing Frisco Railway.....	39 58 02.4	88 05 09.0

Geographic positions along the highways between Tolono and Sidney—Continued.

Station.	Latitude.	Longitude.
T. 18 N., R. 10 E., corner secs. 28, 29, 32 and 33, at crossroads.....	39 58 54.7	88 05 07.6
T. 18 N., R. 10 E., in southeast corner sec. 20, 4 feet from corner of hedge fence, iron post stamped "Prim. Trav. Sta. No. 3, 1905".....	39 59 48.7	88 05 08.1
T. 18 N., R. 10 E., quarter corner between secs. 16 and 21, crossroads near.....	40 00 40.4	88 04 33.6
Sidney, Lake Survey triangulation station chimney.....	40 01 25.45	88 04 10.02

Geographic positions along the Wabash Railway east of Sidney.

Station.	Latitude.	Longitude.
Sidney, crossing of Wabash and Frisco railways, 1 mile east of.....	40 01 30.6	88 03 25.7
Road crossing north and south between secs. 11 and 12.....	40 01 40.5	88 01 43.6
Road crossing north and south between secs. 7 and 12...	40 01 47.2	88 00 35.0
T. 18 N., R. 14 W., near quarter corner west side sec. 7, in southwest corner of field and just off right of way, iron post stamped "Prim. Trav. Sta. No. 4, 1905".....	40 01 52.9	87 59 39.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
Ts. 18 and 19 N., R. 11 E., and 14 W., 0.5 mile north of corner to secs. 6, 6, 31, and 31, T road west.....	40 03 28.7	87 59 40.1
Clark schoolhouse, crossroads at.....	40 04 34.7	87 59 40.0
T. 19 N., R. 11 E., 14 W., corner secs. 18, 18, and 19, 19, crossroads near.....	40 05 52.2	87 59 39.8
T. 19 N., R. 11 E., in northeast corner sec. 18, in corner of field owned by Lou Richards, 2.5 feet southwest of corner fence post and 133 feet south of Big Four Railway, in limestone 40 by 7 by 5 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 5, 1905".....	40 06 45.0	87 59 39.9
T. 19 N., R. 11 E., 14 W., corner secs. 6, 6, and 7 and 7, crossroads.....	40 07 39.0	87 59 39.7
Ts. 19 and 20 N., R. 11 E., 14 W., corner secs. 6 and 6 and 31 and 31, crossroads.....	40 08 31.8	87 59 39.7
T. 20 N., R. 14 W., west corner secs. 30 and 31, at Union schoolhouse, T road east.....	40 09 23.9	87 59 39.8
T. 20 N., R. 11 E., 14 W., corner secs. 19, 19, and 30, 30.....	40 10 15.2	87 59 39.6
T. 20 N., R. 14 W., west corner secs. 18 and 19, T road east.....	40 11 06.9	87 59 39.7
T. 20 N., R. 14 W., west corner secs. 7 and 18, T road east.....	40 11 59.1	87 59 39.8
T. 20 N., R. 14 W., west corner secs. 6 and 7, T road east.....	40 12 50.7	87 59 39.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 20 N., Rs. 11 E., 14 W., north corner secs. 6 and 6, T. road south.....	° ' " 40 13 29.8	° ' " 87 59 40.2
T. 21 N., R. 11 E., southeast corner sec. 25, in southeast corner of Doctor McFarland's garden, corner secs. 25, 30, 31, and 36, T. 21 N., Rs. 10 and 11 E., bears S. 43° E., distant 55 feet, iron post stamped "Prim. Trav. Sta. No. 6, 1905"	40 14 23.1	88 00 06.2
T. 21 N., R. 10 E., corner secs. 25, 26, 35, and 36; crossroads.	40 14 22.6	88 01 15.1
T. 21 N., R. 10 E., corner secs. 26, 27, 34, and 35; crossroads.	40 14 22.3	88 02 23.8
T. 21 N., R. 10 E., cornersecs. 27, 28, 33, and 34, at Flatville.	40 14 22.2	88 03 32.7
T. 21 N., R. 10 E., corner secs. 28, 29, 32, and 33; crossroads.	40 14 22.0	88 04 41.8
T. 21 N., R. 10 E., in northeast corner sec. 31, at crossroads, 1.5 feet from corner fence post, iron post stamped "Prim. Trav. Sta. No. 7, 1905"	40 14 21.3	88 05 51.7
T. 21 N., Rs. 9 and 10 E., corner secs. 30, 31, 36, and 25; crossroads	40 14 21.1	88 06 59.9
T. 21 N., R. 9 E., corner secs. 25, 26, 35, and 36; crossroads.	40 14 20.8	88 08 08.7
Thomasboro, crossroads 0.5 mile southeast of	40 14 19.6	88 11 02.0

Geographic positions along the Illinois Central Railroad between Thomasboro and Champaign.

Station.	Latitude.	Longitude.
Milepost 792, east and west road crossing 470 feet south of, east track.....	° ' " 40 13 27.0	° ' " 88 11 44.2
Leverett, east and west road crossing 1 mile north of, east track	40 12 00.8	88 12 20.3
Leverett, east and west road crossing, east track	40 11 21.2	88 12 36.8
T. 20 N., R. 9 E., secs. 19 and 20, south corner of, T road north	40 10 15.6	88 13 12.8
Milepost 787, east and west road crossing, east track	40 09 22.9	88 13 26.3
Milepost 786, east and west road crossing, 230 feet south of, east track	40 08 30.1	88.13 48.3
Illinois Central Railway and Big Four Railway, crossing of, north track Big Four, east track Illinois Central Railway	40 07 17.9	88 14 17.7

IOWA.

PRIMARY TRAVERSE.

BOONE, DALLAS, POLK, AND STORY COUNTIES.

DES MOINES 30-MINUTE QUADRANGLE.

The following geographic positions were determined from primary traverse in 1904 by J. R. Ellis. The line starts from adjusted position near southwest corner of Des Moines Special quadrangle, follows Rock

Island Railway westward to west edge of quadrangle; thence north and east along wagon roads to northeast corner of quadrangle; thence south to Enterprise along Des Moines, Iowa Falls and Northern Railway, and is closed on adjusted position near northeast corner of Des Moines Special quadrangle. Positions are given on the Des Moines astronomic datum.

Geographic positions along the Chicago, Rock Island and Pacific Railway between Milepost 369 and Desoto.

Station.	Latitude.	Longitude.
Polk-Dallas County line, north and south railroad crossing on.....	° ' " 41 32 17.8	° ' " 93 47 19.0
Milepost 369, private road crossing 0.25 mile east of.....	41 32 13.0	93 48 22.5
Milepost 370, north and south road crossing 500 feet west of.....	41 32 57.6	93 49 52.8
Milepost 371, private road crossing 1,410 feet west of.....	41 31 42.9	93 51 12.5
Booneville, Iowa, in northwest corner of pasture owned by E. P. Farnsley, on south side of Chicago, Rock Island and Pacific Railway crossing, cross on southwest corner of foundation to station bears N. 59° 40' E., distant 465.4 feet; south rail at center of crossing bears N. 80° 15' W., distant 98 feet, iron post stamped "Prim. Trav. Sta. No. 9".....	41 31 22.5	93 52 59.9
Booneville, private road crossing 1.25 miles west of.....	41 31 10.4	93 54 23.7
Milepost 375.....	41 31 28.6	93 55 20.5
Van Meter, road crossing 600 feet east of station.....	41 31 56.9	93 56 56.2
Spur, road crossing 275 feet northwest of.....	41 32 20.5	93 57 39.2
Bridge No. 362, road crossing 940 feet west of.....	41 31 55.9	93 58 57.0
Desoto, in northwest corner of public school grounds; southeast corner of J. C. Thrailkill's house bears S. 65° 45' W., distant 94 feet, iron post stamped "Prim. Trav. Sta. No. 10".....	41 31 57.3	94 00 22.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
Desoto, road west 1 mile northwest of, 21 feet northeast to east end culvert, 30 feet northwest to cross cut on gatepost.....	° ' " 41 32 46.8	° ' " 94 00 34.5
South fork of Raccoon River, north end of bridge over....	41 33 23.8	94 00 17.2
South fork of Raccoon River, T road east 0.75 mile north of; 21 feet northwest to cross cut on telephone pole, 36 feet northeast to cross cut on telephone pole.....	41 34 04.5	94 00 20.2
T road east, 40 feet southeast to cross cut on telephone pole, 42 feet northeast to cross cut on corner fence post..	41 35 42.1	94 00 39.2
Adel, in southeast corner of court-house yard; northeast corner of cornerstone to court-house bears N. 29° 55' W., 167.7 feet, water table at northeast corner of bank bears S. 15° 40' E., distant 69.3 feet; iron post stamped "Prim. Trav. Sta. No. 11".....	41 37 01.9	94 00 56.5
Adel, center pier of bridge 1 mile north of.....	41 38 05.0	94 01 18.0

40 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Schoolhouse No. 3, T road east at; 42 feet southwest to cross cut in telephone pole.....	° ' " 41 38 50.3	° ' " 93 01 16.0
Adel, crossroads, 3 miles north of; 33 feet southeast to Freeman's mail box; 30 feet northeast to guide post...	41 39 29.4	94 01 16.1
Dallas County farm, T road east 0.75 mile north of; 39 feet southeast to cross cut on telephone pole, 40 feet northeast to cross cut on corner fence post.....	41 40 21.2	94 01 15.8
Dallas Center, crossroads 3 miles west of, 32 feet southeast to guide post, 30 feet northeast to cut on telephone pole.	41 41 17.5	94 01 19.6
Schoolhouse, crossroads 0.25 mile south of; 33 feet southeast to cross cut on fence post, 38 feet southwest to cross cut on telephone pole.....	41 41 56.7	94 01 21.8
T. 29 N., R. 27 W., sec. 30, T road south, near, 40 feet southwest to cross cut on telephone pole, 31 feet southeast to cross cut on corner post.....	41 43 15.5	94 01 16.5
T road west; 36 feet southwest to mail box, 31 feet northwest to cross cut on telephone pole.....	41 43 54.9	94 00 59.3
Minburn, north and south road crossing of, Chicago, Rock Island and Pacific Railway, 1 mile southeast of..	41 44 43.3	94 01 00.5
Minburn, 0.5 mile east of; in northeast corner of field owned by E. S. Hill at T road south, nail in blaze on west face of pine tree bears N. 87° 20' E., distant 63.7 feet; same on northwest face of maple tree bears S. 41° 20' E., distant 103 feet.....	41 45 13.4	94 01 01.1
Quarter corner, crossroads at, 33 feet southwest to cross cut on corner fence post 39 feet northwest to mail box.	41 45 13.6	93 59 15.6
Ts. 80 and 81 N., R. 27 W., secs. 3, 4, 33, and 34, corner of, crossroads at.....	41 46 36.6	93 59 14.4
T. 81 N., R. 27 W., corner secs. 27, 28, 33, and 34, crossroads at.....	41 47 28.9	93 59 14.7
T. 81 N., R. 27 W., quarter corner to secs., 22 feet east to crossroads.....	41 48 21.1	93 59 14.7
Chris Hargin's mail box, 29 feet northwest to cross cut on fence post.....	41 48 21.1	93 59 14.8
T. 81 N., R. 27 W., secs. 21, 22, T road north 0.25 mile west of; 6 feet to stone in road, 25 feet to cross cut on corner fence post.....	41 49 13.6	93 59 32.2
T. 81 N., R. 27 W., quarter corner between secs. 16 and 17, T road north.....	41 49 39.8	94 00 25.6
T road east, 30 feet northwest to cross cut on fence post, 30 feet northeast to cross cut on corner fence post.....	41 50 32.3	94 00 25.8
Benton, railway crossing, 130 feet west of station.....	41 51 10.1	94 00 25.5
Benton, 1 mile north of, T. 81 N., R. 27 W., in northwest corner of section 4, on land owned by Hans Meyer, at crossroads, iron post stamped "Prim. Trav. Sta. No. 13"	41 51 46.5	94 00 25.2
T. 82 N., R. 27 W., corner secs. 28, 29, 32, and 33, crossroads.....	41 52 39.4	94 00 25.5
T. 82 N., R. 27 W., corner secs. 21, 22, 27, and 28, crossroads at.....	41 53 31.0	93 59 15.2
T. 82 N., R. 27 W., corner secs. 15, 16, 21, and 22, crossroads at.....	41 54 23.4	93 59 15.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 82 N., R. 27 W., corner secs. 9, 10, 15, and 16, crossroads at.....	41 55 15.8	93 59 16.3
T. 82 N., R. 27 W., corner secs. 3, 4, 9, and 10, crossroads at.....	41 56 08.4	93 59 16.3
Ts. 82 and 83 N., R. 27 W., corner secs. 3, 4, 33, and 34, crossroads at.....	41 57 00.6	93 59 15.3
T. 83 N., R. 27 W., corner secs. 27, 28, 33, and 34, crossroads at.....	41 57 52.6	93 59 14.8
T. 83 N., R. 27 W., corner secs. 27, 28, 21, and 22, crossroads at.....	41 58 44.6	93 59 14.4
Schoolhouse No. 7, in northwest corner to school yard, T. 83 N., R. 27 W., northwest corner sec. 22; northwest corner foundation bears S. 15° 45' E., distant 153 feet; section corner bears N. 52° 30' W., distant 40 feet; iron post stamped "Prim. Trav. Sta. No. 14".....	41 59 36.4	93 59 14.0
T. 83 N., R. 27 W., corner secs. 14, 15, 22, and 23, corner of T road south at.....	41 59 36.5	93 58 04.6
T road north, 33 feet northwest to boulder, 39 feet northeast to cross cut on telephone pole.....	41 59 36.5	93 57 14.0
T. 83 N., Rs. 26 and 27 W., corner secs. 18, 19, 24, and 13, T road west.....	41 59 36.6	93 55 45.2
Des Moines River, center pier of bridge.....	41 59 56.4	93 54 06.9
T road south, near large elm tree.....	41 59 34.6	93 53 12.6
Luther station, 2 miles north and 3 miles west of; T. 83 N., R. 26 W., in southwest corner sec. 15, in corner of pasture owned by R. N. Cartwright; stone at corner secs 15, 16, 21, and 22 bears S. 38° 40' W., distant 35.7 feet; iron post stamped "Prim. Trav. Sta. 15".....	41 59 37.5	93 52 18.8
T. 83 N., R. 26 W., corner secs. 22 and 23, 14 and 15, T road south.....	41 59 38.1	93 51 09.3
T. 83 N., R. 26 W., corner secs. 13, 14, 23, and 24, T road north.....	41 59 38.7	93 49 58.9
T. 83 N., Rs. 25 and 26 W., corner secs. 18, 19, 24, and 13, crossroads at.....	41 59 38.2	93 48 48.8
T. 83 N., R. 25 W., corner secs. 17, 18, 19, and 20, crossroads at.....	41 59 38.0	93 47 37.9
T. 83 N., R. 25 W., corner secs. 16, 17, 20, and 21, crossroads at.....	41 59 38.8	93 46 28.7
School No. 5; T. 83 N., R. 25 W., sec. 15, in and near southwest corner school yard; section corner to secs. 15, 16, 22, and 21 bears N. 45° W.; iron post stamped "Prim. Trav. Sta. No. 16".....	41 59 39.1	93 45 17.9
T. 83 N., R. 25 W., corner secs. 14, 15, 22, and 23, crossroads at.....	41 59 38.2	93 44 08.5
T. 83 N., R. 25 W., corner secs. 13, 14, 23, and 24, crossroads at.....	41 59 38.1	93 42 58.0
T. 83 N., R. 24 and 25 W., corner secs. 18, 19, 24, and 13, crossroads at.....	41 59 37.3	93 41 48.1
T. 83 N., R. 24 W., corner secs. 17, 18, 19, and 20, crossroads at.....	41 59 37.4	93 40 36.1

42 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 83 N., R. 24 W., corner secs. 17, 18, 7, and 8, T road west at	° ' " 42 00 29.8	° ' " 93 40 36.3
T road south, 31 feet north to Willow tree, 50 feet southwest to cottonwood	42 00 42.2	93 39 25.9
Ames, in southeast corner of Agricultural College grounds, southwest corner of foundation to porch of house bears N. 51° 10' E., distant 169.7 feet; southeast corner foundation to first house north of southeast corner bears N. 13° W., distant 129.5 feet, iron poststamped "Prim. Trav. Sta. No. 17"	42 01 21.5	93 38 25.4
T road north at section corner (no numbers), 33 feet southwest to electric-light reel on post, 27 feet northeast to cross cut on telephone pole	42 01 21.8	93 37 06.0
Skunk ditch, center of bridge over	42 01 21.2	93 35 38.8
Stone corner secs. (no numbers), 36 feet northwest to J. C. Marsh's mail box, 36 feet northeast to cross cut on telephone pole	42 01 21.0	93 34 46.4
T. 83 N., R. 24 W., secs. 4, 5, 8, and 9, corner of, crossroads at schoolhouse	42 01 22.4	93 32 20.6
T. 83 N., R. 24 W., corner secs. 8, 9, 16, and 17, crossroads	42 00 30.2	93 32 20.6
T. 83 N., R. 24 W., corner secs. 16, 17, 20, and 21, crossroads	41 59 37.9	93 32 20.6
T. 83 N., R. 24 W., corner secs. 15, 16, 21, and 22, crossroads	41 59 38.0	93 31 10.6
T. 83 N., R. 24 W., in northeast corner of northwest quarter sec. 22, at T road south, nail in root of willow tree bears N. 79° 30' E., distant 99 feet; west end of culvert bears N. 26° E., distant 9 feet, iron post stamped "Prim. Trav. Sta. No. 18"	41 59 37.7	93 30 35.8

Geographic positions along the Des Moines, Iowa Falls and Northern Railroad.

Station.	Latitude.	Longitude.
Shipley, north and south road crossing 0.25 mile west of Quarter corner at crossroads, 43 feet northwest to cross cut on schoolhouse fence, 39 feet southwest to cross cut on fence post	° ' " 41 58 39.6	° ' " 93 30 35.6
Quarter corner at crossroads, 38 feet northeast to cross cut on telephone pole, 37 feet southeast to T. P. Child's mail box	41 57 53.2	93 30 35.9
Quarter corner at crossroads, 42 feet northwest to D. C. Hanks's mail box, 39 feet southwest to cross cut on telephone pole	41 57 00.9	93 30 36.7
T road west, 41 feet northwest to cross on corner fence post, 39 feet southwest to cross on telephone pole	41 56 07.4	93 30 36.7
Cambridge, east and west road crossing 0.5 mile north of Cambridge, crossing Chicago, Milwaukee and St. Paul Railway and Des Moines, Iowa Falls and Northern Railroad	41 55 15.5	93 30 36.3
	41 54 05.0	93 31 25.9
	41 53 39.1	93 31 21.3

Geographic positions along the Des Moines, Iowa Falls and Northern Railroad—Cont'd.

Station.	Latitude.	Longitude.
Cambridge, 1.5 miles south of; in northeast corner of Perry Crook's field, west rail of railroad at crossing bears N. 61° E., distant 53 feet, iron post stamped "Prim. Trav. Sta. No. 19"	41 52 38.7	93 31 13.2
Story and Polk county line, crossing with railway	41 51 46.9	93 31 05.2
Milepost 21, east and west road crossing 110 feet south of	41 50 57.3	93 30 58.3
Milepost 20, east and west road crossing 270 feet south of; also corner of secs. (no numbers)	41 50 04.9	93 31 12.2
Milepost 19, east and west road crossing 1,000 feet south of	41 49 06.5	93 31 27.8
Elkhart, east and west crossing 0.75 mile north of	41 48 20.5	93 31 28.4
Elkhart station	41 47 36.4	93 31 28.8
Milepost 16	41 46 39.5	93 31 29.5
Enterprise, east and west road crossing 2 miles north of ..	41 45 24.0	93 31 30.3
Enterprise, 1 mile north of; in southeast corner of J. Wohlwind's farm, on north side of east and west road, corner post of field bears SE., distant 2.5 feet, iron post stamped "Prim. Trav. Sta. No. 5"	41 44 46.2	93 31 31.4

POLK COUNTY.

DES MOINES SPECIAL QUADRANGLE.

The following geographic positions were determined from primary traverse in 1904 by Mr. J. R. Ellis, topographic aid. The line starts from north meridian stone in court-house yard at Des Moines, located by astronomic observations by the United States Coast and Geodetic Survey, and follows the Chicago Great Western Railway southwest to Orillia; thence north along public highways to northwest corner of quadrangle; thence east to Enterprise. The line follows Des Moines, Iowa Falls and Northern Railway for about three miles; thence runs south along public highways to Levey; thence northwest along Chicago, Rock Island and Pacific Railway to Des Moines, connecting with original position.

Geographic positions along the Chicago Great Western Railway between Des Moines and Orillia.

Station.	Latitude.	Longitude.
Des Moines, north meridian stone in court-house yard ...	41 35 05.6	93 37 16.9
Des Moines, Ninth street crossing Chicago Great Western Railroad, in south part of	41 34 18.7	93 37 17.6
South Des Moines, road crossing 0.5 mile west of station ..	41 33 57.8	93 38 35.0
Blacksmith shop, road crossing north and south	41 33 46.1	93 39 21.3
Millman, section line road crossing 1 mile north of	41 33 19.3	93 40 36.7

44 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

Geographic positions along the Chicago Great Western Railway, etc.—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 78 N., Rs. 24 and 25 W., corner secs. 19, 24, 25, and 30.	41 32 27.0	93 40 20.5
Milepost 318, road crossing 0.25 mile northeast of.....	41 31 34.5	93 41 29.2
Milepost 319, road crossing east and west 600 feet north-east of.....	41 31 08.8	93 42 37.0
Orillia, in south corner of triangular lot owned by G. W. Briggs; northeast corner of brick foundation to A. Muller's residence bears N. 63° 40' W., distant 106.1 feet; northeast corner of brick foundation to R. G. Latimer's residence bears S. 77° 30' W., distant 196.1 feet; iron post set 40 inches in the ground, stamped "Prim. Trav. Sta. No. 1".....	41 30 37.1	93 43 47.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north, 42 feet northwest to cross on telephone pole.....	41 31 08.7	93 44 05.6
Bridge over branch north.....	41 31 34.9	93 45 00.9
Commerce, road crossing Chicago, Rock Island and Pacific Railroad, 600 feet east of station.....	41 32 12.6	93 45 26.8
T. 78 N., R. 25 W., corner secs. 19, 20, 29, and 30, at T road north, 28 feet west to cross on corner cedar fence post, 39 feet northeast to cross on telephone pole.....	41 32 27.2	93 46 07.3
T. 78 N., R. 25 W., corner secs. 17, 18, 19, and 20, 24 feet due east to railroad spike in tie used for fence post.....	41 33 19.3	93 46 08.1
T. 78 N., R. 25 W., corner secs. 7, 8, 17, and 18, at crossroads, 27 feet northwest to cross on fence post, 36 feet northeast to cross on fence post.....	41 34 11.6	93 46 08.2
T. 78 N., R. 25 W., corner secs. 5, 6, 7, and 8, at crossroads, 39 feet northwest to cross on telephone pole, 39 feet northeast to cross on fence post.....	41 35 03.7	93 46 08.4
T. 78 N., R. 25 W., corner secs. 5 and 6 (north corner), T road south, 30 feet north to front yard gate, 33 feet southeast to east end of stone culvert.....	41 36 01.0	93 46 09.5
T. 79 N., R. 25 W., corner secs. 28, 29, 32, and 33, T road east 0.25 mile north of; 33 feet southeast to iron corner fence post, 40 feet northeast to cross on corner fence post.....	41 37 03.0	93 46 22.6
T. 79 N., R. 25 W., corner secs. 20, 21, 28, and 29, T road south 0.5 mile east of; 28 feet northeast to cross on fence post, 42 feet southeast to cross on fence post.....	41 37 45.6	93 46 05.8
T. 79 N., R. 25 W., near southeast corner of sec. 21, on land owned by B. B. Harding, nail in blaze on west face of cottonwood tree bears N. 71° 30' E., distant 29.6 feet; nail in blaze on south face of large water maple tree bears N. 14° 40' E., distant 94.5 feet, iron post set 42 inches in ground, stamped "Prim. Trav. Sta. No. 2".....	41 37 45.6	93 45 14.8
T. 79 N., R. 25 W., corner secs. 15, 16, 21, and 22, at crossroads; 33 feet northeast to cross on telephone pole, 33 feet northwest to cross on corner fence post.....	41 38 37.2	93 45 14.1

Geographic positions along highways—Continued.

Station..	Latitude.	Longitude.
T. 79 N., R. 25 W., corner secs. 9, 10, 15, and 16, at crossroads, 21 feet northwest to John Everett's mail box, 24 feet northeast to cross on railing	° ' " 41 39 29.9	° ' " 93 45 13.9
T. 79 N., R. 25 W., corner secs. 3, 4, 9, and 10 at crossroads, 37 feet southeast to S. A. Richardson's mail box, 39 feet southwest to cross on corner fence post....	41 40 22.0	93 45 13.8
T. 79 N., R. 25 W., corner secs. 3 and 4 (north corner), at T road south, 36 feet west to Bauman's mail box, 28 feet northwest to cross on telephone pole.....	41 41 17.3	93 45 13.6
T. 80 N., R. 25 W., corner secs. 27, 28, 33, and 34, T road west at, 13 feet southeast to P. Smith's mail box, 40 feet northeast to cross on corner fence post.....	41 42 09.8	93 45 13.4
T road east, 48 feet southeast to John McIntyre's mail box, 38 feet northeast to cross on corner post.....	41 43 16.5	93 45 13.8
Schoolhouse, T road west 0.25 mile south of; 35 feet northwest to cross on corner post, 31 feet southwest to cross on corner fence post.....	41 43 19.4	93 44 38.8
Andrews, 1 mile southeast of; in northwest corner of yard at forks of road, nail in root of post oak tree bears N. 71° 40' W.; nail in blaze on post oak tree bears S. 11° 20' W., iron post set 42 inches in ground, stamped "Prim. Trav. Sta. No. 3"	41 44 46.8	93 44 20.9
Cardon, iron bridge over Des Moines River, center pier of.....	41 44 44.2	93 42 28.1
T. 80 N., R. 24 W., quarter corner between secs. 17 and 18, at T road north; 18 feet south to cross on corner fence post, 27 feet northwest to cross on corner fence post.....	41 44 19.8	93 40 31.8
T. 80 N., R. 24 W., corner secs. 8, 9, 16, and 17, crossroads 0.25 mile east of; 17 feet southwest to Mr. Harley's mail box, 31 feet southeast to cross on corner fence post.....	41 44 45.9	93 39 05.0
T. 80 N., R. 24 W., near southeast corner of sec. 9, 80 feet west of corner fence post, 1 foot north of east and west fence, iron post set 38 inches in the ground, stamped "Prim. Trav. Sta. No. 4"	41 44 46.1	93 38 14.5
T. 80 N., R. 24 W., quarter corner between secs. 11 and 14, crossroads at, 39 feet northwest to cross on corner fence post, 39 feet northeast to cross on corner fence post.....	41 44 46.2	93 36 28.5
T. 80 N., Rs. 23 and 24 W., corner secs. 7, 12, 13, and 18, at crossroads; 35 feet southwest to cross on corner fence post, 37 feet southeast to cross on telephone pole brace.....	41 44 46.2	93 34 44.3
T. 80 N., R. 23 W., corner secs. 7, 8, 17, and 18, at T road north; 35 feet northeast to mail box, 50 feet northwest to cross on corner fence post.....	41 44 46.0	93 33 31.3
T. 80 N., R. 23 W., corner secs. 8, 9, 16, and 17, at crossroads, 35 feet northeast to H. W. Long's mail box, 50 feet northwest to cross on fence post.....	41 44 46.0	93 32 22.4

Geographic positions along the Des Moines, Iowa Falls and Northern Railway near Enterprise.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Enterprise station.....	41 43 58.6	93 31 41.4
Milepost 12, private road crossing east and west 1,950 feet south of	41 42 53.6	93 31 49.1
Enterprise, section line road crossing 2 miles south of....	41 42 09.7	93 31 49.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ts. 79 and 80 N., R. 23 W., corner secs. 3, 4, 33, and 34, at crossroads, 39 feet northeast to mail box on corner fence post; 44 feet southeast to cross on telephone pole.....	41 41 17.5	93 31 14.1
T. 79 N., R. 23 W., corner secs. 3, 4, 9, and 10, at crossroads at schoolhouse, 32 feet southeast to cross on corner schoolhouse yard fence, 33 feet northeast to cross on corner fence post.....	41 40 22.4	93 31 13.8
T. 79 N., R. 23 W., corner secs. 9, 10, 15, and 16, at crossroads, 40 feet southeast to James Watts's mail box; 39 feet northeast to cross on corner fence post.....	41 39 30.3	93 31 13.8
T. 79 N., R. 23 W., at crossroads at corner secs. 15, 16, 21, and 22, at southwest corner of West Schoolhouse yard, southwest corner of foundation to schoolhouse bears N. 58° 45' E., distant 70.7 feet; north rail of electric railroad at center of north and south road crossing bears S. 3° 00' W., distant 163 feet from iron post stamped "Prim. Trav. Sta. No. 6"	41 38 38.3	93 31 13.1
T. 79 N., R. 23 W., corner secs. 21, 22, 27, and 28, at T road north, 45 feet northeast to cross on telephone pole, 39 feet northwest to cross on telephone pole.....	41 37 46.0	93 31 13.7
T. 79 N., R. 23 W., corner secs. 22, 23, 26, and 27, at T road west	41 37 45.9	93 30 04.9
T. 79 N., R. 23 W., quarter corner between sections 34 and 35, north and south road crossing Chicago, Rock Island and Pacific Railroad near	41 36 29.1	93 30 05.9
Township line road crossing east and west	41 36 01.3	93 31 03.4
Youngstown, west end of wagon bridge over Fourmile Creek	41 34 59.0	93 31 53.5
T. 78 N., R. 23 W., quarter corner between secs. 8 and 17 at T road south, 18 feet northeast to H. Wilson's mail box, 42 feet northwest to cross on telephone pole.....	41 34 06.3	93 31 40.0
Levey, on west side of north and south road, on property of E. S. Irwin, northeast corner of brick foundation to Irwin's residence, bears N. 21° 50' W., distant 174.5 feet; five nails in large telephone pole bear S. 54° 15' E., distant 54 feet; iron post stamped "Prim. Trav. Sta. No. 7"	41 32 50.9	93 31 23.2

Geographic positions along the Chicago, Rock Island and Pacific Railroad between Levey and Des Moines.

Station.	Latitude.	Longitude.
Levey, Chicago, Rock Island and Pacific Railroad, at east and west road crossing, 0.5 mile southwest of.....	° ' " 41 32 35.3	° ' " 93 31 49.5
Brick works, private road crossing just north of.....	41 33 17.8	93 33 37.7
Milepost 361, private road crossing 790 feet southeast of..	41 33 58.9	93 34 18.9
Des Moines, crossing Chicago, Rock Island and Pacific Railroad, and Chicago, Burlington and Quincy Railroad in east part of	41 34 45.7	93 34 33.3
Des Moines, crossing Chicago, Burlington and Quincy and electric railroads at Scott street, in east part of.....	41 35 00.3	93 35 26.2
Des Moines, in southeast corner of granite base to statue at west entrance to State house grounds, aluminum tablet stamped "Prim. Trav. Sta. No. 8".....	41 35 26.3	93 36 12.5
Azimuth of K. D. & F. D. R. R., 0.75 mile west of Ashawa=278° 18' 50''.		
Azimuth of C., M. & St. P. R. R. at road crossing near secs. 21, 22, 27, 28, T. 79 N., R. 25 W.=146° 10' 15''.		
Azimuth of C. & N. W. R. R. at east and west sec. line road crossing 1.5 mi. N. of Ankeny=306° 32' 20''.		
Azimuth of C., B. & Q. R. R. at Levey=330° 30' 10''.		

KENTUCKY.

PRIMARY TRAVERSE.

UNION COUNTY.

MORGANFIELD QUADRANGLE.

The following geographic positions were located by Mr. J. R. Ellis, topographic aid, in 1904. The line starts from a position determined by primary traverse at Free Union and follows public highway via Hearin post-office to Sullivan; thence along Illinois Central Railroad to Sturgis; thence along public highway via Grove Center to Uniontown, where the line connects with another position previously located by primary traverse.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Free Union; hub.....	° ' " 37 31 29.4	° ' " 87 45 43.1
Ashland Church, T road southeast about 0.25 mile northeast of, 22 feet east to corner of picket fence, 22 feet north to telephone brace.....	37 30 41.2	87 47 23.6
Rice's residence, T road north; 21 feet north to corner post to wire fence, 30 feet southeast to corner of yard fence.....	37 31 26.0	87 48 46.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T road southeast, 21 feet northwest to corner of board fence, 25 feet southeast to telephone pole.....	° ' " 37 31 40.4	° ' " 87 49 35.7
Hearin post-office, in east corner of Mrs. Jennie Nall's garden, east corner of blacksmith shop bears N. 50° 30' W., distant 141 feet; north corner of Mrs. Nall's residence bears S. 25° 15' W., distant 63 feet, sandstone post 8 by 15 by 36 inches set 30 inches in ground, with bronze tablet cemented in top, stamped "Prim. Trav. Sta. No. 9".....	37 32 07.3	87 50 52.7
T road southwest, 21 feet south to corner of picket fence.	37 32 19.9	87 52 09.0
T road north at bridge over creek southwest, 24 feet northeast to corner gatepost, 35 feet west to center of bridge.	37 32 31.6	87 52 37.6
Wynne bridge, center of.....	37 32 37.4	87 54 10.5
T road northeast, 15 feet to easternmost gatepost, 40 feet northeast to corner picket fence.....	37 32 09.5	87 54 14.2
T road southwest at bridge over ditch, 21 feet north to large black oak tree at corner picket fence, 12 feet south to corner of bridge over ditch.....	37 31 20.8	87 54 30.2
T road northeast, 10 feet southwest to bill post and stump, 20 feet northwest to center of small bridge.....	37 30 52.4	87 55 03.5
T road northeast at schoolhouse, 30 feet east to corner of picket fence, 21 feet northwest to center of small bridge.	37 30 30.5	37 55 48.0
Sullivan, T road northwest about 0.75 mile northeast of, 25 feet north to rail-and-picket fence.....	37 30 23.0	87 56 12.4
Sullivan, in north corner of Jno. McGraw's front yard, northeast corner of McGraw's house bears S. 33° 45' E., distant 16.6 feet; east corner of house opposite McGraw's bears N. 62° 15' W., distant 70.4 feet. Bronze tablet cemented in top of sandstone post 8 by 9 by 26 inches, set 22 inches in ground, stamped "Prim. Trav. Sta. No. 10".....	37 29 58.8	87 56 37.1

Geographic positions along the Illinois Central Railroad between Sullivan and Sturgis.

Station.	Latitude.	Longitude.
Milepost 72, private road crossing 600 feet northwest of ..	° ' " 37 30 21.5	° ' " 87 57 09.3
Road crossing east and west 800 feet northwest of milepost 73	37 31 03.9	87 57 59.0
Road crossing east and west at milepost 74	37 31 39.4	87 58 31.6
Road crossing 270 feet north of milepost 75.....	37 32 29.8	87 58 52.5
Sturgis, Adams street, crossing north and south	37 32 48.5	87 59 03.6

Geographic positions along highways.

Station.	Latitude.	Longitude.
Sturgis, center of iron bridge over Cypress Creek about 1 mile north of	° ' " 37 33 31.0	° ' " 87 58 46.2
T road west about 0.75 mile north of bridge over Cypress Creek, 30 feet southwest to large elm tree at corner of fence, 27 feet east of telephone pole.....	37 34 06.3	87 58 31.4
T road northeast, 25 feet northeast to corner of stable lot fence, 33 feet to corner of picket fence	37 34 15.9	87 59 28.3
Crossroads at hackberry tree, 15 feet northeast to hackberry tree, 21 feet west to corner of rail fence	37 34 48.3	87 59 31.9
T road east, 20 feet southeast to telephone pole, 30 feet northwest to large gum tree.....	37 34 51.4	88 00 13.7
T road west where telephone line branches west; 10 feet west to center of small bridge	37 36 11.2	88 00 19.8
Gum grove, in northeast corner of Ben F. Perkins's front yard, northeast corner of his residence bears S. 56° 45' W. distant 39.9 feet; east face of silver poplar tree bears N. 51° W. distant 34.4 feet; telephone pole bears N. 32° E. distant 6 feet, aluminum tablet in top of sandstone post 7 by 12 by 24 inches, set 22 inches in ground, stamped "Prim. Trav. Sta. No. 11".....	37 37 00.8	88 00 19.6
Grove Center, intersection of roads 1 mile south of, 28 feet north to J. L. Geiger's mail box, 28 feet southeast to corner of wire fence.....	37 37 49.4	88 00 37.8
Grove Center, road crossing Illinois Central Railroad at station.....	37 38 29.3	88 00 43.5
Blue bridge (covered) over Heins Creek west.....	37 39 39.4	88 01 05.4
Lane east, 28 feet east to corner of hedge fence, 27 feet southeast to corner of rail and picket fences	37 40 08.0	88 00 51.1
Woodgrove Church, intersection of Morganfield and Springgrove road and road southeast $\frac{1}{4}$ mile southwest of, 36 feet southwest to stone at corner of garden fence 30 feet east to corner of picket fence	37 41 04.1	88 00 51.1
Woodgrove Church, T road $\frac{1}{4}$ mile east of, 24 feet west to corner of culvert.....	37 41 16.5	88 00 26.1
T road west at F. Thomas's residence, 18 feet northwest to hickory tree, 23 feet east to mail box.....	37 41 41.1	88 00 19.2
T road east, 21 feet east to John Masons's mail box	37 42 47.0	87 59 30.4
T road west, 24 feet northeast to corner of picket fence, 27 feet southwest to corner of picket fence	37 43 23.2	87 59 08.4
Uniontown, 4 miles south west of, hickory tree 16 inches in diameter bears N. 69° 45' E., 35.2 feet distant, southwest corner of John Thompson's tenement house bears S. 53° E. distant 49.5 feet, aluminum tablet cemented in top of sandstone post 7 by 12 by 26 inches, set 23 inches in ground, in John Thompson's tenement-house yard, $1\frac{1}{2}$ feet east of front fence and 6 feet south of stile, stamped "Prim. Trav. Sta. No. 12".....	37 43 56.3	87 58 41.8
T road east, 33 feet due south to corner of rail and picket fences; this T road is 130 feet south of top of hill.....	37 45 05.3	87 57 50.4
T road north just east of creek, 35 feet north to corner of rail and wire fence	37 45 54.0	87 57. 19.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Uniontown, in south part of, in south corner of R. H. Sooper's tobacco factory property, nail in black oak tree bears N. 23° 30' W., distant 10.2 feet; south corner of tobacco factory (main building) bears N. 25° 15' E., distant 103.9 feet; corner post to south corner fence is 4.6 feet distant, aluminum tablet cemented in top of sandstone 7 by 13 by 26 inches, set 23 inches in ground, stamped "Prim. Trav. Sta. No. 13" -----	° ' " 37 46 14.6	° ' " 87 56 16.6
Uniontown, Mill street crossing Illinois Central Railroad.	37 46 06.2	87 55 53.9

MAINE.

TRIANGULATION STATIONS.

KNOX AND WALDO COUNTIES.

BELFAST QUADRANGLE.

In the fall of 1904, Mr. E. L. McNair, topographer, located six new stations for the control of this quadrangle. These stations were based upon Harris and Ragged of the United States Coast and Geodetic Survey. Positions are given on the United States standard datum.

RAGGED, KNOX COUNTY.

A United States Coast and Geodetic Survey station on summit of high mountain, 4 miles southwest of village of Camden.

Station mark: A copper bolt in solid rock.

Reference marks: Seven iron ring bolts at foot of quadripod legs. No. 1, distant 6.6 feet; azimuth, 196° 10'. No. 2, distant 6.2 feet; azimuth, 203° 23'. No. 3, distant 6.9 feet; azimuth, 287° 08'. No. 4, distant 7 feet; azimuth, 309° 21'. No. 5, distant 7 feet; azimuth, 25° 57'. No. 6, distant 8.5 feet; azimuth, 112° 13'. No. 7, distant 8.2 feet; azimuth, 120° 43'.

[Latitude 44° 12' 45.38". Longitude 69° 09' 05.33'.]

To station.	Azimuth.	Back azimuth.	Log. distance.
	° ' " ° ' "	° ' " ° ' "	Meters.
Liberty	148 38 04.55	328 31 28.33	4.3823695
Liberty Church	148 55 10	-----	4.36347
Frye	169 47 31.16	349 44 44.28	4.4738346
Harris.....	180 16 03.41	0 16 10.87	4.7015453
Patterson.....	203 26 52.65	23 30 54.80	4.2854389
Bald Rock.....	234 43 33	-----	4.02164
Mount Desert.....	257 52 04.70	78 30 48.08	4.8772814

HARRIS, PENOBSCOT COUNTY.

A station of the United States Coast and Geodetic Survey on highest point of largest hill in town of Dixmont, 1.5 miles east of Dixmont.

Station mark: A masonry column 10 feet high and 7 feet in diameter, with a hole in center 2 feet in diameter.

Reference marks: Drill hole in rock N. $2^{\circ} 38'$ E., distant 74 feet; drill hole in rock S. $80^{\circ} 50'$ E., distant 17.3 feet; drill hole in rock S. $72^{\circ} 50'$, distant 69.4 feet.

[Latitude $44^{\circ} 39' 54.87''$. Longitude $69^{\circ} 08' 54.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ragged.....	0 16 10.87	180 16 03.41	4.7015453
Frye.....	14 42 41.97	194 39 46.94	4.3365735
Liberty.....	23 17 52.10	203 11 06.80	4.5097166
Patterson.....	347 08 23.11	167 12 18.77	4.5241926
Charleston.....	191 51 30.15	11 57 05.28	4.7034506
Carmel.....	229 05 12.30	49 12 44.67	4.2719702
Greenfield.....	230 15 31.96	50 44 54.33	4.8516641
Bangor.....	241 11 48.28	61 27 13.31	4.5179486
Eddington.....	243 33 32.38	63 53 55.23	4.6297717
Peaked Mountain.....	251 11 30.06	71 40 23.99	4.7570784
Mount Saunders.....	270 50 43.86	91 13 37.14	4.6339557

BALD ROCK, WALDO COUNTY.

(Not occupied.)

A high, bald knob in town of Lincolnville, 3 miles south of Frenchs Beach.

Station mark: An iron ringbolt set horizontally in south face of highest projection of rock.

[Latitude $44^{\circ} 16' 01.86''$. Longitude $69^{\circ} 02' 38.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ragged.....	4.02164
Liberty.....	4.40902
Frye.....	4.43219
Patterson.....	4.06694

52 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

CHURCH AT HEAD OF TIDE, WALDO COUNTY.

(Not occupied.)

Station mark: Center of spire.

[Latitude $44^{\circ} 26' 58.25''$. Longitude $69^{\circ} 03' 20.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Patterson	3. 93591
Frye	4. 12162

FRYE, WALDO COUNTY.

Situated on high, bare hill in town of Montville.

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

Reference mark: Six iron ringbolts at foot of quadripod legs. No. 1, distant 4.2 feet; azimuth, $252^{\circ} 28'$. No. 2, distant 8.5 feet; azimuth, $266^{\circ} 10'$. No. 3, distant 7.8 feet; azimuth, $359^{\circ} 39'$. No. 4, distant 5.8 feet; azimuth, $75^{\circ} 09'$. No. 5, distant 4.1 feet; azimuth, $155^{\circ} 56'$. No. 6, distant 4.5 feet; azimuth, $178^{\circ} 53''$.

[Latitude $44^{\circ} 28' 34.66''$. Longitude $69^{\circ} 13' 04.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Liberty	39 50 28.03	219 46 38.03	4. 0549328
Harris	194 39 46.94	14 42 41.97	4. 3365735
Patterson	311 47 57.89	131 54 47.74	4. 2402895
Bald Rock .....	.....	.....	4. 43219
Ragged	349 44 44.28	169 47 31.16	4. 4738346

LIBERTY, WALDO COUNTY.

Situated on bare hill, locally known as Haystack, in town of Liberty. Village of Liberty is at foot of hill.

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

Reference marks: Four iron ringbolts at foot of quadripod legs. No. 1, distant 7.4 feet; azimuth, $137^{\circ} 20'$. No. 2, distant 7.3 feet; azimuth, $238^{\circ} 34'$. No. 3, distant 7 feet; azimuth, $323^{\circ} 04'$. No. 4, distant 6.8 feet; azimuth, $59^{\circ} 41'$.

[Latitude 44° 23' 52.23''. Longitude 69° 18' 32.60''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Harris.....	203 11 06.80	23 17 52.10	4.5097166
Frye.....	219 46 38.03	39 50 28.03	4.0549328
Patterson.....	278 01 43.57	98 12 22.92	4.3104300
Bald Rock.....			4.40902
Ragged.....	328 31 28.33	148 38 04.55	4.3823695

LIBERTY CHURCH, WALDO COUNTY.

(Not occupied.)

Station mark: Center of spire on church in village of Liberty.

[Latitude 44° 23' 25.80''. Longitude 69° 18' 03.93''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Patterson.....			4.29466
Ragged.....			4.36347

PATTERSON, WALDO COUNTY.

Situated on a bare hill about 4 miles southwest of Belfast.

Station mark: A bronze tablet cemented in solid rock.

Reference marks: Four iron ringbolts at foot of quadripod legs.
 No. 1, distant 6.9 feet; azimuth, 210° 06'. No. 2, distant 6.4 feet;
 azimuth, 297° 35'. No. 3, distant 5.3 feet; azimuth, 34° 03'. No. 4,
 distant 6.4 feet; azimuth, 132° 47'.

[Latitude 44° 22' 18.73''. Longitude 69° 03' 18.56''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ragged.....	23 30 54.80	203 26 52.65	4.2854389
Liberty.....	98 12 22.92	278 01 43.57	4.3104300
Frye.....	131 54 47.74	311 47 57.89	4.2402895
Harris.....	167 12 18.77	347 08 23.11	4.5241926
Bald Rock.....			4.06694

MARYLAND.

PRIMARY TRAVERSE.

CARROLL, FREDERICK, HOWARD, AND MONTGOMERY COUNTIES.

MONOCACY, RIDGEVILLE, ROCKVILLE, AND SENECA QUADRANGLES.

The following geographic positions on the United States standard datum were obtained from primary traverse run in 1904 by Mr. C. B. Kendall. The first line starts from the west tower of the Lutheran Church at Frederick, Md., a triangulation station of the United States Coast and Geodetic Survey, and follows highways north to the edge of the quadrangle, and thence east through Libertytown, Unionville, and Winfield, and connects with line run in 1902 by Mr. E. L. McNair, $1\frac{1}{2}$ miles north of Bennett post-office at the junction of the Washington and Liberty roads. Line No. 2 starts at Libertytown and follows highways south through New Market to Brink post-office; thence west to the Chesapeake and Ohio Canal at the mouth of the Monocacy River; thence along the canal to Noland Ferry and north to Frederick. Line No. 3 starts at Brink and follows highways east through Goshen and Laytonsville to Glenelg, where it connects with point located in 1902 by Mr. E. L. McNair and in 1903 by Mr. C. B. Kendall. Line No. 4 starts at Brink and follows highways south through Gaithersburg and Travilah to the Chesapeake and Ohio Canal. Line No. 5 starts from the Monocacy River aqueduct of the Chesapeake and Ohio Canal and follows the canal south and east, connecting with line No. 4, and thence east along highways through Potomac and connects with line run in 1903 by Mr. C. B. Kendall 1 mile west of Burnt Mills.

FREDERICK COUNTY, MONOCACY QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Frederick, west tower of Lutheran Church.....	39 24 55.3	77 24 34.8
Frederick, Seventh and Market streets, junction of, 45 feet west to fountain, 55 feet northeast to brick corner post of yard	39 25 21.7	77 24 34.9
Warmon's mill, junction of pikes, 50 feet northeast to mail box, 35 feet west to telephone pole at fence corner.....	39 26 37.4	77 23 41.8
Harmony Grove station, 200 feet southwest of, Baltimore and Ohio Railroad and pike crossing.....	39 27 10.4	77 23 58.1
Toll gate, 3 corners at, 12 feet north to southeast corner of porch	39 28 03.6	77 24 09.3
Three corners, 25 feet northeast to fence corner post, 25 feet southeast to corner stone fence.....	39 28 54.3	77 23 45.8
Harrisville, forks of road	39 29 51.6	77 24 07.3
Three corners, 35 feet southeast to blazed locust tree, 25 feet west to pole fence	39 30 32.3	77 23 53.6

FREDERICK COUNTY, MONOCACY QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Monocacy River, on north end of center pier of Devilbiss Bridge, cemented in bed rock in northwest corner of span of bridge, bronze tablet stamped "Prim. Trav. Sta. No. 54"	39° 30' 26.6"	77° 22' 37.8"
Walkersville, 1 mile northwest of, Pennsylvania Railroad crossing	39° 29' 45.8"	77° 20' 45.2"
Walkersville, 1 mile east of, at cemetery, 4 corners, 60 feet northeast to corner of cemetery fence, 25 feet southeast to fence corner	39° 29' 33.9"	77° 19' 57.6"
Forks of road	39° 29' 33.4"	77° 19' 06.3"
Daysville, forks of road $\frac{3}{4}$ mile west of, 20 feet southwest to fence corner post, 15 feet north to arrow on fence ...	39° 29' 15.6"	77° 17' 39.7"
Red Brick Church, 3 corners 150 feet west of	39° 29' 14.3"	77° 16' 47.5"
Libertytown, forks of road at west edge of, 40 feet southwest to telephone pole, 60 feet southeast to northwest corner of house	39° 29' 04.2"	77° 15' 03.6"
New London, 4 corners $1\frac{1}{4}$ miles north of, near summit, 20 feet northeast to mail box, 25 feet northwest to mail box	39° 26' 10.2"	77° 15' 12.6"
New London, northwest corner of iron bridge over Bens Branch	39° 25' 13.6"	77° 15' 16.7"
Sand Hill schoolhouse, forks of road, 25 feet southwest to fence, 25 feet northwest to fence	39° 24' 40.8"	77° 15' 36.3"
Four corners, 25 feet northwest to tree at fence corner, 20 feet northeast to large rock	39° 24' 13.9"	77° 15' 33.4"
New Market, cross pikes at, 45 feet southeast to northwest corner yellow dwelling, 40 feet southwest to bay window	39° 22' 58.6"	77° 16' 11.5"
South end of coping stone to west abutment of Baltimore and Ohio Railroad girder span over public road, bronze tablet stamped "Prim. Trav. Sta. No. 25"	39° 22' 20.8"	77° 16' 20.9"
Three corners, 30 feet southeast to blazed cherry tree, 15 feet northwest to telephone pole	39° 21' 36.6"	77° 16' 10.5"
Forks of road, 10 feet west to mark on fence	39° 20' 46.3"	77° 16' 14.5"
Fountain Mills, forks of road, 40 feet east to store corner, 40 feet north to locust tree at fence	39° 20' 21.2"	77° 16' 13.6"
Browningsville, 3 corners at top of hill $1\frac{1}{4}$ miles northwest of; 30 feet south to telephone pole, 30 feet southeast to blazed tree	39° 19' 13.6"	77° 15' 38.8"
Baltimore and Ohio girder bridge, center of	39° 15' 01.6"	77° 28' 55.1"
Licksville, 4 corners 0.5 miles west of, 20 feet northwest to mark on fence post, 35 feet southeast to telephone pole	39° 15' 34.5"	77° 28' 38.8"
Three corners, 25 feet west to mark on fence, 25 feet northeast to corner fence gate	39° 17' 11.9"	77° 28' 07.9"
Adamstown, 4 corners 1 mile northeast of, 25 feet northeast to fence corner, 25 feet northwest to fence corner ..	39° 18' 44.6"	77° 27' 38.8"
Adamstown, Baltimore and Ohio Railroad crossing 2 miles northeast of, center between tracks	39° 19' 32.9"	77° 27' 23.9"

FREDERICK COUNTY, MONOCACY QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Four corners, 350 feet north of, cemented in southwest corner of brick dwelling of Mr. Robert Graham, aluminum tablet stamped "Prim. Trav. Sta. No. 490"	° ' " 39 19 54.3	° ' " 77 27 16.7
Forks of road, small grassplot in angle of, 25 feet east to mark on fence, 20 feet west to locust tree	39 21 38.2	77 26 37.5
Old Mill, 3 corners 300 feet north of, 25 feet south to bridge, 50 feet northeast to apple tree	39 22 27.3	77 26 48.5
Frederick, 1 mile west of, at pike junction, 45 feet southwest to corner wire fence, 25 feet southeast to mark on plank fence	39 24 17.0	77 26 09.5
Frederick, junction of National and Jefferson pikes at west edge of, 25 feet northwest to telephone pole, 25 feet south to telephone pole	39 24 40.6	77 25 20.3

MONTGOMERY COUNTY, ROCKVILLE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Cedar Grove, grass plot at forks of road 100 feet west of Upper Seneca Baptist Church	° ' " 39 14 26.7	° ' " 77 14 05.1
Brink post-office, 4 corners, 27 feet west to nail in persimmon tree, 27 feet north to nail in fence post	39 12 35.9	77 14 24.4
Brink post-office, cemented in rock foundation at northeast corner of dwelling of W. T. Dowden, aluminum tablet stamped "Prim. Tra. Sta. No. 341"	39 12 35.2	77 14 25.1
Neelsville, large spreading tree at forks of road	39 12 49.7	77 14 57.2
Forks of road, 30 feet northwest to chestnut tree, 35 feet southwest to oak tree	39 12 25.2	77 13 08.0
Seneca Creek, forks of road 80 feet southeast of center of bridge over, 45 feet southeast to mark on fence corner	39 12 03.6	77 12 14.2
Goshen, forks of road, 20 feet west to fence, 30 feet southeast to stump	39 12 13.1	77 11 14.9
Laytonsville, 4 corners, 1½ miles west of, 40 feet southwest to locust tree, 40 feet northeast to mark on fence corner	39 12 29.6	77 10 10.3
Laytonsville, cemented in north wall of brick dwelling of Mr. Ed. O. Brown on southeast corner of Baltimore and Washington streets, aluminum tablet stamped "Prim. Trav. Sta. No. 46"	39 12 42.6	77 08 34.8
Hawlings River, center of bridge over	39 13 03.5	77 06 21.5
Forks of road, at whitewashed house, 25 feet north to yard fence, 35 feet south to fence	39 13 18.5	77 03 09.2
Unity, 4 corners, ½ mile west of, 30 feet northwest to stump, 25 feet southeast to corner of plank fence	39 13 36.7	77 04 34.9
Patuxent River, center of bridge over	39 14 58.6	77 03 58.9

MONTGOMERY COUNTY, ROCKVILLE QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Brink post-office, 3 corners, 1 mile south of, at Neelsville Presbyterian Church, 50 feet east to wire fence, 40 feet northwest to yard corner	° ' " 39 11 43.7	° ' " 77 14 39.4
Middlebrook, 4 corners, 60 feet north west to store corner, 45 feet southwest to stone at fence corner	39 10 42.6	77 14 18.8
Seneca Creek, center of bridge over	39 10 01.2	77 13 37.4
Three corners, 40 feet east to tree at fence corner, 45 feet northeast to fence corner	39 09 28.1	77 13 04.7
Gaithersburg, cemented in north wall at northwest corner of brick store of Mr. R. A. Young at junction of Frederick avenue and Chestnut street, aluminum tablet stamped "Prim. Trav. Sta. No. 24"	39 08 38.1	77 12 06.1
Gaithersburg, Frederick avenue crossing, Baltimore and Ohio Railroad, 55 feet east to telegraph office, 40 feet northwest to crossing sign	39 08 29.8	77 11 55.3
Three corners	39 07 30.3	77 12 48.8
Three corners, 30 feet northeast to cedar tree, 35 feet southeast to fence corner	39 06 55.7	77 12 58.8
Three corners, at signboard, 35 feet north to signboard, 15 feet south to telephone pole	39 06 12.3	77 13 26.0
Three corners, 40 feet north to fence corner, 40 feet southwest to fence painted	39 05 01.9	77 14 54.9
Grimes Lock No. 21, 3 corners, $\frac{1}{2}$ mile north of, 29 feet southeast to nail in fence post, 36 feet southwest to nail in fence post	39 02 07.6	77 14 26.2
Grimes Lock No. 21, cemented in coping stone of west wing wall to south end of, aluminum tablet stamped "Prim. Trav. Sta. No. 179"	39 01 53.2	77 14 36.7
Forks of road, 25 feet south to mark on fence	39 01 54.3	77 13 59.4
Three corners, 35 feet south to corner fence, 30 feet east to fence	39 01 38.0	77 13 13.5
Potomac, 4 corners, 75 feet northeast to southwest corner post-office, 50 feet east to corner Jno. Stones store	39 01 06.1	77 12 33.1
Three corners, 30 feet south to wire fence, 30 feet northwest to fence corner	39 00 08.4	77 10 51.8
Cabin John Creek, crossroads 125 feet west of	38 59 49.4	77 10 11.3
Emeryn crossroads, 40 feet southeast to corner small dwelling, 25 feet south to stable corner	38 59 33.4	77 09 41.3
Cabin John Bridge, forks of road 1 mile northeast of, 25 feet east to wire fence corner, 50 feet north to telephone pole	38 59 00.9	77 08 15.3
Forks of road, 25 feet southeast to telephone pole, 25 feet north to forked cherry tree	38 59 24.6	77 07 17.8
Bethesda street car station, 3 corners, $\frac{3}{4}$ mile south of, 25 feet east to car track, 50 feet southwest to store corner	39 00 00.9	77 06 35.6
Georgetown pike, 3 corners at	39 00 23.7	77 05 52.0
Bethesda street car station, cemented in middle stone of west wall of culvert near Rock Creek on Georgetown pike 0.8 miles east of, aluminum tablet stamped "Prim. Trav. Sta. No. 302"	39 00 21.9	77 05 52.1

MONTGOMERY COUNTY, ROCKVILLE QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Forks of road, 60 feet northeast to telephone pole, 50 feet east to telephone pole	° ' " 38 59 46.3	° ' " 77 05 48.7
Forest Glen, street car crossing 1 mile south of	38 59 59.9	77 04 37.8
Overhead bridge	38 59 52.1	77 03 25.9
Triangle, junction Brookville pike and road to Forest Glen, 45 feet southwest to cedar tree at gate, 25 feet northwest to telephone pole	39 00 34.5	77 02 27.5
Burnt Mills, 4 corners, 1 mile west of, junction Coleville pike and Blanchard and Wheaton road, 33 feet west to real estate office	39 01 13.1	77 00 47.1
Burnt Mills, 4 corners, 1 mile west of, cemented in north stone of gatepost to entrance to farm of Mr. Kolk, aluminum tablet stamped "Prim. Trav. Sta. No. 361"	39 01 13.2	77 00 46.3

MONTGOMERY COUNTY, SENECA QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Clarksburg, 3 corners at, 30 feet northwest to corner post, 50 feet northeast to stone at corner iron fence	° ' " 39 14 19.6	° ' " 77 16 46.7
Clarksburg, 3 corners 1 mile northwest of	39 14 49.4	77 17 47.5
Thompsons Corners, 400 feet west of store, 40 feet northwest to blazed tree, 30 feet southwest to post of yard fence	39 14 33.7	77 19 20.1
Comus, cemented in large stone in northwest corner of intersection of crossroads, 60 feet northeast of northeast corner of post-office and 10 feet east of southeast corner of fence of W. A. Maxwell's house, aluminum tablet stamped "Prim. Trav. Sta. No. 384"	39 14 48.9	77 21 00.3
Forks of road, 25 feet east to front-yard fence, 35 feet west to oak tree	39 14 11.5	77 21 36.7
Barnesville, 3 corners 150 feet west of schoolhouse in east edge of, 30 feet northeast to oak tree	39 13 14.0	77 22 32.3
Little Monocacy River, center of iron bridge over	39 13 36.7	77 24 20.7
Dickerson, center of bridge over Baltimore and Ohio Railroad, 1 mile northwest of	39 13 25.0	77 26 27.7

MONTGOMERY COUNTY, SENECA QUADRANGLE—continued.

Geographic positions along the Chesapeake and Ohio Canal between Monocacy River and Sandy Run.

Station.	Latitude.	Longitude.
Monocacy aqueduct, cemented in coping of east wing wall of south abutment, aluminum tablet stamped "Prim. Trav. Sta. No. 442"	° ' " 39 13 23.1	° ' " 77 27 06.5
Culvert.....	39 14 36.9	77 28 30.8
Tower gate of Monocacy Lock No. 27.....	39 12 56.8	77 27 29.7
Lock No. 26, towpath opposite upper gate.....	39 11 26.2	77 28 17.1
Sawmill road, towpath opposite.....	39 10 25.7	77 30 00.0
White's ferry bridge, towpath under center of.....	39 09 16.2	77 31 02.5
D. C. Winbrenner Landing No. 2, towpath opposite	39 07 08.6	77 29 56.4
Edwards Ferry, Lock No. 25, cemented in top coping stone of west wing wall to south gate of, aluminum tablet stamped "Prim. Trav. Sta. No. 88"	39 06 11.2	77 28 20.3
Road north at two dwellings and red barn, towpath opposite	39 04 41.4	77 26 23.3
Sycamore Landing, towpath opposite center of warehouse.....	39 04 25.8	77 25 09.0
Seneca Creek aqueduct, cemented in south wing wall of west abutment of, aluminum tablet stamped "Prim. Trav. Sta. No. 127"	39 04 05.3	77 20 28.5
Rushville, cross mark in coping stone of upper gate at south end of Lock No. 23	39 03 59.7	77 19 43.0
Pennfields, Lock No. 22, towpath opposite upper gate ...	39 03 15.2	77 17 21.5
Wood road, towpath opposite.....	39 02 43.1	77 16 25.2

Geographic positions along highways.

Station.	Latitude	Longitude.
Travilah, 4 corners at, 35 feet southeast to stone porch, 25 feet northeast to front-yard fence.....	° ' " 39 04 08.7	° ' " 77 15 48.6
Forks of road, small grass plat at, 275 feet west of iron bridge over Sandy Branch	39 02' 42.5	77 15 40.9

CARROLL, FREDERICK, AND HOWARD COUNTIES, RIDGEVILLE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Libertytown, in face of south wall, 2 feet west of front entrance to public school No. 1, Liberty District No. 8, aluminum tablet stamped "Prim. Trav. Sta. No. 123 A" ..	° ' " 39 29 05.9	° ' " 77 14 40.7
Libertytown, Main and Church streets	39 29 06.4	77 14 26.3
Albaugh's mill, forks of road just south of, 35 feet east to oak tree, 65 feet to oak tree at large rock	39 28 13.5	77 14 55.5
Public school, 3 corners to west of, 25 feet northwest to mail box, 60 feet south to elm tree	39 27 24.2	77 14 54.9

CARROLL, FREDERICK, AND HOWARD COUNTIES, RIDGEVILLE QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Bethesda Methodist Episcopal Church, forks of road 150 feet south of, 30 feet northwest to pump, 35 feet southeast to oak tree	° ' " 39 18 47.8	° ' " 77 14 48.6
Browningsville, 3 corners $\frac{3}{4}$ mile southeast of, 25 feet east to fence, 25 feet northwest to fence	39 18 05.8	77 14 09.8
Forks of road, 25 feet southeast to double chestnut tree, 30 feet west to mark on fence	39 17 11.8	77 13 17.4
Kings Valley post-office, 3 corners; 35 feet southeast to front step of post-office, 25 feet west to blazed cherry tree	39 16 07.5	77 14 08.0
Cedar Heights, crossroads, 22 feet south to north corner of small house, 24 feet northwest to dead cherry tree ..	39 15 11.2	77 13 47.0
Three corners, 20 feet south to telephone pole, 45 feet northeast to maple tree	39 28 45.5	77 12 27.0
Unionville, forks of road at, 60 feet south to creek, 35 feet west to scales	39 28 29.2	77 11 08.5
Forks of roads, mail box in center of diamond at, 70 feet south to large oak tree, 45 feet northwest to blazed maple tree	39 28 06.9	77 10 08.0
Schoolhouse, 3 corners 400 feet west of, 30 feet south to fence corner, 15 feet north to large rock	39 28 04.4	77 08 43.7
Frederick-Carroll county line, 4 corners at, 45 feet northwest to fence corner, 35 feet southwest to fence corner.	39 27 46.1	77 07 08.0
"Four Corners schoolhouse," cemented in south wall at southeast corner of, aluminum tablet stamped "Prim. Trav. Sta. No. 46"	39 27 45.7	77 06 49.0
Franklinville, 1,000 feet east of store; 3 corners	39 27 33.2	77 05 58.3
Taylorville, 4 corners at, 60 feet southwest to northeast corner of store, 35 feet southeast to northwest corner of house	39 27 28.5	77 05 13.2
Winfield, 4 corners at, 15 feet southwest to telephone pole, 50 feet southeast to northwest corner store	39 26 50.9	77 03 20.4
Piney Run, bridge over	39 26 23.4	77 02 05.3
Berrett post-office, 4 corners $1\frac{1}{4}$ miles north of, 33 feet south to nail in telephone pole, 41 feet southwest to nail in tree	39 25 46.2	77 00 30.8
Berrett post-office, $1\frac{1}{4}$ miles north of, cemented in brick foundation under southeast corner of store of Messrs. A. and P. D. Dorsey, aluminum tablet stamped "Prim. Trav. Sta. No. 15"	39 25 46.2	77 00 29.7
Roxburg Mills, 4 corners $\frac{1}{2}$ mile south of	39 15 04.8	77 03 17.7
West end of bridge over small stream	39 15 21.3	77 02 44.1
Glenelg, forks of road $\frac{3}{4}$ mile west of, 35 feet southeast to fence, 20 feet north to fence	39 15 19.8	77 01 02.5
Glenelg, cemented in south wall at southeast corner of Providence Methodist Episcopal Church, aluminum tablet stamped "Prim. Trav. Sta. No. 131"	39 15 37.2	77 00 37.1

ANNE ARUNDEL, CALVERT, AND PRINCE GEORGE COUNTIES.

OWENSVILLE QUADRANGLE.

The following geographic positions were determined by primary traverse run by Mr. C. B. Kendall, field assistant, in the summer of 1904. The line begins with adjusted position of north end of highway bridge over the Philadelphia, Baltimore and Washington Railroad at Bowie, established by primary traverse by Mr. C. B. Kendall in 1903, and follows the Popes Creek branch of the Pennsylvania Railroad to Upper Marlboro, thence along the Chesapeake Beach Railway to Chaney station. From Chaney station the line follows highways east and is tied to the position of the old Fairhaven wharf as given on the Coast and Geodetic Survey Chart No. 135.

Geographic positions along the Popes Creek branch of the Pennsylvania Railroad between Bowie and Upper Marlboro.

Station.	Latitude.	Longitude.
Bowie, east edge of road, 25 feet north of north end of bridge over Philadelphia, Baltimore and Washington Railroad.....	° ' " 39 00 29.4	° ' " 76 46 44.8
Bowie, the Imperial Hotel, in brick foundation at southwest corner of; aluminum tablet stamped "Prim. Trav. Sta. No. 3 (A)".....	39 00 24.9	76 46 47.8
Bowie, 1.1 miles southeast of, center of track at road crossing.....	38 59 38.1	76 46 29.9
Collington station, 400 feet north of, center of track at road crossing.....	38 58 12.7	76 45 30.8
Trestle, waterway No. 4, overhead crossing.....	38 57 28.6	76 45 11.3
Mulliken station, 300 feet north of, center of track at road crossing.....	38 55 31.2	76 44 35.9
Halls station, 350 feet north of, 120 feet northwest of crossing, at southeast corner of post-office and store of H. C. Hopkins; iron bench-mark post stamped "Prim. Trav. Sta. No. 22 (A)".....	38 54 09.8	76 44 09.4
Leeland station, center of road crossing.....	38 52 18.7	76 44 53.3
Hill station, center of road crossing.....	38 50 57.4	76 45 02.4
Marlboro station, 700 feet north of, center of track at south end of road crossing.....	38 49 15.0	76 44 39.2
Upper Marlboro, Prince George County court-house, in northwest corner of stone to porch; aluminum tablet stamped "Prim. Trav. Sta. No. 54".....	38 49 00.0	76 45 02.4

Geographic positions along Chesapeake Beach Railroad between Marlboro and Chaney.

Station.	Latitude.	Longitude.
Marlboro, Chesapeake Beach Railroad station, 150 feet south of, center of track at road crossing.....	° ' " 38 48 47.6	° ' " 76 45 30.7
Marlboro, 1.2 miles southeast of, crossing of Pennsylvania and Chesapeake Beach railroads.....	38 48 07.0	76 44 40.0
Mount Calvert station, center of main track opposite....	38 46 56.9	76 43 12.4
Patuxent River, 0.9 mile east of, center of track at road crossing.....	38 46 53.4	76 41 56.6
Pindell station, 750 feet east of, center of track under overhead highway bridge.....	38 46 29.3	76 40 52.5
Lyons Creek station, at corner of wire fence 100 feet west of road crossing and 50 feet north of center of main track; bench-mark post stamped "Prim. Trav. Sta. No. 73 (A)".....	38 45 56.3	76 39 37.8
Lyons Creek station, 0.5 mile east of, trestle, center of track over public road.....	38 45 35.8	76 39 13.3
Chaney station, 500 feet east of, north end of highway bridge over railroad.....	38 44 55.3	76 38 23.0

Geographic positions along highways.

Station.	Latitude.	Longitude.
Jewell post-office, road forks at, 35 feet west to rail fence, 55 feet south to rail fence.....	° ' " 38 45 18.7	° ' " 76 37 06.7
Gravel Hill, road forks west and southwest, at top of hill.	38 45 09.4	76 35 32.9
Old Fairhaven wharf, 1.2 miles west of; four corners, 35 feet north to large oak.....	38 45 16.4	76 34 44.7
Old Fairhaven wharf, 0.3 mile west of, on north edge of east and west road at junction with road leading south to new Fairhaven wharf; iron bench-mark post stamped "Prim. Trav. Sta. No. 137.".....	38 45 18.9	76 33 37.9
Old Fairhaven wharf, shore end of, at retaining wall.....	38 45 24.9	76 33 26.0

MINNESOTA.

PRIMARY TRAVERSE.

ANOKA, CARVER, HENNEPIN, AND WRIGHT COUNTIES.

ANOKA, LAKE MINNETONKA, AND LAKE SARAH QUADRANGLES.

The following geographic positions were determined by primary traverse by Mr. George T. Hawkins, topographer. Starting from United States Coast and Geodetic Survey astronomic station in the grounds of the University of Minnesota, at Minneapolis, a spur line was run in 1899 along the main line of the Northern Pacific Railway to Itasca station, and another spur line along the main line of the Canadian Pacific Railway to Hamel station. In 1904 circuits were completed by continuing these lines around the borders of the Lake Sarah and Minnetonka quadrangles.

ANOKA QUADRANGLE.

Geographic positions along the Northern Pacific Railway between Minneapolis and Itasca.

Station.	Latitude.	Longitude.
Minneapolis, astronomic pier in grounds of the State University on the small knoll about 300 feet south of the main stone building. Station mark: A brick pier with foundation 2 feet below surface.....	° ' " 44 58 37.72	° ' " 93 14 12.68
Great Northern and Northern Pacific railways crossing ..	45 01 35.5	93 16 01.6
Fridley station.....	45 05 05.9	93 16 09.9
T. 30 N., R. 24 W., quarter corner between secs. 13 and 14.	45 05 09.4	93 16 02.6
Junction station.....	45 08 52.9	93 17 28.0
Coon Creek station.....	45 10 10.1	93 19 21.9
T. 31 N., R. 24 W., quarter corner between secs. 9 and 16.	45 10 58.4	93 20 13.2
Anoka station (Great Northern)	45 12 18.8	93 22 33.5
T. 32 N., R. 25 W., corner secs. 27, 28, 33, and 34.....	45 13 31.4	93 26 55.5
T. 32 N., R. 25 W., corner secs. 19, 20, 29, and 30	45 14 27.7	93 29 23.9
Itasca station	45 14 59.0	93 30 15.1

Geographic positions along the Canadian Pacific Railway between Minneapolis and Hamel.

Station.	Latitude.	Longitude.
Great Northern and Canadian Pacific railways crossing ..	° ' " 45 02 51.8	° ' " 93 21 12.9
Crystal station	45 02 49.5	93 21 37.0
T. 118 N., R. 21 W., corner secs. 5, 6, 7, and 8	45 03 02.5	93 22 46.2
T. 118 N., Rs. 22 and 23 W., quarter corner between secs. 7 and 12	45 02 36.7	93 31 16.5
Hamel station	45 02 29.6	93 31 24.9

LAKE MINNETONKA QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bench mark No. 2, crossroads 0.75 mile southeast of.	44 59 41.7	93 30 03.9
Crossroads.....	44 58 14.9	93 30 04.3
Wayzata, crossroads near south end of bridge over rail- way east of	44 57 49.3	93 29 44.9
Narrows of Lake Minnetonka, T road north at south side of.	44 56 55.7	93 29 50.1
Crossroads.....	44 56 29.9	93 30 05.1
Excelsior, 4 miles southeast of, 350 feet southwest of Mr. Charles Pichner's house, 250 feet south of T road south, on west side of north and south road, bench mark post set 38 inches in the ground stamped "Prim. Trav. Sta. No. 3, 1904".....	44 53 25.3	93 31 11.8
Chanhassen, T road south	44 51 41.9	93 31 49.0
Chanhassen, T road north 1.5 miles southwest of.....	44 50 26.6	93 32 25.0
Chanhassen, T road east 2.5 miles south of.....	44 49 31.8	93 32 07.8
Chaska, 3 miles east of, 15 feet north of St. Paul and St. Louis Railway, 100 feet west of crossing under railroad, bench-mark post set 44 inches in ground stamped "Prim. Trav. Sta. No. 4, 1904"	44 48 49.0	93 32 23.2

Geographic positions along the Minneapolis and St. Louis Railway near Chaska.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Railway crossing 0.5 mile west of bench mark No. 4.....	44 48 47.2	93 33 04.0
Chaska, 1.5 miles east of, railway crossing north and south	44 47 58.7	93 34 51.4
Chaska, crossing Chicago, Milwaukee and St. Paul Rail- way and Minneapolis and St. Louis Railway	44 47 19.2	93 36 01.1
Chaska, 40 feet west of station, 15 feet north of Minne- apolis and St. Louis Railway, bench-mark post stamped "Prim. Trav. Sta. No. 5".....	44 47 18.5	93 36 02.4

LAKE MINNETONKA QUADRANGLE—continued.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 115 N., Rs. 26 and 27 W., corner secs. 7, 18, 13, and 12.	44 46 34.1	93 38 29.7
T. 115 N., R. 27 W., corner secs. 10, 11, 14, and 15	44 46 33.4	93 40 59.0
T. 115 N., R. 27 W., corner secs. 8, 9, 16, and 17	44 46 31.9	93 43 26.9
T. 115 N., Rs. 27 and 28 W., corner secs. 7, 18, 13, and 12.	44 46 28.3	93 46 02.1
T. 115 N., Rs. 27 and 28 W., 275 feet north of corner secs. 7, 8, 13, and 12, on west side of north and south road, bench-mark post set 36 inches in ground, stamped "Prim. Trav. Sta. No. 6, 1904"	44 46 31.0	93 46 02.3
T. 116 N., R. 28 W., secs. 25, 26, 35, and 36, crossroads..	44 48 13.2	93 47 14.4
T. 116 N., R. 28 W., secs. 23, 24, 25, and 26, crossroads..	44 49 05.2	93 47 15.4
T. 116 N., R. 28 W., quarter corner between secs. 13 and 14, crossroads	44 50 23.2	93 47 16.2
Waconia, T street south, 0.25 mile east of Catholic Church and 1 block west of where street elbows north.	44 50 56.2	93 46 45.5
Waconia, T road east at schoolhouse 2 miles northeast of..	44 51 44.4	93 45 26.0
St. Bonifacius, 0.5 mile south of; on east side of north and south road at southwest corner of Thomas Kohman's yard, bench-mark post set 40 inches in ground, stamped "Prim. Trav. Sta. No. 7, 1904"	44 53 41.4	93 44 47.7
St. Bonifacius, T 117 N., R. 27 W., corner secs. 29, 30, 31, and 32	44 54 15.5	93 44 47.8
St. Bonifacius T. road east 0.75 mile north of	44 54 58.7	93 44 47.5
T. 117 N., R. 27 W., corner secs. 17, 18, 19, and 20	44 56 04.8	93 44-46.5
T. 117 N., R. 27 W., corner secs. 7, 8, 17, and 18	44 56 57.2	93 44 46.8
T. 117 N., R. 27 W., corner secs. 5, 6, 7, and 8	44 57 48.2	93 44 47.2
Ts. 117 and 118 N., Rs. 27 and 28 W., corner secs. 1, 6, 31, and 36	44 58 35.6	93 46 00.0
T. 117 N., R. 27 W., quarter corner between secs. 30 and 31.	44 59 31.4	93 45 24.4

Geographic positions along the Great Northern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mapleplain, road crossing over railway 2 miles southeast of	44 59 34.4	93 37 10.2
Long Lake, road crossing over railway 1 mile west of....	44 59 07.0	93 35 36.4
Long Lake, road crossing east of station	44 59 06.4	93 34 22.4
Long Lake, road crossing 0.25 mile east of station	44 59 04.8	93 34 09.7
Long Lake-Wayzata, road crossing over, half way between	44 58 27.9	93 32 21.3

LAKE SARAH QUADRANGLE.

Geographic positions along the Great Northern Railway between Delano and Mapleplain.

Station.	Latitude.	Longitude.
Delano, 3 miles southeast of, 250 feet west of John Relay's house, in front yard of Charles Lagheen, on west side of north and south road, bench-mark post stamped "Prim. Trav. Sta. No. 8, 1904".....	° ' " 45 00 59.8	° ' " 93 45 25.6
Delano, south end of bridge over Great Northern Railway, 2 miles east of.....	45 02 10.3	93 44 42.9
Comstock, railway crossing 2 miles northwest of.....	45 01 39.4	93 43 06.2
Comstock, railway crossing at.....	45 00 41.4	93 41 09.0
Mapleplain, railway crossing at.....	45 00 22.4	93 39 18.7
Mapleplain, road crossing under railway 0.75 mile east of..	45 00 10.2	93 38 41.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
Rockford, crossroads 3 miles southwest of.....	° ' " 45 04 18.3	° ' " 93 45 07.1
Rockford, "Soo" Railway crossing 1 mile south of.....	45 04 22.4	93 44 12.4
Rockford, north end of bridge over Crow River.....	45 05 17.2	93 43 57.8
Rockford, T road west 1.5 miles north of.....	45 06 41.3	93 44 13.7
Rockford, T road east 2.75 miles north of.....	45 07 20.5	93 44 13.9
Rockford, 3 miles north of, on west side of road at top of hill and on line with east and west fence on east side of road, bench-mark post stamped "Prim. Trav. Sta. No. 9, 1904".....	45 07 41.4	93 44 13.9
T. 119 N., R. 27 W., quarter corner between secs. 5 and 8.	45 08 13.0	93 44 13.4
T. 120 N., R. 27 W., corner secs. 28, 29, 32, and 33.....	45 09 58.0	93 43 34.0
St. Michaels, three corners 3 miles west and 1 mile south of (road east and west and road southeast).....	45 11 41.6	93 44 34.0
T. 120 N., R. 27 W., sec. 9, center of.....	45 13 00.9	93 42 53.8
T. 120 N., R. 27 W., quarter corner between secs. 4 and 9.	45 13 26.9	93 42 53.2
T. 120 N., R. 27 W., north quarter corner sec. 4.....	45 14 16.6	93 42 52.1
T. 121 N., R. 27 W., 20 feet north of center of sec. 33, on north side of east and west road at T road south, 1 foot from corner of wire fence, bench-mark post stamped "Prim. Trav. Sta. No. 10, 1904".....	45 14 42.4	93 42 50.8
T. 121 N., R. 27 W., quarter corner between secs. 33 and 34.	45 14 42.2	93 42 12.4
T. 121 N., R. 27 W., quarter corner between secs. 34 and 35.	45 14 42.2	93 40 59.6
St. Michaels station, T road south.....	45 14 16.4	93 39 12.0
T. 121 N., Rs. 26 and 27 W., sixteenth corner 0.75 mile north between secs. 31 and 36.....	45 14 55.3	93 38 32.4
St. Michaels station, 1.5 miles northeast of, on line between secs. 29 and 32, about 400 feet east of west corner of and near elbow in road, bench-mark post stamped "Prim. Trav. Sta. No. 11, 1904".....	45 15 08.2	93 37 12.5

LAKE SARAH QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 121 N., R. 26 W., corner secs. 28, 29, 32, and 33	45 15 08.3	93 36 03.2
T. 121 N., R. 26 W., quarter corner between secs. 28 and 33	45 15 08.4	93 35 26.2
Crossroads, 1.75 miles east of quarter corner between secs. 28 and 33	45 15 08.1	93 33 18.0
Dayton, 0.5 mile west of, on north side of road where it bends to northwest at top of hill, bench-mark post set 38 inches in the ground, stamped "Prim. Trav. Sta. No. 12, 1904"	45 14 39.2	93 31 39.2
Dayton, cross streets 600 feet north of Catholic Church.....	45 14 38.3	93 30 52.1
T. 120 N., R. 25 W., corner secs. 5, 6, 7, and 8	45 13 27.0	93 30 07.7
T. 120 N., R. 25 W., corner secs. 7, 8, 17, and 18	45 12 35.7	93 30 07.0
Schoolhouse, crossroads at	45 11 56.0	93 29 13.3
Anoka station, Great Northern Railway	45 12 18.8	93 22 33.5
Anoka, crossing Main street and Second avenue	45 11 52.0	93 23 19.0
T. 120 N., R. 25 W., quarter corner between secs. 22 and 23	45 11 16.8	93 26 30.0
T. 120 N., R. 25 W., quarter corner between secs. 21 and 22	45 11 16.4	93 27 41.7
T. 120 N., R. 25 W., at sixteenth corner 0.25 mile west of corner secs. 20, 21, 28, and 29; on north side of east and west road 400 feet west of T road north, bench- mark post stamped "Prim. Trav. Sta. No. 1, 1904".....	45 10 51.9	93 29 16.7
Bench mark No. 1, 0.5 mile west of, elbow of road east and southeast	45 10 52.1	93 29 55.9
Great Northern Railway, crossroads 50 feet north of	45 09 21.7	93 29 47.0
T road east.....	45 08 42.9	93 29 47.6
Crossroads north and south with northwest and southeast.....	45 07 37.8	93 30 05.5
T. 119 N., R. 25 W., secs. 5 and 8, sixteenth corner 0.25 mile from corner secs. 5, 6, 7, and 8.....	45 06 59.0	93 30 05.9
Crossroads	45 04 57.3	93 30 04.5
Church and schoolhouse, crossroads at.....	45 03 42.3	93 30 04.6
Hamel, crossing "Soo" Railway 1 mile east of	45 02 28.6	93 30 23.7
Hamel, crossing north and south road with road north- west and southeast, 2 miles southeast of	45 01 24.9	93 30 23.3
Gerdet Lake, 100 feet north of where north and south road turns to southeast, corner of wire fence bears S. 20° E., and is 30 feet distant, bench-mark post set 38 inches in ground, stamped "Prim. Trav. Sta. No. 2, 1904"	45 00 12.4	93 30 22.7

NEBRASKA-IOWA.

PRIMARY TRAVERSE.

OTOE AND CASS COUNTIES, NEBR.; FREMONT COUNTY, IOWA.

NEBRASKA CITY QUADRANGLE.

The following geographic positions were determined from primary traverse run by Mr. J. R. Ellis in 1905. The line starts from the Missouri River Commission triangulation station, Otoe, follows the Burlington Railway across Missouri River; thence north along Kansas City, Saint Joseph and Council Bluffs Railway to Percival, thence along highways to the Missouri River Commission triangulation station, Pugh. Again starting at Otoe triangulation station the line follows Missouri Pacific Railway to Peru, Nebr., thence along highways westward to Talmage and connects with adjusted position near there.

Another line starts from adjusted position near Dunbar, Nebr., follows highways north and east along the border of the quadrangle to Wyoming, thence southeast along Missouri Pacific Railway to Nebraska City and connects with adjusted position there.

Geographic positions along the Kansas City, Saint Joseph and Council Bluffs Railway.

Station.	Latitude.	Longitude.
Otoe triangulation station.....	° ' " 40 39 26.96	° ' " 95 49 04.16
Burlington Bridge over Missouri River, west end of.....	40 40 30.1	95 50 12.3
Schoolhouse, east and west railway crossing, 400 feet east of.....	40 40 50.8	95 48 31.2
IOWA.		
Nebraska City Junction, 700 feet north of, at road crossing on main line of Burlington Railroad, just west of right of way fence on land of M. M. Payne, iron post stamped "Prim. Trav. Sta. No. 1, 1905".....	40 40 18.4	95 45 33.2
Private road crossing at corn sheds.....	40 41 20.0	95 46 22.4
Section line road crossing north and south.....	40 42 33.0	95 47 21.7
East and west road crossing at mile post 154.....	40 43 43.6	95 48 19.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
Percival, Iowa, east side of Burlington Railroad, at cattle guard, 600 feet north of depot and just off right of way, on land of George Crocker, iron post stamped "Prim. Trav. Sta. No. 2, 1905".....	° ' " 40 45 11.3	° ' " 95 48 27.9
T road north at corner, secs. 20, 21, 28, 29, T. 69 N., R. 43 W., 36 feet south to corner of hedge, 25 feet north to west end of bridge.....	40 45 37.4	95 48 08.5
T. 69 N., R. 43 W., secs. 21, 22, 27, and 28, corner of, T road north.....	40 45 37.9	95 46 59.9
T. 69 N., R. 43 W., secs. 22, 23, 26, and 27, corner of, T road south.....	40 45 40.7	95 45 54.0
T. 69 N., R. 43 W., secs. 23, 24, 25, and 26, corner of....	40 45 40.1	95 44 44.7
Pugh triangulation station.....	40 46 43.34	95 44 16.8

Geographic positions along the Missouri Pacific Railway.

Station.	Latitude.	Longitude.
NEBRASKA.		
Road crossing east and west at wagon bridge over Four Mile Creek	° ' " 40 38 55.2	° ' " 95 48 38.6
Road crossing east and west.....	40 37 36.9	95 47 57.9
Minesville station, road crossing at north end of siding ..	40 36 00.9	95 47 14.8
Spier, switch block at section house	40 35 07.2	95 46 50.6
Barney, Nebr., platform.....	40 32 58.4	95 45 57.1
Otoe-Nemaha county line, road crossing	40 31 32.0	95 45 04.8

Geographic positions along highways.

Station.	Latitude.	Longitude.
Tps. 6 and 7 N., R. 15 E., quarter corner between secs. 5 and 32, T road south	° ' " 40 31 32.0	° ' " 95 45 11.8
Private road crossing at windmill	40 30 40.8	95 44 34.9
Peru, Nebr., 400 feet northwest of station, in southeast corner of field of Sam Adams, iron post stamped "Prim. Trav. Sta. No. 3, 1905"	40 29 23.4	95 43 50.2
Road north across lowlands.....	40 29 47.2	95 45 10.5
Duck Creek, east end of bridge over.....	40 30 16.1	95 47 24.5
T. 6 N., R. 14 E., corner secs. 2, 3, 10, and 11, crossroads..	40 30 39.8	95 49 10.0
T. 6 N., R. 14 E., corner secs. 3, 4, 9, and 10, crossroads..	40 30 40.2	95 50 18.9
T. 6 N., R. 14 E., corner secs. 4, 5, 8, and 9, crossroads, 48 feet southwest, to corner cemetery fence.....	40 30 39.3	95 51 26.7
Schoolhouse, just outside of southwest corner of, at corner section, iron post stamped "Prim. Trav. Sta. No. 4, 1905"	40 30 39.5	95 52 34.3
T. 6 N., Rs. 13 and 14 E., corner secs. 1, 6, 7, and 12, crossroads	40 30 38.5	95 53 43.4
T. 6 N., R. 10 E., corner secs. 1, 2, 11, and 12, crossroads..	40 30 39.1	95 54 52.0
T. 6 N., R. 13 E., corner secs. 3, 4, 9, and 10, T road east, 33 feet northeast to corner fence post, 62 feet northwest to cross on telephone pole	40 30 39.3	95 57 08.9
Tps. 6 and 7 N., R. 13 E., secs. 3, 4, 33, and 34, also line between Otoe and Nemaha counties	40 31 31.2	95 57 08.9
Tps. 6 and 7 N., R. 13 E., corner secs. 4, 5, 32, and 33, crossroads, 40 feet northeast to large cottonwood tree, 22 feet southeast to south end of small bridge	40 31 31.2	95 58 16.9
Center of bridge.....	40 31 31.0	95 59 22.2
Talmage, Nebr., 1 mile southeast of, in south corner of field of Henry Faranholtz, at county line road crossing Missouri Pacific Railroad, iron post bears S. 34° 00' W. distant 68.8 feet, iron post stamped "Prim. Trav. Sta. No. 5, 1905"	40 31 31.2	96 00 23.7
Road crossing north and south; 515 feet south of this crossing is corner of Tps. 6 and 7 N., Rs. 12 and 13 E., secs. 1, 6, 31, and 36.....	40 31 36.0	96 00 30.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Section line road crossing east and west.....	40 32 23.2	96 01. 28. 1
T. 7 N., R. 12 E., corner secs. 13, 14, 23, and 24	40 34 07.6	96 01 39. 7
T. 8 N., R. 13 E., sec. 18, on northwest corner of township, on land of Henry W. Kruse, iron post stamped "Prim. Trav. Sta. No. 6, 1905"	40 40' 12.5	96 00 34.5
T. 8 N., R. 12 E., corner secs. 7, 8, 17, and 18, crossroads.	40 40 12.7	95 59 26.5
T. 8 N., R. 12 E., corner secs. 5, 6, 7, and 8, crossroads..	40 41 04.9	95 59 27.5
T. 8 N., R. 12 E., north corner secs. 5 and 6, T road south at, 49 feet southeast to mail box, 36 feet southwest to cross on corner of fence post	40 41 57.0	95 59 28.4
T. 9 N., R. 12 E., south corner secs. 31 and 32, T road north at	40 41 57.1	95 59 11.2
T. 9 N., R. 12 E., corner secs. 29, 30, 31, and 32, crossroads at, 33 feet northwest to mail box	40 42 49.3	95 59 11.1
T. 9 N., R. 12 E., corner secs. 19, 20, 29, and 30.....	40 43 41.3	95 59 11.1
T. 9 N., R. 12 E., northwest corner sec. 20, in top of lime- stone 30 by 11 by 7 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1905"	40 44 33.3	95 59 10.7
T. 9 N., R. 12 E., corner secs. 16, 17, 20, and 21, T road north.	40 44 33.7	95 58 02.3
T. 9 N., R. 12 E., quarter corner between secs. 15 and 22, crossroads	40 44 33.5	95 56 19.3
Wyoming, Nebr., in east part of orchard of O. C. West, iron post stamped "Prim. Trav. Sta. No. 8, 1905"	40 44 11.0	95 55 02.7

Geographic positions along the Missouri Pacific Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wyoming, 0.75 mile south of; north and south road cross- ing.....	40 43 40.5	95 54 36.5
Road crossing east and west.....	40 42 48.2	95 53 40.7
Road crossing east and west, 0.5 mile south of milepost 438.....	40 41 56.2	95 52 30.6
Road crossing north and south.....	40 41 05.5	95 51 12.1

NEW HAMPSHIRE AND VERMONT.

TRIANGULATION STATIONS.

MERRIMAC AND SULLIVAN COUNTIES, N. H.; WINDSOR COUNTY, VT.

SUNAPEE LAKE QUADRANGLE.

During the summer of 1904 control for the Sunapee Lake quadrangle was obtained from triangulation by Mr. E. L. McNair, topographer. The work was based upon the United States Coast and Geodetic Survey positions of Ascutney and Croydon. Four new stations were occupied and six secondary points cut in. Positions are given on United States standard datum.

NEW LONDON BAPTIST CHURCH, MERRIMAC COUNTY, N. H.

(Not occupied.)

Station mark: Center of church spire.

[Latitude $43^{\circ} 24' 45.6''$. Longitude $71^{\circ} 58' 50.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Croydon.....	4. 31899
Graves	4. 34882

SUNAPEE, MERRIMAC COUNTY, N. H.

Situated about 2 miles south of Mount Sunapee station, on the most northerly end of the Sunapee Range. Summit partly covered with small timber. Can be reached in about one hour from the home of Nathan S. Johnson.

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

Reference marks: Three iron ringbolts at corners of signal, as follows: (1) Distant 7.2 feet; azimuth, $42^{\circ} 57'$. (2) distant 7.5 feet; azimuth, $133^{\circ} 19'$. (3) distant 7 feet; azimuth, $226^{\circ} 48'$.

[Latitude $43^{\circ} 18' 51.63''$. Longitude $72^{\circ} 04' 29.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lempster.....	28 07 23.7	208 04 46.4	4. 0402614
Graves	67 47 27.2	247 42 47.8	3. 9966933
Ascutney	115 44 06.3	295 28 32.8	4. 5305363
Catholic Church in Newport.....	.....	.....	3. 98731
Hoyt.....	186 23 31.9	6 24 36.4	4. 2766559

CROYDON, SULLIVAN COUNTY, N. H.

A United States Coast and Geodetic Survey station about 8 miles north of Newport on a well-known mountain within the limits of the Blue Mountain Game Preserve, or Corbin Park.

Station mark: An iron bolt a little below surface of rock.

Reference marks: A bronze triangulation tablet cemented in solid rock 3 inches south of station mark. An iron bolt distant 7.3 feet; azimuth, $136^{\circ} 36'$. An iron bolt distant 10 feet; azimuth, $222^{\circ} 12'$. An iron bolt distant 7.3 feet; azimuth, $307^{\circ} 14'$.

[Latitude $43^{\circ} 28' 55.01''$. Longitude $72^{\circ} 13' 11.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ascutney.....	78 11 48.0	258 02 12.0	4. 2838623
Hoyt.....	269 14 18.9	89 21 22.9	4. 1412011
New London Baptist Church.....			4. 31899
Sunapee.....	327 41 34.0	147 47 32.8	4. 3428037
Lempster.....	346 50 39.2	166 54 00.4	4. 46327
Graves.....	353 24 19.5	173 25 38.4	4. 3527001

GRAVES, SULLIVAN COUNTY, N. H.

Situated on a bare rocky hill in town of Unity about 6 miles south of Newport. Land owned by B. Graves.

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

Reference marks: Four iron ringbolts at corners of signal as follows: (1) Distant 6.8 feet; azimuth, $243^{\circ} 36'$. (2) distant 6.8 feet; azimuth, $332^{\circ} 16'$. (3) distant 7.8 feet; azimuth, $63^{\circ} 43'$. (4) distant 6.5 feet; azimuth, $150^{\circ} 32'$.

[Latitude $43^{\circ} 16' 49.88''$. Longitude $72^{\circ} 11' 16.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ascutney.....	130 46 24.8	310 35 31.4	4. 4511148
Croydon.....	173 25 38.4	353 24 19.5	4. 3527001
Hoyt.....	206 31 55.3	26 37 39.5	4. 4016189
Sunapee.....	247 42 47.8	67 47 27.2	3. 9966933
Lempster.....	325 47 24.3	145 49 26.4	3. 8547810

HOYT, SULLIVAN COUNTY, N. H.

Situated about 1 mile south of West Springfield, on Hoyt Mountain.

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

Reference marks: Three iron ringbolts at corners of signal as follows: (1) Distant 6.6 feet; azimuth, $122^{\circ} 08'$; (2) distant 7 feet; azimuth, $218^{\circ} 03'$; (3) distant 7 feet; azimuth, $302^{\circ} 25'$.

[Latitude $43^{\circ} 29' 00.52''$. Longitude $72^{\circ} 02' 55.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sunapee	6 24 36.4	186 23 31.9	4. 2766559
Lempster	14 21 24.6	194 17 42.9	4. 4680855
Graves	26 37 39.5	206 31 55.3	4. 4016189
Croydon	89 21 22.9	269 14 18.9	4. 1412011

LEMPSTER, SULLIVAN COUNTY, N. H.

Situated on the highest point of the Lempster range of mountains, in town of Lempster.

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

Reference marks: Iron ringbolts at the four corners of the signal.

[Latitude $43^{\circ} 13' 38.02''$. Longitude $72^{\circ} 08' 18.54''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ascutney	133 49 33.6	313 36 38.2	4. 5467712
Graves	145 49 26.4	325 47 24.3	3. 8547810
Croydon	166 54 00.4	346 50 39.2	4. 4632700
Hoyt	194 17 42.9	14 21 24.6	4. 4680855
Sunapee	208 04 46.4	28 07 23.7	4. 0402614

NEWPORT CATHOLIC CHURCH, SULLIVAN COUNTY, N. H.

(Not occupied.)

Station mark: Center of church spire.

[Latitude $43^{\circ} 22' 00.1''$. Longitude $72^{\circ} 10' 14.6''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Graves			3. 98570
Sunapee			3. 98731

NEWPORT CONGREGATIONAL CHURCH, SULLIVAN COUNTY, N. H.

(Not occupied.)

Station mark: Center of church spire.

[Latitude $43^{\circ} 21' 39.2''$. Longitude $72^{\circ} 10' 14.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o / "	o / "	<i>Meters.</i>
Graves			3. 95603
Croydon.....			4. 14689

NEWPORT COURT-HOUSE, SULLIVAN COUNTY, N. H.

(Not occupied.)

Station mark: Center of tower on court-house.

[Latitude $43^{\circ} 21' 52.7''$. Longitude $72^{\circ} 10' 23.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o / "	o / "	<i>Meters.</i>
Graves			3. 97404
Croydon.....			4. 13257

NEWPORT METHODIST CHURCH, SULLIVAN COUNTY, N. H.

(Not occupied.)

Station mark: Center of church spire.

[Latitude $43^{\circ} 21' 56.7''$. Longitude $72^{\circ} 10' 26.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	o / "	o / "	<i>Meters.</i>
Graves			3. 97937
Croydon.....			4. 12820

ASCUTNEY, WINDSOR COUNTY, VT.

A United States Coast and Geodetic Survey station on a well-known mountain about 3 miles southwest of Windsor village. There is an excellent path from house of Allen Dudley to the summit. Station is on north end of mountain about 30 feet northeast of stone house built in 1904.

Station mark: A bronze triangulation tablet cemented in solid rock in the position of Coast Survey bolt and covering bolt of the old State survey. A triangle chiseled in the rock surrounds the tablet.

[Latitude $43^{\circ} 26' 46.74''$. Longitude $72^{\circ} 27' 08.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Croydon.....	258 02 12.0	78 11 48.0	4. 2838623
Sunapee.....	295 28 32.8	115 44 06.3	4. 5305363
Graves.....	310 35 31.4	130 46 24.8	4. 4511148
Lempster.....	313 36 38.2	133 49 33.6	4. 5467712

NEW YORK.

TRIANGULATION STATIONS.

HERKIMER, MADISON, ONEIDA, AND OTSEGO COUNTIES.

SANGERFIELD AND WINFIELD QUADRANGLES.

In July, 1904, Mr. E. L. McNair, topographer, controlled by triangulation the above-mentioned quadrangles by reoccupying Litchfield, Plainfield, and Tassel stations, from which he located five new points. Positions are given on United States standard datum.

ARMSTRONG, HERKIMER COUNTY.

(Not occupied.)

On a bare hill about 2 miles north of Plainfield Center.

Station mark: A lone elm tree.

[Latitude $42^{\circ} 50' 55.48''$. Longitude $75^{\circ} 09' 36.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Plainfield.....	208 14 23	3. 67382
Owen.....	95 44 20	3. 69171

LITCHFIELD, HERKIMER COUNTY.

Situated in Litchfield Township 0.5 mile north of Jerusalem Church on a cultivated bare hill owned by H. Wheelock.

Station mark: A stone post 30 by 8 by 6 inches set 28 inches in the ground, in the center of the top of which is cemented a bronze triangulation tablet.

[Latitude 42° 59' 05.65". Longitude 75° 08' 44.17'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Plainfield.....	10 03 14.58	190 01 32.16	4. 2918677
Tassel.....	70 59 03.1	250 52 03.1	4. 1696687
Schuyler.....	186 52 09.4	6 53 21.2	4. 2975436
Owen.....	346 38 19.77	166 40 10.98	4. 2054577

M'CARTY, HERKIMER COUNTY.

(Not occupied.)

On a bare hill about 2 miles south of Winfield.

Station mark: A pile of rock.

[Latitude 42° 52' 07.91". Longitude 75° 08' 01.24'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Plainfield.....	214 28 34	3. 88961
Owen.....	134 55 41	3. 58656

BROOKFIELD, MADISON COUNTY.

On a bare hill in town of Brookfield, about 2 miles south of North Brookfield, on land owned by C. F. York. Station is 4 feet west of fence between lands of Joseph Ritz and C. F. York, and 34 feet north of corner between Joseph Ritz and Alonzo York.

Station mark: A marble post 20 by 6 by 6 inches set 19 inches in ground, resting on solid rock. In the top is cemented a bronze triangulation tablet.

Subsurface mark: A 1-inch drill hole, 3 inches deep, in which are placed 7 tenpenny wire nails.

Reference mark: Elm tree about 15 inches in diameter, true azimuth, 307°; distant 9.25 feet.

[Latitude 42° 49' 36.51". Longitude 75° 23' 49.40'".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Madison.....	150 56 44.9	330 54 38.8	3. 93743
Tassel.....	207 13 05.99	27 16 22.61	4. 1559903
Owen.....	265 18 47.35	85 30 53.86	4. 3864292
Plainfield.....	275 39 26.87	95 47 59.87	4. 2353386

MADISON, MADISON COUNTY.

On a bare hill in Madison Township about 5 miles southeast of Waterville, on land owned by M. T. M. Mason.

Station mark: An iron bench mark post set 27 inches in the ground, resting on solid rock.

Subsurface mark: A 1-inch hole, $1\frac{1}{2}$ inches deep, in which are placed 4 twentypenny spikes.

Reference marks: (1) A drill hole 1 inch in diameter and 3 inches deep in surface boulder beside north and south fence running over hill, true azimuth, $210^{\circ} 12'$; distant 22.85 feet; (2) a drill hole 1 inch in diameter, 3 inches deep in surface boulder along same fence; true azimuth, $348^{\circ} 39'$; distant 119 feet

[Latitude $42^{\circ} 53' 41.75''$. Longitude $75^{\circ} 26' 54.71$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tassel	244 18 15.8	64 23 38.7	4.07671
Brookfield	330 54 38.8	150 56 44.9	3.93743

TASSEL, ONEIDA COUNTY.

A station of the United States Coast and Geodetic Survey and of the New York State Survey, in Marshall Township, 5 miles east of Waterville.

Station mark: A granite post 48 by 6 by 6 inches set 44 inches in the ground and marked "N. Y. S. S. 29."

[Latitude $42^{\circ} 56' 29.13''$. Longitude $75^{\circ} 19' 00.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brookfield	27 16 22.61	207 13 05.99	4.1559903
Madison	64 23 38.7	244 18 15.8	4.07671
Schuyler	213 34 46.8	33 42 59.6	4.4692854
Litchfield	250 52 03.1	70 59 03.1	4.1696687
Owen	301 17 51.88	121 26 42.52	4.3163701
Plainfield	323 46 06.78	143 51 23.75	4.2530268

OWEN, OTSEGO COUNTY.

On a prominent bare hill 5 miles west of Richfield Springs, on land of Robert J. Owen, who lives in New York City.

Station mark: A marble post 20 by 6 by 6 inches set 16 inches in the ground and resting on solid rock. In top is cemented a bronze triangulation tablet.

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Subsurface mark: A 1-inch hole drilled 3 inches deep directly under station mark, with two nails placed in it.

Reference marks: (1) A drill hole 1 inch in diameter and 1 inch deep in surface boulder, true azimuth, $37^{\circ} 42'$; distant 87.3 feet; (2) a drill hole 1 inch in diameter and 1 inch deep in surface boulder, true azimuth, $102^{\circ} 54'$; distant 63 feet.

[Latitude $42^{\circ} 50' 39.60''$. Longitude $75^{\circ} 06' 00.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° / "	° / "	Meters.
Plainfield.....	62 48 24.17	242 44 50.86	3.9039243
Brookfield.....	85 30 53.86	265 18 47.35	4.3864292
Armstrong.....	95 44 20.00	.....	3.69171
Tassel.....	121 26 42.52	301 17 51.88	4.3163701
McCarty.....	134 55 41.00	.....	3.58656
Litchfield.....	166 40 10.98	346 38 19.77	4.2054577

PLAINFIELD, OTSEGO COUNTY.

On a bald ridge owned by J. J. Roberts in town of Plainfield, 1.5 miles south of Plainfield Center.

Station mark: A bluestone post 36 by 6 by 6 inches set 22 inches in the ground and resting on solid rock. In the center of top of post is cemented a bronze triangulation tablet.

[Latitude $42^{\circ} 48' 40.77''$. Longitude $75^{\circ} 11' 14.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° / "	° / "	Meters.
Brookfield.....	95 47 59.87	275 39 26.87	4.2363386
Tassel.....	143 51 23.75	323 46 06.78	4.2530268
Litchfield.....	190 01 32.16	10 03 14.58	4.2918677
Armstrong.....	208 14 23.00	.....	3.67382
McCarty.....	214 28 34.00	.....	3.88961
Owen.....	242 44 50.86	62 48 24.17	3.9039243

PRIMARY TRAVERSE.

ERIE COUNTY.

EDEN QUADRANGLE.

The following geographic positions were determined from primary traverse by Mr. E. L. McNair, topographer, in 1904. The line starts at Hamburg triangulation station, United States Lake Survey, follows highways eastward to Orchard Park, and is connected with a point at

that place located by primary traverse in 1903. The line then follows highways along the eastern, southern, and western borders of the quadrangle, and is tied to Sturgeon Point triangulation station, United States Lake Survey. Another line crosses the quadrangle from west to east, connecting with Shefflin and Richmond triangulation stations of the United States Geological Survey. Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Hamburg triangulation station, United States Lake Survey, in Hamburg Township, about 7 miles south of Buffalo, 2 miles northeast of Hamburg Railway station and 0.7 mile northwest of Bay View Hotel, 50 feet from edge of bluff. Station mark: A stone post 30 by 6 by 6 inches set 28 inches in ground. Reference marks: A stone post S. $12^{\circ} 14'$ E., 18.13 meters distant. A stone post N. $64^{\circ} 32'$ E., 42.5 meters distant	<div> <div>° ' "</div> <div>42 46 50.49</div> </div>	<div> <div>° ' "</div> <div>78 51 30.88</div> </div>
Four corners.....	42 46 19.0	78 50 10.9
Big Tree Inn, 4 corners.....	42 46 18.4	78 49 26.9
Four corners.....	42 46 01.4	78 47 30.3
Four corners.....	42 45 54.8	78 46 40.2
Buffalo, Rochester and Pittsburg crossing.....	42 45 47.7	78 45 25.1
Orchard Park, 4 corners	42 46 02.2	78 44 39.0
Orchard Park, Briggs Bros.' brick store, aluminum benchmark tablet stamped elevation "868 feet"	42 46 02.4	78 44 39.6
Orchard Park, 1 mile south of, 4 corners.....	42 45 03.0	78 44 53.3
Four corners.....	42 43 56.0	78 44 58.5
Big Gulf, center of bridge over.....	42 43 08.2	78 44 49.9
Four corners.....	42 41 45.5	78 44 50.2
Forks of road at foot of hill	42 40 11.8	78 45 14.9
Boston Center (Patchin post-office).....	42 39 27.6	78 44 52.5
T corners, road west.....	42 38 40.1	78 44 26.5
Boston Corners (Boston post-office), in triangular grass plot between roads, iron post set 44 inches in ground and stamped "Prim. Trav. Sta. 61." Reference marks: To southeast corner of Mrs. Charles Demmerly's house, true azimuth 118° , distance 78.3 feet to northwest corner of Boston Hotel; azimuth $313^{\circ} 19'$, distance 130.5 feet. To northwest corner Iroquois Hotel, azimuth $329^{\circ} 39'$, distance 102.5 feet	42 37 43.1	78 44 17.8
Road north; 300 feet northwest of residence of Felix Cosline.....	42 37 02.8	78 45 26.2
Brigham's cheese factory, 4 corners 170 feet south of	42 36 33.1	78 46 10.7
Peffer (Frank); in road opposite mail box in front of house	42 35 27.4	78 46 21.5
Three corners, 200 feet south of house of William Geiger.....	42 35 16.8	78 46 52.4
Nye (William); in road opposite house of	42 34 12.6	78 46 08.8
Woodwards Hollow, or Wyandale.....	42 33 18.7	78 45 58.2
Murdock (D. W.); road west at house of	42 32 13.8	78 45 41.0
Nichole, 4 corners.....	42 31 18.4	78 45 56.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mortons, 4 corners	42 30 40.3	78 45 55.8
Mortons, 4 corners, 500 feet west of, iron bench-mark post set 42 inches in ground and stamped "Prim. Trav. Sta. 134." Reference marks: Corner of house of Mrs. Martha Schabehorn, azimuth 120° 13', distance 106 feet. Corner of house of Mrs. Helen Briggs, azimuth 245° 20', distance 77.6 feet. Corner of house of Mrs. Emily Sampson, azimuth 301° 34', distance 151.1 feet	42 30 40.5	78 46 02.4
Forks of road	42 30 41.0	78 47 18.4
Four corners	42 30 41.0	78 48 39.9
Road north	42 30 39.7	78 49 41.5
Four corners, 0.5 mile east of house of H. T. Brown	42 30 38.6	78 50 40.6
Collins Center, 1 mile north of, 2 feet from northwest corner of porch of house of Mr. C. P. Naegle, iron bench mark post stamped "Prim. Trav. Sta."	42 30 36.8	78 51 46.7
Four corners	42 30 37.3	78 52 36.0
Forks of road	42 30 37.0	78 53 41.6
Four corners at Frank Sissens, on Quaker street	42 31 12.7	78 54 50.6
Lawton station, four corners 1 mile south of	42 31 10.7	78 56 05.2
Four corners, 260 feet east of Indian Reservation line	42 31 12.7	78 56 35.6
School, four corners	42 30 00.4	78 56 29.1
Versailles, 1 mile north of; four corners on Indian Reservation	42 31 57.5	78 59 11.2
Iroquois, Indian Orphan Asylum, in southeast corner of brick school, bronze triangulation tablet stamped "Prim. Trav. Sta."	42 32 19.1	78 59 51.3
Pierce's (S. J.) house, three corners at	42 32 37.1	79 01 07.3
Road east	42 33 49.9	79 01 05.4
Brant post-office, four corners	42 35 17.9	79 01 04.6
Sheffin, Jacob, four corners at house of	42 36 35.5	79 01 03.0
T corners, south, east, and west	42 37 27.5	79 01 02.8
White's (Paul) house, forks of road 1,000 feet south of	42 37 46.3	78 58 50.8
Dash (Alfred), T corners, road west, 600 feet east of house of	42 38 13.7	78 59 01.2
Mr. Gowans, T corners north, south, and west	42 38 29.2	78 58 19.5
Clark's (Sydney) house, four corners, school district No. 10 ..	42 39 08.7	78 58 21.9
Derby post-office, four corners 775 feet east of	42 40 42.0	78 58 20.8
East Evans, four corners	42 40 59.4	79 00 55.2
Four corners	42 40 59.6	79 02 09.7
Sturgeon Point triangulation station, United States Lake Survey, in Evans Township at extreme end of Sturgeon Point, 3 miles northwest of Angola, 3 miles west of Derby, at east end of road leading from Derby to lake shore. Station mark: A stone post 36 by 6 by 6 inches set 32 inches in ground. Reference marks: A stone post N. 45° 52' E., distance 32.75 meters. A stone post N. 75° 03' E., distance 5.5 meters.	42 41 24.75	79 02 52.90

Geographic positions along highways between Sheflin triangulation station and New Oregon.

Station.	Latitude.	Longitude.
Sheflin triangulation station, in town of Evans, 2 miles southeast of Angola Railroad station, 250 feet north of Brant Line road, 0.25 mile east of north and south road, on highest ground in pasture owned by Jacob Sheflin. Station mark: A stone monument 48 by 6 by 6 inches set 44 inches in ground, having in center of top of post a copper bolt stamped "U. S. G. S. 459 N. Y."	° ' " 42 36 38.21	° ' " 79 00 30.25
Road south	42 36 33.6	78 59 17.7
Four corners	42 36 33.4	78 58 24.5
Road south	42 36 32.5	78 57 27.2
T corners at house of H. R. Hibbards	42 36 31.8	78 56 18.6
North Collins, 0.25 mile north of Erie Railway crossing ..	42 35 55.0	78 56 05.8
Four corners at farm of Mrs. Eunice Rogers	42 35 55.2	78 54 03.1
Taber Cheese Factory, four corners	42 35 15.3	78 54 03.5
Richmond triangulation station, in North Collins, 1.5 miles west of Langford, on land owned by Nathaniel Richmond just north of main east and west road, 225 feet north of house of Charles Cók, 10 feet northeast of old well. Station mark: A stone post 48 by 6 by 6 inches, set 44 inches in ground, having in center of top of post a copper bolt stamped "U. S. G. S. 458 N. Y." ..	42 35 16.2	78 52 37.2
Four corners at schoolhouse	42 35 14.3	78 52 18.5
Langford, four corners	42 35 14.2	78 50 31.7
New Oregon, four corners	42 35 17.8	78 47 31.3

HERKIMER AND LEWIS COUNTIES.

McKEEVER QUADRANGLE.

The following geographic positions were determined from primary traverse by Mr. E. L. McNair, topographer, in 1904: The line starts at Bald Mountain triangulation station, follows trails to Fulton Chain station, New York Central Railroad; thence westward via roads and trails along northern border of quadrangle to Brantingham. It also follows the New York Central Railroad from Fulton Chain to White Lake station. A loop was run via trails from McKeever east, south, and west to White Lake station and continued to Boonville triangulation station. A line was also run along highways from McKeever to Port Leyden. Positions are given on the United States standard datum.

Geographic positions along trails from Bald Mountain triangulation station to Brantingham.

Station.	Latitude.	Longitude.
Bald Mountain triangulation station; a bare rocky summit on the northern shore of Third Lake of the Fulton Chain. Station mark: A copper bolt cemented in solid rock stamped "U. S. G. S. N. Y. 481"	° ' " 43 44 19.3	° ' " 74 54 47.1
Forks of road and trail to Bald Mountain from Bald Mountain House	43 44 20.9	74 54 04.2

Geographic position along trails from Bald Mountain triangulation station, etc.—Cont'd.

Station.	Latitude.	Longitude.
Old Forge, center of iron bridge across river at fish hatchery	° ' " 43 42 45.8	° ' " 74 58 12.8
Fulton Chain railroad station, 22 feet east of center of main track, 10 feet north of hotel porch, in boulder, bronze tablet stamped "Elev. 1712 feet"	43 41 57.1	75 00 19.9
Tate road crossing, 750 feet north of milepost 59 (line leaves railroad and follows Tate road to Blackfoot Pond) ..	43 42 55.2	75 00 06.5
Dead tree, 25 feet west of road, cloth penalty notice marked with red ink "Sta. 92"	43 43 03.3	75 00 44.2
Beech tree (dead), cloth penalty notice marked with red pencil "Sta. 103"	43 43 26.1	75 01 14.0
Wakely's first lumber camp, 75 feet from, on dead maple tree west side of road, cloth penalty notice marked with red pencil "Sta. 115+470'"	43 43 54.4	75 01 05.6
Spruce tree (dead) on west side of road, cloth penalty notice marked with red pencil "124+377'"	43 44 27.8	75 01 07.5
Blackfoot Pond, 200 feet northwest of outlet, at Wakely's camp, on live birch tree beside trail, cloth penalty notice marked "136"	43 44 33.4	75 01 42.2
Spruce tree beside trail, cloth penalty notice marked "153+10'"	43 44 37.0	75 02 10.9
East Pond, south side of, on spruce tree beside trail, cloth penalty notice marked "Sta. 166"	43 44 19.7	75 02 55.7
Beech tree beside trail, cloth penalty notice marked "Sta. 184"	43 44 15.5	75 03 51.7
Birch tree beside trail, cloth penalty notice marked in red "199+65'"	43 44 11.6	75 04 34.1
Beech tree beside trail, cloth penalty notice marked in red "213+40'"	43 44 05.9	75 05 19.3
Birch tree, cloth penalty notice	43 43 47.3	75 05 57.4
Otter Lake House, 135 feet from, and between house and barn, in face of large boulder, bronze tablet stamped "Prim. Trav. Sta. No. 234"	43 43 49.3	75 06 45.4
Herkimer-Lewis county line, iron milepost marked "No. 18; 7.40 miles," 700 feet northeast of dam at outlet of Otter Lake, 15 feet northwest of road	43 43 19.9	75 07 25.7
Maple tree, cloth penalty notice	43 43 11.4	75 08 18.0
Small birch tree on north side of road, cloth penalty notice marked "Sta. 288"	43 43 11.0	75 09 07.8
Maple tree beside road	43 43 31.4	75 09 55.6
Hubbard's place on Otter Creek, 30 feet south of porch ..	43 43 35.4	75 10 32.3
Beech tree 15 feet south of road, 100 feet west of plank bridge over low place, cloth penalty notice marked in red "344+40'"	43 43 01.8	75 11 54.4
Small bridge, cloth penalty notice marked "Sta. 1234+90'"	43 42 55.1	75 14 43.6
Patridgeville (abandoned), old sawmill dam, on bridge ..	43 43 07.3	75 15 27.9
Brantingham post-office, 1.7 miles northeast of, on road up Otter Creek, in large rock outcrop, on northwest side of road and 15 feet higher than road, bronze triangulation tablet stamped "Prim. Trav. Sta. No. 1215" ..	43 42 31.7	75 16 14.3

Geographic positions along the New York Central Railroad between Fulton Chain and White Lake.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost H 57.....	43 41 15.2	75 00 56.7
Milepost H 56.....	43 40 43.3	75 01 52.4
Milepost H 55.....	43 40 13.2	75 02 49.4
Milepost H 54.....	43 39 46.4	75 03 48.8
Minnehaha flag station	43 39 43.0	75 04 06.0
Milepost H 53.....	43 39 19.1	75 04 41.0
Milepost H 52.....	43 38 32.4	75 04 15.0
Milepost H 51.....	43 37 51.2	75 04 56.2
Milepost H 50.....	43 37 08.9	75 05 03.4
McKeever station, 550 feet south of, in solid ledge in cut, copper bolt stamped "U. S. G. S." "elev. 1544 ft. R."	43 36 38.1	75 05 57.2
Milepost H 47.....	43 35 06.0	75 07 05.2
Milepost H 46.....	43 34 19.1	75 07 32.8
Milepost H 45.....	43 33 31.0	75 07 59.3
Milepost H 44.....	43 32 42.1	75 08 22.2
Milepost H 43.....	43 31 49.9	75 08 23.1

Geographic positions along trails and roads from McKeever east, south, and west to Boonville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Beech tree on north side of road, cloth penalty notice marked "Sta. 433+90'"	43 36 33.3	75 05 03.5
Large birch tree, cloth penalty notice marked "Sta. 453+ 227'"	43 36 41.8	75 03 59.2
Beech tree, cloth penalty notice marked "Sta. 472'"	43 36 46.9	75 02 55.2
Beech tree, cloth penalty notice marked "Sta. 492+15'"	43 37 01.8	75 02 02.3
Large birch tree, cloth penalty notice marked "Sta. 507'"	43 36 33.9	75 01 30.2
Woodhull Lake Landing, 0.25 mile from, forks of road ..	43 36 12.3	75 01 21.3
Large birch tree, cloth penalty notice marked "Sta. 528'"	43 35 44.1	75 01 18.0
Curriers Camp, on birch tree, cloth penalty notice marked "Sta. 547+123'"	43 35 20.3	75 01 25.1
T. B. M. painted elev. in red "U. S. G. S. B. M. 1958 ft." ..	43 35 00.4	75 01 28.6
Beech tree, 40 feet north of road, cloth penalty notice marked "Sta. 568+10'"	43 34 57.0	75 01 48.4
T. B. M. elev. painted in red "G. S. 1897 ft."	43 34 51.4	75 02 22.2
Maple tree, signboard, "Woodhull 4 mi. White Lake Corner 7 mi."	43 34 23.1	75 02 55.7
Large rock on south side of road, elev. marked in red paint "G. S. 1690 ft."	43 33 59.4	75 03 25.2
Rock in middle of road, elev. marked in red paint "G. S. 1624 ft."	43 34 01.2	75 03 35.1

Geographic positions along trails and roads from McKeever east, etc.—Continued.

Station.	Latitude.	Longitude.
Gull Lake, near road to, on plank of bridge, cloth penalty notice marked "Sta. 656+167"	° ' " 43 33 32.7	° ' " 75 04 26.9
Rock south side of road, elev. painted in red "G. S. 1671 ft."	43 32 50.2	75 05 34.2
Herkimer-Oneida county line, stone monument marked "H↑O" on top, "1888" on side	43 32 27.7	75 06 07.6
White Lake station, New York Central Railroad, road crossing, 400 feet south of	43 31 19.9	75 08 23.6
White Lake station, in boulder 81 feet west of railroad and 10 feet north of road, copper bolt stamped "elev. U. S. G. S. R. 1421 B. M."	43 31 19.8	75 08 24.7
White Lake Corners, post-office, four corners	43 31 14.7	75 09 17.4
Second-class road northwest, at spruce tree on north side of road	43 31 09.0	75 10 28.0
Forks of road, 25 feet west of telephone pole	43 30 56.0	75 12 24.0
Cummings Creek, 25 feet east of channel, 10 feet north of bridge, in solid ledge of rock, bronze triangulation tablet stamped "Prim. Trav. Sta. No. 811"	43 30 23.2	75 13 19.5
Road north	43 30 00.8	75 14 56.2
Road north	43 29 44.7	75 16 24.6
Hawkinsville, four corners	43 29 36.6	75 16 38.6
Forks of road, three corners 40 feet west of wild cherry tree	43 28 58.8	75 17 57.7

Geographic positions along highways, Port Leyden, via Moose River, to McKeever.

Station.	Latitude.	Longitude.
Lyonsdale, school district No. 2, in road opposite school-house	° ' " 43 34 16.1	° ' " 75 15 15.8
Porters Corners, 500 feet west of forks of road, 75 feet north of road; in large boulder in pasture, bronze tablet stamped "Prim. Trav. Sta. 983"	43 34 19.0	75 14 11.0
Earl's (George W.) residence, in road opposite front gate	43 35 11.3	75 13 11.3
Telephone pole on north side of road marked with red "Sta. 1005+35"	43 35 47.6	75 11 51.0
Scharbonneau (William) residence, in road opposite front gate	43 36 07.0	75 11 14.9
Maple tree opposite unoccupied house on south side of road, cloth penalty notice, fence marked "Sta. 1033"	43 36 27.1	75 10 14.6
Moose River House, on telephone pole at corner of yard, cloth penalty notice	43 36 25.8	75 09 31.8
Telephone pole, cloth penalty notice marked "Sta. 1052+195"	43 35 59.8	75 09 15.8
Beech tree on north side of road, cloth penalty notice marked "Sta. 1079"	43 36 18.2	75 08 05.0
Forest Home Hotel, in center of road opposite east end of	43 36 36.4	75 06 37.4
Herkimer, Lewis, and Oneida counties, corner of, 2,000 feet north of Forest Home Hotel, a drill hole in small boulder marked " $\frac{L}{O/H}$ "	43 36 54.7	75 06 37.8

LEWIS COUNTY.

PORT LEYDEN QUADRANGLE.

The following geographic positions were determined by Mr. E. L. McNair, topographer, in 1904. The line starts at Boonville flagstaff, previously located by triangulation, follows highways westward, and is tied to forks of road at Highmarket post-office, located by primary traverse in 1902. Another line leaves the first line at a point $3\frac{1}{2}$ miles west of Port Leyden, passes through that place, and is connected with Schwartz triangulation station; thence continues north to Brantingham and west to a position located by primary traverse in school district No. 21, Martinsburg Township.

Geographic positions along highways between Boonville and Highmarket.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Boonville, flagstaff in public park	43 28 47.61	75 19 23.79
Boonville, northeast corner of Post and West streets.....	43 29 11.0	75 20 12.1
Forks of road, 50 feet south of iron signboard, "Constableville 5 mi., Talcottville $1\frac{1}{2}$ miles"	43 30 47.6	75 21 41.3
Road west, signboard, "Constableville 6 miles, W. Leyden 6 miles"	43 31 44.7	75 22 52.2
Road northeast, Port Leyden $3\frac{1}{2}$ miles.....	43 32 50.6	75 24 09.4
Sugar River, south end of iron bridge over.....	43 33 25.0	75 24 33.5
Constableville, four corners at Catholic church.....	43 33 59.3	75 25 42.5
S. T. Parkhurst residence, forks of road 400 feet east of...	43 33 54.2	75 26 56.6
Old sawmill near cheese factory, creek crossing.....	43 34 12.1	75 27 44.7
Highmarket, forks of road in front of post-office.....	43 35 06.5	75 31 08.1
Highmarket, 900 feet south of post-office, in solid ledge, B. M. tablet.....	43 34 57.8	75 31 07.5

Geographic positions along highways from a point 2 miles southwest of Port Leyden east and north, via Schwartz triangulation station, to Brantingham, thence west to Martinsburg.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Port Leyden, 2 miles southwest of four corners.....	43 33 48.7	75 22 29.4
Port Leyden, street crossing New York Central Railway..	43 34 57.2	75 20 48.6
Port Leyden, Hotel Brunswick, front face in brickwork, bronze bench-mark tablet stamped "Elevation 897 ft. Albany, 1900" (898.400)	43 34 57.7	75 20 47.7
Port Leyden, 2 miles east of, forks of road.....	43 34 47.0	75 18 40.8
Five corners	43 34 24.6	75 16 56.0
Villiers, T corners, 875 feet east of Bethel Baptist Church.	43 36 00.8	75 16 44.0
Fowlerville, south end of span bridge across Moose River.	43 37 24.4	75 16 27.0
Lyonsdale, school district No. 7, four corners at school-house	43 38 10.9	75 16 14.2

Geographic positions along highways, etc.—Continued.

Station.	Latitude.	Longitude.
T corners at road east, cloth penalty notice on fence post marked "sta. 1165"	° ' " 43 39 29.0	° ' " 75 16 21.0
Four corners	43 39 27.4	75 16 52.5
Four corners	43 39 24.1	75 17 53.2
Schwartz triangulation station, in Greig Township, 0.5 mile east of Schwartz schoolhouse. Station mark: A granite post set in ground; in center of top of post is cemented a copper bolt	43 39 09.63	75 19 28.37
Fish Creek, bridge over	43 39 56.2	75 17 34.3
Forks of road at schoolhouse	43 40 58.8	75 17 40.9
Brantingham post-office, four corners	43 41 19.6	75 17 33.7
Greig post-office, three corners 0.5 mile north of	43 41 14.6	75 21 21.6
Forks of road	43 42 05.3	75 22 03.9
Forks of road (northeasterly to Chases Lake)	43 42 32.2	75 23 30.5
Glenfield, in face of foundation of New York Central Railway station, bronze tablet	43 42 37.8	75 24 09.4
Glendale, crossing of Whetstone Creek	43 42 59.0	75 25 00.2
Goodrich's, four corners	43 43 22.0	75 26 08.2
Martinsburg, four corners at schoolhouse district No. 1	43 42 51.3	75 27 48.7
Wakefield, four corners	43 43 17.9	75 28 45.9
Martinsburg, road west at schoolhouse	43 42 32.8	75 29 35.3
Martinsburg, school district No. 21, in large boulder in field 244 feet from corner of schoolhouse, mag. bearing S. 6° 30' E., bronze triangulation tablet stamped "Prim. Trav. Sta. 1342"	43 42 31.0	75 29 34.6

NORTH CAROLINA AND SOUTH CAROLINA.

PRIMARY TRAVERSE.

CABARRUS, GASTON, IREDELL, LINCOLN, MECKLENBURG, AND ROWAN COUNTIES, N. C.; YORK COUNTY, S. C.

CHARLOTTE 30-MINUTE QUADRANGLE.

The following geographic positions were determined from primary traverse in 1904, by Mr. C. B. Kendall, field assistant. The line starts from the cupola of Simonton College at Statesville, N. C., a Coast and Geodetic Survey triangulation station, and follows the Charlotte Branch of the Southern Railway to Davidson; thence west along public highways along north border of Charlotte quadrangle to Triangle post-office, thence south along public highways to Fort Mill, S. C. From Fort Mill the line follows public highways east to Monroe, N. C.; thence north along public highways to Salisbury; thence along the Asheville Branch of the Southern Railway northwest to Barber Junction; thence north along trail to Young triangulation station, United States Coast and Geodetic Survey.

A line was also run, beginning at Davidson and following public highways, east along north boundary of quadrangle to Rimer.

Positions are given on United States standard datum.

Geographic positions along highways between Davidson and Triangle.

Station.	Latitude.	Longitude.
Davidson station, 50 feet south of; street crossing, center of track at	35 30 01.9	80 50 58.7
Davidson, 1.25 miles west of; bridge over stream, center of.	35 29 31.1	80 52 09.9
Davidson, 1.75 miles west of; Knox's gin, forks at, 15 feet northwest to oak tree, 25 feet east to oak tree	35 28 52.4	80 53 12.7
T road to south (second class), 15 feet south to mail box.	35 29 12.3	80 54 14.9
Catawba Ferry, 0.9 mile east of; forks, road south down east bank of river, 200 feet northwest to small dwelling.	35 29 13.8	80 55 52.6
Catawba or Sherrells Ferry, east bank at landing	35 29 20.2	80 56 48.7
Battles Ford, 0.5 mile west of; four corners, 75 feet northwest to corner of old store, 45 feet southwest to corner of old store	35 29 51.4	80 58 05.6
Unity Presbyterian Church, forks of road just north of, 25 feet east to stump, 20 feet southeast to end of old log...	35 29 05.4	80 59 04.4
Triangle at northeast corner of post-office, store of Robert Nixon, iron post stamped "PRIM. TRAV. STA. NO. 199"	35 28 34.8	80 59 49.4

Geographic positions along highways between Triangle, N. C., and Fort Mill, S. C.

Station.	Latitude.	Longitude.
Triangle, 1.5 miles south of; four corners, 60 feet west to large oak, 70 feet south to telegraph pole	35 27 24.1	80 59 31.8
Hagar post-office (discontinued), T road to east, 5 feet southeast to cedar post	35 26 34.9	80 59 24.7
Store, 500 feet south of; T road to northwest, 30 feet north to mail box, 35 feet south to telephone pole	35 26 21.7	81 00 02.8
Hills Chapel, 350 feet south of, forks of second-class road to east, 45 feet north to telephone pole, 50 feet south to tombstone	35 25 28.0	81 00 37.7
Lowesville, four corners at, 60 feet southwest to corner front-yard fence, 40 feet southeast to corner of store porch	35 25 00.7	81 00 39.5
Lucia post-office, at southwest corner of post-office, store of A. U. Straup, iron post stamped "Prim. Trav. Sta. No. 242"	35 23 07.3	81 00 37.1
Lucia, 1 mile south of; at top of hill, forks of road, 20 feet west to telephone pole	35 22 25.2	81 00 06.1
Abernathy's store, on "Open View Farm," 150 feet south of; forks of road to east, 35 feet south to telephone pole.	35 21 20.9	80 59 35.2
Store, 750 feet southeast of; four corners, 20 feet southwest to telephone pole, 45 feet east to large pine	35 19 57.8	80 59 51.0
Green schoolhouse, forks of road; 40 feet southeast to telephone pole, 70 feet south to small oak	35 18 52.8	81 00 48.2

Geographic positions along highways between Triangle, N. C., and Fort Mill, S. C.—Cont'd.

Station.	Latitude.	Longitude.
Mount Holly, Main street crossing of Seaboard Air Line Railway, center of track	35 17 51.5	81 00 58.3
Mount Holly, at south edge of, four corners, public crossroads, 45 feet north to fence corner, 25 feet east to telephone pole	35 17 16.6	81 01 11.6
Mount Holly, 1.75 miles south of; second-class crossroads, 30 feet south to telephone pole	35 16 30.5	81 01 49.7
St. Marys College, 0.25 mile north of; at end of macadam road, public crossroads, 20 feet southeast to sign tree "Tuckasege Ferry, 1 mile, Charlotte, 11.5 miles," 35 feet north to telephone pole	35 15 57.4	81 02 22.7
Belmont station, 75 feet east of; street crossing of Southern Railway, center of main track	35 14 32.1	81 02 16.9
Belmont station, 200 feet north of; on sidewalk opposite southwest corner of store of L. P. Stowe, iron post stamped "Prim. Trav. Sta. No. 338 (A)"	35 14 32.8	81 02 18.0
Belmont, 1 mile east of; road crossing, center of track ...	35 14 13.1	81 01 20.2
Catawba River, Southern Railway bridge over, center of stream	35 14 07.9	81 00 38.7
Catawba River, 0.75 mile east of; road crossing, south rail ..	35 13 57.3	80 59 42.5
Paw Creek, 0.5 mile east of; public road crossing, south rail	35 13 46.8	80 58 27.9
Southern Railway, 0.75 mile south of; four corners, 30 feet southeast to signpost "Charlotte 7.25 miles, Ft. Mill 17.25 miles," 40 feet west to oak tree	35 13 24.7	80 57 44.5
Dixie post-office, 230 feet south of; junction with macadamized road, 40 feet west to oak tree, 115 feet southwest to signpost "Ft. Mill 16 miles"	35 12 11.7	80 57 42.9
Steel Creek Church, 600 feet south of; forks of road; 10 feet southeast to post	35 10 55.1	80 57 23.2
Shopton post-office, 400 feet south of; forks of road south and southeast, 10 feet south to small bridge, 50 feet west to oak tree	35 10 08.1	80 57 49.7
Shopton, 1 mile south of; forks of road north and northwest	35 09 21.0	80 58 08.6
Shopton, 2.4 miles south of; T road east at small white-washed house, 45 feet east to corner of house	35 08 14.0	80 58 40.4
Kendricks crossroads, 2 miles north of; at dwelling on top of small hill, forks second-class road to east, 40 feet west to chimney, 55 feet east to locust tree	35 07 45.6	80 58 52.6
Kendricks crossroads, 1 mile east of Romesburg; 50 feet east of front door of store of J. R. Baine; in southwest corner of intersection of roads, iron post stamped "Prim. Trav. Sta. No. 417"	35 06 06.5	80 59 24.4
Kendricks crossroads, 0.75 mile south of; at cotton gin, second-class crossroads, 45 feet southeast to corner of gin, 45 feet southwest to corner of garden	35 05 32.6	80 59 32.9
North Carolina-South Carolina State line, center of road at	35 04 29.0	80 59 21.3

Geographic positions along highways between Triangle, N. C., and Fort Mill, S. C.—Cont'd.

Station.	Latitude.	Longitude.
SOUTH CAROLINA—YORK COUNTY.		
North Carolina-South Carolina State line, 1 mile south of, three corners public road to Pineville, 40 feet northeast to oak tree, 35 feet west to back-yard gate	35 03 41.5	80 59 29.7
Forks, road leading west to Charlotte Electric Power Co.'s dam, 30 feet southwest to persimmon tree, 35 feet northwest to elm	35 02 46.1	80 59 20.7
Charlotte Electric Power Co.'s line of wires, center of road under	35 02 07.6	80 58 29.7
Fort Mill, 2 miles north of; at brick store, T road, 25 feet to north end of store, 40 feet to south end of store..	35 01 45.5	80 57 59.0
Fort Mill, in south wall at southwest corner of Fort Mill Bank building, at junction of Main and Confederate streets, aluminum tablet stamped "Prim. Trav. Sta. No. 468"	35 00 27.5	80 56 39.8

Geographic positions along highways between Fort Mill, S. C., and Monroe, N. C.

Station.	Latitude.	Longitude.
Fort Mill, 1 mile southeast of; forks of road, center of triangle at; 45 feet southwest to telephone pole.....	35 00 08.5	80 55 45.4
Fort Mill, 1.75 miles southeast of; forks of road east and northeast	35 00 31.6	80 54 54.6
Sugar Creek, bridge over center of creek.....	35 00 22.4	80 54 08.8
Sugar Creek, 0.8 mile east of; three corners, east up north and south road at, 40 feet west to rock.....	35 00 20.2	80 53 18.1
Pleasant Valley, 0.75 mile north of, T road 75 feet north to telephone pole, 75 feet west to telegraph pole.....	35 00 05.8	80 51 22.7
Pleasant Valley, at northeast corner of front yard to residence of J. W. Davidson, iron post stamped "Prim. Trav. Sta. No. 523"	34 59 36.6	80 51 07.8
Sixmile Creek, 250 feet east of bridge over, four corners, 40 feet southeast to blazed elm tree.....	34 59 28.0	80 50 39.8
North Carolina-South Carolina State line, center of road at	34 59 39.0	80 50 02.4
NORTH CAROLINA.		
Poortith post-office, 200 feet southeast of; road forks south and east, 35 feet south to oak tree, 50 feet west to corner of shop	34 59 29.9	80 48 54.3
Marvin Church, 500 feet east of; at top of hill, second-class roads, 25 feet south to oak tree, 40 feet northeast to cedar tree	34 59 29.1	80 48 04.8
Marvin Church 1.6 miles east of; four corners, Charlotte and Camden road (telephone line), 30 feet northeast to pine tree, 40 feet southeast to telephone pole.....	34 59 18.9	80 46 31.8
Wolfsville post-office, 1.2 miles west of; four corners, 40 feet south to pine tree	34 59 26.3	80 45 23.8

Geographic positions along highways between Fort Mill, S. C., and Monroe, N. C.—Cont'd.

Station.	Latitude.	Longitude.
NORTH CAROLINA—continued.		
Wolfsville post-office, at southwest corner of post-office and store of R. D. Redwine, 500 feet east of road forks, iron post stamped "Prim. Trav. Sta. No. 598."	° ' " 34 59 09.5	° ' " 80 44 14.0
Union Church, 500 feet west of; forks of road to south (telephone line), 40 feet south to telephone pole	34 58 54.2	80 43 24.5
Union Church, 1 mile east of; four corners, 15 feet southeast to oak tree, 40 feet west to telephone pole	34 59 02.7	80 42 19.1
Vance post-office, 200 feet east of; forks of road to north, 40 feet west to telephone pole	34 59 02.1	80 41 21.8
Oak Grove Church, 300 feet west of; four corners, 35 feet southeast to telephone pole, 80 feet west to oak tree ...	34 58 31.5	80 39 38.3
Oak Grove Church, 2.1 miles southeast of; four corners..	34 57 55.1	80 37 19.1
Monroe, 2 miles west of; Seaboard Air Line Railway crossing, center of track at	34 58 43.1	80 35 03.9
Monroe, 1 mile west of; forks of road south and west of; 25 feet northeast to telephone pole, 35 feet south to hedge fence	34 58 56.9	80 34 20.2
Monroe, at Union County court-house, in southeast corner of square, south meridian stone United States Coast and Geodetic Survey	34 58 57.8	80 32 59.3
Monroe, Union County court-house, set in south wall at southeast corner of; aluminum tablet stamped "Prim. Trav. Sta. No. 659 (A)"	34 58 58.2	80 32 59.8

Geographic positions along highways between Monroe and Rimer.

Station.	Latitude.	Longitude.
Monroe, 0.75 mile north of; forks of Concord and Charlotte roads, 30 feet east to telephone pole, 45 feet southwest to telephone pole	° ' " 34 59 23.5	° ' " 80 33 16.2
Monroe, 2.2 miles north of; public crossroads, 20 feet east to telephone pole	35 00 40.6	80 32 46.5
Monroe, 3.3 miles north of; public crossroads, 30 feet southeast to telephone pole, 40 feet west to pine tree...	35 01 36.8	80 32 24.1
Monroe, 5 miles north of; second class east and west crossroads	35 03 07.1	80 31 50.1
Monroe, 6.2 miles north of; forks of road leading northeast to Unionville, 60 feet east to telephone pole, 50 feet north to road to west	35 04 29.3	80 31 50.9
Crooked Creek, Scotts bridge, 2.7 miles south of; forks second-class road to west	35 05 27.4	80 31 58.6
Crooked Creek, Scotts bridge, 2.1 miles south of; four corners at church, 40 feet northwest to oak tree, 50 feet east to oak tree	35 06 14.3	80 32 12.4
Crooked Creek, Scotts bridge, 0.5 mile south of; second class T road to east, 35 feet northeast to pine tree at gate, 30 feet southeast to holly bush	35 07 23.8	80 32 11.2

Geographic positions along highways between Monroe and Rimer—Continued.

Station.	Latitude.	Longitude.
Loveslevel, 0.75 mile west of; in southeast corner of intersection of Monroe-Concord and Charlotte-Wadesboro road, iron post stamped "Prim. Trav. Sta. No. 733" ..	35 08 17.2	80 32 16.0
Longs Mill, T road to east at; 25 feet north to bridge over mill road, 40 feet west to corner of mill.....	35 09 11.2	80 32 08.3
Longs Mill, 1 mile north of; four corners, 60 feet southwest to blacksmith shop, 30 feet east to oak tree.....	35 09 55.2	80 32 28.6
Schoolhouse, four corners at; 25 feet northeast to telephone pole, 35 feet west to oak tree	35 11 01.7	80 32 17.8
Brief post-office, 0.6 mile north of; Cabarrus-Union county line stone, 185 feet north of; T road to west; 40 feet southwest to telephone pole, 35 feet northwest to signpost, Mount Pleasant 17 miles, Concord 17 miles.	35 11 49.8	80 31 39.0
Cabarrus-Union county line, 1 mile north of; T road to east	35 12 33.5	80 31 17.5
Mill Hill Camp ground, forks of road; road to east; 25 feet south to oak tree.....	35 13 44.0	80 30 31.9
Mill Hill Camp ground, 1.1 miles north of; four corners, second-class crossroads, 35 feet southwest to oak tree, 40 feet east to persimmon tree.....	35 14 38.9	80 30 12.8
Furrs post-office, 1.9 miles south of; Charlotte-Albermarle, Concord-Monroe roads, intersection of; in northeast corner of, iron post stamped "Prim. Trav. Sta. No. 798"	35 14 58.7	80 30 06.9
Anderson Creek, ford of, center of road at	35 15 53.6	80 29 55.6
Furrs post-office, forks at; road to northwest, 35 feet southeast to fence corner, 90 feet west to front door of store (post-office)	35 16 31.3	80 29 50.2
Furrs post-office, 1 mile north of; road forks, second-class road to east.....	35 17 18.9	80 29 19.9
Furrs, 1.8 miles north of; T road to northwest at small dwelling, 40 feet east to apple tree.....	35 17 56.0	80 29 20.2
Rocky River, center of Huyler's bridge over	35 18 49.8	80 28 44.1
Rocky River, 1.6 miles north of; T road to west; 35 feet east to pine tree, 25 feet north to double oak	35 19 56.8	80 27 47.8
Rocky River, 2.5 miles north of; four corners; 30 feet northwest to oak tree, 30 feet southwest to mail box....	35 20 37.0	80 27 17.6
Forks of roads to west, 10 feet southwest to mail box	35 21 26.1	80 27 00.1
Mount Pleasant, 2.1 miles south of; forks of roads north to Mount Pleasant and west to Concord; 20 feet east to large oak tree.....	35 22 34.2	80 26 51.8
Success, 3.5 miles southeast of; forks of road to north; 15 feet north to mail box.....	35 22 46.9	80 28 31.6
Success, 1.8 miles southeast of; T road to southwest; 50 feet south to mail box, 10 feet east to large oak stump ..	35 23 37.5	80 29 46.3
Success, 1 mile southeast of; forks of road; 40 feet north to hickory tree, 30 feet northwest to hickory tree.....	35 24 02.9	80 30 11.9
Concord, 4 miles east of; formerly Success post-office, at northwest corner of vacant store in southeast corner of intersection of Concord-Mount Pleasant road with north and south road; iron post stamped "Prim. Trav. Sta. No. 954"	35 24 52.6	80 30 48.1

Geographic positions along highways between Monroe and Rimer—Continued.

Station.	Latitude.	Longitude.
Success, 1.3 miles north of; forks of road to northwest; 25 feet west to large hickory, 40 feet north to pine tree.	° ' " 35 25 55.2	° ' " 80 30 36.4
Rimer, 3 miles south of; 300 feet south of cotton gin, forks of road; 35 feet northwest to post, 35 feet north-east to pine root.	35 26 53.7	80 30 35.1
Buffalo Creek, center of bridge over	35 27 13.7	80 29 46.1
Rimer, 1 mile south of; at blacksmith shop, T road north, 50 feet north to corner of shop	35 27 24.6	80 28 53.6
Rimer, set opposite T road east, at west line of front yard fence to residence of W. D. Barrier, iron post stamped "Prim. Trav. Sta. No. 1016"	35 28 36.0	80 28 52.0
Rimer, 1.2 miles north of; T road west, center of north and south road	35 29 38.2	80 28 47.4

Geographic positions along highways between Davidson and Rimer.

Station.	Latitude.	Longitude.
Davidson, Davidson Presbyterian Church, set in south wall at southeast corner of; aluminum tablet stamped "Prim. Trav. Sta. No. 2 (A)"	° ' " 35 29 57.3	° ' " 80 50 53.2
Davidson, 2 miles east of; forks of road to south (second class)	35 29 02.5	80 49 11.8
Davidson, 4.5 miles east of; T road to south, 30 feet north to pine tree, 35 feet east to clump of small locust trees.	35 28 27.5	80 47 54.1
Rocky River, 0.3 mile west of; near top of hill, second-class road, 20 feet south to small elm, 30 feet north to small elm.	35 28 23.8	80 47 06.9
Rocky River, Mecklenburg-Cabarrus county line, center of bridge over	35 28 29.7	80 46 46.3
Coddle post-office, 1 mile south of; three corners	35 28 57.6	80 45 58.4
Coddle post-office, 1 mile south of; 150 feet southwest of three corners, 200 feet west of northwest corner of residence of G. H. Hamilton, in top of large granite boulder, aluminum tablet stamped "Prim. Trav. No. 50 (A)"	35 28 57.4	80 46 00.2
Erskine post-office, 0.75 mile west of; forks of road to northwest, 40 feet northwest to dead tree stump, 15 feet southwest to small stump	35 29 10.6	80 44 15.6
Coddle Creek, 0.25 mile east of; forks of road 30 feet west to oak stump	35 29 00.3	80 42 40.6
Mill Hill post-office, three corners at, second-class road to south, 30 feet north to elm	35 29 11.7	80 41 33.9
Mill Hill, 0.5 mile east of; four corners, 60 feet west to oak tree, 10 feet south to large store	35 29 10.9	80 41 07.9
Mill Hill, 1.8 miles east of; forks of road southeast and northeast, 30 feet north to hickory tree	35 29 07.6	80 39 59.3
Schoolhouse, four corners at, 65 feet south to pine tree	35 29 13.6	80 38 11.5
Glass post-office, at southeast corner of; iron post stamped "Prim. Trav. Sta. No. 150"	35 28 29.3	80 37 27.3

Geographic positions along highways between Davidson and Rimer—Continued.

Station.	Latitude.	Longitude.
Glass post-office, 1 mile north of; forks of road; 10 feet southwest to mail box.....	35 29 23.8	80 37 19.8
Church, 400 feet south of; forks of road; 20 feet east to oak in triangle.....	35 28 50.2	80 36 50.3
Dog Trot, church at forks of road; front door of.....	35 28 23.8	80 36 24.6
Helemons Mill, forks of road; 25 feet north to front door of store, 35 feet south to mill door.....	35 28 49.2	80 34 48.5
Helemons Mill, 0.75 mile east of; three corners, 10 feet northwest to mail-box post	35 28 40.6	80 34 11.9
Helemons Mill, 1.4 miles east of; four corners; 10 feet west to pine tree	35 29 05.3	80 33 34.5
Helemons Mill, 3.5 miles east of; four corners, north and south and east and west roads, 10 feet northwest to telephone pole, 35 feet south to oak tree	35 30 28.7	80 32 11.4
Yost post-office, 1.5 miles west of; four corners, Irish Potato road, 15 feet southeast to elm, 45 feet north to corner of fence.....	35 30 13.6	80 31 14.2
Yost, 0.5 mile northwest of; forks of road; 10 feet south to oak tree.....	35 30 25.6	80 30 11.1
Yost, 0.75 mile east of; forks of road; 25 feet northwest to oak tree, 30 feet southeast to pine tree.....	35 29 59.4	80 29 31.7
Rimer, 1.2 miles north of; T road west; center of north and south road.....	35 29 38.2	80 28 47.4

IREDELL AND ROWAN COUNTIES.

STATESVILLE QUADRANGLE.

Geographic positions along Southern Railway from Statesville to Davidson.

Station.	Latitude.	Longitude.
Statesville, Simonton College cupola, United States Coast and Geodetic Survey station (Geodetic value).....	35 46 57.8	80 53 39.0
Statesville, Southern Railway passenger station, 80 feet west of, center of main track.....	35 46 34.2	80 53 03.6
Statesville, 1.8 miles south of; road crossing, center of track.....	35 45 44.6	80 53 04.5
Third Creek, 0.75 mile south of; road crossing, center of track	35 44 23.7	80 53 24.0
Barium station, 600 feet north of; road crossing, center of track	35 43 17.8	80 53 46.5
Barium station, 1 mile south of; road crossing, center of track	35 42 30.0	80 53 37.7
Ostwalt station, 1.3 miles north of; road crossing, center of track	35 41 39.4	80 52 26.2
Ostwalt station, 300 feet south of; road crossing, center of track	35 40 46.6	80 51 33.0
Ostwalt station, in brick foundation under bay window at south corner of dwelling of F. K. Ostwalt, aluminum tablet stamped "Prim. Trav. Sta. No. 41 (A)".....	35 40 51.2	80 51 34.4

Geographic positions along Southern Railway from Statesville to Davidson—Continued.

Station.	Latitude.	Longitude.
Ostwalt station, 0.75 mile south of; road crossing, center of track	° ' " 35 40 15.0	° ' " 80 51 12.4
Shepherd station, 1,000 feet north of; road crossing, center of track	35 38 07.7	80 49 41.1
Shepherd station, 0.2 mile south of; road crossing, center of track	35 36 26.3	80 48 56.8
Mooreville Junction, switch point of junction of Caroline, Midland and Statesville branch of Southern Railway, center of track	35 35 36.4	80 48 27.1
Moore station, 100 feet west of; at northwest corner of Broad and First North streets, in east wall at southeast corner of Templeton Williams & Co.'s brick store, aluminum tablet stamped "Prim. Trav. Sta. No. 81 (A)"	35 34 58.5	80 48 48.0
Mooreville, 1 mile south of; road crossing, center of track	35 34 20.6	80 49 31.3
Milepost 26, 260 feet south of; road crossing, center of track	35 33 27.4	80 50 20.2
Mount Mourn station, at south end of; road crossing, center of track	35 32 28.7	80 50 53.6
Mount Mourn station, 1.4 miles south of; road crossing at forks of road, center of track	35 31 16.7	80 50 31.1
Davidson station, 50 feet south of; street crossing, center of track	35 30 01.9	80 50 58.7

Geographic positions along highways from Rimer to Salisbury.

Station.	Latitude.	Longitude.
Rimer, 1.2 miles north of; T road west, center of north and south road at	° ' " 35 29 38.2	° ' " 80 28 47.4
Rimer, 2.2 miles north of; forks of road to southeast, 25 feet northeast to oak tree, 30 feet west to oak tree	35 30 02.9	80 28 03.9
Organ Church post-office, 0.75 mile north of; T road south, 30 feet southeast to fence post, 20 feet northeast to persimmon tree	35 31 29.6	80 27 32.6
Organ Church, just east of; four corners, intersection Gold Hill-China Grove and Mount Pleasant-Salisbury roads, 35 feet northwest to oak tree, 30 feet southwest to post	35 31 42.0	80 26 52.9
Organ Church, 1.25 miles north of; T road to south, double oak at north edge of road	35 32 50.4	80 27 05.2
Faith, 1 mile south of; forks of road to southwest, 30 feet south to oak tree	35 34 10.9	80 27 33.9
Faith, in northeast corner of yard to Faith Lutheran Church, in side of large granite boulder, aluminum tablet stamped "Prim. Trav. Sta. No. 1116"	35 35 00.4	80 27 41.6
Faith, 1 mile north of; four corners, 20 feet west to gum tree, 25 feet southeast to corner of garden	35 36 02.5	80 27 51.7
Cane Creek, center of bridge over	35 26 44.4	80 27 55.1
Salisbury; 3 miles south of; forks of road to southeast, 90 feet southeast to persimmon tree, 40 feet southwest to fence corner	35 37 36.9	80 27 27.1

Geographic positions along highways from Rimer to Salisbury—Continued.

Station.	Latitude.	Longitude.
Salisbury, 2.6 miles south of; Southern Railway crossing, 4 feet north of north rail.....	° ' " 35 37 55.0	° ' " 80 27 21.8
Salisbury, 1 mile south of; forks of road, 140 feet southeast to milestone No. 1, 40 feet south to telephone pole.	35 39 21.3	80 27 30.6
Salisbury, Rowan County court-house, in south wall at southeast corner, bronze tablet stamped "Prim. Trav. Sta. No. 1159—Elevation, 765 ft."	35 40 05.5	80 28 07.9

Geographic positions along Southern Railway from Salisbury to Young triangulation station.

Station.	Latitude.	Longitude.
Salisbury, 1 mile northwest of; Southern Railway crossing, center of track.....	° ' " 35 40 34.5	° ' " 80 28 49.8
Salisbury, 2.3 miles northwest of; road crossing, center of track	35 40 55.2	80 30 05.7
Majolica station, road crossing, center of track	35 41 42.0	80 32 19.5
Majolica station, 0.6 mile northwest of; second-class road crossing, center of track.....	35 42 00.3	80 32 49.1
Eight-mile siding, 1.6 miles southeast of; road crossing, center of track	35 42 21.5	80 33 40.7
Eight Mile Siding, road crossing at, center of main track.	35 42 35.3	80 35 14.9
Second Creek, at Southern Railway bridge over, center of creek	35 42 50.8	80 35 53.4
Barber Junction, 1 mile southeast of; road crossing, center of track	35 43 12.4	80 37 36.4
Barber Junction, crossing of W. N. C. R. R. and Carolina Midland Railroad, center of track	35 43 28.9	80 38 34.6
Young triangulation station, United States Coast and Geodetic Survey, on Youngs Mountain in Rowan County, 1 mile north of Barber Junction, Southern Railway. Station mark: A bottle underground. Reference marks: Granite posts set north, south, east, and west of center and each 6 feet distant	35 44 14.36	80 38 51.12

NORTH CAROLINA.

PRIMARY TRAVERSE.

MECKLENBURG AND UNION COUNTIES.

CHARLOTTE 15-MINUTE QUADRANGLE.

The following geographic positions were established in 1905 by Mr. C. B. Kendall: The line starts from adjusted position, center of bridge over Catawba River, 1.5 miles east of Belmont, and runs eastward along Southern Railway to Charlotte; thence along wagon roads east and south near the border of the quadrangle and connects with adjusted position 1.6 miles east of Marvin Church.

Geographic positions along the Southern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Belmont, center of bridge 1.5 miles east of	35 14 07.9	81 00 38.7
Juneau, pike crossing 1.1 miles west of	35 13 41.8	80 56 45.4
Juneau, pike crossing	35 13 35.9	80 56 10.8
Juneau, 1.1 miles east of; 400 feet south of bridge over railway, at junction of roads, iron post stamped "Prim. Trav. Sta. No. 33, 1905"	35 13 23.2	80 54 45.1
Road crossing	35 13 20.2	80 52 49.1
Charlotte, road crossing 0.75 mile west of	35 13 19.8	80 51 47.7
Road crossing	35 13 30.5	80 51 21.6
Charlotte, northwest corner of court-house, in west wall, aluminum tablet stamped "Prim. Trav. Sta. No. 34, 1905"	35 13 31.1	80 50 43.1
Charlotte, North Tryon street, road crossing overhead...	35 14 13.8	80 49 47.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Charlotte, four corners 1.5 miles northeast of, at end of street-car track	35 13 18.7	80 49 18.8
T road north	35 13 13.0	80 48 39.8
Crossroads, 40 feet northeast to bridge, 20 feet south to bridge	35 13 08.9	80 47 52.7
Old Chester, at southwest corner of A. M. Wallace's store, iron post stamped "Prim. Trav. Sta. No. 35, 1905"	35 12 42.1	80 45 38.7
Forks of road, 10 feet south to cedar tree, 10 feet west to elm tree	35 12 09.7	80 45 38.8
Sardis, forks of road 1 mile north of; 50 feet west to telephone pole, 60 feet east to telephone pole painted "752"	35 10 55.8	80 45 31.4
Four corners, 50 feet southwest to railway crossing, 80 feet northeast to large oak	35 09 27.2	80 44 58.8
McAlpin Creek, bridge over	35 08 53.6	80 44 44.2
T road south, 25 feet east to J. P. Hunnicut's mail box	35 08 08.7	80 44 15.3
Matthews, three corners at	35 06 57.6	80 43 21.7
Matthews, 50 feet east of Heath & Reed's store, iron post stamped "Prim. Trav. Sta. No. 36, 1905"	35 06 59.7	80 43 16.4
Matthews, forks of road 0.5 mile south of; 70 feet south to corner of house	35 06 30.0	80 43 35.3
Fivemile Creek, center of bridge over	35 06 01.4	80 43 57.8
Four corners, 40 feet west to oak, 50 feet southeast to peach	35 04 52.1	80 43 50.0
County line post at corner Sandy Ridge, Vance, Providence, and Morning Star townships	35 03 59.3	80 48 43.3
Forks of road, 40 feet south to clump plum bushes, 40 feet west to oak	35 03 34.7	80 43 37.0
T road south, 40 feet southeast to apple tree, 60 feet west to pine stump	35 03 23.3	80 44 06.6
Gin, four corners 150 feet north of	35 02 06.8	80 44 31.3
Weddington Church at Wardlaw, crossroads opposite	35 01 17.3	80 45 46.7
Wardlaw, T road west 0.75 mile south of	35 00 41.0	80 45 57.7
Marvin, four corners at church 1.6 miles east of	34 59 18.9	80 46 31.8

CABARRUS AND MECKLENBURG COUNTIES.

MATTHEWS QUADRANGLE.

The following geographic positions were determined by primary traverse in 1905, by Mr. C. B. Kendall. The line starts from an adjusted position near northeast corner of Charlotte 15-minute quadrangle, follows highways eastward, and connects with primary traverse station No. 798.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Second-class road north, 10 feet east to oak painted "774".	35 13 25.7	80 44 42.7
Madge post-office, 4 corners, 30 feet south to stone painted "790"	35 13 23.3	80 43 30.6
T road north.....	35 13 43.8	80 43 38.4
Four corners, 15 feet south west to Alex. Morris's mail box.	35 14 29.9	80 41 51.2
Roberson's Church, forks of road 100 feet east of store...	35 14 13.6	80 40 11.7
Forks of road on top of hill	35 14 22.0	80 39 21.7
Four corners, 10 feet southwest to oak	35 14 10.2	80 38 11.6
Forks of road, 90 feet northeast to oak	35 14 53.3	80 37 42.8
Four corners, 600 feet south of sawmill	35 15 15.8	80 37 05.1
Pioneer Mills post-office, forks of road	35 15 37.8	80 35 19.7
Pioneer Mills, 0.75 mile east of; at southwest corner of intersection of roads, iron post stamped "699 ADJ, 1903"	35 15 47.0	80 34 35.8
Four corners, 30 feet southwest to double dogwood tree..	35 15 53.5	80 33 36.5
Carriker, 4 corners, 0.5 mile south of; 15 feet west to milepost marked "Concord 13 miles"	35 14 55.9	80 32 52.5
Four corners at head of small stream	35 14 31.2	80 31 15.0
Furrs post-office, 1.9 miles south of; Charlotte-Albemarle and Concord-Monroe roads, intersection of; iron benchmark post stamped "Prim. Trav. Sta. No. 798"	35 14 58.7	80 30 06.9

CHOWAN, GATES, HERTFORD, PASQUOTANK, AND PERQUIMANS COUNTIES.

ELIZABETH CITY, HOBBSVILLE, OKISKO, ROSEMEAD, WINTON, AND WOODLAND QUADRANGLES.

The following geographic positions were determined from primary traverse run in the spring of 1905, by Mr. C. B. Kendall, field assistant. The line starts from United States Coast and Geodetic Survey position of cupola of court-house at Elizabeth City, follows Norfolk and Southern Railway to Okisko; thence by wagon road to Ryland; thence northwest to Eure; thence by Atlantic Coast Line Railway across Chowan River; thence by wagon road southeast to near southeast corner of Winton quadrangle; thence west, north, and east along border of quadrangles to near northeast corner of Hobbsville quadrangle, thence southeast to starting point.

PASQUOTANK COUNTY, ELIZABETH CITY QUADRANGLE.

Station.	Latitude.	Longitude.
Elizabeth City court-house cupola (United States Coast and Geodetic Survey)	° ' " 36 18 01.6	° ' " 76 13 21.1
Milepost 45, road crossing 400 feet west of; Norfolk and Southern	36 18 12.7	76 14 15.9
Elizabeth City, in southeast corner of fence opposite southeast corner of court-house, iron post stamped. "Prim. Trav. Sta. No. 15, 1905"	36 18 01.2	76 13 21.0

CHOWAN, GATES, AND PERQUIMANS COUNTIES, HOBBSVILLE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Church, forks of road west of, 5 feet north to signpost painted "16.4."	° ' " 36 16 46.8	° ' " 76 31 09.3
Belvidere, corner of Rufus White's porch, southeast corner of, iron post stamped "Prim. Trav. Sta. No. 2, 1905."	36 16 08.1	76 32 10.6
T road south, 1,200 feet west of river, 25 feet to signpost marked "Belvidere $\frac{1}{2}$ mile, Suffolk 39 miles"	36 16 05.7	76 32 58.4
T road east, 5 feet northeast to signpost marked "Hertford 10 miles, Belvidere $1\frac{1}{2}$ miles, Suffolk 38 miles"	36 16 35.0	76 34 03.6
Cemetery, forks of road 200 feet west of, 40 feet north to pine, 20 feet west to water oak	36 16 39.8	76 35 37.6
T road south, 15 feet southwest to post, 10 feet northwest to rail fence	36 16 50.0	76 36 34.0
Ryland, railway crossing 75 feet south of station	36 16 33.6	76 37 47.8
Ryland, at northeast corner of Ward & Spivy's store, 142 feet west of railway crossing, 30 feet south of wagon road, iron post stamped "Prim. Trav. Sta. No. 3, 1905"	36 16 32.9	76 37 49.2
Gin, 4 corners at, 25 feet southwest to signpost marked "Belvidere 8 miles, Emmions Ferry 1 mile"	36 15 55.7	76 39 18.8
Chowan, T road south at	36 16 00.4	76 40 05.9
T road southeast, 20 feet east to corner of fence, 30 feet south to well	36 17 09.4	76 39 38.6
T road east, 200 feet south to forks northeast, 30 feet northeast to pine, 25 feet northwest to fence corner	36 18 31.6	76 39 15.0
Four corners, 25 feet south to rail fence, 40 feet north to rail-fence corner	36 19 11.5	76 39 27.2
T road north, 50 feet east to T road south, 15 feet northeast to corner wire fence, 40 feet north to oak tree	36 20 34.1	76 39 22.2
Carter, 4 corners at	36 21 27.6	76 41 04.1
T road north, 10 feet south to rail fence, 50 feet west to hickory tree	36 21 44.1	76 41 59.0
Road forks to southwest, 20 feet west to cedar, 10 feet east to rail fence	36 22 03.2	76 43 28.7
Gatesville, road forks 1 mile southeast of, 25 feet southeast to signpost	36 23 35.9	76 44 23.7
Gates, T road west $1\frac{1}{2}$ miles east of; 8 feet west to signpost "Gates $1\frac{1}{2}$ miles"	36 29 57.4	76 44 39.4

CHOWAN, GATES, AND PERQUIMANS COUNTIES, HOBBSVILLE QUADRANGLE—continued.

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road northwest, 20 feet west to corner of fence	36 30 30.4	76 43 21.9
Schoolhouse, road forks at, 20 feet east to signpost "Sunbury 10 miles"	36 31 06.7	76 41 56.7
Second-class T road east, 20 feet southeast to corner of wire fence	36 31 51.1	76 40 35.4
Four corners, 15 feet southwest to signpost, "Somerton 5 miles, Sunbury, 8 miles"	36 32 31.2	76 40 16.3
Second-class T road south	36 31 54.6	76 39 03.4
Wiggins crossroads, four corners at schoolhouse 1 mile north of	36 31 47.6	76 38 28.6
Wiggins crossroads, at southwest corner of C. C. Savage's store, iron post stamped "Prim. Trav. Sta. No. 12"	36 31 06.5	76 38 14.3
Wiggins, T road east 1.25 miles south of; 50 feet northeast to persimmon tree	36 30 05.8	76 37 56.2
Road forks south and east, 5 feet southeast to gatepost	36 29 45.3	76 37 03.8
Savage, railway crossing 500 feet north of station	36 29 24.6	76 35 21.9
Savage, 1 mile east of; at junction of roads, iron post stamped "Prim. Trav. Sta. No. 13, 1905"	36 29 08.9	76 34 35.5
Road forks east and southeast, 20 feet north to fence, 50 feet east to fence	36 28 24.7	76 33 54.1
Four corners, 20 feet west to corner wire fence, 30 feet northeast to corner rail fence	36 27 30.8	76 33 21.1
Acorn Hill, road forks 600 feet north of; 150 feet south to bridge	36 26 26.1	76 32 44.2
Second-class T road east, 10 feet east to post planted in ground	36 25 35.7	76 32 22.9
Second-class T road east, 25 feet northeast to rail fence ..	36 24 30.9	76 32 29.2
T road west, 40 feet northwest to maple tree, 25 feet southwest to corner rail fence	36 23 41.5	76 32 43.7
Sandy Cross, in southeast corner of intersection of crossroads, at northwest corner of vacant store, iron post stamped "Prim. Trav. Sta. No. 14, 1905"	36 22 07.9	76 33 11.2

Geographic positions along highways from Niconor to Belvidere.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Whetstone, 4 corners at	36 19 10.8	76 29 13.8
Store, road forks at, 10 feet northeast to signpost "Sandy Cross, 5 miles, Belvidere, 4½ miles"	36 19 08.1	76 30 17.1
White Church, second-class crossroads at	36 18 22.6	76 31 26.1
White Church, road forks 500 feet north of	36 17 16.9	76 31 55.1
B. M. No. 2	36 16 08.1	76 32 10.6

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PASQUOTANK AND PERQUIMANS COUNTIES, OKISKO QUADRANGLE.

Geographic positions along the Norfolk and Southern Railway between Elizabeth City and Okisko.

Station.	Latitude.	Longitude.
Norfolk and Southern and Suffolk and Carolina Railroad crossing	° ' " 36 17 53.7	° ' " 76 15 00.9
Harris Siding, road crossing	36 17 36.1	76 15 51.9
Second class road crossing	36 17 22.2	76 16 32.1
Pasquotank station, road crossing 125 feet southwest of ..	36 16 03.4	76 20 20.0
Okisko station, road crossing 100 feet northeast of	36 15 38.5	76 21 32.0

Geographic positions along highways.

Station.	Latitude.	Longitude.
Perry's store, T road at, 34 feet northwest to nail in sycamore tree, 28 feet southwest to nail in post	° ' " 36 16 41.3	° ' " 76 21 53.8
Forks of road at west edge of swamp, 50 feet west to sign tree, 40 feet north to cypress tree	36 16 56.9	76 23 19.1
Parkville, 700 feet southeast of station; at east edge of Desert road at Junction; iron post stamped "Prim. Trav. Sta. No. 1, 1905"	36 17 30.9	76 23 58.2
T road west, 20 feet east of bridge	36 17 04.2	76 24 31.9
Milepost, second-class T road west, 1,000 feet northeast of ..	36 16 18.1	76 25 29.3
T road southeast at south edge of swamp, 25 feet east to gum tree painted, 60 feet south to pine tree	36 15 39.0	76 26 18.0
White's store, T road northeast at	36 14 57.1	76 27 10.2
T road southwest, 15 feet to oak tree painted, 40 feet northeast to rail fence	36 15 37.1	76 28 31.9
T road north, 10 feet north to post painted, 20 feet south to wire fence	36 16 14.4	76 29 50.1

Geographic positions along the Suffolk and Carolina Railway.

Station.	Latitude.	Longitude.
Sandy Cross; railway crossing 1 mile east of	° ' " 36 21 30.8	° ' " 76 32 22.8
Milepost 17, road crossing 450 feet east of	36 20 29.6	76 29 55.7
Niconor, road crossing 150 feet east of	36 19 56.0	76 28 49.2
Tram road, switch block	36 17 44.4	76 24 41.6
B. M. No. 1	36 17 30.9	76 23 58.2
Milepost 9, road crossing 100 feet east of	36 17 46.6	76 22 27.7
Crossing of railways, road crossing just east of	36 18 27.8	76 16 54.3

BERTIE AND HERTFORD COUNTIES, ROSEMEAD QUADRANGLE.

Geographic positions along highways on north border of quadrangle.

Station.	Latitude.	Longitude.
T road west, 15 feet southwest to telephone pole, 10 feet east to rail fence	° ' " 36 14 50.8	° ' " 76 46 01.3
T road south, 20 feet southeast to signpost, reads "Cole-rain 5 miles, Harrellsville 5 miles"	36 14 52.3	76 47 40.7
Four corners, 1,300 feet west of railway, 30 feet north-east to signpost, 35 feet northwest to gum tree.....	36 15 05.4	76 49 16.3
Four corners at store and sawmill	36 14 23.0	76 50 01.5
Road forks south and east, 25 feet southeast to signpost, 30 feet west to gum tree	36 13 28.4	76 51 00.9
Trapp crossroads.....	36 12 25.3	76 52 08.7
Road forks to south, 20 feet north to rail fence.....	36 12 30.2	76 53 06.8
T road south, 50 feet west to oak tree, 40 feet southeast to wire fence.....	36 12 49.0	76 53 59.5
T road south, at east edge of Powellsville, 40 feet south-east to signpost, 25 feet north to door of store.....	36 13 25.0	76 55 33.2
Powellsville, northeast corner of porch to store of J. C. Britton; iron post stamped "Prim. Trav. Sta. No. 6, 1905"	36 13 34.0	76 55 57.6
Second-class road to north.....	36 13 38.4	76 56 53.6
Road forks, 700 feet west of swamp, 20 feet north to pine stump, 50 feet east to rail fence.....	36 13 40.7	76 58 12.7
T road north, 30 feet northeast to signpost, reads "Hex-lena 4 miles, Olaski 6 miles"	36 13 10.5	76 59 18.6
Church, T road north	36 12 52.9	77 00 03.2
Williford schoolhouse, at southwest corner of; iron post stamped "Prim. Trav. Sta. No. 7"	36 12 18.3	77 01 51.0

BERTIE, GATES, AND HERTFORD COUNTIES, WINTON QUADRANGLE.

Geographic positions along highways between Gatesville and Gates station.

Station.	Latitude.	Longitude.
Gatesville, road forks north and northwest 2 miles north-west of, 15 feet to signpost reads, "Gatesville 2 miles, Suffolk 28 miles"	° ' " 36 25 38.7	° ' " 76 45 31.8
Old store, four corners at, 3 miles northwest of.....	36 26 13.7	76 45 31.1
Buckland, T road north	36 28 34.3	76 45 43.5
Gatesstation, crossing of road and railway, 350 feet south of.....	36 30 09.2	76 46 08.9

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BERTIE, GATES, AND HERTFORD COUNTIES, WINTON QUADRANGLE—continued.

Geographic positions along highways between Gatesville and Eure.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gatesville, corner of Main and Courtland streets.....	36 24 13.7	76 45 07.0
Gates County court-house, in south wall at east side of entrance; aluminum tablet stamped "Prim. Trav. Sta. No. 4, 1905".....	36 24 13.9	76 45 10.5
T road north, 30 feet northeast to rail fence.....	36 24 23.2	76 46 07.8
Four corners, 20 feet northeast to signpost, "Suffolk 30 miles, Surem Creek 2 miles," 40 feet southwest to corner yard fence.....	36 24 39.5	76 47 55.9
Crossroads, 35 feet south to signpost "Gatesville 5 miles," 50 feet north to oak tree.....	36 25 14.5	76 49 26.6

Geographic positions along the Atlantic Coast Line Railway between Eure and Tunis.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Eure, 400 feet south of station; railway crossing.....	36 25 41.4	76 51 06.6
Eure, railway crossing 1 mile southwest of.....	36 25 06.8	76 51 44.9
Center of trestle.....	36 23 58.2	76 52 45.5
Chowan River, center of draw to bridge over.....	36 23 10.9	76 53 14.7
Tunis, 1 mile southwest of; road crossing.....	36 22 23.9	76 53 43.7

Geographic positions along highways between Tunis and Newsom's store.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads, 25 feet northwest to gum tree, 30 feet southwest to corner rail fence.....	36 21 40.7	76 51 28.9
Four corners, 30 feet southeast to fence corner, 25 feet northeast to fence corner.....	36 21 19.0	76 50 10.4
Philonds, four corners.....	36 20 46.7	76 48 41.4
T road northeast, 30 feet southeast to corner of rail fence, 30 feet southwest to corner of rail fence.....	36 20 11.1	76 48 15.8
Second-class road to northeast.....	36 19 20.6	76 47 48.2
Harrellsville, four corners, intersection of streets.....	36 18 10.8	76 47 35.0
Harrellsville, railway crossing 1 mile southeast of.....	36 17 45.6	76 46 31.8
Mount Pleasant Church, forks of road.....	36 17 17.5	76 46 27.3
T road east, 20 feet northeast to fence corner, 10 feet northwest to telephone pole.....	36 16 16.9	76 46 25.6
T road leading to harbor, at southwest corner of Newsom's store; iron post stamped "Prim. Trav. Sta. No. 5, 1905".....	36 15 41.3	76 46 04.9

BERTIE, GATES, AND HERTFORD COUNTIES, WINTON QUADRANGLE—continued.

Geographic positions along highways between Como and Gates station.

Station.	Latitude.	Longitude.
Como, road forks, 2 miles northeast of, 40 feet south to pine, 80 feet east to pine.....	° ' " 36 30 46.8	° ' " 76 59 19.2
Second-class road forks to northwest, 15 feet south to corner of rail fence.....	36 31 21.3	76 58 03.0
Riddicksville, T road southeast, 40 feet south to chimney, 80 feet west to gate.....	36 31 39.3	76 56 21.8
Mannys Ferry, east landing.....	36 31 43.6	76 54 44.4
Mannys Ferry, four corners, 1 mile southeast of.....	36 31 13.8	76 54 01.2
T road south, northwest of Topsy, 10 feet north to fence, 30 feet southwest to fence.....	36 30 39.4	76 52 52.5
Topsy, in angle at forks of road near store; iron post stamped "Prim. Trav. Sta. No. 10, 1905".....	36 30 13.8	76 52 18.0
Church, T road north, 700 feet east of.....	36 30 23.6	76 50 48.0
T road north, 25 feet south to gate, 30 feet northeast to cedar.....	36 30 14.4	76 49 45.1
Four corners, 20 feet east to signpost, reads "Gatesville 10 miles," 30 feet west to gum tree.....	36 30 08.1	76 48 37.7
Second-class T road east.....	36 30 08.9	76 47 35.8
Four corners, 25 feet west to persimmon tree, 60 feet southeast to oak.....	36 30 03.8	76 46 40.1
Gates, at northeast corner of C. R. Hinton's house; iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	36 30 13.6	76 46 07.9
Gates, railway crossing, 350 feet south of station.....	36 30 09.2	76 46 08.9

HERTFORD COUNTY, WOODLAWN QUADRANGLE.

Geographic positions along highways between Earleys and Como.

Station.	Latitude.	Longitude.
Second-class road to northwest 200 feet south of Spring Branch, 20 feet southwest to cedar, 25 feet southeast to oak.....	° ' " 36 13 11.3	° ' " 77 01 53.5
Earleys, railway crossing.....	36 15 23.6	77 01 39.6
Newsonville, four corners.....	36 16 57.4	77 01 29.3
Four corners, 40 feet southwest to old well, 40 feet northwest to plank fence.....	36 18 25.7	77 01 30.2
Union, nail in root of tree at junction Main street and Windsor road.....	36 20 02.8	77 01 26.4
Union, four corners 1 mile north of; 25 feet southwest to corner of fence, 35 feet southeast to corner fence.....	36 20 57.3	77 01 22.4
Bridge, forks of road 0.25 mile north of.....	36 22 28.9	77 01 39.8
Junction of Murfreesboro-Union road with road leading south, iron post stamped "Prim. Trav. Sta. No. 8, 1905".....	36 23 09.5	77 03 12.3
Mapleton, forks of road 3 miles southwest of; 15 feet to signpost reads, "Murfreesboro 6 miles, Mapleton 3 miles".....	36 23 56.4	77 02 31.3

HERTFORD COUNTY, WOODLAWN QUADRANGLE—continued.

Geographic positions along highways between Earleys and Como—Continued.

Station.	Latitude.	Longitude.
Mapleton, forks of road 0.75 mile south of; 25 feet to signpost reads, "Murfreesboro 5 miles, Winston 6 miles".....	36 25 05.3	77 01 37.8
Mapleton, five corners.....	36 25 38.4	77 02 03.2
Second-class road to east, 1 mile north of Mapleton, 40 feet west of wire fence, 30 feet east to old pine stump..	36 26 25.5	77 02 12.7
Hills ferry, north landing.....	36 27 21.0	77 02 35.7
Forks of road west and south, 20 feet north to telephone pole, 40 feet south to black gum tree.....	36 28 33.8	77 02 16.3
T road east, 25 feet northeast to sycamore tree, 25 feet south to sweet gum tree	36 29 27.3	77 01 13.6
Como, at southeast corner of G. C. Picot's store, iron post stamped "Prim. Trav. Sta. No. 9, 1905"	36 30 05.6	77 00 26.3

JOHNSTON, SAMPSON, AND WAYNE COUNTIES.

FOUROAKS QUADRANGLE.

The following geographic positions were determined by primary traverse run in 1905 by Mr. C. B. Kendall, field assistant. The line starts from an adjusted position at Pinelevel and follows highways near border of quadrangle and closes at starting point. Another line starts near southeast corner of quadrangle, runs east, and is tied to an adjusted position at Dudley.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Pinelevel station, Southern Railway.....	35 30 45.3	78 14 37.1
Pinelevel, 150 feet southwest of station, at northeast corner of Z. Taylor's store, iron post stamped "Prim. Trav. Sta. No. 16, 1905".....	35 30 45.0	78 14 38.8
Pinelevel, railway crossing, 1.75 miles southwest of.....	35 29 34.8	78 15 34.0
Stream, forks of road south of, 20 feet north to gum tree, 30 feet south to fence.....	35 29 27.4	78 16 11.0
Forks of road, east and southeast.....	35 29 45.8	78 17 32.7
Four corners.....	35 29 58.0	78 18 27.3
Crossing, Atlantic Coast Line Railway.....	35 30 19.1	78 19 28.4
Smithfield, in northwest corner of court-house, bronze tablet stamped "Prim. Trav. Sta. No. 17, 1905".....	35 30 41.8	78 20 47.9
Bridge, forks of road 0.25 mile west of.....	35 30 58.8	78 21 24.4
T road south, 10 feet south to bridge	35 31 09.0	78 22 28.4
Smithfield, 2 miles west of; at northeast corner of old store at junction of roads, iron post stamped "Prim. Trav. Sta. No. 18, 1905".....	35 31 11.9	78 23 10.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sawmill, forks of road near	35 30 19.2	78 24 14.1
White Church, T road northwest at	35 29 51.2	78 25 00.2
T road north, 20 feet west to corner fence, 20 feet south to fence	35 29 15.9	78 25 39.6
Store, forks of road	35 28 31.3	78 27 27.3
Old Spilond post-office, inside of yard at southeast corner of Lassiter's store, iron post stamped "Prim. Trav. Sta. No. 19, 1905"	35 29 17.2	78 28 34.3
Church, forks of road	35 29 23.9	78 29 24.2
T road northwest, 30 feet northwest to gate, 15 feet northeast to stump	35 29 53.6	78 29 49.4
Junction of telephone lines, T road southwest at	35 29 54.5	78 30 23.8
Clearing, forks of road at southeast corner of, 15 feet west to telephone pole	35 29 35.1	78 31 15.1
Benson, 8 miles northwest of; in angle of road at junction, iron post stamped "Prim. Trav. Sta. No. 20, 1905" ..	35 29 18.6	78 32 10.3
T road north, 40 feet east to fence, 40 feet south to hickory ..	35 28 10.0	78 33 12.3
T road southeast, 60 feet east to oak, 40 feet south to hickory	35 26 54.4	78 33 25.7
Bonnir, four corners	35 25 46.9	78 33 47.1
T road west, 15 feet northwest to corner plank fence, 10 feet southwest to oak	35 24 28.5	78 33 25.0
Benson, at northeast corner of Boykin Hotel, 250 feet southwest of station, iron post stamped "Prim. Trav. Sta. 21, 1905"	35 22 50.1	78 32 52.3
Forks of road, 15 feet south to fence, 10 feet north to oak stump	35 22 11.5	78 31 41.5
T road north, 30 feet north to signpost, 20 feet south to telephone pole	35 21 51.2	78 30 31.6
Four corners	35 21 09.1	78 30 26.8
Four corners, 30 feet east to pine, 10 feet south to fence ..	35 20 10.8	78 29 48.1
Four corners, at Burnt Store	35 19 32.1	78 29 45.1
Four corners, 15 feet southwest to fence corner, 10 feet southeast to fence corner	35 18 43.1	78 30 36.1
Four corners, 35 feet southeast to gate, 10 feet north to corner of plank fence	35 18 05.3	78 31 39.9
Forks of road, 600 feet west of sawmill	35 17 28.9	78 32 24.5
Forks of road, 20 feet northwest to front gate, 40 feet south to hickory	35 16 40.4	78 32 57.1
Mingo post-office, 600 feet east of; at junction of roads, iron post stamped "Prim. Trav. Sta. No. 22, 1905"	35 16 14.2	78 33 11.0
Mingo, 1 mile east of; bridge at forks of road	35 15 58.1	78 32 13.9
Four corners, 25 feet northwest to oak, 40 feet east to pine snag	35 15 26.5	78 31 45.5
T road south, 30 feet south to corner of fence and, signpost "Clinton 22 miles"	35 14 46.8	78 30 31.1
T road south, 15 feet south to bridge	35 14 27.3	78 29 33.5

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Forks of roads, 70 feet east to oak, 5 feet north to fence ..	35	14	13.8	78	28	09.2
Timothy, forks of road, 0.25 mile northwest of	35	13	32.9	78	27	35.9
Four corners, 15 feet northeast to corner of plank fence, 20 feet northwest to corner rail fence	35	12	58.2	78	25	59.0
Rosin Hill post-office, at northwest corner of J. McPhail's store, iron post stamped "Prim. Trav. Sta. No. 23, 1905" ..	35	12	31.8	78	24	54.8
Oak Grove Church, four corners 0.5 mile east of	35	13	21.0	78	23	44.9
Great Coharie crossing, forks of road	35	13	10.2	78	22	14.6
T road south, 25 feet east to signboard "Clinton 19 miles" ..	35	13	47.5	78	21	53.8
Beaverdam shoolhouse, forks of road	35	13	43.1	78	20	49.3
Newton Grove, 1 mile southeast of; forks of road	35	14	29.3	78	20	19.6
Forks, 10 feet east to signpost "Dobbinville 4 miles, Goldsboro 24 miles"	35	15	05.8	78	17	44.4
Intersection of roads, iron post stamped "Prim. Trav. Sta. No. 29, 1905"	35	15	40.6	78	16	59.7
Falling Creek, 0.25 mile north of; three corners, 15 feet north to signpost "Goldsboro 22 miles," 15 feet south to fence	35	16	27.9	78	16	41.4
T road west, 25 feet northwest to gate, 20 feet southwest to fence corner	35	17	06.0	78	16	41.5
Thornton's store, T road west	35	17	35.8	78	16	51.9
T road east	35	18	28.1	78	16	57.5
White Church and store, forks of road	35	19	14.2	78	16	43.0
Forks of road, 15 feet north to pine, 100 feet east to second- class T road south	35	19	41.2	78	15	06.6
Cemetery, forks of road, 300 feet east of	35	19	56.8	78	14	01.5
Cox's mill, forks of road	35	20	04.4	78	12	55.2
Cox's mill, T road east 1 mile northeast of	35	20	56.6	78	12	26.6
Forks of road, second-class road to east	35	22	13.3	78	11	48.0
Richardson's Bridge, forks of road 700 feet east of	35	22	34.7	78	11	43.8
Richardson's Bridge, 1.75 miles northeast of; on east edge of road at junction, iron post stamped "Prim. Trav. Sta. No. 32, 1905"	35	24	03.6	78	10	56.8
Bridge, forks of road 40 feet east of	35	24	19.8	78	12	53.2
Forks of road, 20 feet east of signpost "Princeton 6 miles," 10 feet north to fence corner	35	25	46.9	78	14	46.0
Forks of road, 20 feet east to gate, 20 feet west to wire fence	35	26	52.6	78	14	23.1
Forks of road, 10 feet east to wire fence, 35 feet west to yard fence	35	27	46.1	78	14	31.6
T road south, 40 feet southwest to fence corner, 40 feet north to oak	35	28	57.9	78	14	39.7
Carolina Midland Railroad crossing, at station	35	29	34.7	78	15	33.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
WAYNE COUNTY.		
	° ' "	° ' "
Schoolhouse, T road south at	35 15 42.6	78 16 19.6
Starlight, four corners at schoolhouse 0.25 mile east of ...	35 15 59.1	78 15 29.1
Ranors Mill, bridge over mill tail	35 16 34.1	78 14 19.8
Eureka Church, four corners	35 16 12.1	78 13 40.5
Schoolhouse, T road south 200 feet east of	35 15 55.8	78 12 51.6
T road southwest	35 15 57.2	78 11 43.8
Corbett Hill schoolhouse, at northeast corner iron post stamped "Prim. Trav. Sta. No. 30, 1905"	35 15 26.4	78 10 44.6
T road south, 30 feet west to oak, 30 feet north to fence.	35 15 03.7	78 09 56.6
Mount Carmel Church, T road north 0.5 mile east of	35 15 06.1	78 08 08.1
Thorofare Swamp, T road north 0.25 mile west of	35 15 12.7	78 07 07.9
Forks of road, 70 feet southwest to double oak, at corner of fence	35 15 20.6	78 05 43.8
Dudley, forks of road 1 mile west of	35 16 06.4	78 03 24.7
Dudley, at northeast corner of J. Aldridge's store, iron post stamped "Prim. Trav. Sta. No. 31, 1905"	35 16 03.6	78 02 13.3
Dudley, south end of station	35 15 58.2	78 02 13.0

OHIO.

PRIMARY TRAVERSE.

SUMMIT COUNTY.

AKRON QUADRANGLE.

Additional control for this quadrangle was obtained in December, 1904, by Mr. J. R. Ellis, topographic aid, who ran a line from the Erie Railroad station at Barberton west along that railroad 1.5 miles, thence north along highways to West Richfield, and tied to Primary Traverse Station 106 A at that place.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Barberton, Barberton Inn, at right side of main entrance stairway to, in face of support to veranda, aluminum tablet stamped "Prim. Trav. Sta. No. 50, 981 Cleveland" (elevation 981.260)	41 00 47.0	81 36 39.7
Barberton, Erie station	41 01 13.2	81 36 36.5
Barberton, road crossing 1½ miles west of (Erie Railroad) ..	41 01 08.6	81 38 19.3
Loyal Oak, crossroads at, 46 feet northeast to guidepost, 47 feet southeast to northwest corner of porch to hotel.	41 03 01.6	81 38 16.9
Norton and Copley townships, line between, T road west, 13 feet southwest to south end of culvert, 33 feet northwest to apple tree at corner of fence	41 03 43.9	81 38 16.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Miksch's mills, forks of road north of, 30 feet east to corner of yard fence, 60 feet south to guidepost.....	° ' " 41 04 28.0	° ' " 81 38 21.4
Copley, in southwest corner of Disciples Church, aluminum tablet stamped "Prim. Trav. Sta. No. 51, 1049, Cleveland" (elevation 1,049.163).....	41 05 58.5	81 38 39.5
Montrose, crossroads, at line between Copley and Bath townships, 39 feet southeast to cross on telegraph pole, 45 feet northwest to F. Collins's mail box.....	41 08 08.9	81 38 15.2
Ghent, T road west, 24 feet southeast to northwest corner of water trough, 41 feet southwest to northeast corner of porch to store.....	41 09 29.6	81 38 14.0
Bath High School, crossroads at, 28 feet southeast to cross on telegraph pole, 43 feet southwest to cherry tree at corner of fence.....	41 10 08.4	81 38 13.4
Hammonds Corners, crossroads at, 45 feet to northeast corner of portion to Bath Hotel, 39 feet northwest to guidepost.....	41 11 20.4	81 38 12.0
Bath and Richfield townships, crossroads at, 90 feet east to Wm. Miller's mail box, 48 feet southeast to sign-board on tree.....	41 12 08.4	81 38 17.8
Richfield Center, forks of road 1½ miles south of, 24 feet west to Park Lee's mail box, 46 feet southeast to guide post.....	41 13 07.0	81 38 18.0
West Richfield, aluminum tablet stamped "Prim. Trav. Sta. No. 106 A," elevation 1,279, Cleveland, in south wall at southeast corner at stone foundation to the Carter House.....	41 14 24.0	81 39 20.1

ALLEN AND PUTNAM COUNTIES.

BLUFFTON QUADRANGLE.

The following geographic positions were established by Mr. J. R. Ellis in 1904. The line starts from primary traverse position at Westminster station and follows range line road (public) to primary traverse position on Findlay, Fort Wayne and Western Railroad about 3 miles east of Ottawa.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Westminster station.....	° ' " 40 42 57.2	° ' " 83 59 35.3
Westminster station, T. 4 S., R. 7 E., southeast corner sec. 1, in southeast corner of field of Joseph Craig, northwest corner of his residence bears S. 88° E., distant 62.3 feet; south rail of Erie Railroad at road crossing bears S. 6° E., distant 243.2 feet; in top of a limestone post 30 by 8 by 8 inches set 26 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 1".....	40 42 59.9	83 59 38.9
Ts. 3 and 4 S., Rs. 7 and 8 E., secs. 1, 6, 31, and 36, at crossroads, 35 feet southeast to cross cut on corner fence post, 34 feet northeast to cross cut on corner fence post.....	40 43 52.0	83 59 38.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 3 S., R. 8 E., corner secs. 30 and 31 (west corner) at T road east, corner stone.....	° ' " 40 44 44.5	° ' " 83 59 38.8
Pittsburg; Fort Wayne and Chicago Railroad, at road crossing between ranges 7 and 8 E., between tracks, azimuth of railroad= $82^{\circ} 21' 09''$	40 45 13.7	83 59 38.7
T. 3 S., Rs. 7 and 8 E., corner secs. 24 and 25 (east corner), corner stone.....	40 45 36.7	83 59 38.8
T. 3 S., Rs. 7 and 8 E., corner secs. 13, 18, 19, and 24, corner stone.....	40 46 29.0	83 59 38.9
T. 3 S., Rs. 7 and 8 E., corner secs. 7, 12, 13, and 18, corner stone, at crossroads.....	40 47 21.1	83 59 39.2
T. 3 S., Rs. 7 and 8 E., west corner secs. 1 and 12, corner stone.....	40 48 13.3	83 59 39.5
Lake Erie and Western Railroad, road crossing between ranges 7 and 8 E., azimuth of railroad= $229^{\circ} 10' 15''$	40 49 17.4	83 59 40.1
T. 2 S., R. 7 E., northeast corner of sec. 36, in field owned by Louis Roberts, northeast corner of Roberts's residence bears S. 78° E., distant 63.3 feet; nail in telephone pole on south side of pike bears N. $12^{\circ} 15'$ E., distant 8.6 feet, aluminum tablet set in stone 7 by 16 by 24 inches set 20 inches in ground, stamped "Prim. Trav. Sta. No. 2".....	40 49 57.7	83 59 40.8
T. 2 S., Rs. 7 and 8 E., east corner secs. 24 and 25, at T road west.....	40 50 51.4	83 59 40.9
T. 2 S., Rs. 7 and 8 E., east corner secs. 13 and 24, at T road east, corner stone.....	40 51 44.1	83 59 41.5
Rockport, crossroads at, 25 feet northeast to pump, 33 feet northwest to cross cut on telephone pole.....	40 52 17.5	84 00 00.0
T. 2 S., R. 7 E., quarter corner between secs. 1 and 12, at crossroads.....	40 53 26.8	84 00 15.8
Ts. 1 and 2 S., Rs. 7 and 8 E., corner secs. 1, 6, 31, and 36, at T road north, 24 feet southwest to cross cut on telephone pole, 30 feet northwest to arrow on corner fence post.....	40 54 18.8	83 59 42.7
T. 1 S., R. 7 E., corner secs. 25 and 36, at T road west, 18 feet southwest to cross on south end of culvert, 30 feet northwest to cross on corner fence post.....	40 55 11.4	83 59 43.1
T. 1 S., R. 7 E., in northeast corner of sec. 25 in field owned by John Keine, W. J. Luginbill's mail box bears N. 15° E., distant 39.5 feet; cross cut on third layer of stone retaining wall to culvert bears N. 87° E.; distant 14.5 feet; in top of Bedford limestone 30 by 16 by 6 inches, set 27 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 3".....	40 56 03.6	83 59 43.8
Northern Ohio Railroad at road crossing between ranges 7 and 8 E., azimuth of railroad= $246^{\circ} 59' 59''$	40 56 08.9	83 59 43.6
T road south at small bridge, 18 feet southeast to cross cut on south end of bridge, 25 feet southeast to cross cut on corner fence post.....	40 57 48.9	84 00 01.7
Schoolhouse, Subdistrict No. 1, intersection of roads at, 18 feet southwest to south end of stone culvert, 15 feet west to cross on telephone pole.....	40 58 41.5	84 00 46.8
T. 1 S., R. 7 E., north corner secs. 1 and 2, at T road south, 32 feet southwest to cross on corner fence post, 45 feet southeast to cross on telephone pole.....	40 59 34.2	84 00 53.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 1 N., R. 7 E., west corner secs. 25 and 36, center of road at fence east.....	° ' " 41 00 26.7	° ' " 84 00 54.8
Ottawa, 3 miles east of; in southwest corner of James Maidlow's front yard, southwest corner of Maidlow's residence bears N. 44° 30' E., distant 46.8 feet; corner post to southwest corner of Maidlow's yard fence bears SW., distant 2 feet; in top of marble post 6 by 6 by 24 inches, set 23 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 4".....	41 00 54.1	83 59 48.9
Findlay, Fort Wayne and Western Railroad road crossing between ranges 7 and 8 E.....	41 01 18.2	83 59 45.3

TRUMBULL COUNTY.

BRISTOLVILLE QUADRANGLE.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis from a point located at Phalanx to Mesopotamia triangulation station of the United States Lake Survey:

Geographic positions along highways.

Station.	Latitude.	Longitude.
Phalanx post-office, crossroads at; 20 feet southeast to guidepost, 18 feet west to stone in road.....	° ' " 41 15 39.5	° ' " 80 58 43.9
Phalanx post-office, Y road 0.5 mile north of; 24 feet north to cross on telephone pole, 30 feet east to cross on gatepost.....	41 16 12.6	80 58 38.9
T. 5 N., R. 5 W., corner to secs. 31, 32, 33, and 34.....	41 17 38.6	80 59 01.1
Crossroads, 40 feet northeast to cross on telephone pole, 40 feet northwest to cross on fence post.....	41 18 30.3	80 59 01.0
T road east.....	41 19 43.2	80 59 00.9
Crossroads at schoolhouse and corner secs. 1, 2, 3, and 4, T. 5 N., R. 5 W.; 20 feet northeast to E. F. Culp's mail box, 45 feet southeast to milk platform.....	41 20 21.4	80 59 00.7
T. 6 N., R. 5 W., corner stone to secs. 2 and 11 (east corner).....	41 21 42.0	80 59 00.3
West Farmington, 1.5 miles southwest of; in G. A. McKay's orchard, 120 feet northeast of State road at road northeast; southwest corner of McKay's house bears N. 54° 50' E., distant 211 feet; nail in east face of elm tree on west side of road bears N. 27° 55' W., distant 48.7 feet; iron post stamped "Prim. Trav. Sta. No. 31".....	41 22 37.1	80 59 45.4
Pennsylvania Railroad at road crossing.....	41 24 09.1	80 59 24.5
Bundysburg, large flag pole at road intersection.....	41 25 17.9	81 00 17.4
Mesopotamia triangulation station, 0.12 mile east of west line and 0.5 mile south of center line of township of Mesopotamia, and 4 miles east of village of Middlefield. Station mark: A stone post under ground, with stone post over it as a surface mark. Reference: Three stone posts, one N. 23° 23' W., distant 102.6 meters; one N. 9° 51' E., distant 96 meters; and one S. 20° 40' E., distant 129.4 meters from geodetic point.....	41 26 59.75	80 59 53.15

HOCKING, PICKAWAY, AND ROSS COUNTIES.

CHILlicothe QUADRANGLE.

The following geographic positions were determined by primary traverse in 1904 by Mr. J. R. Ellis, topographic aid. The line starts from northwest corner of quadrangle and follows east along public highways to Stringtown; thence south near east border of quadrangle to Gillespieville; thence west to Schooley; thence northwest along Baltimore and Ohio Railroad to Chillicothe; thence north along public highway to tie point at northwest corner of quadrangle. A line was also run from Chillicothe south along Portsmouth pike to Waller.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Scioto River, east end of bridge over	39 28 21.9	82 59 43.1
Scioto River bridge, nail in hub at T road west 1 mile east of; 24 feet east to cross on telephone pole, 27 feet northwest to D. W. Kellenberger's mail box.....	39 28 20.9	82 58 43.8
Corner secs. 1, 2, 35, and 36; 15 feet west to stone between Ross and Pickaway counties; 35 feet southeast to cross cut on rail fence.....	39 28 45.6	82 58 42.4
Nash's Corners, crossroads at; 33 feet southwest to Vernon Estill's mail box; 30 feet southeast to cross on corner of fence post	39 30 31.1	82 58 20.7
Nash's Corners, T road south 1 mile east of; 17 feet northeast to Manger's mail box; 18 feet northwest to cross on gatepost.....	39 30 29.4	82 57 15.2
Nash's Corners, T road west at small bridge 1.5 miles east of; 3 feet northwest to southwest corner of bridge; 15 feet east to southeast corner of bridge.....	39 30 27.9	82 56 40.7
(Azimuth of Norfolk and Western Railroad at Elmwood station=334° 44' 45".)		
Elmwood station, T road west about 900 feet east of; 22 feet east to cross on gatepost; 50 feet northwest to cross on telephone pole	39 30 01.6	82 55 28.0
Meade, T road northwest 1 mile southwest of; 21 feet south to cross on gatepost; 30 feet west to cross on fence post	39 29 49.0	82 53 29.1
Meade, crossroads at; 22 feet north to W. F. Anderson's mail box; 38 feet east to corner of grocery store.....	39 30 25.1	82 52 55.5
Meade, in west corner of schoolhouse yard; west corner of water table to schoolhouse bears N. 46° 45' E., distant 38.3 feet; east corner of brick foundation to G. W. Greeg's residence bears S. 25° W., distant 116.3 feet; in top of sandstone 6 by 12 by 36 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 8".....	39 30 18.0	82 52 40.5
Meade, T road southwest 0.75 mile southeast of; 16 feet southwest to David Polling's mail box; 21 feet north to cross on fence post at end of hedge fence.....	39 30 00.3	82 52 04.3
Oak Grove schoolhouse; crossroads; 37 feet north to A. J. & Guy E. Pouter's mail box; 24 feet southwest to cross on large corner fence post.....	39 29 43.6	82 50 56.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Whistler, crossroads at church; 36 feet northwest to iron fence post; 34 feet southeast to cross on telephone pole.	° ' " 39 29 11.0	° ' " 82 49 19.7
T. 11, R. 20, corner secs. 28, 29, 32, and 33.....	39 29 09.3	82 48 46.9
Whistler, T road north 1 mile east of; 36 feet northwest to George Duhrsten's mail box; 18 feet southeast to south end of easternmost culvert	39 29 07.5	82 48 13.4
T. 11, R. 20, corner secs. 27, 28, 33, and 34; at T road north; 21 feet south to cross on fence post, 30 feet north to cross on corner fence post	39 29 05.6	82 47 40.0
T. 11, R. 20, corner secs. 26, 27, 34, and 35; at T road north; 21 feet south to cross on fence post, 27 feet northwest to cross on corner fence post	39 29 02.0	82 46 33.6
Stringtown, in southwest corner of William Ballard's pasture; southeast corner of Levi Imer's store bears N. 24° W., distant 62.4 feet; cross cut on last end of stone culvert bears S. 18° W., distant 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 road east, 18 feet west to cross on gatepost	39 29 07.2	82 45 23.5
Adelphi, crossing Main and Concord streets; 40 feet southeast to lamppost; 36 feet northwest to telephone pole at general store	39 27 58.9	82 44 52.3
Adelphi, T road west 1 mile south of; 33 feet northwest to cross on corner fence post; 21 feet to northwest corner of stone culvert.....	39 26 51.2	82 45 01.7
T. 10, R. 20, corner secs. 18, 19, 23, and 24; also line between Ross and Hocking counties.....	39 25 28.7	82 44 38.5
Feightner, T road north at blacksmith shop; 21 feet west to southwest corner of shop; 30 feet northwest to small apple tree.....	39 24 45.4	82 44 48.2
Pritchard's (Tom) residence, intersection of roads; 15 feet north to cross cut on small cottonwood tree	39 23 39.0	82 43 28.4
Feightner, 2 miles south of; in northeast corner of T. B. Pritchard's front yard; northeast corner to foundation of porch of Pritchard's residence bears S. 73° 15' W., distant 49.2 feet; nail in north face of cottonwood tree in front yard bears S. 15° E., distant 7.7 feet; in top of sandstone post 6 by 10 by 36 inches set 32 inches in ground, aluminum tablet stamped "Prim. Trav. Sta. No. 10" ..	39 23 36.8	82 43 28.8
T road southwest, 18 feet south to cross on corner fence post, 20 feet northeast to cross on fence post	39 22 19.2	82 43 47.9
Pike Run, T road east at; 25 feet northeast to cross on telephone pole, 25 feet southeast to corner of old store building	39 21 11.8	82 43 19.8
Pike Run, crossroads 0.75 mile south of; 18 feet northwest to cross on corner fence post; 22 feet southwest to south end of box culvert.....	39 20 40.3	82 43 26.6
Pike Run, intersection of roads at bridge about 1 mile west of; 10 feet east to north corner of bridge; 10 feet south to southwest corner of bridge.....	39 21 19.2	82 44 22.2
Haddox (George) residence, Y road east; 10 feet south to cross on board fence; 30 feet west to cross on post...	39 21 37.5	82 45 41.8
Summit of hill, center of road; 30 feet north to cross on gatepost	39 21 22.6	82 45 58.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Tedron farm, forks of road near head of Piney Creek; 18 feet northwest to cross on fence post; 24 feet east to cross on fence post.....	° ' " 39 21 12.6	° ' " 82 46 56.5
Watson Bobbett's farm, T road north; 21 feet south to cross on rail fence.....	39 20 12.9	82 46 38.7
Intersection of roads, about 0.75 mile north of store; 25 feet southwest to mail box; 25 feet east to cross on corner fence post.....	39 18 14.6	82 46 48.1
Store, T road west 0.33 mile south of; 27 feet northwest to cross on corner fence post; 25 feet south to J. W. Cunningham's mail box.....	39 17 20.5	82 46 31.1
Schoolhouse, T road northwest; 21 feet south to cross on gatepost; 36 feet northeast to cross on board fence.....	39 16 51.7	82 46 25.2
Gillespieville, in ground owned by George Radcliff; southwest corner of Radcliff's residence bears N. 25° 45' E., distant 98.9 feet; northeast corner of Radcliff's general store bears S. 35° W., distant 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
Gillespieville, T road south 1 mile west of; 27 feet southwest to mail box; 35 feet southeast to cross on fence post.....	39 16 09.5	82 48 24.0
Gillespieville, T road north about 2 miles west of; 36 feet northeast to cross on corner fence post; 21 feet southwest to cross on walnut tree.....	39 16 33.8	82 49 29.7
Bridge over Walnut Creek, center of.....	39 16 49.2	82 50 21.9

Geographic positions along the Baltimore and Ohio Southwestern Railroad between Schooley and Chillicothe.

Station.	Latitude.	Longitude.
Schooley station, in C. E. Harness's pasture, on north side of railroad; nail in crosscut on south face of elm tree bears N. 3° 35' W., distant 51.1 feet; north rail at center of north and south road crossing railroad, azimuth 8° 26' 50", distant 159.8 feet; in top of sandstone post 6 by 8 by 30 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 12".....	° ' " 39 15 59.0	° ' " 82 52 11.0
Milepost 104, private road crossing 1,500 feet northwest of.....	39 16 47.9	82 53 19.5
Gravel pit, private road crossing 235 feet northwest of west end of switch.....	39 17 35.1	82 54 22.0
Scioto River Bridge, west end of.....	39 18 18.9	82 55 20.0
Chillicothe and Gillespieville pike crossing.....	39 18 50.7	82 56 02.2
Milepost 99, pike crossing 820 feet west of.....	39 19 42.4	82 57 17.3
Chillicothe, crossing Baltimore and Ohio and Norfolk and Western railroads.....	39 20 05.3	82 58 12.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
Schoolhouse No. 2, T lane west; 22 feet east to cross on board fence, 33 feet southwest to cross on fence post . . .	° ' " 39 21 22.3	° ' " 82 58 34.6
T road east, 29 feet northeast to A. J. Seney's mail box, 33 feet northeast to guidepost	39 21 50.9	82 58 33.5
Hopetown, crossroads; 26 feet northeast to C. W. Down's mail box, 50 feet northeast to southwest corner of P. H. Klatz's shoe shop	39 22 43.3	82 58 29.0
Hopetown, forks of pike 1 mile north of; 18 feet east to cross on fence post, 50 feet northwest to arrow painted on corner fence post	39 23 31.5	82 58 07.1
Hopetown, cross pikes 2 miles north of; 30 feet south to William Albright's mail box, 24 feet northwest to cross on corner fence post	39 24 27.0	82 58 30.7
Mettler (George), in northeast corner of field; on west side of pike opposite Mettler's house, northwest corner of foundation to corncrib, bears S. 22° 15' E., distant 78.2 feet; nail in west face of black locust tree in front yard bears S. 82° 30' E., distant 54 feet. Iron post set 40 inches in the ground, stamped "Prim. Trav. Sta. No. 13."	39 26 16.6	82 58 35.2
Road east, 28 feet southeast to David Umstead's mail box, 24 feet northeast to corner of yard fence	39 27 26.6	82 58 42.6

Geographic positions along highways from Chillicothe south to southwest corner of quadrangle.

Station.	Latitude.	Longitude.
Chillicothe, in stone floor to court-house porch on right side of main entrance to building. Aluminum tablet stamped "Prim. Trav. Sta. No. 14."	° ' " 39 20 00.6	° ' " 82 58 56.4
Chillicothe, crossing of Cincinnati, Hamilton and Dayton Railway and Paint street	39 19 20.9	82 58 45.2
Chillicothe and Portsmouth pikes, center of, at milepost 2 (Chillicothe)	39 18 31.2	82 57 51.6
Ludbecks Siding, crossroads west of; 24 feet east to mail box, 32 feet northwest to cross on telephone pole	39 17 53.4	82 57 12.9
Waller, T road southeast at, water trough about 2 miles north of; 27 feet northeast to Blain's mail box, 18 feet northwest to northeast corner of water trough	39 17 23.5	82 56 48.6
Waller, T road northwest; 24 feet south to cross on gatepost, 18 feet east to cross on board fence	39 16 04.1	82 57 51.6
Waller, 0.75 mile south of; in northeast corner of field owned by Joseph Deuschle, on west side Chillicothe and Portsmouth pike; nail in east face of apple tree on fence line bears N. 74° 15' W., distant 39.3 feet; hitching ring in east face of locust tree in front of Deuschle's store bears S. 26° 15' W., distant 262.1 feet—iron post set 36 inches in the ground, stamped "Prim. Trav. Sta. No. 15"	39 15 34.7	82 58 10.3

COLUMBIANA AND MAHONING COUNTIES.

EAST PALESTINE QUADRANGLE.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from an adjusted position at Lisbon, runs eastward over the Pittsburg, Lisbon and Western Railroad, and ties to the Ohio-Pennsylvania State line monument No. 81, near Negley.

Geographic positions along the Pittsburg, Lisbon and Western Railroad.

Station.	Latitude.	Longitude.
Lisbon, United States Geological Survey bench mark No. 45.....	40° 46' 20.28"	80° 46' 04.04"
Lisbon, street crossing of Pittsburg, Lisbon and Western Railroad, just south of.....	40 46 16.5	80 45 27.4
American Pipe Co., road crossing 0.25 mile east of	40 46 02.3	80 44 08.6
Road crossing under trestle.....	40 45 55.8	80 42 46.5
Elkton, road crossing north and south at station	40 45 52.8	80 41 54.6
Newhouse, switch-block to mine.....	40 46 51.8	80 41 16.7
Summit, road crossing; second crossing south of station..	40 47 53.7	80 39 34.2
Rogers, road crossing 1 mile west of.....	40 47 38.1	80 38 37.1
Rogers, in southeast corner of Ida M. Rogers farm; on north side of Pittsburg, Lisbon and Western Railroad; southeast abutment to wagon bridge N. 9° 45' W., distant 202.8 feet; cross on northeast corner of foundation to D. M. Millers residence bears S. 4° 40' E., distant 644 feet; in sandstone post, aluminum tablet stamped "Prim. Trav. Sta. No. 46.".....	40 47 35.6	80 37 39.4
Rogers, road crossing 0.75 mile east of	40 47 42.1	80 36 58.5
Millrock station, road crossing	40 47 56.1	80 35 31.2
Private road crossing at spur.....	40 47 55.5	80 34 30.8
Negley, north and south road crossing at station	40 47 27.5	80 32 20.5
Ohio-Pennsylvania State line monument No. 81; stone is 25 feet east of center of north and south road	40 47 49.98	80 31 08.93

PORTAGE COUNTY.

GARRETTSVILLE QUADRANGLE.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from an adjusted position at Mantua, Ohio, and follows the Erie Railroad east through Mahoning to Phalanx.

Geographic positions along the Erie Railroad between Mantua and Phalanx.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mantua, road crossing north and south, Erie Railroad....	41 16 52.8	81 13 28.8
Mantua, 0.33 mile east of; in southwest part of grounds of Standard Oil Co. pumping station, southwest corner of foundation to boiler building bears N. 41° 50' E., distant 135 feet; nail in sugar maple tree bears N. 61° W., distant 35.7 feet, and is 2 feet north of Erie Railroad fence, iron post stamped "Prim. Trav. Sta. No. 29"....	41 16 59.7	81 13 00.9
Mantua, road crossing 1.75 miles east of.....	41 16 50.6	81 11 32.4
T. 5 N., R. 7 W., quarter corner between secs. 41 and 50..	41 16 51.7	81 10 58.5
Overhead road crossing near milepost 34.....	41 16 34.8	81 09 44.0
Hiram station, road crossing.....	41 16 37.4	81 08 42.9
Overhead road crossing north and south.....	41 16 45.1	81 07 57.9
Garrettsville, in south part of H. J. Langton's yard, southwest corner of foundation to Langton's residence bears N. 30° 45' W., distant 129 feet; nail in cross mark on west face of cherry tree bears S. 49° 30' E., distant 6.2 feet; iron post stamped "Prim. Trav. Sta. No. 30".....	41 16 53.4	81 05 54.2
Road crossing east and west about 800 feet east of milepost 38.....	41 16 48.2	81 05 16.6
Road crossing east and west 0.50 mile southeast of milepost 39.....	41 16 46.4	81 04 02.3
Mahoning, road crossing.....	41 15 42.9	81 02 57.7
Milepost 42, private road crossing 130 feet east of.....	41 15 29.6	81 01 39.4
County line, north and south road crossing.....	41 15 21.5	81 00 10.8

SCIOTO COUNTY.

GREENUP QUADRANGLE.

The line starts from southeast corner of Scioto quadrangle, and follows highways south via Powellsville to Gould triangulation station, United States Coast and Geodetic Survey.

Geographic positions along highways.

Station.	Latitude.	Longitude.
T road southwest, 30 feet west to J. Herchman's mail box; 24 feet south to cross on rail fence	38 44 30.9	82 45 47.0
Road northeast; 12 feet south to cross on fence post; 57 feet northeast to cross on sycamore tree	38 44 08.4	82 44 59.8
Cadot farm, intersection of Lyra and Wheelersburg pike, and road southeast to Powellsville, near summit of hill; 36 feet northeast to cross on fence post; 36 feet southeast to cross on fence post	38 42 59.9	82 45 21.3
J. M. Morgan's residence, intersection of roads just east of; 18 feet south to cross on picket fence	38 42 38.1	82 45 22.6
Quarter corner between sec. 28 and 32 (stone)	38 41 42.2	82 45 52.1
Knapp's (George) residence, intersection of roads at, 18 feet northeast to Knapp's mail box; 40 feet southwest to cross on large willow tree	38 40 51.5	82 45 27.3
Powellsville, about 1 mile northeast of; in orchard owned by Lewis Knapp, north corner of foundation to Knapp's residence bears S. 32° 15' W., distant 164.5 feet; nail in cross cut in black oak tree 8 inches in diameter bears N. 86° 30' E., distant 85.2 feet; iron bench mark post stamped "Prim. Trav. Sta. No. 24"	38 40 30.4	82 46 05.9
Powellsville, crossroads at; 24 feet southeast to Rase Bros.' mail box; 50 feet southwest to northeast corner of Rase Bros.' store	38 40 00.3	82 47 01.1
Covered bridge over Piney Creek, intersection of roads 200 feet southeast of; 18 feet north to cross on post	38 39 10.0	82 48 08.0
Stacker's (H.) farm, T road northwest at; 30 feet east to cross on beech tree, 32 feet west to cross on corner fence post	38 38 07.6	82 49 02.1
Franklin Furnace, T road west on top of hill; 1.5 miles east of; 27 feet north to cross on black-oak sapling, 40 feet west to cross on stump	38 38 34.0	82 49 17.4
Gould triangulation station (United States Coast and Geodetic Survey); on the hills east of the Ohio river 1.5 miles air line from river at Franklin Furnace landing. Station mark: Center by a pottery pyramid 3 feet below surface, above which is a sewer pipe 6 inches in diameter, filled with concrete with a nail in center. Other pieces of pipe, 4 inches in diameter, with concrete, are sunk as follows: North, true, 6.08 feet distant; south, true, 6.11 feet distant; east, true, 5.78 feet distant; west, true, a brass rod 0.25 inch in diameter, driven in smooth top of an oak stump, and surrounded by nails as follows: distant 5.77 feet	38 38 27.6	82 49 56.7

Geographic positions along the Norfolk and Western Railroad between Franklin Furnace and Wheelersburg.

Station.	Latitude.	Longitude.
Franklin Furnace, in northeast corner of Methodist Church yard; cross on northwest corner to foundation to church bears S. 24° 25' E., distant 26.4 feet; cross on northwest corner to foundation to public school building bears S. 85° 10' E., distant 130.4 feet; iron bench mark post set 40 inches in the ground, stamped "Prim. Trav. Sta. No. 25"	° ' " 38 38 42.2	° ' " 82 50 56.0
Milepost 113, private road crossing 900 feet south of.....	38 39 48.8	82 51 20.7
Milepost 112, private road crossing 935 feet south of	38 40 39.8	82 51 34.0
Milepost 111, road crossing east and west 1,400 feet south of	38 41 26.4	82 51 46.2
Wheelersburg, private road crossing at old log house 2 miles south of	38 42 14.7	82 51 52.8
Wheelersburg, road crossing east and west 135 feet south of station	38 43 44.4	82 51 46.2
Wheelersburg, private road crossing east and west, just south of (1 mile to water board), 1 mile north of.....	38 44 31.6	82 52 09.8
Railroad bridge over Little Scioto River, private road crossing just south of	38 45 13.4	82 52 52.7

TRUMBULL COUNTY.

KINSMAN QUADRANGLE.

The following geographic positions were obtained by Mr. J. R. Ellis, topographic aid, in 1904. The line starts at a point located by primary traverse near southwest corner of quadrangle, follows highways along the western border of the quadrangle, and is tied to a position near Triumph, located by Mr. C. B. Kendall in 1903.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Schoolhouse, T road east; 21 feet southeast to W. B. King's mail box, 21 feet northwest to west end of stone culvert	° ' " 41 15 40.2	° ' " 80 44 26.9
Guidepost ("Cortland 4 mi."), road northeast at, 90 feet north to guidepost	41 16 31.6	80 44 27.1
T road east, 35 feet northeast to corner fence post, 34 feet southeast to corner fence post	41 17 02.8	80 44 27.4
T. 5 N., R. 3 W., corner to secs. 47, 48, 53, and 54, T road south at, 13 feet north to A. Barnard's mail box, 40 feet southeast to C. W. Kennedy's mail box.....	41 18 29.7	80 44 28.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T. 5 N., R. 3 W., corner to secs. 14, 15, 27, and 28, crossroads; 37 feet southwest to corner fence post, 42 feet northwest to guidepost	° ' " 41 19 48.6	° ' " 80 44 28.5
Cortland, guidepost at Y road north, 2 miles north of. . .	41 21 11.1	80 44 13.5
Mecca, 1 mile south of; in west part of yard to schoolhouse, nail in east face of maple tree bears S. 55° W., distant 73.5 feet; nail in south face of maple tree near fence bears N. 19° E., distant 79.8 feet; iron post stamped "Prim. Trav. Sta. No. 34"	41 21 53.2	80 44 12.4
Mecca, corner stone in center of park	41 23 22.7	80 44 13.3
Crossroads, 40 feet northwest to guidepost, 40 feet southwest to cross on fence post	41 25 07.9	80 44 13.7
T. 7 N., R. 3 W., corner secs. 44, 45, 46, and 47, T road east; 10 feet northeast to milk platform	41 25 58.1	80 44 13.8
Crossroads, center of bridge	41 26 51.4	80 44 47.7
Kenilworth, crossroads 0.5 mile west of; 40 feet northeast to telephone pole, 66 feet southeast to maple tree. .	41 27 43.4	80 44 48.2
Triumph, T road east 1 mile south of; 27 feet west to wild cherry tree, 70 feet southeast to maple tree	41 28 36.7	80 44 48.5
Triumph, crossroads, 57 feet southwest to northeast corner of shop, 40 feet southeast to C. M. Rice's mail box	41 29 28.4	80 44 48.6
Triumph, 0.75 mile north of; in southeast corner of Mrs. E. P. Priar's farm, on west side of Jefferson road, northeast corner of W. Cleat's residence bears S. 37° 20' W., distant 48.6 feet; southwest corner of O. B. Humphrey's house bears N. 29° E., distant 129.4 feet; in stone post, aluminum tablet stamped "Prim. Trav. Sta. No. 35" ..	41 30 08.1	80 45 03.0
Schoolhouse, nail in plug at three corners	41 30 51.9	80 45 17.6

COLUMBIANA AND MAHONING COUNTIES.

LEETONIA QUADRANGLE.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from an adjusted position at Canfield and runs south over the Erie Railroad to Leetonia; continues southward along highways to Lisbon; thence westward over highways along south border of quadrangle, and is tied to Kensington triangulation station United States Geological Survey.

Geographic positions along the Erie Railroad between Canfield and Washingtonville.

Station.	Latitude.	Longitude.
Canfield, west end of water trough at crossroads	41° 01' 29.36"	80° 45' 38.59"
Canfield, in town park, cross on southwest corner to water trough bears N. 2° 50' E., distant 32.15 feet; cross on northeast corner of foundation of Farmers National Bank bears N. 47° W., distant 148.4 feet; iron post stamped "Prim. Trav. Sta. No. 143"	41° 01' 26.1"	80° 45' 38.6"
Canfield, T road east 1 mile south of; 19 feet northeast to end of culvert, 58 feet southeast to cross on telephone pole	41° 00' 19.9"	80° 45' 38.7"
T road south, 90 feet west to east and west road crossing, Erie Railroad	40° 59' 17.8"	80° 45' 49.2"
Corner to secs. 1, 2, 11, and 12, at crossroads	40° 58' 21.5"	80° 45' 49.5"
Corner secs. 11, 12, 13, and 14, at crossroads, 21 feet southeast to mail box, 18 feet southwest to west end of culvert ..	40° 57' 29.8"	80° 45' 50.3"
Crossroads at schoolhouse, corner secs. 13, 14, 23, and 24 ..	40° 56' 38.0"	80° 45' 50.8"
Corner secs. 23, 24, 25, and 26	40° 55' 46.1"	80° 45' 51.4"
Schoolhouse, T road west at, 14 feet north to east end of stone culvert, 21 feet northwest to west end of culvert ..	40° 55' 01.3"	80° 45' 52.0"
Washingtonville, Main street crossing of Erie Railroad ..	40° 54' 02.6"	80° 45' 50.5"

Geographic positions along highways.

Station.	Latitude.	Longitude.
Leetonia, 0.5 mile northwest of; in southwest corner of city reservoir grounds, cross cut on stone foundation of left side of ventilator bears N. 52° 10' E., distant 50.3 feet; cross cut on northeast corner of foundation to Mont Stover's residence bears S. 89° W., distant 106.4 feet; iron post stamped "Prim. Trav. Sta. No. 44" ..	40° 53' 14.4"	80° 45' 52.8"
Leetonia, north and south road crossing Pennsylvania Railroad at Salem Iron Works	40° 52' 22.7"	80° 45' 53.6"
Leetonia, crossroads 2.5 miles south of; 24 feet southwest to guidepost, 39 feet southeast to mail box	40° 51' 03.0"	80° 45' 54.3"
T. 15, R. 3, corner to secs. 23, 24, 25, and 26	40° 50' 33.7"	80° 45' 54.5"
Crossroads at schoolhouse, T. 15, R. 3, corner to secs. 25, 26, 35, and 36	40° 49' 40.8"	80° 45' 54.9"

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Ts. 14 and 15, R. 3, corner secs. 1, 2, 35, and 36, at T road north.....	40° 48' 48.7"	80° 45' 55.0"
Lisbon, T road west, 0.25 mile east of; covered bridge, 21 feet northwest to corner fence post, 31 feet southeast to mail box.....	40 47 56.2	80 45 38.8
Lisbon, crossroads 0.25 mile northeast of, 30 feet northwest to cross on telephone pole, 42 feet southeast to water trough.....	40 46 51.9	80 45 47.4
Lisbon, in southwest corner of eastmost park; east corner of foundation to mounted gun bears N. 79° 15' W., distant 78.8 feet; bronze tablet in northeast corner of court-house bears S. 48° 05' W., distant 119.9 feet; iron post stamped "Prim. Trav. Sta. No. 45".....	40 46 20.3	80 46 04.6
T. 14, R. 3, corner secs. 15, 16, 21, and 22.....	40 46 12.3	80 48 13.6
Lisbon, T road south, 2.5 miles west of; 39 feet southwest to P. Joseph's mail box, 36 feet east to large white-oak tree.....	40 46 07.0	80 48 59.7
T. 14, R. 3, corner to secs. 17, 18, 19, and 20, at crossroads; 18 feet northeast to mail box, 36 feet southeast to 4 milepost.....	40 46 12.5	80 50 30.0
Lisbon, 5.5 miles west of; in southwest corner of Charles Miller's stable lot; cross on southwest corner to foundation to residence bears N. 56° 20' E., distant 111 feet; cross on southwest corner of stable foundation bears S. 66° E., distant 106 feet; cemented in sandstone post; aluminum tablet stamped "Prim. Trav. Sta. No. 47".....	40 45 55.9	80 51 56.8
Hanoverton, T road 3 miles northeast of; 46 feet northeast to guidepost, 10 feet south to cross on fence post....	40 45 58.4	80 52 42.6
Hanoverton, crossroads 2.5 miles east of; 18 feet south to mail box, 24 feet northwest to mail box.....	40 45 47.1	80 53 36.7
Hanoverton, T road north, 1.25 miles east of; 53 feet northeast to telephone pole, 36 feet northwest to cross on rail fence.....	40 45 21.0	80 54 11.6
Hanoverton, crossing of Canal and First streets at 60 feet northeast to southwest corner of Wilhelm Hotel, 241 feet northwest to lamp post.....	40 45 03.7	80 56 12.7
Kensington triangulation station, 1 mile south of Kensington, on highest point of wooded hill; a county road passes over south side; station mark: A marble post 48 by 6 by 6 inches, 36 inches in ground, in center of top of which is cemented a bronze triangulation tablet stamped "U. S. Geological Survey, Ohio".....	40 43 20.6	80 56 39.1

This line starts from Kensington triangulation station of the United States Geological Survey and runs northward over highways through Beloit to a point 1.75 miles west of Berlin Center.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 50, road crossing 620 feet west of	40 44 05.4	80 58 52.3
Lynchburg, road crossing 0.25 mile south of	40 44 19.4	81 00 02.4
Thomas (J. C.), field of, in northwest corner of, east side of north and south road and just south of road to east; cross on northeast corner of foundation to Thomas's residence, N. 66° W., distant 54.5 feet; nail in west face of locust tree on east and west fence line bears N. 87° 10' E., distant 117.6 feet; in top of sandstone post; aluminum tablet stamped "Prim. Trav. Sta. No. 48"	40 45 38.3	80 59 58.3
Road west, 18 feet north to guidepost, 24 feet south to corner stone	40 46 14.6	80 59 43.3
Section corner, T road east, 15 feet northwest to fence post, 27 feet northeast to guidepost	40 47 06.6	80 59 38.8
Section corner, no numbers, T road east at schoolhouse ..	40 47 59.0	80 59 38.4
New Alexander, crossroads 2 miles north of; 39 feet southwest to guidepost, 9 feet east to stone in center of east and west road	40 48 50.1	80 59 32.0
North Georgetown, crossroads 1 mile south of; 28 feet northeast to east end stone culvert, 30 feet northwest to cross on telephone pole	40 49 42.6	80 59 20.7
North Georgetown, crossroads, 30 feet southwest to guidepost, 32 feet northwest to American Hotel signpost	40 50 35.2	80 59 10.1
Section corner stone to sections 14 and 23, T. 6, R. 5, T road west at	40 51 28.0	80 59 39.0
Section corner stone, crossroads at	40 52 20.4	80 59 39.1
T road east, 33 feet southeast to northwest corner of schoolhouse, 19 feet northeast to north end of culvert ..	40 53 13.2	80 59 39.0
Westville, on property owned by R. F. Randolph; northwest corner to Randolph stable bears S. 25° E., distant 15.2 feet; northwest corner to tile foundation to blacksmith shop bears N. 59° 40' W., distant 65 feet; iron post stamped "Prim. Trav. Sta. No. 49"	40 54 08.0	80 59 38.8
Beloit, Pennsylvania Railroad at north and south road crossing	40 55 14.7	80 59 37.6
Section corner 23 and 24, T road west	40 55 50.0	80 59 37.4
Crossroads, 31 feet northeast to cross on telephone pole, 22 feet northwest to cross on milk platform	40 56 42.1	80 59 37.2
Snodes station, corner to secs. 11, 12, 13, and 14, road crossing of Pennsylvania Railroad	40 57 34.3	80 59 37.0
Corner to secs. 1, 2, 11, and 12	40 58 26.5	80 59 36.9
Corner to secs. 1 and 2, at T road S	40 59 16.2	80 59 36.8
Christie's pottery, crossroads at; 42 feet southwest to letter box, 39 feet southeast to cross on telephone pole ...	40 59 59.4	80 59 08.9

ROSS COUNTY.

NEW HOLLAND AND ROXBELL QUADRANGLES.

The following geographic positions were determined from primary traverse run in 1904 by J. R. Ellis. The line starts from adjusted position at southeast corner of Washington Court House quadrangle and follows public highways east to northwest corner of Chillicothe quadrangle.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Schoolhouse No. 9, in northeast corner of yard, northeast corner of schoolhouse bears S. 53° 45' W., distant 30.4 feet; center of wood pump in schoolhouse yard bears N. 71° 15' W., distant 51.2 feet; in top of sandstone post 5 by 10 by 30 inches, aluminum tablet stamped "Prim. Trav. Sta. No. 5"	° ' " 39 30 15.0	° ' " 83 15 03.5
Schoolhouse No. 9, center of bridge about 1 mile east of ..	39 30 19.1	83 13 49.3
Schoolhouse No. 1, Deerfield Township, T road west, 33 feet northwest to cross on board fence, 26 feet southwest to cross on east end of wood steps	39 30 23.4	83 12 30.7
Egypt Church, intersection of roads about 300 feet north of; 27 feet north to cross on corner fence post; 48 feet west to front yard gate	39 29 59.0	83 12 10.1
Clarksburg, T road north 1.5 miles west of; 30 feet northeast to cross on corner of fence; 33 feet northwest to cross on large corner fence post	39 30 11.4	83 10 46.1
Clarksburg, T road northwest 0.75 mile southwest of; 27 feet east to cross on gatepost; 25 feet southeast to cross on telephone pole	39 30 05.6	83 09 50.1
Clarksburg, in north corner of James Corcoran's property; southeast corner of foundation of Wilkins's residence bears N. 60° 30' W., distant 43 feet; northwest corner to brick foundation to James Corcoran's front porch bears S. 30° E., distant 96.3 feet; iron benchmark post stamped "Prim. Trav. Sta. No. 6"	39 30 16.2	83 09 11.7
Clarksburg, T road southwest 1 mile southeast of; 18 feet west to cross on white-oak tree; 28 feet north to A. L. Lippincott's mail box	39 29 41.5	83 08 20.6
Bridge, T road northeast about 400 feet southeast of (on Chillicothe pike); 33 feet north to cross on telephone pole, 40 feet east to cross on corner fence post	39 29 11.5	83 07 37.1
Carrie, T road north; 19 feet northwest to north corner of post-office porch; 50 feet east to cross cut on board fence	39 29 36.5	83 06 10.8
Deer creek, south end of steel-covered bridge over	39 29 12.1	83 05 06.3
T road northeast, 21 feet west to mail box; 30 feet north to cross on corner fence post	39 29 21.1	83 04 32.3
Schoolhouse No. 3, T road north; 27 feet southeast to cross on gatepost; 30 feet northwest to cross on corner fence post	39 28 55.0	83 03 13.8
Yellowbud, T road west 0.75 mile south of; 25 feet northeast to cross on telephone pole; 40 feet southwest to cross on corner fence post	39 29 28.7	83 00 48.9
Yellowhead, town pump at T road east	39 30 11.8	83 00 35.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Yellowbud, in southeast corner of George Kline's front yard on east side of canal; southeast corner of foundation to Kline's residence bears N. 43° 50' W., distant 25.9 feet; center of southeast corner fence post of yard bears S. 60° E., distant 3.4 feet; lower hinge of front yard gate bears S. 77° 20' W., distant 37.4 feet; in 7 by 14 by 26 inch sandstone post, aluminum tablet stamped "Prim. Trav. Sta. No. 7"	39 30 12.0	83 00 29.8
Yellowbud, T road east about 1.75 miles south of; 21 feet southwest to cross on telephone pole, 21 feet northeast to cross on fence post	39 28 39.3	83 01 02.5

PORTAGE COUNTY.

RAVENNA QUADRANGLE.

The following geographic positions were obtained by Mr. J. R. Ellis, topographic aid, in 1904, by primary traverse line along the Lake Erie, Alliance and Western Railroad from Phalanx to Deerfield; thence along highways to Atwater, where it was tied to a traverse position located in 1900:

Geographic positions along highways.

Station.	Latitude.	Longitude.
Christie's pottery, crossroads 1 mile north of; 35 feet north to cross on board fence, 39 feet north to corner fence post	41 00 37.1	80 59 10.7
Berlin Center, crossroads, 1.75 miles west of; at school-house	41 01 28.1	80 59 11.4
T road south at stone culvert	41 01 28.8	81 00 08.2
Deerfield, station, in southeast corner of Hubbards orchard on north side of road east and west, 418 feet east of road crossing, northeast corner of house owned by Mullen Coal Co. bears S. 51° 15' E., distant 160.1 feet; nail in root of black oak tree on south side road bears S. 42° 15' W., distant 72 feet; iron post stamped "Prim. Trav. Sta. No. 38"	41 01 29.3	81 01 11.8
T road south, 27 feet southeast to telephone pole	41 01 28.8	81 02 34.7
T. 1, R. 6, corner to secs. 29, 30, 31, and 32	41 01 28.5	81 03 02.1
T road south, 36 feet southeast to cross on corner fence post, 13 feet north to A. H. Legaller's mail box	41 01 28.9	81 03 54.4
Deerfield, 0.5 mile west of; T. 1, R. 6, corner to secs. 43, 44, 52, 53	41 01 29.0	81 04 46.1
T. 1, R. 6, corner secs. 55 and 56, crossroads, 36 feet southwest to guidepost, 40 feet southeast to large fence post ..	41 01 29.0	81 05 55.6
Crossroads, 40 feet northeast to cross on corner yard fence, 40 feet southeast to cross on corner board fence	41 01 24.6	81 07 25.0
Atwater, crossroads	41 01 25.2	81 08 53.3
Atwater, in northeast corner of George Heiser's front lawn, iron post stamped "Prim. Trav. Sta. No. 37"	41 01 25.1	81 09 41.5
Atwater, Pennsylvania Railroad at east and west road crossing	41 01 25.4	81 09 49.4

Geographic positions along the Lake Erie, Alliance and Wheeling Railroad between Newton Falls and Deerfield.

Station.	Latitude.	Longitude.
Newton Falls, 2.66 miles south of; in southwest corner of D. T. Hott's farm, at east and west road crossing, nail in root of gum tree bears N. 53° 40' E., distant 72.4 feet; nail in root of black-oak tree bears S. 79° 55' E., distant 39.8 feet, in sandstone post, aluminum tablet stamped "Prim. Trav. Sta. No. 36"	° ' " 41 09 10.8	° ' " 81 00 05.3
Pritchard, road crossing	41 08 03.1	81 00 29.2
Road crossing	41 06 48.2	81 00 51.6
Diamond post-office, road crossing at station	41 05 55.5	81 01 21.3
Diamond post-office, road crossing 1 mile south of	41 05 14.0	81 01 21.3
Davis, road crossing at station	41 04 22.3	81 01 20.7
Davis, road crossing east and west 0.75 mile south of station	41 03 43.8	81 01 16.9
Schoolhouse, road crossing	41 02 47.6	81 01 16.7
Deerfield station, road crossing east and west 70 feet northwest of	41 01 29.0	81 01 17.2

JACKSON, PIKE, AND SCIOTO COUNTIES.

SCIOTO QUADRANGLE.

The line starts from adjusted position at Glade and runs south along highways to southeast corner of quadrangle; thence along Baltimore and Ohio Southwestern Railroad to Sciotoville; thence along Norfolk and Western Railroad to Portsmouth, and north to Sargents. A line was also run from Portsmouth along highway to Scioto triangulation station, United States Coast and Geodetic Survey.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Glade, north and south road crossing	° ' " 39 00 48.9	° ' " 82 46 58.4
Glade, in John Whitman's woods pasture; 440 feet south of road crossing; on east side of north and south road, spike in north face of white-oak tree bears S. 14° 10' E., distant 27.3 feet; spike in white-oak tree bears S. 46° E., distant 31.6 feet; iron bench-mark post set 40 inches in the ground, stamped "Prim. Trav. Sta. No. 20"	39 00 44.6	82 46 58.5
Glade, T road west 1 mile south of; 15 feet east to cross on fence, 30 feet northwest to cross on corner fence post	39 00 04.0	82 47 02.3
Schoolhouse, T road west just south of; 15 feet east to cross on rail fence, 36 feet southwest to cross on corner fence post	38 59 21.2	82 46 40.9
Crabtree's (Mary), residence, crossroads at; 21 feet northwest to cross on picket fence, 35 feet southeast to cross or corner post to yard fence	38 58 41.6	82 46 27.0

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Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
T road east, 30 feet southeast to cross on fence post; 21 feet northeast to cross on white-oak tree	° ' " 38 57 27.2	° ' " 82 46 15.5
T. 5, R. 19, corner to secs. 5 and 6	38 56 46.6	82 46 08.4
Myrtle post-office (discontinued), 0.25 mile north of; in ground in northwest part of Hamilton churchyard; wire nail in cross cut on south face of large white-oak tree on north side of east and west road bears N. 27° E., distant 49.5 feet; cross cut on northwest corner of foundation to church bears S. 15° 45' E., distant 13.1 feet, iron bench-mark post stamped "Prim. Trav. Sta. No. 21"	39 55 18.8	82 45 34.8
T. 5, R. 19, quarter corner between secs. 8 and 17	39 54 54.5	82 45 52.5
McDaniel's residence, intersection of roads south of; 30 feet north to cross on sycamore tree; 24 feet south to arrow on corner fence post.....	39 54 38.9	82 46 42.8
Schoolhouse No. 12, near; cemented in solid rock, bench-mark tablet stamped elevation "678 feet"	38 54 16.1	82 46 42.7
Dever's (J. H.) farm, T road west just north of covered bridge; 27 feet southwest to cross on top board fence, 24 feet east to J. H. Dever's mail box.....	39 53 43.5	82 46 18.6
Iron bridge over Brushy Fork, T road west; 60 feet west to east end of bridge; 60 feet north to J. D. Martin's mail box	39 53 10.8	82 46 30.0
T. 5, R. 20, 0.25 mile west of corner to secs. 28, 30, 32, and 33.....	38 52 12.1	82 45 59.6
Intersection of roads near church; east end of small bridge.....	38 51 24.0	82 46 06.7
Pinkerman, in Liberal Brethren Church, southwest corner of foundation to church bears N. 67° E., distant 6.3 feet; northwest corner foundation to church bears N. 45° E., distant 38 feet; iron post set 36 inches in the ground stamped "Prim. Trav. Sta. No. 22"	39 50 17.4	82 46 09.9

Geographic positions along the Baltimore and Ohio Southwestern Railroad between Webster and Scioto Furnace.

Station.	Latitude.	Longitude.
Webster, road crossing Baltimore and Ohio Southwestern Railroad about 0.75 mile southwest of	° ' " 39 48 57.4	° ' " 82 44 27.0
Trestle No. 374, north and south road crossing under....	38 48 28.8	82 45 35.5
Scioto Furnace station	38 47 57.9	82 45 54.8

Geographic positions along highways.

Station.	Latitude.	Longitude.
Cameron farm, crossroads; 33 feet southeast to cross on apple tree	39 46 49.1	82 45 17.7
Scioto Furnace, 3 miles south of; in orchard at John Bisco's farm; southwest corner of stone foundation bears N. 40° 35' E., distant 108.6 feet; wire nail in south face of apple tree used for gatepost bears N. 30° 45' E., distant 22.5 feet; iron bench-mark post stamped "Prim. Trav. Sta. No. 23"	39 45 48.3	82 46 24.4
Corner to secs. 4, 5, 8, and 9, T road west; 24 feet northwest to E. Strickland's mail box; 24 feet southeast to cross on fence post	39 45 22.7	82 46 38.0

Geographic positions along the Baltimore and Ohio Southwestern Railroad between Scioto-ville and Lilly.

Station.	Latitude.	Longitude.
Sciotoville, in east corner of W. M. Price's property; on north side of Baltimore and Ohio Southwestern Railroad just off of right of way; northeast corner of foundation to Sciotoville Milling Company's building bears S. 6° 50' E., distant 168.5 feet; northeast corner of Baltimore and Ohio Southwestern Railroad depot bears S. 59° W., distant 441.5 feet; iron bench-mark post set 42 inches in the ground stamped "Prim. Trav. Sta. No. 26."	39 45 37.9	82 53 26.9
Milepost 48, road crossing north and south 600 feet west of ..	39 46 05.0	82 52 14.2
Slocum, road crossing north and south west of platform..	39 45 59.8	82 50 32.9
Slocum, road crossing east and west 1 mile east of	39 45 58.1	82 49 39.6
Milepost 45, road crossing 220 feet south of	39 46 29.8	82 49 16.7
Trestle No. 387, road crossing under	39 46 36.3	82 48 27.7
Lilly, road crossing at south end of switch	39 47 06.5	82 47 46.5
Lilly, overhead road crossing 0.75 mile northeast of	39 47 31.8	82 47 09.7

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Geographic positions along the Norfolk and Western Railroad between Doty, Portsmouth, and Sargents.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Doty station	39 45 19.5	82 54 23.9
New Boston, road crossing just west of Burgess steel plant (south track)	39 44 50.7	82 56 08.6
Norfolk and Western shops, road crossing north and south (south track)	39 44 28.6	82 57 25.5
Portsmouth, Gallia street crossing (south track)	39 44 15.4	82 58 35.4
Portsmouth, northeast corner of Tracy Park; northwest corner of brick foundation to residence on southeast corner of Tenth and Findlay streets bears S. 80° 15' E., distant 101.1 feet; northeast corner to foundation of Tracy monument bears S. 63° 30' W., distant 261.9 feet; iron bench mark post stamped "Prim. Trav. Sta. No. 27."	39 44 17.1	82 59 40.3
Chillicothe and Portsmouth pike crossing	39 44 44.5	82 59 32.6
Junction, road crossing under trestle No. 1068; 700 feet north of (east track)	39 45 43.7	82 59 28.2
Milepost 97, private road crossing 870 feet north of (west track)	39 46 53.7	82 59 07.7
Milepost 96 (east track)	39 47 33.0	82 59 09.4
Chillicothe and Portsmouth pike crossing under trestle No. 1081 (west track)	39 48 38.7	82 59 05.6
Davis station	39 49 34.2	82 58 57.3
Davis station, road crossing under trestle No. 1083, 1 mile north of	39 50 28.0	82 59 03.0
Schoolhouse, private road crossing	39 51 07.1	82 59 12.0
Milepost 90, private road crossing 200 feet south of	39 52 13.2	82 59 38.3
Lucasville, at southwest corner of Purdue Brothers' roller mills, southeast corner of foundation to elevator bears N. 58° 20' W., distant 53.5 feet; cross on southwest corner of foundation to roller mills bears N. 1.4 feet distant; iron bench mark post set 42 inches in the ground, stamped "Prim. Trav. Sta. No. 28."	39 52 51.6	82 59 44.4
Milepost 88, private road crossing 1,080 feet south of	39 53 45.3	83 00 05.1
Milepost 87, Chillicothe and Portsmouth pike crossing northwest and southeast 630 feet north of	39 54 48.0	83 00 44.4
Clifford station	39 55 29.3	83 01 12.4
Wakefield, road crossing east and west 1 mile south of	39 57 14.3	83 01 22.6
Wakefield, road crossing	39 58 13.1	83 01 14.2
Wakefield, Chillicothe and Portsmouth pike crossing 1 mile north of	39 58 57.7	83 01 19.5
Sargents Pit, private road crossing 760 feet south of milepost 81 near	39 59 38.0	83 01 21.0

*Geographic positions along highway between Portsmouth and Scioto triangulation station,
United States Coast and Geodetic Survey.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Portsmouth, south end of wagon bridge over Scioto River.	38 43 53.5	83 00 40.4
Bertha, T road northwest just south of; 12 feet north to cross on post; 20 feet east to cross on telephone pole...	39 44 51.5	83 01 50.0
Scioto triangulation station (United States Coast and Geodetic Survey); on land of George Davis, 1.5 miles west of his distillery at west side of Scioto River, which is about 1.5 miles northwest of Portsmouth. Station mark: Center is marked by a pottery pyramid sunk 3 feet below surface, over which was placed a 6-inch drain tile pipe 2 feet long filled with concrete, in center of which is an iron spike. Four 4-inch pipes, each filled with concrete, with a nail marking their centers, are, one north, 6.29 feet; one south, 6.18 feet; one east, 6.25 feet; and one west, 6.11 feet.....	38 45 47.7	83 03 03.6

MAHONING AND TRUMBULL COUNTIES.

WARREN QUADRANGLE.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from an adjusted position at Phalanx station, runs southward over the Lake Erie, Alliance and Wheeling Railroad through Diamond, and connects with adjusted position at Deerfield. A line was also run from an adjusted position near Berlin Center east over highways along south border of quadrangle to Canfield; thence north over highways to Ohlstown; thence north over Erie Railroad, and was tied to an adjusted position 5 miles east of Warren.

Geographic positions along the Lake Erie, Alliance and Wheeling Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Phalanx station, bench mark No. 32.....	41 14 55.7	80 57 17.3
Briceville, crossing of the Lake Erie, Alliance and Wheeling Railroad and the Erie Railroad.....	41 13 45.6	80 57 31.1
Road crossing east and west	41 13 16.3	80 57 43.6
Private road crossing east and west.....	41 11 55.6	80 58 03.2
Newton Falls, road crossing 320 feet north of station.....	41 11 16.5	80 58 21.7
Newton Falls, road crossing north and south 1 mile south of	41 10 34.5	80 59 01.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
Schoolhouse, crossroads; 31 feet southwest to guidepost; 27 feet southeast to A. L. Bardos's mail box.....	41 01 28.1	80 59 11.4
Berlin Center, crossroads, 24 feet southeast to pump, 90 feet northeast to corner of stone porch.....	41 01 28.6	80 56 52.2
Berlin Center, Pennsylvania Railroad, east and west road crossing 1 mile east of.....	41 01 28.5	80 55 33.7
Berlin Center, 2 miles east of; in southwest corner of H. C. Beardsley's farm at crossroads, nail in root of hickory tree bears north 57° 30' E., distant 24.3 feet; nail in root of hickory tree bears N. 26° 30' W., distant 8.5 feet; iron post stamped "Prim. Trav. Sta. No. 39"....	41 01 27.3	80 54 20.8
Ellsworth Center, crossroads; 40 feet southwest to guide- post, 100 feet northeast to iron pump.....	41 01 28.0	80 51 27.0
Meander Creek, center of bridge over.....	41 01 29.8	80 50 18.2
T road south, 42 feet northwest to Peach Hill Coal Co.'s mail box, 32 feet north to cross on picket fence.....	41 01 28.7	80 48 34.1
Canfield, crossroads 1.5 miles west of; 40 feet southwest to guidepost, 36 feet southeast to mail box.....	41 01 29.3	80 47 16.2
Canfield, west end of stone water trough at crossroads...	41 01 29.4	80 45 38.6
Canfield, crossroads 1 mile north of; 43 feet southwest to guidepost, 36 feet northeast to telephone pole.....	41 02 39.2	80 45 38.4
Canfield, T road west 2 miles north of; 36 feet southwest to corner hedge fence, 45 feet northwest to hickory post...	41 03 20.4	80 45 38.3
Sample, crossroads; 17 feet southeast to guidepost, 52 feet northeast to churchyard gate.....	41 04 08.4	80 45 42.0
Austintown, crossroads 1 mile south of; 33 feet southeast to corner of yard fence, 35 feet southwest to telephone pole.....	41 05 02.6	80 45 46.0
Austintown, iron pump at crossroads.....	41 05 58.6	80 45 50.0
National Sandstone plant, road crossing tramway to.....	41 06 50.2	80 46 26.1
Ohlstown, road crossing Erie Railroad.....	41 07 18.8	80 46 47.8
Mineral Ridge, in southeast corner of E. R. Edwards's farm on west side of road; northeast corner of Andrew Armadio's residence, bears S. 58° W., distant 20.1 feet, southwest corner of Erie Railroad depot, bears N. 2° E. distant 355 feet, iron post stamped "Prim. Trav. Sta. No. 40".....	41 08 19.3	80 46 26.0
Road crossing east and west.....	41 08 59.3	80 46 35.6
Niles and Mineral Ridge pike crossing.....	41 09 38.3	80 46 07.5
Niles, crossing of Erie Railroad (branch) and Baltimore and Ohio Southwestern Railroad.....	41 10 34.0	80 45 20.3
Niles, Cedar street and Vienna avenue, 21 feet west to stone hitching post, 45 feet northeast to telephone pole...	41 11 22.6	80 45 11.9
Crossroads.....	41 12 19.4	80 44 25.2
T road east, 25 feet northwest to Hayrick's mail box, 27 feet southwest to front yard gate.....	41 13 26.2	80 44 25.4

This line starts at an adjusted position at Phalanx and runs east over Erie Railroad and highways along south border of quadrangle to a point 4 miles east of Warren.

Geographic positions along Erie Railroad between Phalanx and Warren.

Station.	Latitude.	Longitude.
Phalanx station, road crossing of Erie Railroad 1 mile west of	° ' " 41 15 12.8	° ' " 80 58 39.8
Phalanx station, in southeast corner of G. W. Strong's yard; southeast corner of foundation of Strong's house bears N. 24° 20' W., distant 95.5 feet; north rail of north track of Erie Railroad at road crossing bears S. 6° 40' E., distant 157.5 feet; iron post stamped "Prim. Trav. Sta. No."	41 14 55.7	80 57 17.3
Phalanx station, road crossing 1 mile east of	41 14 37.1	80 56 04.4
Milepost 48, road crossing 400 feet east of	41 14 22.8	80 55 03.5
Milepost 49, road crossing 1,200 feet west of	41 14 17.9	80 54 18.5
Leavittsburg, road crossing just west of station	41 14 15.7	80 52 50.3
Milepost 51, road crossing 500 feet east of	41 14 09.7	80 51 38.3
Warren Tile Co., road crossing north and south	41 14 01.5	80 50 09.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
Warren, copper bolt in south meridian stone in court-house yard	° ' " 41 14 11.6	° ' " 80 49 06.8
Warren, Market street crossing Pittsburgh, Painesville and Fairport Railroad	41 14 10.8	80 48 13.0
Mosquito Creek, crossroads 0.5 mile west of; 30 feet north to mail box, 36 feet southeast to mail box	41 14 13.8	80 45 58.0
Crossroads, in southwest corner of Z. T. Ewalt's garden on north side of road just west of; northwest corner foundation of Ewalt's new house bears N. 43° 30' W., distant 83.6 feet; southwest corner of foundation to porch of Ewalt's old house bears S. 89° 10' E., distant 208.6 feet; iron post stamped "Prim. Trav. Sta. No. 33"	41 14 18.0	80 44 27.9

JACKSON, PIKE, AND ROSS COUNTIES.

WAVERLY QUADRANGLE.

The line starts from primary traverse station No. 15 (near northwest corner of quadrangle) and follows the Chillicothe and Portsmouth pike south to Waverly; thence south along Norfolk and Western Railroad to Sargents; thence east along highways to Glade; thence north along highway to tie point at Gillespieville.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Waller, forks of road about 2 miles south of; 45 feet west to G. W. Bender's mail box; 40 feet northeast to cross on telephone pole	° ' " 39 14 53.4	° ' " 82 58 50.9
Milepost, "Waverly, 8 miles," center of Chillicothe and Portsmouth pike	39 14 06.7	82 59 03.7
T road west, 15 feet east to cross on gatepost, 27 feet southwest to cross on white oak tree	39 13 20.0	82 59 01.9
Hermit Cave, road east near, 15 feet northwest to southwest corner of bridge, 30 feet southeast to mail box	39 11 53.9	82 58 43.7
Coler's store, T road northeast, 30 feet east to pump, 27 feet to arrow on telephone pole	39 11 02.8	82 58 34.2
Alma, T road west about 1 mile south of; 36 feet southeast to cross on telephone pole	39 10 31.5	82 58 30.6
Waverly, dirt road northeast, 2 miles north of; 15 feet east to cross on board fence, 21 feet northwest to cross on telephone pole	39 09 05.9	82 58 37.8
Waverly, T road west 0.75 mile north of; 15 feet east to cross on telephone pole; 18 feet northwest to northeast corner of bridge	39 08 18.0	82 58 55.9
Waverly, in west corner of court-house yard, west corner of foundation to court-house bears S. 62° 50' E., distant 31.7 feet; corner iron fence post to court-house yard bears W. 2.9 feet, iron bench mark post set 36 inches in ground stamped "Prim. Trav. Sta. No. 16"	39 07 33.8	82 59 04.0

Geographic positions along the Norfolk and Western Railroad between Glen Junction and Sargent station.

Station.	Latitude.	Longitude.
Glen Junction, crossing of Norfolk and Western and Detroit Southern railroads	° ' " 39 06 48.4	° ' " 82 58 41.5
Chillicothe and Portsmouth pike crossing	39 05 53.6	82 58 21.0
Milepost 634, 600 feet north of; private road crossing	39 05 09.3	82 59 03.0
Glen Junction, private road crossing 2.75 miles south of ..	39 04 34.3	82 59 39.7
Piketown station, road crossing 165 feet north of	39 03 51.0	83 00 50.3
Piketown, crossing Chillicothe and Portsmouth pikes 1 mile south of	39 03 14.6	82 01 09.9
Switch block to spur	39 02 34.9	82 01 35.3
Sargents, road crossing east and west 1 mile north of	39 01 20.9	82 01 32.7
Sargents station, 1,200 feet north of; in southwest corner of Mrs. Carrie Sargent's farm; on east side of Chillicothe and Portsmouth pike; wire nail in cross cut in west face of sugar maple tree bears S. 88° 05' E.; 9 feet southwest to corner post to southwest corner of Mrs. Sargent's farm; iron bench-mark post stamped "Prim. Trav. Sta. No. 17"	39 00 39.1	82 01 24.8

Geographic positions along highways.

Station.	Latitude.	Longitude.
Shyville, forks of road 0.25 mile southeast of; 24 inches southwest to cross on corner fence post, 18 inches west to south end of culvert.....	° ' " 39 00 27.7	° ' " 82 59 07.8
Church, intersection of roads north of; 27 feet northwest to cross on hickory tree, 27 feet east to cross on small black oak.....	39 00 50.1	82 57 05.9
Bobs, road west about 0.5 mile northeast of; 21 feet west to cross on large white oak tree, 22 feet east to cross on corner fence post.....	39 01 40.6	82 56 07.7
Beaver, intersection of roads 5 miles west of; 18 feet southeast to guide post, 18 feet southwest to cross on small oak tree.....	39 02 05.0	82 55 17.8
Beaver, crossroads, at Arminstrout schoolhouse, 4 miles west of; 21 feet southeast to corner fence post, 30 feet southwest to cross on board fence.....	39 02 00.2	82 54 05.3
Beaver, 2.5 miles west of; church at crossroads, in northeast corner of churchyard; cross cut on northeast corner of foundation to church bears S. 56° 15' W., distant 27.3 feet; 2 nails in blaze on west face of locust tree in northeast corner of churchyard bears S. 82° 30' E., distant 6.5 feet; iron bench-mark post set 42 inches in the ground, stamped "Prim. Trav. Sta. No. 18"....	39 01 56.7	82 52 43.8

Geographic positions along the Detroit Southern Railway between Beaver and Glade.

Station.	Latitude.	Longitude.
Beaver, Beaver and Waverly pike crossing Detroit Southern Railroad, 1.5 miles west of.....	° ' " 39 01 53.9	° ' " 82 51 30.2
Beaver, road crossing north and south, 1 mile west of....	39 01 40.6	82 50 47.6
Beaver station, road crossing north and south, 35 feet east of.....	39 01 25.2	82 49 39.2
Beaver, road crossing north and south at east end of siding.....	39 01 18.3	82 49 08.6
Glade, private road crossing 0.75 mile west of.....	39 00 59.2	82 47 44.1
Glade, north and south road crossing.....	39 00 48.9	82 46 58.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
Salem Church, intersection of roads at bridge, 0.25 mile north of; 35 feet west to northeast corner of bridge....	° ' " 39 01 34.4	° ' " 82 47 12.9
Hoover's (H. B.) residence, road east through gate at bridge; 18 feet southeast to cross on butternut tree, 16 feet northeast to cross on locust tree.....	39 02 29.5	82 45 42.0
Road southwest; 33 feet southwest to cross on corner fence post, 30 feet west to cross on corner fence post....	39 03 29.0	82 46 38.5
Bethel Church, T road east at; 22 feet north to mail box, 27 feet west to cross on rail fence.....	39 03 48.8	82 46 41.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Schoolhouse, intersection of roads just south of; 43 feet south to C. L. Grover's mail box, 15 feet southwest to cross on board fence.....	39 04 25.6	82 46 11.0
Vance's store, T road west 1.5 miles south of; 10 feet southwest to M. A. Harper's mail box, 18 feet east to cross on fence post.....	39 04 54.0	82 45 53.1
Vance's store or Eastbrooke, T road west; 15 feet northeast to door of store, 24 feet southwest to cross on front-yard gatepost.....	39 06 14.7	82 45 19.4
Bridge, road southeast; 27 feet to northeast corner of bridge; 15 feet northeast to cross on small sycamore tree.....	39 06 57.1	82 45 09.6
Limerick, in southeast corner of T. J. Beatty's garden, southeast corner of foundation to Beatty's residence bears N. 34° W., distant 81 feet; center of commissioners' plate on north truss of bridge over Pidgeon Creek bears south 63° 30' E., distant 96.1 feet; iron bench-mark post set 40 inches in the ground, stamped "Prim. Trav. Sta. No. 19".....	39 07 31.4	82 45 01.4
Limerick, intersection of roads 1.5 miles north of; 12 feet southwest to mail box, 27 feet northeast to cross on locust tree at corner of fence.....	39 08 43.6	82 45 08.1
Springer, T road east 1 mile southwest of; 20 feet northeast to cross on gatepost, 30 feet west to cross on board fence.....	39 09 46.5	82 45 54.1
Springer, T road west at; 30 feet west to cross on telephone pole, 50 feet southeast to cross on telephone pole.....	39 10 20.9	82 44 45.2
McGill's store, intersection of roads; 40 feet northeast to east corner of bridge, 40 feet southwest to store door...	39 11 15.1	82 45 04.5
Cemetery, intersection of roads about 400 feet east of; 18 feet east to cross on rail fence, 15 feet northwest to west end of small stone culvert.....	39 11 28.1	82 45 39.6
T road west at line between Jackson and Benton counties; 27 feet southwest to cross on walnut tree; 45 feet northwest to cross on corner fence post.....	39 12 27.6	82 45 39.0

Geographic positions along the Baltimore and Ohio Southwestern^o Railroad between West Junction and Vigo.

Station.	Latitude.	Longitude.
West Junction, overhead road crossing about 0.25 mile east of.....	39 13 02.6	82 45 50.1
Milepost 111, road crossing 330 feet southeast of.....	39 13 58.3	82 46 52.9
Vigo station, road crossing north and south 90 feet southeast of.....	39 14 52.2	82 47 33.5

MAHONING AND TRUMBULL COUNTIES.

YOUNGSTOWN QUADRANGLE.

The following geographic positions were obtained by primary traverse run in 1904 by Mr. J. R. Ellis. A line starts from an adjusted position 5 miles east of Warren and follows highways east through

Paynes Corners to Sharon, where it ties to boundary monument No. 51 on Ohio-Pennsylvania State line. A line was also run west from Ohio-Pennsylvania State line boundary monument No. 65½ near Lowellville along highways near south border of quadrangle to Canfield.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Warren, U. S. B. M. Post No. 33, 5 miles east of.....	41	14	18.0	80	44	27.9
T road north at shops, 28 feet northwest to mail box, 42 feet northeast to blacksmith shop (southwest corner of).....	41	14	12.8	80	42	45.7
Schoolhouse No. 7, T road north.....	41	14	17.8	80	41	24.3
Vienna crossroads; T. 4 N., R. 2. W., corner to secs. 17, 18, 27, and 28.....	41	14	15.9	80	39	49.7
Vienna, 1.5 miles east of; in northeast corner of Newman's farm at crossroads, nail in west part of large maple tree on north side of road bears N. 64° 20' E., distant 110.4 feet, cross on south end stone culvert bears N. 75° 30' W., distant 96.7 feet, iron post stamped "Prim. Trav. Sta. No. 41".....	41	14	15.7	80	38	11.5
Paynes Corners, crossroads; 42 feet northwest to guidepost, 30 feet southwest to west end stone culvert.....	41	14	13.2	80	37	01.6
T. 4 N., R. 1 W., corner secs. 14 and 23, T road north, 19 feet northeast to east end of box culvert.....	41	14	09.2	80	35	50.2
Brookfield, T road north at, 33 feet northwest to guideboard on telephone pole, 36 feet south to iron pump....	41	14	02.7	80	34	05.5
Schoolhouse, road northwest about 600 feet east of, 35 feet north to guidepost, 24 feet south to cross on fence.....	41	14	07.6	80	31	55.9
Sharon, Ohio-Pennsylvania State boundary monument No. 51 on High street in west part of.....	41	13	55.1	80	31	09.2
Ohio-Pennsylvania State line monument No. 65½.....	41	01	27.3	80	31	08.9
T. 1 N., corner secs. 49, 50, 55, and 57, T road north at schoolhouse.....	41	01	25.9	80	32	37.6
Crossroads at schoolhouse, corner to secs. 34, 35, 42, and 43, 36 feet southeast to guidepost, 33 feet northwest to post.....	41	01	25.5	80	34	03.2
T. 1 N., corner secs. 15, 16, 25, and 26, T road north, 24 feet northeast to mail box, 30 feet south to cross on corner fence post.....	41	01	25.1	80	35	29.5
Poland, T road northeast at Bishop's Hotel, 33 feet east to lamp-post, 39 feet north to hotel signpost.....	41	01	25.3	80	36	49.8
Poland, 1 mile west of; in southeast corner of Joseph Hitchcock's farm, at crossroads, iron guidepost bears S. 89° 25' W., distant 58.6 feet; southwest corner of Hitchcock's residence bears S. 38° 15' W., distant 173 feet, iron post stamped "Prim. Trav. Sta. No. 42".....	41	01	27.5	80	38	04.0
Oakland, road crossing Youngstown Southern Railroad....	41	01	27.6	80	39	18.3
Schoolhouse, T road north; 32 feet northwest to John Hitchcock's mail box, 20 feet northeast to northwest corner culvert.....	41	01	28.2	80	40	55.7
Canfield, crossroads 2½ miles east of; 19 feet southeast of mail box, 42 feet northwest to cross on fence post.....	41	01	28.7	80	42	40.8
Canfield, crossroads at schoolhouse 1.5 miles east of.....	41	01	29.0	80	44	13.2
Canfield, west end of water trough at crossroads.....	41	01	29.4	80	45	38.6

PENNSYLVANIA.

TRIANGULATION STATIONS.

JUNIATA AND PERRY COUNTIES.

LOYSVILLE AND HONEYGROVE QUADRANGLES.

Control for these two quadrangles was obtained in September, 1904, by Mr. George T. Hawkins, topographer, who extended triangulation westward from stations Newport and Peters. In addition to reoccupying these Mr. Hawkins selected, built, and occupied six new stations.

BIG KNOB, PERRY COUNTY.

On spur of Tuscarora Mountain, about 3 miles northwest of Blair, Pa. It is reached by going 1 mile on Newport road and turning to left through lane up to top of ridge by wood road, then going 1 mile west along ridge to signal.

Signal: Red-oak tree 8 inches in diameter.

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

Reference marks: The red-oak signal tree; true azimuth, $123^{\circ} 55'$; distance, 14 feet from station mark.

[Latitude $40^{\circ} 21' 37.42''$. Longitude $77^{\circ} 32' 46.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blair	52 47 07	232 41 32	4.18586
Shade	150 58 40	330 55 51	4.10210
Tuscarora	225 00 15	45 05 22	4.19821
Bowers	276 22 09	96 29 36	4.21447

BLAIR, FRANKLIN-JUNIATA COUNTY LINE.

(Not occupied.)

On a knob on the Tuscarora ridge, about 2 miles east of Blair, Pa. The knob was nearly cleared of timber and one tree left for signal, with white flag in top. The point is reached by going about 1.5 miles southeast on road from Blair to old sawmill, then up the mountain on foot.

Station mark: The lone signal tree.

[Latitude $40^{\circ} 16' 36.30''$. Longitude $77^{\circ} 41' 23.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shade	196 32 58	16 35 44	4.32693
Big Knob	232 41 32	52 47 07	4.18586

BOWERS, PERRY COUNTY.

About 3 miles southwest of Loysville by road, on land owned by Sam Waller, about 0.25 mile east of Waller's house. It is nearly 3 miles west by road from Landisburg, on east side of fence row between fields. It is much lower than surrounding timbered hills, but overlooks much of surrounding country.

Station mark: A marble post 6 by 6 by 30 inches set 24 inches in ground and resting on solid rock.

[Latitude 40° 20' 37.92". Longitude 77° 21' 16.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Big Knob.....	96 29 36.00	276 22 09.00	4.21447
Tuscarora	158 34 55.74	338 32 35.58	4.14465
Eschol	206 00 35.75	26 03 00.42	4.0791292
Newport.....	237 09 00.95	57 17 39.23	4.3508360
Peters.....	264 24 56.20	84 35 54.16	4.3818308

ESCHOL, PERRY COUNTY.

In cleared field 100 yards west of road and 0.25 mile northwest of forks of road, 1½ miles southeast of village of Eschol, nearly 2 miles northwest of Mansville, and 4½ miles northeast of Ellittsburg.

Signal: A lumber tripod.

Station mark: A marble post 6 by 6 by 30 inches set 26 inches in the ground.

[Latitude 40° 26' 27.46". Longitude 77° 17' 32.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bowers.....	26 03 00.42	206 00 35.75	4.0791292
Tuscarora	102 03 45.00	281 58 59.85	4.0248510
Newport.....	264 13 22.18	84 19 36.14	4.1352045

NEWPORT, PERRY COUNTY.

Situated on timbered ridge 2 miles south of Newport. The summit was cleared of timber and lone oak tree 8 inches in diameter was left standing on the highest point. It can be reached by following Duncannon road 1½ miles south from Newport to old sawmill site, thence southwest by trail to summit.

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Station mark: Center of lone signal tree.

[Latitude $40^{\circ} 27' 11.6''$. Longitude $77^{\circ} 07' 56.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bowers.....	57 17 39.23	237 09 00.95	4.3508360
Eschol.....	84 19 36.14	264 13 22.18	4.1352045
Tuscarora.....	92 06 37.12	271 55 37.90	4.3793545
Millerstown.....	167 04 02.00	347 02 41.00	4.11684
Spruce.....	217 36 06.00	37 39 10.00	4.03919
Peters.....	332 33 37.00	152 35 57.00	4.04464

PETERS, PERRY COUNTY.

Situated on Peters Mountain, about 4 miles west of Duncannon; about 2 acres cleared of timber and lone pine tree 24 inches in diameter left standing for signal.

Station mark: A copper bolt cemented in solid rock.

Reference mark: The lone signal tree, true azimuth $331^{\circ} 09'$. 4 feet distant.[Latitude $40^{\circ} 21' 52.7''$. Longitude $77^{\circ} 04' 19.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bowers.....	84 35 54.16	264 24 56.20	4.3818308
Tuscarora.....	110 17 38.74	290 04 20.12	4.4907718
Newport.....	152 35 57.00	332 33 37.00	4.04464
Spruce.....	184 53 30.00	4 54 14.00	4.26888

SHADE, MIFFLIN-JUNIATA COUNTY LINE.

On Shade Mountain, on land owned by Alexander Anderson, about 2 miles northwest of Reedsgap post-office and about 3 miles nearly west of McCoytown. Timber on summit. Go from Reedsgap 0.75 mile, then turn along road to right opposite signal and walk to top.

Signal: Hickory tree 20 inches in diameter.

Station mark: A bronze tablet cemented in solid rock.

[Latitude $40^{\circ} 27' 35.98''$. Longitude $77^{\circ} 37' 06.54''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blair.....	16 35 44	196 32 58	4.32693
Tuscarora.....	269 37 42	89 45 38	4.23803
Big Knob.....	330 55 51	150 58 40	4.10210

TUSCARORA, JUNIATA-PERRY COUNTY LINE.

On summit of Tuscarora Mountain 5 miles by road from Ickesburg. To reach signal go from Ickesburg on Port Royal road to fork of road near summit, and 0.25 mile above spring take left hand and follow top of ridge along old wood road to signal. Instrument elevated 38 feet.

Station mark: Pine tree with target on top. One hundred feet north of wood road.

Reference mark: A bronze tablet 8 feet due northeast of signal tree.

[Latitude $40^{\circ} 27' 38.97''$. Longitude $77^{\circ} 24' 52.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Big Knob.....	45 05 22.00	225 00 15.00	4.19821
Shade.....	89 45 38.00	269 37 42.00	4.23803
Newport.....	271 55 37.90	92 06 37.12	4.3793545
Eschol.....	281 58 59.85	102 03 45.00	4.0248510
Peters.....	290 04 20.12	110 17 38.74	4.4907718
Bowers.....	338 32 35.58	158 34 55.74	4.14465

FRANKLIN COUNTY.

SHIPPENSBURG QUADRANGLE.

In August, 1904, Mr. George T. Hawkins selected and occupied three new triangulation stations for the control of this quadrangle, based upon Chambersburg and Parnell United States standard datum.

CHAMBERSBURG, FRANKLIN COUNTY.

The balcony of the clock tower on the county court-house at Chambersburg was occupied, and the angles were reduced to center of tower.

Station mark: Center of clock tower.

[Latitude $39^{\circ} 56' 15.41''$. Longitude $77^{\circ} 39' 39.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Strasburg.....	149 15 58.62	329 12 37.23	4.1623856
Roxbury.....	182 36 06.00	2 36 35.00	4.37343
Timber Hill.....	227 17 34.80	47 22 24.60	4.1629694
Parnell.....	82 25 31.4	262 17 45.3	4.2405209
Quirauk.....	334 33 43.9	154 39 25.8	4.4715130
Alto.....	316 52 07.6	136 56 56.7	4.1954468

PARNELL, FRANKLIN COUNTY.

On mountain locally known by same name, about 9 miles west of Chambersburg and 3 miles east of Fort London.

Theodolite elevated 24 feet on top of stump of a tree; sight lines were cut through timber to other stations.

Station mark: A bronze tablet stamped "U. S. Geological Survey—Pennsylvania," cemented in solid rock.

[Latitude 39° 55' 00.42". Longitude 77° 51' 45.82'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fairview	17 36 22.3	197 32 15.8	4.4822860
Cove	44 49 11.6	224 41 37.6	4.3790001
Pike	88 07 15.8	268 03 34.2	3.9142524
Chambersburg	262 17 45.3	82 25 31.4	4.2405209
Alto	287 59 23.8	108 11 58.4	4.4687745
Quirauk	309 04 53.8	129 18 20.6	4.5874493
Martin	340 38 14.6	160 42 52.2	4.4941249
Strasburg	213 27 30.29	33 31 55.57	4.2491919
Timber Hill	246 20 39.85	66 33 16.13	4.4839373

ROXBURY, FRANKLIN COUNTY.

(Not occupied.)

On the first ridge northwest of valley on well-known knob of that name. All timber was cleared from summit and 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.
	° ' "	° ' "	Meters.
Chambersburg	2 36 35	182 36 06	4.37343
Strasburg	37 25 40	217 21 49	4.14580
Timber Hill	324 59 40	145 04 01	4.22450

STRASBURG, FRANKLIN COUNTY.

On northeast end of long ridge 2 miles south of west from Upper Strasburg and 1 mile southeast of where road crosses mountain. Instrument elevated 35 feet.

Station mark: Tall black oak tree trunk used for theodolite support.

Reference mark: A cross on a stone post of the United States Coast and Geodetic Survey set in the ground 17.5 feet east of station mark.

[Latitude $40^{\circ} 03' 00.35''$. Longitude $77^{\circ} 44' 52.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Parnell	33 31 55.57	213 27 30.29	4. 2491919
Roxbury	217 21 49.00	37 25 40.00	4. 14580
Timber Hill	278 10 33.96	98 18 45.67	4. 2627043
Chambersburg	329 12 37.23	149 15 58.62	4. 1623856

TIMBER HILL, FRANKLIN COUNTY.

On hill of same name about 1.5 miles south of Shippensburg on land owned by Mr. John Plaster.

Station mark: A lone hickory tree near west edge of a cleared field.

Reference marks: A cross cut in limestone, 11.4 feet distant from signal, bearing S. 38° W.

[Latitude $40^{\circ} 01' 35.22''$. Longitude $77^{\circ} 32' 08.61''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chambersburg	47 22 24.60	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 01.00	324 59 40.00	4. 22450

PRIMARY TRAVERSE.

LAWRENCE AND MERCER COUNTIES.

NESHANNOCK QUADRANGLE.

The following geographic positions were obtained by primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from a position at Sharon on the Ohio-Pennsylvania State line and follows highways east to Mercer; thence south over highways and the Pennsylvania Railroad through Volant to McCaslin; thence west over highways through Newcastle and Edinburg, and ties to Ohio-Pennsylvania State line monument, No. 65 $\frac{1}{2}$, at Lowellville.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sharon, Ohio-Pennsylvania State line monument No. 51.	41 13 55.1	80 31 09.2
Sharon, T road south at Baptist Church in east part of...	41 13 59.0	80 29 11.3
Sharon, crossroads 2 miles east of; 30 feet southeast to guidepost.....	41 13 59.8	80 28 17.5
Sharon, T road near schoolhouse, 3 miles east of; 30 feet northwest to corner fence post, 24 feet northeast to W. Kerr's mail box	41 14 00.0	80 27 21.9
Sharon, crossroads 4 miles east of; 40 feet southwest to to guidepost, 25 feet northeast to D. De Forests' mail box	41 14 07.6	80 25 58.9
T road north, 12 feet southeast to mail box, 30 feet northeast to cross on telephone pole	41 14 11.2	80 25 05.7
Crossroads, 25 feet southwest to pump, 40 feet northeast to signboard	41 14 15.7	80 24 20.5
T road south, 22 feet southwest to west end of culvert ...	41 14 14.4	80 23 15.8
Charleston, crossroads 0.75 mile west of; 20 feet northwest to Reno's mail box, 30 feet northeast to cross on telephone pole	41 14 14.7	80 22 27.1
Hill or Charleston, on property of Mrs. Mary Buchanon; cross on northeast corner of stone foundation Buchanan Hotel bears S. 2° 45' E., distant 17.6 feet; southeast corner of stone foundation to E. A. Beals's store bears N. 54° 10' W., distant 110.5 feet; in top of sandstone post, aluminum tablet stamped "Prim. Trav. Sta. No. 1"	41 14 13.4	80 21 37.3
Charleston, crossroads 1 mile east of; 36 feet southwest to guidepost, 25 feet southeast to south end of culvert..	41 14 06.3	80 20 26.0
Road south, 20 feet north to property of W. H. Wallace, 30 feet southwest to west end of culvert.....	41 14 02.5	80 19 33.2
Mercer, crossroads 3.75 miles east of; 27 feet north to guidepost, 22 feet southwest to cross on telephone pole.	41 14 02.8	80 18 24.1
T road north, 30 feet northwest to cross on rail fence, 24 feet south to cross on west rail fence post	41 13 39.5	80 16 49.3
Mercer, T road north 1.25 miles west of; 27 feet south to cross on gate; 30 feet northeast to cross on rail fence...	41 13 33.6	80 15 54.4
Mercer, in Mercer County C. H., tablet No. 2.....	41 13 37.1	80 14 20.0
T road west, 30 feet southeast to corner fence post, 42 feet southwest to maple tree.....	41 12 44.0	80 14 15.7
Hope Mills, road crossing north and south	41 12 27.5	80 13 39.4

Geographic positions along the Pennsylvania Railroad between Milburn and Volant.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Private road crossing	41 10 50.3	80 13 53.8
Milburn, road crossing east and west	41 10 07.0	80 13 38.9
Standard oil pump station, road crossing northeast and southwest	41 09 26.8	80 13 50.3
Banbury, road crossing at station	41 08 33.9	80 14 25.2
Private road crossing, 1,330 feet north of spur	41 07 53.8	80 14 27.1
Volant, in southeast corner of B. Hemstreet's garden; cross on northeast corner of foundation to N. W. Aller's stable bears S. 15° 30' W., distant 22.9 feet; cross on northwest corner of foundation to stable bears S. 59° 45' E., distant 112.9 feet; iron post stamped "Prim. Trav. Sta. No. 5"	41 06 50.9	80 15 28.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
State road crossing and road east and west	41 05 41.0	80 15 48.7
Rich Hill schoolhouse, crossroads 0.5 mile south of; 30 feet northwest to fence post, 27 feet southwest to corner yard fence	41 04 50.2	80 15 53.9
Volant, T road 3.5 miles south of; 27 feet northwest to guidepost, 42 feet to cross on large sugar-maple tree	41 03 53.6	80 15 57.2
Esterbrook, crossroads 0.5 mile east of; 40 feet southeast to guidepost, 40 feet northwest to Smith's mail box	41 02 42.2	80 16 03.4
Crossroads, 24 feet southwest to guidepost, 21 feet southeast to W. Warnock's mail box	41 01 56.7	80 15 30.9
McCaslin, in northeast corner of J. A. Hickathorn's property, southwest corner of Houck's store bears S. 23° 25' E., distant 206 feet; cross on northeast corner of foundation to J. L. Hickathorn's house bears S. 34° 45' W., distant 206.5 feet; in sandstone post, aluminum tablet stamped "Prim. Trav. Sta. No. 6"	41 00 49.4	80 15 25.6
McCaslin, T road south 1.5 miles west of; 36 feet southwest to letter box, 36 feet southeast to cross on corner fence post	41 00 44.7	80 17 03.8
Schoolhouse, road north 0.25 mile west of	41 00 37.7	80 18 45.4
Newcastle, in southeast corner of base to north meridian stone in court-house yard; south meridian stone bears due S. 119.1 feet distant; aluminum tablet stamped "Prim. Trav. Sta. No. 7"	40 59 55.6	80 20 22.0
Newcastle, crossing of West Grand avenue and Locust street; center of station car tracks	41 00 11.5	80 21 19.8
Newcastle, crossroads at schoolhouse 1 mile west of; 45 feet southeast to guidepost, 27 feet northwest to United States letter box	41 00 23.5	80 22 37.8
Summit schoolhouse, road north just west of	41 00 40.1	80 23 31.3
Newcastle, crossroads 3 miles west of; 27 feet southwest to telephone pole, 27 feet northeast to cross on telephone pole	41 00 58.8	80 24 24.0
Road north, 12 feet north to John Haney mail box, 45 feet northwest to John Pfeils mail box	41 01 15.8	80 25 10.4
Edenburg, crossroads 1 mile north of; 36 feet southwest to guidepost; 43 feet southeast to cross on telephone pole	41 01 32.1	80 26 01.6

Geographic positions along the Pennsylvania Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hillsville and Edenburg, road crossing of Pennsylvania Railroad.....	41 00 48.1	80 26 36.6
Private road crossing.....	41 01 07.9	80 27 40.3
Hillsville, road crossing.....	41 01 09.4	80 29 21.6
Quaker Creek, road crossing south of bridge over.....	41 01 35.9	80 30 23.8
Ohio-Pennsylvania State line monument No. 65½.....	41 01 27.3	80 31 08.9

CUMBERLAND, DAUPHIN, AND YORK COUNTIES.

NEW CUMBERLAND QUADRANGLE.

The following geographic positions were obtained from primary traverse run in 1905 by Mr. J. R. Ellis. The line starts from a position at York located in 1899 by primary traverse, and follows north along the Northern Central Railroad to Middletown and north over highways to Rutherford station; thence west over the Philadelphia and Reading Railroad to Harrisburg; thence southeast along highways to Mechanicsburg; thence south along highways, and connects with Round Top triangulation station (Coast and Geodetic Survey); continues south to Hall; thence east along highways through Dover to starting point at York.

Geographic positions along the Northern Central Railroad between York and Middletown.

Station.	Latitude.	Longitude.
	° ' "	° ' "
York, south meridian stone; in Pennsylvania Park. Station mark: A sandstone post 40 by 6 by 6 inches, having a bronze tablet cemented in its top, set 36 inches in ground, 430 feet east of center of Water street and 57 feet north of center of Fulton street.....	39 57 20.1	76 43 36.8
York, Pennsylvania Railroad crossing, at York Chemical Works (west track).....	39 58 32.8	76 43 21.0
Cordons Creek, center pier of bridge over.....	39 59 51.0	76 43 18.7
Road crossing under trestle No. 100.....	40 00 31.5	76 42 57.0
Emigsville station.....	40 01 12.3	76 43 38.1
Overhead crossing.....	40 02 22.3	76 43 18.5
Mount Wolf station.....	40 03 54.2	76 42 32.7
Road crossing under trestle 116.....	40 04 48.2	76 41 56.9
Junction with cut off to Philadelphia.....	40 05 36.2	76 42 02.9
York Haven, road crossing at station.....	40 06 40.6	76 42 45.8
Cly post-office, in southeast corner of foundation, bronze tablet stamped "Prim. Trav. Sta. No. 1, 1905".....	40 07 20.7	76 44 04.0
Milepost 67.....	40 08 04.3	76 44 44.4
Goldsboro station.....	40 09 14.0	76 44 56.6
Middletown Ferry station, road crossing 0.5 mile south of.....	40 10 14.6	76 45 07.2
Middletown, southwest corner of National Tube Co.'s pumping station.....	40 11 16.3	76 44 42.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Middletown, crossing of Emans and Union streets	40 11 42.1	76 43 53.1
Coble schoolhouse, forks of road	40 12 46.4	76 44 08.6
Ulrichs Corners, crossroads, 21 feet northwest to cross on corner fence post; 25 feet northeast to cross on corner fence post.	40 13 48.0	76 44 17.0
Elbow Farm, in southwest corner of Adam Greigrich's stone outhouse, cross and "U. S. G. S." cut in, primary traverse station No. 2.	40 14 48.8	76 44 09.8
T road south, at Ray Delanoe's residence, 27 feet southwest to cross on telephone pole, 32 feet southeast to corner yard fence	40 15 37.5	76 44 55.1

Geographic positions along the Philadelphia and Reading Railroad between Rutherford and Harrisburg.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rutherford station, overhead road crossing 0.75 mile east of	40 15 47.3	76 46 41.7
Rutherford station, road crossing 50 feet south of waiting shed	40 15 33.3	76 47 38.4
Overhead road crossing	40 15 17.4	76 48 31.7
Paxtang station, road crossing 50 feet east of	40 15 28.1	76 49 55.6
Harrisburg, Ninth street overhead crossing	40 15 27.0	76 51 22.6

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Harrisburg, in southeast corner of State Library, aluminum tablet stamped "Prim. Trav. Sta. No. 3;" elevation 364	40 15 48.2	76 53 00.6
Harrisburg, south end of Water street bridge	40 15 01.1	76 53 28.3
Camp Hill, electric railway tracks at T road south, at top of hill	40 14 24.6	76 54 48.0
Crossroads at turn of electric railway	40 14 23.6	76 56 05.7
St. John's Church, crossroads 0.5 mile northwest of; 63 feet southeast to guidepost, 27 feet northeast to cross on board fence	40 14 16.0	76 57 40.2
Road south, 45 feet south to mailbox, 25 feet southwest to cross on corner fence post	40 14 24.1	76 58 59.7
Salem Methodist Church, in north end of stone wall at northwest corner of, stamped "Prim. Trav. Sta. No. 4, 1905"	40 14 43.9	76 59 56.4
Mechanicsburg, T road northwest 1 mile northeast of	40 13 45.9	76 59 39.3
Mechanicsburg, in brick high school, bronze tablet stamped "Prim. Trav. Sta. No. 5, 1905;" elevation 456 ..	40 12 40.1	77 00 41.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Y road south, 16 feet east to telephone pole, 24 feet southwest to cross on board fence	40 12 09.9	77 00 00.2
Graham schoolhouse, crossroads	40 11 31.1	76 59 30.3
Shepherdstown, crossroads 0.25 mile northeast of; 35 feet south to guidepost, 19 feet east to north end of culvert ..	40 10 48.3	76 59 22.8
Brumarsdale, Philadelphia and Reading overhead crossing 400 feet west of station	40 09 58.0	76 58 41.3
Siddonsburg, crossroads, 21 feet east to guidepost, 24 feet northwest to southeast corner of post-office	40 08 46.5	76 57 57.9
Monagham, in north corner of foundation to Church of God, bronze tablet stamped "Prim. Trav. Sta. No. 6" ..	40 08 11.4	76 57 48.2
Meyers schoolhouse, crossroads, 19 feet south to mailbox, 36 feet northeast to guidepost	40 07 30.5	76 56 31.7
Round Top triangulation station: Of the United States Coast and Geodetic Survey in Warrington Township, 8 miles east of Dillsburg. Station mark: A sandstone post 18 by 6 by 6 inches set 15 inches in ground and resting on a flat rock having cross lines cut on its upper surface	40 06 13.24	76 55 34.14
Beaver Creek, west end of bridge over	40 05 32.0	76 55 58.8
T road south at schoolhouse	40 05 19.4	76 56 54.4
Crossroads, guidepost	40 04 11.2	76 57 10.9
Mount Pleasant schoolhouse, T road east just north of, 27 feet northeast to guidepost, 33 feet southeast to end of wire fence	40 03 37.7	76 57 57.4
Crossroads	40 03 11.6	76 58 10.8
Hall, guidepost at crossroads, 1 mile northwest of	40 02 06.6	76 59 20.4
Hall, in southwest corner of stone wall of Dr. F. Shelley's front yard, bronze tablet stamped "Prim. Trav. Sta. No. 7"	40 01 11.2	76 58 57.3
Bermudian Creek, northwest end of covered bridge over ..	40 00 30.6	76 57 46.9
Road northeast, 300 feet south of schoolhouse	39 59 16.3	76 56 58.1
Steel bridge, west end of	39 59 15.5	76 55 54.1
Davidsburg, T road north just west of hotel	39 59 00.9	76 53 40.5
Davidsburg, crossroads 1 mile east of, 21 feet northwest to guidepost, 18 feet south to cross on post	39 58 56.0	76 52 18.2
Salem Church, road southeast	39 59 25.2	76 51 33.2
Dover, in stone foundation to White Hall Hotel just east of ladies' entrance, bronze tablet stamped "Prim. Trav. Sta. No. 8"	40 00 04.1	76 51 00.9
Road southwest, 21 feet south to guidepost, 18 feet southwest to east end of culvert	39 59 02.1	76 49 26.1
Katz Mill, east end of iron bridge over Little Conewago Creek	39 58 50.2	76 48 23.9
Blacksmith shop, road southwest	39 58 34.4	76 47 32.0
Road southwest, 22 feet south to guidepost, 19 feet north to cross on telephone pole	39 57 48.0	76 45 56.6
York, Carlyle road crossing of Pennsylvania Railroad	39 57 28.0	76 44 56.5

MERCER COUNTY.

STONEBORO QUADRANGLE.

This line starts at Mercer and runs northward along highways and is tied to a point 5 miles east of Atlantic, located by Mr. C. B. Kendall in 1903.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Mercer, in top step at northeast corner of porch to north entrance of Mercer County court-house; aluminum tablet stamped "Prim. Trav. Sta. No. 2".....	° ' " 41 13 37.1	° ' " 80 14 20.0
Mercer, north part of; center of bridge at road intersection.....	41 14 04.8	80 14 17.0
Mercer, crossroads, 2 miles north of; 37 feet southwest to guidepost, 18 feet northwest to west end of culvert.....	41 15 31.5	80 14 19.6
T road east, 20 feet west to cross on apple tree, 40 feet southeast to cross on fence post.....	41 16 34.2	80 14 21.1
Mercer, crossroads 5 miles north of; 40 feet east to road crossing of Pennsylvania, Bessemer and Lake Erie Railroad, 30 feet northwest to signboard.....	41 17 51.8	80 14 23.6
Fairview, Y road 1.5 miles south of; 45 feet northwest to cross on gatepost; 39 feet east to guidepost.....	41 18 24.3	80 14 03.7
Fairview, T road east; 27 feet southeast to guidepost; 30 feet northwest to James Gamble's mail box.....	41 19 34.1	80 13 48.7
Fairview, T road east 0.5 mile east of; 18 feet southeast to James Welch's mail box; 37 feet northeast to cross on black oak tree.....	41 20 32.3	80 13 36.4
T road east; 25 feet southeast to guidepost, 17 feet west to cross on board fence.....	41 21 27.2	80 13 24.8
Hadley, 3 miles south of; in northwest corner of F. R. McDowell's orchard; at southwest corner of yard on Pittsburg and Erie Road; nail in root of wild cherry tree on northwest side of road bears N. 74° 15' W., distant 52 feet; southwest corner of foundation to F. R. McDowell's residence bears N. 69° E., distant 46 feet; iron post stamped "Prim. Trav. Sta. No. 3".....	41 22 42.1	80 13 08.3
Road northwest, 15 feet northwest to cross on board fence, 37 feet east to guidepost.....	41 23 52.3	80 12 53.2
Hadley, road crossing of Lake Shore Railroad 1 mile east of.....	41 24 36.3	80 12 47.3
Sheakleyville, T road west 1 mile south of; 40 feet southwest to guidepost; 21 feet northwest to west end stone culvert.....	41 25 30.7	80 12 34.8
Sheakleyville, road west at Baptist Church, 33 feet northwest to iron fence; 63 feet west to northeast corner of Baptist Church.....	41 26 49.0	80 12 24.3
T road east, 40 feet east to McCrackers mail box; 36 feet south to cross on gatepost.....	41 27 55.8	80 12 26.8
Boutner schoolhouse, crossroads 0.25 mile south of.....	41 28 30.7	80 12 48.1
Boutner schoolhouse, T road south at; 21 feet north to cross on board fence, 35 feet southwest to guidepost...	41 29 32.5	80 13 08.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Williams (Fred), in southwest corner of his orchard; at northwest corner of yard; north corner of foundation to residence bears S. 28° 30' E., distant 47.8 feet; west corner of foundation to same bears S. 1° 25' W., distant 64.1 feet, in top of marble post, aluminum tablet stamped "Prim. Trav. Sta. No. 4"	° ' " 41 29 53.5	° ' " 80 14 18.7
Atlantic, crossroads 5 miles east of	41 30 23.1	80 14 17.8

SOUTH CAROLINA.**PRIMARY TRAVERSE.****CHESTER, UNION, AND YORK COUNTIES.****BLAIRSVILLE AND ROCKHILL QUADRANGLES.**

The following geographic positions were determined by primary traverse in 1905 by Mr. C. B. Kendall, field assistant. The line starts from an adjusted position on the United States standard datum at Fort Mill, follows wagon roads and railroads west, south, east, and north near borders of quadrangle and checks on itself at Fort Mill. Starting again at Yorkville, it follows highways and railroad west, south, and east near borders of the Blairsville quadrangle and checks on point on the Rockhill line.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge, southwest end of, at forks of road	35 00 34.1	80 58 18.0
Catawba River bridge; middle of center span	35 00 27.8	80 59 56.6
Church, four corners, 15 feet north to double pine, 25 feet southeast to hickory	35 00 27.5	81 01 17.5
Forks of roads north and west, 20 feet southwest to peach tree	35 01 03.5	81 02 33.8
Four corners, 500 feet north of church	35 00 40.2	81 03 41.1
Belmont, 0.75 mile west of; four corners, 30 feet south to mail box	35 00 30.0	81 04 41.7
T road north, 200 feet south of Smith's store	35 00 31.7	81 06 04.5
Newport, 150 feet south of station; 600 feet west of mile-post 106, between 2 stores, iron post stamped "Prim. Trav. Sta. No. 1, 1905"	34 59 22.1	81 05 58.3

Geographic positions along Southern Railway, Newport via Yorkville to Chester.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Newport, road crossing 1.25 miles west of.....	34 59 44.8	80 06 58.8
Tirzah, 200 feet west of station, road crossing	34 59 47.8	81 08 33.9
Road crossing, center of track.....	34 59 52.8	81 10 15.8
Trestle over second-class road.....	35 00 10.3	81 11 46.9
Yorkville, 1 mile east of; road crossing	34 59 49.7	81 13 22.3
Yorkville, East Liberty street crossing Southern Railway.	34 59 26.8	81 14 07.1
Yorkville, street crossing 75 feet south of station, Carolina and Northwestern Railway	34 59 34.4	81 14 23.6
Yorkville, in north face at northeast corner of Methodist Church, aluminum tablet stamped "Prim. Trav. Sta. No. 2, 1905".....	34 59 34.0	81 14 24.8
North end of girder bridge of Carolina and Northwestern Railway over Southern Railway.....	34 58 46.6	81 14 45.7
Road crossing, center of track.....	35 57 29.5	81 14 21.6
Road crossing 570 feet north of milepost 20, center of track	34 56 51.3	81 14 07.8
Delphia, road crossing at station	34 56 12.2	81 13 31.5
Road crossing, center of track.....	34 54 38.0	81 12 31.3
Guthriesville, 300 feet southwest of station; 200 feet west of center of Carolina and Northwestern Railway track, in east face of chimney of north end of M. G. Guthrie's residence, aluminum tablet stamped "Prim. Trav. Sta. No. 3, 1905".....	34 53 46.7	81 12 25.7
Milepost 15, 400 feet south of; center of track at second-class road crossing.....	34 52 56.4	81 12 56.7
McConnellsville, 30 feet south of mail crane, road crossing, center of main track	34 52 06.1	81 13 36.6
McConnellsville, 1.25 miles south of; road crossing, center of main track	34 51 32.5	81 14 22.3
Road crossing.....	34 49 41.8	81 14 54.4
Lowrysville, 50 feet east of station; road crossing.....	34 48 14.7	81 14 18.5
Lowrysville, 100 feet southeast of station, 60 feet south of main track, Carolina and Northwestern Railway, in north wall at northwest corner of brick store of J. L. Ahel, bronze tablet stamped "Prim. Trav. Sta. No. 4, 1905".....	34 48 14.2	81 14 18.7
Road crossing 1 mile south of Lowrysville, center of track	34 47 59.8	81 13 13.6
Milepost 6, 430 feet south of, at forks of road; center of track at road crossing.....	34 47 12.5	81 12 10.5
Milepost 4, 900 feet northwest of; road crossing	34 45 46.0	81 11 52.3
Airlee station, 50 feet south of; road crossing, center of track	34 44 50.8	81 11 56.7
Chester, 1.25 miles north of; center of track at road crossing.....	34 43 15.7	81 12 16.0
Chester, 0.75 mile north of; crossing of Seaboard Air Line and Carolina and Northwestern railroads.....	34 42 55.2	81 12 11.4
Chester, in front of ticket office; center of main track, Southern Railway.....	34 42 16.9	81 12 14.5

Geographic positions along Seaboard Air Line between Chester and Rodman.

Station.	Latitude.	Longitude.
Main track, Southern Railway at street crossing, 200 feet south of center of railway	° ' " 34 42 14.6	° ' " 81 12 14.8
Chester, in north wall at northwest corner of the Nicholson Hotel; bronze tablet stamped "540, Columbia, 1900;" "Prim. Trav. Sta. No. 5, 1905"	34 42 14.3	81 12 13.7
Second-class road crossing, center of track	34 43 22.6	81 10 41.6
Milepost 40, road crossing, 200 feet west of; center of track	34 44 08.4	81 08 22.9
Second-class road crossing, 800 feet east of water tank; center of track	34 44 34.6	81 07 31.8
Rodman, 1.25 miles west of; center of track, road crossing	34 45 31.2	81 06 22.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
Rodman, post-office, 300 feet south of Seaboard Air Line station, at northwest corner of store of S. J. Lewis; iron post stamped "Prim. Trav. Sta. No. 12, 1905"	° ' " 34 46 05.1	° ' " 81 05 09.0
Second-class road to northeast	34 45 57.3	81 04 00.7
Grove Church, four corners, 300 feet southwest of; cross-roads, 15 feet west to mail box, 50 feet east to tree	34 45 34.6	81 03 12.7
Four corners, second-class road, 10 feet southeast to mail box	34 46 12.7	81 02 34.3
Lando, forks of road near top of hill, roads southwest and west, 60 feet east to milepost "Col. 61"	34 46 27.3	81 00 46.2
Second-class T road to south, 30 feet northeast to two oaks, 30 feet northwest to three persimmons	34 46 41.4	80 59 04.4
Lando, 2.6 miles southeast of, at junction of Chester, Landsford and Rockhill-Wylis Mills roads; iron post stamped "Prim. Trav. Sta. No. 13, 1905"	34 46 39.6	80 58 08.4
Three-corner junction with Landsford road at schoolhouse, 10 feet southwest to pine tree	34 47 51.8	80 58 01.0
Collins, forks of road at milepost 22, 25 feet southwest to milepost, 20 feet southeast to oak tree	34 48 48.5	80 58 18.7
Seaboard Air Line Railway under crossing of Yorkville and Landsford road	34 49 50.3	80 58 43.1
Four corners intersection Yorkville-Landsford and Columbia-Notinford roads, 10 feet south to posts	34 50 21.7	80 59 23.4
Forks of road southwest and northwest, 30 feet west to mail box, 10 feet north to small pine	34 51 47.7	80 58 11.5
Leslie, 0.5 mile south of; forks of road north and northeast	34 53 21.8	80 57 37.7
Leslie, 200 feet east of station, at northwest corner of Hemphill Hayes's store; iron post stamped "Prim. Trav. Sta. No. 14, 1905"	34 53 24.5	80 57 21.8
Rockhill, 3.5 miles east of, roads east and north at blacksmith shop, 25 feet to car shop, 40 feet southwest to telephone pole	34 54 36.6	80 58 07.9
Forks of road north and east, Indian Nation road to east	34 55 19.0	80 57 42.5
Second-class road to east at well, 40 feet southeast to well	34 56 31.6	80 57 19.9

Geographic positions along Southern Railway near Grattan.

Station.	Latitude.	Longitude.
Catawba River station, center of main track Southern Railway at road crossing.....	° ' " 34 57 34.4	° ' " 80 57 45.9
Grattan, 100 feet south of station; road crossing.....	° ' " 34 58 55.0	° ' " 80 56 58.3

Geographic positions along the Southern Railway between Yorkville and Hickory.

Station.	Latitude.	Longitude.
Trestle over road, center of track over road.....	° ' " 34 58 20.5	° ' " 81 15 25.8
Overhead crossing Southern Railway, center of track under bridge.....	° ' " 34 57 57.4	° ' " 81 16 50.0
Road crossing, center of track.....	° ' " 34 57 28.4	° ' " 81 18 29.3
Sharon, east of; overhead road crossing, center of track under bridge.....	° ' " 34 57 20.4	° ' " 81 19 42.1
Sharon, 300 feet west of station; road crossing.....	° ' " 34 57 08.7	° ' " 81 20 27.4
Sharon, 300 feet east of station, 170 feet northwest of road crossing Southern Railway at forks of road; iron post stamped "Prim. Trav. Sta. No. 6, 1905".....	° ' " 34 57 09.8	° ' " 81 20 29.0
Sharon, 1.25 miles west of; road crossing center of track.....	° ' " 34 57 23.0	° ' " 81 21 46.7
Bullocks Creek, 1 mile west of; road crossing, center of track.....	° ' " 34 57 38.8	° ' " 81 23 54.1
Second-class road crossing, center of track.....	° ' " 34 58 09.4	° ' " 81 24 38.9

Geographic positions along highways.

Station.	Latitude.	Longitude.
Hickory, four corners, intersection of main streets, 50 feet east to old well, 40 feet northeast to telephone pole.....	° ' " 34 58 58.2	° ' " 81 24 57.9
Forks of road west and southwest at church, 25 feet west to persimmon tree, 50 feet east to dead poplar.....	° ' " 34 59 06.4	° ' " 81 25 48.3
Top of hill at forks of roads east and southeast, 10 feet north to oak tree, 20 feet south to telephone pole.....	° ' " 34 59 04.7	° ' " 81 27 26.8
Smith's ford of Broad River, 1 mile east of, at northeast corner of front yard fence to residence of J. T. Smith on top of hill; iron post stamped "Prim. Trav. Sta. No. 7, 1905".....	° ' " 34 59 03.4	° ' " 81 28 08.9
Forks of road north and northeast, 30 feet south to pine, 10 feet west to persimmon tree.....	° ' " 34 58 09.3	° ' " 81 28 36.0
Three corners, second-class road to northwest at junction with Howells Ferry road, about 3 miles southwest of Hickory, 30 feet northwest to oak tree, 20 feet east to oak tree.....	° ' " 34 57 39.0	° ' " 81 27 31.1
Forks of roads southwest and west, 10 feet southwest to mail box, 20 feet southeast to stump in field.....	° ' " 34 57 10.8	° ' " 81 27 55.1
Forks of road southwest and west, junction of Bullocks Creek and Howells Ferry roads, 1 mile east of ferry.....	° ' " 34 55 43.5	° ' " 81 27 42.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Howells Ferry, 0.25 mile west of; forks of roads south west and west, 15 feet west to small bridge, 25 feet southwest to mail box	° ' " 34 55 41.8	° ' " 81 28 59.8
Thompson's mill, center of covered bridge over Thickerty Creek	34 54 51.5	81 29 45.6
Sunnyside post-office, 0.75 mile south of; junction of Spartanburg-Union road and road leading east to Pinkney Ferry, at southwest corner small stone house; iron post stamped "Prim. Trav. Sta. No. 8, 1905"	34 54 06.6	81 31 11.0
Forks of road, 90 feet east of store on top of hill; roads southwest and east, 90 feet west to corner store, 50 feet south to corner blacksmith shop	34 53 41.5	81 32 18.8
Skull Shoals, 0.75 mile north of; road to east on top of hill, 60 feet south to large oak, 50 feet northwest to dead oak	34 52 54.1	81 31 45.0
Skull Shoals Ferry, south landing of, across Pacolet River	34 52 30.7	81 31 55.9
Skull Shoals, 1.5 miles south of; forks of road south and southeast, 50 feet southeast to cedar tree	34 51 24.8	81 32 14.7
Four corners, crossroads, 15 feet southwest to persimmon tree	34 50 31.0	81 30 50.4
Forks of road, 350 feet southeast of store, roads south and southeast, 40 feet north to pine	34 50 05.3	81 30 31.4
Forks of road north and northwest, 10 feet east to pine ..	34 48 35.3	81 29 53.1
South rail at southwest end of Lockhart Railroad crossing of road at Mount Tabor	34 47 47.7	81 30 10.7
Mount Tabor, 2 miles southeast of; four corners, second-class road, 15 feet southeast to oak, 35 feet northeast to pine	34 46 27.1	81 29 46.8
Second-class T road to northeast	34 45 47.7	81 29 39.6
Wortheys Ferry over Broad River, three corners west of; junction of Chester, Union, and road north to Mount Tabor	34 44 31.1	81 29 36.3
Wortheys Ferry, 0.5 mile west of; in northwest corner of junction of Chester, Union, and road leading to Mount Tabor, iron post stamped "Prim. Trav. Sta. No. 9, 1905" ..	34 44 31.6	81 29 36.5
Second-class road to south at top of clay hill, 10 feet south to small oak, 50 feet east to top of hill	34 44 00.9	81 28 17.2
Top of hill at second-class road to south, 35 feet north to oak stump, 50 feet southeast to pine	34 44 26.0	81 27 08.2
Summit of hill at second-class road to south	34 44 36.2	81 25 35.5
Wilkesburg post-office, intersection of roads at southeast corner of store of George W. Byars, iron post stamped "Prim. Trav. Sta. No. 10, 1905"	34 44 38.2	81 23 53.8
Forks of road, 300 feet southeast of milepost 11, roads southeast and south, 30 feet northwest to oak tree	34 44 34.2	81 22 02.2
Forks of roads west and northwest, 50 feet west to telephone pole, 40 feet south to black gum bush	34 44 57.8	81 20 37.1
South end of small bridge at forks of roads east and southeast	34 44 50.8	81 19 12.9
Three corners, second-class T road to southwest, 50 feet southwest to mulberry tree	34 44 09.5	81 18 22.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Four corners west of Chester, center of road	34 43 17.9	81 17 42.5
Chester, 5 miles west of; 0.5 mile west of bridge over Walkers Mill Creek, in southwest corner of crossroads, iron post stamped "Prim. Trav. Sta. No. 11, 1905".....	34 43 17.8	81 17 42.9
Walkers Mill Creek, second class crossroads 0.25 mile east of; 50 feet north to pine, 60 feet southeast to telephone pole	34 43 10.8	81 16 53.6
Chester, four corners 4 miles west of; crossroads, 40 feet east to telephone pole	34 42 42.6	81 16 12.6
Wilkesburg road, overhead crossing Seaboard Air Line Railway	34 42 12.4	81 14 20.4

TENNESSEE.

PRIMARY TRAVERSE.

GILES, LAWRENCE, AND MAURY COUNTIES.

LAWRENCEBURG QUADRANGLE.

The following geographic positions were obtained by primary traverse run in 1904 by Mr. C. B. Kendall. The line starts from position at Columbia established from primary traverse by Mr. Gilbert Thompson, and follows south over the Louisville and Nashville Railroad through Pulaski to Prospect station; thence westward over highways to Iron City, where it ties to an adjusted position established by Mr. E. L. McNair in 1902. A line was also run west over highways from Wales through Lawrenceburg to Aarons Creek, tying to an adjusted position at that place.

Geographic positions along Louisville and Nashville Railroad between Columbia and Prospect stations.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Columbia (Thompson's station No. 6)	35 36 45.95	87 03 16.14
Columbia, crossing of Louisville and Nashville Railroad and South Main street 300 feet east of Union station....	35 36 25.2	87 02 13.3
Overhead road crossing	35 35 47.5	87 01 27.9
Road crossing	35 34 45.4	87 00 58.3
Three corners, 15 feet east to center of railroad, 25 feet northeast to cedar tree with sign boards	35 34 12.9	87 00 20.6
Milepost 237, road crossing 600 feet south of	35 33 13.7	86 59 54.5
Glendale, road crossing 1 mile south of	35 31 35.8	86 59 15.8
Road crossing	35 30 56.8	86 59 15.3
Road crossing	35 30 18.6	86 59 15.8

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Geographic positions along Louisville and Nashville Railroad between Columbia and Prospect stations—Continued.

Station.	Latitude.	Longitude.
Pleasant Grove, in Mr. Wilkes's yard, 20 feet from west corner of house, iron post stamped "Prim. Trav. Sta. No. 49".....	° ' " 35 29 16.8	° ' " 86 59 12.2
Road crossing.....	35 27 25.2	86 59 01.5
Road crossing.....	35 25 16.1	86 59 32.2
Dodson Gap, telegraph office.....	35 24 23.0	86 59 37.0
Road crossing.....	35 23 17.5	86 59 47.6
Lynnville, in southeast corner of south end of grass plot, iron post stamped "Prim. Trav. Sta. No. 91".....	35 22 35.5	87 00 23.8
Lynnville, second-class road crossing 1 mile south of.....	35 21 33.2	87 01 12.6
Lynnville, road crossing 2 miles south of.....	35 21 05.7	87 01 22.5
Buford station, center of track.....	35 19 46.9	87 01 35.4
Buford station, road crossing 1 mile south of.....	35 18 46.6	87 01 32.1
Reynolds station, overhead road 800 feet south of.....	35 17 58.5	87 01 42.3
Riversburg, road crossing 450 feet south of.....	35 16 37.8	87 02 40.8
Riversburg, road crossing 2 miles south of.....	35 15 57.0	87 04 21.7
Wales, 500 feet south of station, center of main track.....	35 14 56.2	87 04 58.5
Wales, road crossing 1 mile east of.....	35 14 00.1	87 04 38.7
Second-class road crossing.....	35 13 03.3	87 03 56.3
Second-class road crossing.....	35 12 34.1	87 03 39.5
Pulaski, in stone water table at southwest corner of Giles County court-house, aluminum tablet stamped "Prim. Trav. Sta. No. 148".....	35 11 56.6	87 01 54.8
Pulaski, road crossing 600 feet south of station.....	35 11 28.0	87 02 13.9
Road crossing.....	35 09 44.9	87 01 51.0
Road crossing.....	35 09 07.1	87 01 23.9
Second-class road crossing.....	35 07 51.1	87 00 41.3
Richland Creek, in east end of north abutment of Louisville and Nashville Railroad bridge over, tablet stamped "Prim. Trav. Sta. No. 176".....	35 06 48.2	87 00 19.5
Aspen Hill, road crossing 100 feet south of.....	35 06 02.4	87 00 15.0
Lester tunnel, north end of.....	35 04 32.4	87 00 19.4
Lester station, road crossing 350 feet south of.....	35 04 08.5	87 00 21.2
Prospect, road crossing 1 mile north of.....	35 02 45.4	87 00 17.9
Prospect, in north end of culvert 350 feet south of station; aluminum tablet stamped "Prim. Trav. Sta. No. 197".....	35 01 39.0	87 00 11.2

Geographic positions along highways between Prospect station and St. Joseph.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Prospect, forks of road 1 mile west of	35 01 34.4	87 01 12.6
Schoolhouse, three corners at	35 01 38.6	87 02 06.4
Bethel, three corners 1.25 miles east of	35 00 42.1	87 02 11.3
Bethel, four corners at; 20 feet northwest to corner of store, 45 feet west to corner of store	35 00 03.9	87 03 16.2
Forks of road, large oak at	34 59 52.4	87 04 13.0
Alabama-Tennessee State line	34 59 44.4	87 05 10.3
Little Shoal Creek, center of ford	34 59 36.8	87 05 18.1
Level Bottom schoolhouse, at four corners; 40 feet west of southwest corner of schoolhouse; iron post stamped "Prim. Trav. Sta. 293"	35 00 15.2	87 06 06.7
Top of hill, four corners at	34 59 47.8	87 07 22.4
Alabama-Tennessee State line	34 59 47.3	87 07 22.4
Haw (post-office), White's store, three corners; 50 feet west to gate, 45 feet northwest to store porch	35 00 35.0	87 08 15.7
Forks of road at bottom of hill	35 01 06.1	87 08 48.4
Sawmill, forks of road	35 00 51.1	87 09 52.9
Booths Chapel, forks of road 0.25 mile west of; 40 feet southwest to persimmon tree, 20 feet north to rail fence	35 01 33.3	87 10 42.6
Sugar Creek, three corners 0.5 mile west of bridge over, 20 feet west to mail-box post, 35 feet east to hazelnut tree	35 00 39.6	87 12 05.2
Three corners, road north; 50 feet south to creek bank, 25 feet northwest to cherry tree	35 01 17.2	87 12 32.1
Appleton, in foundation of south wall at southeast corner of store of Hall & Kelton; aluminum tablet stamped "Prim. Trav. Sta. No. 467"	35 01 24.9	87 14 01.8
Forks of road at foot of hill; 300 feet west of sawmill, 60 feet north to maple tree, 35 feet west to double iron-wood tree	35 01 02.3	87 14 33.4
Second-class road to southwest; 50 feet southwest to oak tree in angle	35 00 27.8	87 14 48.6
Second-class road to south; 25 feet east to oak tree, 35 feet north to rail fence	35 00 23.3	87 16 15.9
Crossroads, 50 feet south to oak tree, 40 feet north to oak tree	35 00 21.8	87 17 28.1
Forks of road east and north; 20 feet northwest to oak tree, 25 feet east to oak tree	35 00 19.1	87 19 19.0
Alabama-Tennessee State line, forks of road	35 00 04.5	87 20 16.6
Forks of road at top of hill	34 59 31.0	87 21 15.2
Lexington, three corners 0.75 mile northeast of	34 58 48.7	87 21 55.0
Lexington, at intersection of five forks; iron post stamped "Prim. Trav. Sta. No. 600"	34 58 11.4	87 22 16.8
Lexington, three corners 1 mile west of; 30 feet north to oak tree	34 58 33.8	87 23 20.2
Williams Mill, forks of road 200 feet south of	34 58 42.3	87 24 12.3
Sweet Gum schoolhouse, three corners 400 feet west of	34 58 51.7	87 25 01.0
Forks of road at sawmill	34 58 47.6	87 25 48.5

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Geographic positions along highways between Prospect station and St. Joseph—Continued.

Station.	Latitude.	Longitude.
Belew post-office, three corners 150 feet south of store; 25 feet east to large oak tree, 40 feet southwest to rail fence	° ' " 34 59 29.3	° ' " 87 26 17.8
Forks of road, southeast and southwest; 10 feet west to rail fence, 35 feet east to hickory tree	34 59 43.3	87 26 57.8
Alabama-Tennessee State line (disputed)	35 00 08.45	87 28 08.8
Old Alabama-Tennessee State line	35 00 10.0	87 28 09.7
Crossroads, 35 feet south to dead oak tree, 50 feet east to oak tree and stump	35 00 35.7	87 28 26.5
Four corners, military road, north and south	35 00 55.9	87 29 12.9
Blue Water Creek	35 01 27.4	87 30 09.5
St. Joseph, four corners	35 02 02.6	87 30 17.4

Geographic positions along the Louisville and Nashville Railroad between St. Joseph and Iron City.

Station.	Latitude.	Longitude.
St. Joseph, road crossing 400 feet west of	° ' " 35 02 30.2	° ' " 87 30 22.2
Milepost 288, road crossing 180 feet south of	35 02 44.7	87 32 14.5
Second-class road	35 02 03.4	87 32 39.5
Road crossing, north end of trestle over	35 01 50.2	87 33 25.4
Iron City, road crossing 0.75 mile northeast of; 40 feet south to cattle guard, 40 feet west to center of bridge ..	35 01 27.1	87 34 19.3
Iron City, 0.25 mile northeast of; on capstone of abutment at northwest corner of 3-span truss bridge over Shoal Creek; chisel mark, "L"	35 01 13.6	87 34 44.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
Wales, 300 feet north of Louisville and Nashville station, in west end of culvert at switch point; aluminum tablet stamped "Prim. Trav. Sta. No. 1"	° ' " 35 14 56.4	° ' " 87 04 58.6
Wales, 1.25 miles west of; three corners at Little Dry Creek	35 14 53.6	87 06 36.2
Big Dry Creek, three corners 0.25 mile west of; 35 feet southeast to telephone pole, 30 feet west to gate	35 14 40.7	87 07 17.9
Lower Bordenham, forks of road 125 feet east of store ...	35 14 04.7	87 08 51.0
Bordenham, forks of road 100 feet west of post-office ...	35 13 56.5	87 08 31.9
Bordenham, forks of road at Choats Creek, 1.25 miles west of; 100 feet east to corner wire fence, 100 feet south to creek	35 13 26.8	87 10 30.4
Choats Creek Church, at southwest corner of; iron post stamped "Prim. Trav. Sta. No. 63"	35 13 30.5	87 11 14.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Forks of road, 75 feet east to creek, 40 feet north to sycamore tree.....	35 13 00.7	87 12 12.7
T road south, 5 feet southwest to small oak, 40 feet east to W. W. Bishop's mail box.....	35 13 07.0	87 13 33.0
Second-class road south.....	35 13 20.1	87 14 44.1
Forks of road, 15 feet southwest to oak tree, 30 feet northwest to double oak tree.....	35 13 36.9	87 16 11.5
Four corners, north and south and east and west, 50 feet northeast to fence corner, 45 feet southeast to fence corner.....	35 13 57.0	87 17 01.2
Four corners at mill.....	35 14 09.6	87 18 24.9
Lawrenceburg, three corners at east edge of; 20 feet north to corner yard fence, 35 feet east to elm tree.....	35 14 17.5	87 19 39.4
Lawrenceburg, crossing of Pulaski street and Louisville and Nashville Railroad.....	35 14 21.5	87 20 04.4
Lawrenceburg, in north wall east of entrance to courthouse, aluminum tablet stamped "Prim. Trav. Sta. No. 166".....	35 14 22.6	87 20 07.7
Shoal Creek, center of pier of iron bridge over.....	35 14 26.3	87 21 15.1
Lawrenceburg, forks of road 2.25 miles west of; 60 feet southeast to persimmon tree; 40 feet north to wire fence.....	35 14 38.1	87 21 57.2
Lawrenceburg, forks of road, 2.75 miles west of; 20 feet south to old stump; 40 feet southwest to oak tree.....	35 14 26.6	87 22 35.5
Lawrenceburg, forks of road 4 miles west of; 25 feet south to small oak; 35 feet west to oak tree.....	35 14 14.8	87 23 32.2
Four corners, 60 feet north to oak tree; 60 feet west to oak tree.....	35 14 07.6	87 24 26.7
Schoolhouse, second-class road to southwest; 500 feet west of.....	35 13 44.6	87 25 24.2
Yellow house, forks of road.....	35 13 30.8	87 26 14.0
Venus, four corners 1 mile east of; 10 feet west to corner rail fence; 50 feet south to oak tree.....	35 13 36.8	87 27 09.0
Venus, forks of road 0.3 mile southeast of; 250 feet southeast of schoolhouse.....	35 12 51.1	87 27 57.5
Venus, forks of road at ford of Knob Creek, 1 mile west of.....	35 12 37.8	87 28 52.1
Second-class road to west.....	35 12 51.5	87 29 50.4
Four corners, 20 feet south to oak tree; 40 feet northwest to oak tree.....	35 12 58.8	87 30 43.3
Forks of road northwest and southwest at branch.....	35 12 52.6	87 32 00.7

MINNESOTA-WISCONSIN.

TRIANGULATION STATIONS.

HOUSTON AND WINONA COUNTIES, MINN.; LA CROSSE AND MONROE COUNTIES, WIS.

LA CROSSE AND SPARTA QUADRANGLES.

In the summer of 1905 Mr. S. S. Gannett, geographer, extended triangulation eastward from Dresbach and McDonald stations, of the Mississippi River Commission, situated on the river bluffs west of La Crosse, Wis., for the control of the La Crosse and Sparta 15-minute quadrangles. Six stations were occupied and 2 points were located by intersections.

Positions are given on the Cairo, Ill., astronomic datum as published in the report of the Chief of Engineers, United States Army, 1895, part 6, pages 3736-3741.

DRESBACH, WINONA COUNTY, MINN.

A station of the Mississippi River Commission on a flat ridge 1 mile below Dresbach, Minn., and 4 miles north of La Crescent, on edge of road at northeast corner of yard in front of residence of Michael Ready.

Station mark: An iron post set 3 feet in the ground.

Reference marks: Windmill in barnyard of Mr. Ready, true azimuth, $83^{\circ} 01'$; distant 142.3 feet.

[Latitude $43^{\circ} 52' 33.93''$. Longitude $91^{\circ} 20' 18.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wedeking	243 52 07.2	63 58 42.8	4.15149
Kinney	261 23 45.8	81 31 13.1	4.16331
St. Joseph	292 03 23.3	112 15 56.3	4.41884
McDonald	343 46 39.0	163 48 37.7	4.13774

MCDONALD, HOUSTON COUNTY, MINN.

A station of the Mississippi River Commission in sec. 2, T. 103 N., R. 4 W., on property of Mr. Michael McDonald, 6 miles below La Crescent, Minn. Station is at northeast corner of barnyard, 194 feet northeast of northeast corner of stone house, but is not on highest point of ridge, which is 100 yards west and 10 feet higher.

Station mark: An iron post set $3\frac{1}{2}$ feet in the ground, stamped "Latitude $43^{\circ} 45' 27''$; longitude $91^{\circ} 17' 27''$."

Reference marks: East chimney on house, true azimuth, $49^{\circ} 09'$; distance, 212.9 feet.

[Latitude $43^{\circ} 45' 26.67''$. Longitude $91^{\circ} 17' 26.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dresbach	163 48 37.7	343 46 39.0	4. 13774
Wedeking	204 37 06.3	24 41 42.7	4. 32970
St. Joseph	260 46 58.2	80 57 31.8	4. 31694

BALLS BLUFF, MONROE COUNTY, WIS.

Station is on northern end of a level ridge, timbered on eastern edge of summit and nearly cleared on western slope, in sec. 8, T. 16 N., R. 3 W., 5 miles southeast of Sparta. To reach it, drive south from Sparta to house of D. Peters, thence by old road through fields to foot of bluff.

Station mark: Black oak signal tree blazed on three sides, with white target nailed on.

Reference marks: Black oak tree N. 30° E., 27 feet distant; oak tree N. 80° E., 33 feet distant; oak tree S. 10° W., 21 feet distant.

[Latitude $43^{\circ} 52' 58.38''$. Longitude $90^{\circ} 46' 11.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Norwegian Lutheran Church	51 59 49.2	231 55 12.4	4. 05424
Kinney	92 42 47.4	272 26 35.6	4. 49583
Wedeking			4. 52370
Castlerock	147 14 30.5	327 10 36.5	4. 14276

CASTLE ROCK, MONROE COUNTY, WIS.

A well-known rocky butte 4 miles northwest of Sparta, in south-central part of sec. 33, T. 18 N., R. 4 W.

Signal: A sapling, brush top, white flag; and targets.

Station mark: A bronze triangulation tablet cemented in out-cropping sandstone ledge on highest point.

[Latitude $43^{\circ} 59' 16.77''$. Longitude $90^{\circ} 51' 48.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Norwegian Lutheran Church	4 15 39.8	184 14 56.7	4. 27213
St. Joseph	31 56 52.9	211 49 41.5	4. 41990
Kinney	66 42 32.9	246 30 14.3	4. 41271
Balls Bluff	327 10 36.5	147 14 30.5	4. 14276

KINNEY, LA CROSSE COUNTY, WIS.

In N.W. $\frac{1}{4}$ N.E. $\frac{1}{4}$ sec. 1, T. 16 N., R. 7 W., 5 miles west of West Salem and 9 miles northeast of La Crosse.

The summit of the knob is heavily timbered and the station is on cleared part of ridge 200 feet south of summit and 60 feet south of a stone quarry, and is 20 feet lower than highest point of knob.

Signal: A trimmed hickory sapling, white flag, and targets.

Station mark: A stone post 8 by 10 by 20 inches, set 18 inches in the ground; in center of top of post is cemented a bronze triangulation tablet.

[Latitude $43^{\circ} 53' 44.03''$. Longitude $91^{\circ} 09' 32.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dresbach	81 31 13.1	261 23 45.8	4.16331
Wedeking			3.64300
Castle Rock	246 30 14.3	66 42 32.9	4.41271
Balls Bluff	272 26 35.6	92 42 47.4	4.49583
St. Joseph	320 38 21.9	140 43 28.1	4.19276

NORWEGIAN LUTHERAN CHURCH, MONROE COUNTY, WIS.

(Not occupied.)

A brick church with tall spire, in center of sec. 32, T. 16 N., R. 4 W., Leon Township, about 6 miles south-southwest of Leon village.

Station mark: Center of spire.

[Latitude $43^{\circ} 49' 12.16''$. Longitude $90^{\circ} 52' 50.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wedeking			4.43262
Castle Rock	184 14 56.7	4 15 39.8	4.27213
Balls Bluff	231 55 12.4	51 59 49.2	4.05424

ST. JOSEPH CHURCH, LA CROSSE COUNTY, WIS.

(Not occupied.)

A prominently located church on St. Joseph Ridge T. 15 N., R. 6 W.
 Station mark: Center of church spire.

[Latitude 43° 47' 13.32''. Longitude 91° 02' 10.77''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McDonald	80 57 31.8	260 46 58.2	4.31694
Dresbach	112 15 56.3	292 03 23.3	4.41884
Kinney	140 43 28.1	320 38 21.9	4.19276
Wedeking			4.29735
Castle Rock	211 49 41.5	31 56 52.9	4.41990

WEDEKING, LA CROSSE COUNTY, WIS.

On a flat, cleared ridge, 4 miles northeast of Onalaska, in sec. 23,
 T. 17 N., R. 7 W., owned by Henry Wedeking, who lives 100 yards
 northeast of station.

Signal: A trimmed sapling with white targets.

Station mark: A dressed stone post 42 by 6 by 6 inches set 40
 inches in the ground, in center of top of which is cemented a bronze
 triangulation tablet.

[Latitude 43° 55' 55.80''. Longitude 91° 10' 47.63''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McDonald	24 41 42.7	204 37 06.3	4.32970
Dresbach	63 58 42.8	243 52 07.2	4.15149
Balls Bluff			4.52370
St. Joseph			4.29735
Kinney			3.64300

WISCONSIN.

PRIMARY TRAVERSE.

DODGE, KENOSHA, MILWAUKEE, RACINE, ROCK, WALWORTH, AND
 WAUKESHA COUNTIES.

CLYMAN, DELAVAN, EAGLE, GENEVA, KOSHKONONG, MILWAUKEE, OCONOMOWOC, RACINE,
 WATERTOWN, AND WHITEWATER QUADRANGLES.

The following geographic positions in southeastern Wisconsin were
 determined from primary traverse by Mr. George T. Hawkins, topog-
 rapher, in 1904. The line starts at Benton triangulation station of the

United States Lake Survey, runs westward along or near Illinois-Wisconsin State line to longitude $88^{\circ} 30'$; thence northward along the eastern border of the Delavan quadrangle to latitude $42^{\circ} 45'$; thence westward along the northern border of the Delavan and Shopiere quadrangles to Janesville triangulation station of the United States Coast and Geodetic Survey, which, however, could not be identified. The line was also run around the Whitewater quadrangle, with a spur to Oakland triangulation station, and extended northward, connecting with Lebanon triangulation station and Clyman primary traverse station. Another line was extended eastward from Dousman along the Chicago and Northwestern Railway, and was connected with Delafield triangulation station and Milwaukee court-house spire triangulation station, United States Lake Survey. Positions are given on the United States standard datum.

DODGE COUNTY, CLYMAN QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	^o ' "	^o ' "
Ashippun, T road west, 2 miles north of	43 15 15.3	88 31 49.0
"Neosho 3.5 mi.; Ashippun 3 miles; Oconomowoc 11 mi." (signboard), 35 feet northwest of, on east side of north and south road, on land owned by Albert Windroff, iron post stamped "Prim. Trav. No. 16, 1904"	43 16 07.5	88 31 54.9
T road north, 0.5 mile west of bench mark No. 16	43 16 08.8	88 33 05.8
Lebanon triangulation station (United States Coast and Geodetic Survey)	43 16 35.2	88 35 33.7
T road north, 1 mile west of Lebanon triangulation station	43 16 39.5	88 36 46.0
Schoolhouse No. 5, three corners	43 17 03.8	88 37 40.5
Silver Cheese Factory, road north	43 16 57.2	88 39 19.8
Clyman, 3 miles southeast of, 2 miles east of Chicago and Northwestern Railway, 400 feet northwest of John Clayton's house, 500 feet southwest of Christ Eiffert's house, on top of hill, south side of road, iron post stamped "Prim. Trav. No. 17, 1904"	43 17 04.8	88 40 55.5
Union Cheese Factory, crossroads	43 17 05.4	88 42 19.4
Clyman, railway crossing 0.25 mile north of	43 18 50.4	88 43 07.7
Clyman, 0.25 mile north of, 37 feet east of railway, 120 feet north of center of east and west road, iron post stamped "Prim. Trav. No. 18, 1904"	43 18 50.5	88 43 07.3

WALWORTH COUNTY, DELAVAN QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Geneva, T road south, 4 miles west of.....	42 34 59.0	88 31 08.3
Yerkes Observatory (geodetic), from primary traverse ..	42 34 15.8	88 33 24.4
Yerkes Observatory (astronomic)	42 34 12.6	88 33 18.6
Williams Bay, junction of roads 1.5 miles north of.....	42 36 00.8	88 32 26.4
Geneva triangulation station, United States Coast and Geodetic Survey	42 37 05.4	88 32 12.9
T. 2 N., Rs. 16 and 17 E., secs. 19 and 24, quarter corner between	42 37 09.4	88 32 26.4
T. 2 N., Rs. 16 and 17 E., secs. 13 and 18	42 38 01.4	88 32 27.2
T. 2 N., Rs. 16 and 17 E., 130 feet southeast of corner of secs. 7, 18, 13, and 12, 2 miles south of Elkhorn, on east side of road in front of Loren Baker's house, iron post stamped "Prim. Trav. Sta. No. 5, 1904"	42 38 26.2	88 32 27.3
T. 2 N., Rs. 16 and 17 E., corner of secs. 7, 18, 13, and 12.	42 38 27.5	88 32 27.5
Elkhorn, crossing Park and East streets	42 40 13.6	88 32 27.5
T. 3 N., Rs. 16 and 17 E., quarter corner between secs. 19 and 24.....	42 42 22.5	88 32 30.5
Elkhorn, T road south, 3.75 miles north of.....	42 43 32.2	88 32 33.2
Mayview, 2.5 miles west of; on north side of east and west road at T road, 12 feet northeast of mail box marked "E. H. Brownson," iron post stamped "Prim. Trav. Sta. No. 6, 1904"	42 44 55.0	88 32 01.9
J. E. Parsons's house, three corners	42 43 54.8	88 34 19.5
Tibbetts's house, three corners	42 44 04.1	88 34 55.0
Millard, T. 3 N., R. 16 E., secs. 8 and 9, quarter corner between	42 44 04.0	88 37 16.0
Millard, 0.5 mile west of; at northeast corner of schoolhouse yard, district No. 4, 12 feet north and west of corner of iron fence, iron post stamped "Prim. Trav. Sta. No. 7, 1904"	42 44 03.5	88 37 52.4
Millard, T road south, 2 miles west of.....	42 44 14.3	88 40 15.4
T. 3 N., R. 15 E., at quarter corner between secs. 5 and 8, 70 feet southwest of schoolhouse, district No. 5, at southwest corner of school yard, 6.5 miles south of Whitewater, 35 feet northeast of crossroad, iron post stamped "Prim. Trav. Sta. No. 8, 1904"	42 44 24.7	88 44 58.1

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JEFFERSON AND WALWORTH COUNTIES, KOSHKONONG QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Whitewater, crossroads 5.5 miles south of.....	42 45 18.4	88 45 00.2
Whitewater, crossroads 3 miles south of (creamery 400 feet west)	42 47 29.4	88 44 48.7
Whitewater, Congregational Church spire (Hawkins)....	42 50 02.6	88 44 11.9
Whitewater, Congregational Church spire (United States States Coast Survey).....	42 50 02.6	88 44 09.5
Whitewater Normal School, T street south, in front of....	42 50 05.8	88 44 37.0
Whitewater Normal School, central dome (Hawkins)....	42 50 09.9	88 44 37.2
Whitewater Normal School, central dome (United States Coast Survey).....	42 50 10.9	88 44 37.3
Whitewater, junction of roads 1.5 miles northwest of.....	42 51 26.0	88 45 24.0
Whitewater, 4 miles northwest of; 0.33 mile southeast of Auman's house, 180 feet from telephone pole, marked "U. S. 794;" on east side of road, iron post stamped "Prim. Trav. Sta. No. 10, 1904".....	42 52 28.1	88 46 13.2
Cold Spring, four corners at store.....	42 53 28.3	88 46 26.2
Cold Spring, T road west, 1 mile north of.....	42 54 15.8	88 46 39.4
Bridge over creek west, T road east, 400 feet north of....	42 55 03.0	88 46 44.0
Fort Atkinson, T road west, 2 miles east of.....	42 55 22.3	88 46 46.3
Bridge, elevation marked "U. S. 803.806".....	42 56 48.4	88 46 51.4
Schoolhouse No. 10, road in front of.....	42 58 57.5	88 46 37.5
T. 6 N., Rs. 14 and 15 E., corner secs. 7, 12, 13, and 18...	42 59 24.0	88 46 37.9
Jefferson, 1 mile east of; T. 6 N., Rs. 14 and 15 E., 30 feet southeast of corner of secs. 1, 6, 7, and 12; iron post stamped "Prim. Trav. Sta. No. 11, 1904".....	43 00 16.5	88 46 57.2
Jefferson, Catholic Church spire 1 mile east of (Hawkins)...	43 00 17.9	88 46 44.4
Jefferson, Catholic Church spire 1 mile east of (Coast and Geodetic Survey).....	43 00 17.9	88 46 45.1
Jefferson, German Methodist Episcopal Church spire.....	43 00 19.7	88 48 19.7
Jefferson, German Methodist Episcopal Church spire (Coast and Geodetic Survey).....	43 00 24.7	88 48 09.6
Jefferson, Catholic Church spire.....	43 00 24.6	88 48 09.7
T. 6 N., R. 14 E., quarter corner between secs. 4 and 9...	43 00 24.8	88 50 48.6
T. 6 N., Rs. 13 and 14 E., corner secs. 1, 6, 7, 12.....	43 00 27.8	88 53 39.2
Oakland triangulation station (Coast and Geodetic Survey)	42 59 11.98	88 53 49.06

KENOSHA AND WALWORTH COUNTIES, GENEVA QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Twin Lakes, 0.75 mile west of; 550 feet west of elbow in road, 400 feet north of Mr. Oelson's barn, iron post stamped "Prim. Trav. Sta. No. 3, 1904".....	° ' " 42 31 52.2	° ' " 88 16 06.6
J. F. Reynold's house, T road south, 0.25 mile north of..	42 31 26.3	88 17 19.6
T. 1 N., R. 18 E., quarter corner between secs. 25 and 26.	42 30 59.6	88 19 27.8
Genoa Junction, crossing Chicago and Northwestern Railway 2 miles northwest of	42 31 13.2	88 20 54.9
T. 1 N., R. 18 E., corner secs. 21, 22, 27, and 28	42 31 25.2	88 21 49.2
T. 1 N., R. 18 E., quarter corner between secs. 20 and 29.	42 31 25.6	88 23 34.6
T. 1 N., Rs. 17 and 18 E., quarter corner between secs. 30 and 25	42 30 59.3	88 25 21.7
T. 1 N., R. 17 E., 30 feet northeast of quarter corner between secs. 25 and 26, at southwest corner of Bloom Prairie Farm, owned by J. G. Nichols, iron post stamped "Prim. Trav. Sta. No. 4, 1904".....	42 30 59.7	88 26 33.1
T. 1 N., R. 17 E., corner of secs. 13, 14, 23, and 24.....	42 32 44.5	88 26 33.9
Geneva, junction of roads, 2 miles southwest of.....	42 33 28.0	88 26 34.0
Geneva, crossing Main and Broad streets.....	42 35 30.6	88 26 06.0
Geneva, crossroads 2.5 miles west of.....	42 35 10.8	88 28 55.6

MILWAUKEE COUNTY, MILWAUKEE QUADRANGLE.

Geographic positions along the Chicago and Northwestern Railway.

Station.	Latitude.	Longitude.
North Greenfield, railway crossing, 1.25 miles east of....	° ' " 43 00 27.8	° ' " 87 59 19.5
Overhead crossing, 200 feet west of	43 00 11.3	87 58 30.2
Layton Park, crossing west of station.....	42 59 45.6	87 57 13.9
Catholic Cathedral, railway crossing 3 blocks south of....	42 59 41.8	87 55 07.4
Milwaukee court-house dome (United States Lake Survey station).....	43 02 31.9	87 54 17.6

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DODGE AND WAUKESHA COUNTIES, OCONOMOWOC QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dousman, crossroads 3.25 miles northwest of	43 02 51.0	88 29 10.8
T. 7 N., R. 17 E., corner of secs. 15, 16, 21, and 22.....	43 03 44.4	88 28 52.6
T. 7 N., R. 17 E., corner of secs. 15, 16, 9, and 10.....	43 04 36.6	88 28 50.7
Oconomowoc, crossing Main and West avenues.....	43 06 41.4	88 29 57.5
Oconomowoc, 2 miles north of, in front of A. Cottrell's house on east side of north and south road; iron post stamped "Prim. Trav. Sta. No. 15, 1904"	43 08 16.9	88 29 58.2
T. 8 N., R. 17 E., quarter corner between secs. 20 and 21.	43 08 35.8	88 29 58.3
T. 8 N., R. 17 E., corner of secs. 16, 17, 20, and 21.....	43 09 01.9	88 29 58.3
Monterey, crossroads $\frac{1}{2}$ mile north of; T. 8 N., R. 17 E., corner of secs. 4, 5, 8, and 9.....	43 10 46.6	88 30 00.3
Monterey, crossroads 1.75 miles northwest of.....	43 11 44.8	88 30 25.4
Ashippun, crossroads 1.25 miles southeast of	43 12 36.9	88 30 54.7
Ashippun, crossroads.....	43 13 29.4	88 31 10.8

Geographic positions along the Chicago and Northwestern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dousman, railway crossing.....	43 00 50.3	88 28 21.6
Dousman, railway crossing 1.25 miles east of	43 00 56.0	88 26 46.4
Delafield triangulation station (United States Coast Sur- vey)	43 01 57.0	88 23 33.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wales, crossroads 0.75 mile northwest of.....	43 00 43.2	88 23 01.4
Wales, 0.75 mile northwest of; 750 feet east of cross- roads, on south side of road; iron post stamped "Prim. Trav. Sta. No. 19, 1904"	43 00 45.7	88 22 51.8
Stone schoolhouse, road south.....	43 01 14.3	88 20 37.3
Stone schoolhouse, three corners 1 mile east of	43 01 13.5	88 19 27.6
Waukesha, crossroads 2.5 miles west of	43 00 47.8	88 17 09.0

KENOSHA COUNTY, RACINE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Benton triangulation station, United States Lake Survey..	42 29 02.88	87 52 43.35
Benton, crossroads on Illinois-Wisconsin State line, 0.75 mile northwest of	42 29 37.4	87 53 12.0
Illinois-Wisconsin State line, T road west 0.25 mile south of.	42 29 25.5	87 54 09.1
Illinois-Wisconsin State line, T road west 0.5 mile north of.	42 30 04.9	87 54 42.9
Illinois-Wisconsin State line, Elbow road north and west on.	42 29 40.9	87 57 03.4
Illinois-Wisconsin State line, crossroads on.....	42 29 41.5	87 58 17.4
T. 1 N., R. 21 E., 50 feet northeast of south corner secs. 34 and 35, on north side of State line road, about 800 feet northwest of Charles Crawford's house; iron post stamped "Prim. Trav. Sta. No. 1 1904".....	42 29 42.5	87 59 24.5

ROCK AND WALWORTH COUNTIES, SHOPIERE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 3 N., Rs. 14 and 15 E., corner secs. 1, 6, 7, and 12.....	42 44 24.1	88 46 41.8
T. 3 N., R. 14 E., quarter corner between secs. 2 and 11..	42 44 23.8	88 48 27.2
Johnson Center, crossroads 3 miles north of and 0.75 mile east of:.....	42 44 14.1	88 49 38.6
Johnson Center, crossroads 3 miles north of.....	42 44 20.2	88 50 31.8
Brick schoolhouse, crossroads	42 44 27.3	88 51 25.1
"Milton, 4 miles" from, 920 feet west of crossroads where signpost is, on north side of road; iron post stamped "Prim. Trav. Sta. No. 9, 1904"	42 44 30.9	88 52 48.3
T. 3 N., Rs. 13 and 14 E., corner secs. 1, 6, 7, and 12.....	42 44 32.1	88 53 43.2
T. 3 N., R. 13 E., corner secs. 1, 2, 11, and 12.....	42 44 33.2	88 54 54.7
T. 3 N., R. 13 E., corner secs. 12, 11, 13, and 14.....	42 43 41.4	88 54 54.0
T. 3 N., R. 13 E., corner secs. 10, 11, 14, and 15.....	42 43 42.6	88 56 03.8
T. 3 N., R. 13 E., corner secs. 9, 10, 15, and 16.....	42 43 42.9	88 57 15.2
Janesville, crossroads 2.75 miles northeast of (roads run northeast and southwest and northwest and southeast).	42 43 12.2	88 59 47.6
County Farm, crossroads at northwest corner of.....	42 43 48.8	89 01 57.5
Brick schoolhouse, crossroads	42 43 48.8	89 02 33.7
Rock River, T road south 0.25 mile west of.....	42 43 48.2	89 03 49.8

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KENOSHA COUNTY, SILVER LAKE QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pikeville, crossroads.....	42 29 44.8	88 01 30.0
Hosmer Church, junction of roads.....	42 30 35.8	88 01 46.5
Antioch, T road west, 2 miles northeast of	42 30 11.4	88 04 43.7
Antioch, 2 miles north of, crossroad	42 30 23.9	88 05 46.2
T. 1 N., R. 20 E., corner secs. 27, 28, 33, and 34.....	42 30 37.2	88 07 40.9
Trevor, 1 mile west of, on south side of road in front of George Faulkner's house, iron post stamped "Prim. Trav. Sta. No. 2, 1904"	42 30 36.8	88 08 17.3
Wilmot, intersection of streets at hotel.....	42 30 46.6	88 10 53.4
T. 1 N., R. 19 E., secs. 26 and 35, quarter corner between.	42 30 35.2	88 12 58.8
T road west.....	42 31 53.2	88 13 00.9
Twin Lakes, T road east, 0.5 mile east of.....	42 31 52.4	88 14 52.8
Twin Lakes, road in front of railway station	42 31 52.6	88 15 12.4

WAUKESHA COUNTY, WAUKESHA QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Waukesha, at southwest corner of Madison and Wash- ington streets, iron post stamped "Prim. Trav. Sta. No. 20, 1904"	43 00 48.3	88 14 43.4

Geographic positions along the Chicago and Northwestern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Waukesha, crossing Wisconsin Central Railway and Chi- cago and Northwestern Railway	43 00 19.8	88 13 53.0
Springdale, railway crossing	43 00 35.2	88 11 10.5
Calhoun, 275 feet southwest of railroad station, on south side of railway, 30 feet west of north and south road, iron post stamped "Prim. Trav. Sta. No. 21, 1904"	43 00 35.7	88 07 37.3
Edgemore, north and south road crossing	43 00 36.1	88 06 26.6
Sunny Slope, north and south road crossing.....	43 00 36.3	88 05 14.7
County line, north and south road crossing	43 00 36.5	88 04 01.9
North Greenfield, overhead road crossing 0.75 mile west of.	43 00 36.8	88 01 36.5
North Greenfield, 150 feet southeast of station, 25 feet south of railway and 50 feet southwest of end of double track, iron post stamped "Prim. Trav. Sta. No. 22, 1904"	43 00 36.7	88 00 47.6

JEFFERSON, WALWORTH, AND WAUKESHA COUNTIES, WHITEWATER QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson, junction of roads at church 2 miles east of.....	43 00 39.9	88 45 50.5
Jefferson, T road north, 3.5 miles east of.....	43 01 01.2	88 44 21.8
Jefferson, T road north, 4.5 miles east of.....	43 01 07.8	88 43 10.8
Helensville, flag pole on schoolhouse.....	43 00 43.7	88 41 55.4
Helensville, crossroads 1 mile east of.....	43 00 51.5	88 40 45.9

Geographic positions along the Chicago and Northwestern Railway between Helensville and Dousman.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Helensville, railway crossing 1.5 miles east of.....	43 00 47.2	88 40 04.4
Helensville, railway crossing 2.5 miles east of.....	43 00 40.0	88 38 43.4
Helensville, railway crossing 4 miles east of.....	43 00 43.8	88 37 24.6
Sullivan, on north side of railway right of way, 200 feet west of station, iron post stamped "Prim. Trav. Sta. No. 12, 1904".....	43 00 42.5	88 35 20.6
Sullivan, overhead railway crossing 1.5 miles east of.....	43 00 41.9	88 33 39.2
Flag station, railway crossing.....	43 00 38.9	88 32 49.1
Dousman, railway crossing 0.5 mile west of.....	43 00 48.7	88 28 58.1

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JEFFERSON, WALWORTH, AND WAUKESHA COUNTIES, WHITEWATER QUADRANGLE—cont'd.

Geographic positions along highways.

Station.	Latitude.	Longitude.
Dousman, 0.75 mile southwest of, at T road north, on south side of road, 8 feet north of east and west fence, 250 feet southwest of Jake Stevens's house, iron post stamped "Prim. Trav. Sta. No. 13, 1904"	43° 00' 38.2"	88° 28' 58.1"
Dousman, junction of roads 1.5 miles southwest of	43° 00' 09.3"	88° 29' 52.9"
Catholic Church, road in front of	42° 59' 36.1"	88° 30' 39.7"
Junction of road south with road northeast and southwest	42° 58' 48.6"	88° 31' 57.2"
T. 6 N., R. 17 E., sec. 19, center of	42° 58' 02.5"	88° 31' 57.3"
T. 6 N., R. 17 E., secs. 19 and 30, quarter corner between	42° 57' 36.2"	88° 31' 57.6"
T. 6-N., R. 17 E., corner secs. 19, 24, 25, and 30	42° 57' 36.7"	88° 32' 30.2"
Siloam Chapel, crossroads	42° 55' 37.6"	88° 32' 30.9"
Creamery, crossing north and south road with northeast and southwest road	42° 54' 18.2"	88° 32' 31.0"
Palmyra, 3 miles east of, 20 feet south of three corners, 6 feet north of railway fence, 160 feet east of railway crossing, iron post stamped "Prim. Trav. Sta. No. 14, 1904"	42° 52' 45.2"	88° 32' 30.7"
T. 5 N., Rs. 16 and 17 E., quarter corner between secs. 31 and 36	42° 51' 08.5"	88° 32' 29.3"
Schoolhouse and creamery, crossroads	42° 48' 01.2"	88° 31' 59.0"
Three corners, road south	42° 47' 36.4"	88° 31' 42.9"
Elbow in road, north and west	42° 46' 43.6"	88° 31' 45.1"
T. 4 N., Rs. 16 and 17 E., quarter corner between secs. 25 and 30	42° 46' 42.8"	88° 32' 36.6"
T. 4 N., Rs. 16 and 17 E., quarter corner between secs. 31 and 36	42° 45' 51.1"	88° 32' 37.3"

WESTERN DIVISION OF TOPOGRAPHY.

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

ARIZONA.

SECONDARY TRIANGULATION STATIONS.

MARICOPA COUNTY.

CAMELS BACK, DESERT WELL, AND FORT McDOWELL QUADRANGLES.

In the winter of 1904-5 Mr. T. M. Bannon, topographer, occupied a number of three-point and secondary triangulation stations in order to obtain additional control for three 15-minute quadrangles in Maricopa County.

Positions are based upon Santan, Walker, Superstition, and Four Peaks; Maricopa astronomic datum.

HUCHANANS TANK, MARICOPA COUNTY.

(Not occupied.)

The galvanized water tank on the platform 10 feet south of the Desert Well. Twelve miles east of mesa on telephone road to Florence.

Station mark: Center of tank.

[Latitude $33^{\circ} 20' 56.90''$. Longitude $111^{\circ} 36' 38.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Number Four	3. 9339890
Usery	4. 2272149

CORRECTION CORNER, MARICOPA AND PINAL COUNTIES.

Correction corner on the base line between Tps. 1 N. and 1 S. and Rs. 7 and 8 E. of the Gila and Salt rivers meridian. This corner also marks an angle between Maricopa and Pinal counties. The station was located by the three-point method.

[Latitude $33^{\circ} 22' 39.19''$. Longitude $111^{\circ} 35' 02.33''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walker	4. 5491195
Santan	4. 4082288

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DOME HILL, MARICOPA COUNTY.

(Not occupied.)

Bush on center of high dome-shaped hill several miles northwest of Goldfield.

Station mark: Center of bush.

[Latitude $33^{\circ} 30' 04.53''$. Longitude $111^{\circ} 32' 43.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Texas	4. 2121371
Usery	3. 9490697

EASTEND, MARICOPA COUNTY.

(Not occupied.)

Station mark: Highest point of a big boulder hill on the northeast end of the McDowell Mountains.

[Latitude $33^{\circ} 40' 42.50''$. Longitude $111^{\circ} 48' 02.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lousley	3. 9819277
Fraesfield	3. 9040694

FORT M'DOWELL, MARICOPA COUNTY.

(Not occupied.)

Station mark: Center of the agent's house at old Fort McDowell.

[Latitude $33^{\circ} 38' 07.72''$. Longitude $111^{\circ} 40' 38.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Texas	3. 9024770
Usery	4. 1900818

FRAESFIELD, MARICOPA COUNTY.

On a lone hill near the divide between the Verdi River and Paradise Valley, about 14 miles northwest of old Fort McDowell.

Station mark: A bronze tablet cemented into solid rock under a large rock monument.

[Latitude $33^{\circ} 45' 01.18''$. Longitude $111^{\circ} 48' 36.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lousley	297 03 54.93	117 07 30.75	4.0507955
Usery	330 35 46.43	150 41 23.08	4.5046607

LOUSLEY, MARICOPA COUNTY.

On the highest point north of the low hills on the west side of the Verdi River and about 4 miles north of old Fort McDowell.

Station mark: A tablet cemented in a large boulder centered under a large rock monument.

[Latitude $33^{\circ} 42' 14.99''$. Longitude $111^{\circ} 42' 07.35''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Texas			4.0889721
Usery	346 01 21.75	166 03 23.08	4.3697898

NUMBER THREE, MARICOPA COUNTY.

A three-point station on a small isolated knob on the north side of the Mesa-Goldfield road, 17 miles east of Mesa and 5 miles west of Goldfield.

Station mark: A bronze tablet cemented into solid rock under a small rock monument.

[Latitude $33^{\circ} 26' 14.96''$. Longitude $111^{\circ} 38' 27.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Number Four			3.6116108
Usery			3.8349543

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NUMBER FOUR, MARICOPA COUNTY.

(Not occupied.)

On a lone malpais hill 12 miles northeast of Mesa, 2 miles northwest of the crossing of Usery Pass—Desert Well and the Mesa—Goldfield roads.

Station mark: A bronze tablet centered under a small rock monument.

[Latitude $33^{\circ} 25' 33.53''$. Longitude $111^{\circ} 35' 57.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Usery	154 23 30.16	334 22 07.08	3.9541864
Superstition	275 32 03.54	95 38 36.05	4.2672195

NUMBER FIVE, MARICOPA COUNTY.

(Not occupied.)

Highest point of the rock bluff on the east side of Usery Pass.

Station mark: A 2 by 4 scantling driven between two rocks.

[Latitude $33^{\circ} 29' 04.56''$. Longitude $111^{\circ} 35' 51.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Texas			4.2449715
Usery			3.6382264

ROCK PINNACLE, MARICOPA COUNTY.

(Not occupied.)

Station mark: Center of a rock pinnacle about 3 miles west of the divide between Paradise Valley and Verdi River.

[Latitude $33^{\circ} 43' 34.40''$. Longitude $111^{\circ} 51' 54.29''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lousley			4.1849621
Fraesfield			3.7604678

STEWARTS, MARICOPA COUNTY.

On the southwestern of three granite mountains on the north side of Salt River 4 miles east of its junction with the Verdi.

Station mark: A cross (+) chiseled on solid rock under a large rock monument.

[Latitude $33^{\circ} 34' 51.50''$. Longitude $111^{\circ} 33' 31.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Texas	3.8771431
Usery	4.074019

SUGARLOAF, MARICOPA COUNTY.

(Not occupied.)

On the highest point of a flat topped malpais hill, locally known as Sugarloaf, on the south side of Sycamore Creek and about 8 miles east of old Fort McDowell.

[Latitude $33^{\circ} 41' 43.50''$. Longitude $111^{\circ} 31' 52.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Texas	3.9077180
Usery	4.3810111

TEXAS, MARICOPA COUNTY.

A 3-point station on the highest point of the center of three malpais hills on the south side of Sycamore, 6 miles east of old Fort McDowell.

Station mark: A bronze tablet cemented into solid rock under a large rock monument.

[Latitude $33^{\circ} 38' 34.82''$. Longitude $111^{\circ} 35' 30.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Superstition .....	.....	.....	4.4961269
Usery	16 03 01.41	196 01 23.08	4.2201578

USERY, MARICOPA COUNTY.

A 3-point station on the highest point of the hills west of the Usery Pass, about 15 miles northeast of Mesa and $3\frac{1}{2}$ miles south of the junction of the Verdi and Salt rivers.

Station mark: A bronze tablet cemented into a large boulder over which was built a tripod.

[Latitude $33^{\circ} 29' 56.90''$. Longitude $111^{\circ} 38' 28.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Superstition	293 54 32.08	114 02 28.05	4. 3874513
Four Peaks	234 00 01.23	55 10 38.43	4. 5520318

CALIFORNIA.

TRIANGULATION STATIONS.

SAN DIEGO COUNTY.

HOLTVILLE AND IMPERIAL QUADRANGLES.

In the spring of 1904 Mr. C. F. Urquhart, topographer, in cooperation with the Reclamation Service, extended a belt of triangulation westward from the vicinity of Yuma, Ariz., through San Diego County, connecting with stations Tecate and Cuyamaca, of the United States Coast and Geodetic Survey. In the prosecution of this work Mr. Urquhart occupied 25 stations for the control of an area of 2,500 square miles.

The positions given herewith are based upon Cuyamaca-Tecate on the United States standard datum.

AMERICAN, SAN DIEGO COUNTY.

On the highest point of a range of mountains lying east of the American gold mine and about 3 miles a little south of east from the mine. Take road from Yuma to the American gold mine. Horses can be taken within a mile of station by following wash from the mine.

Station mark: A bronze triangulation tablet cemented in rock and placed under center of cairn 8 feet high.

[^a Latitude $32^{\circ} 51' 26.38''$. Longitude $114^{\circ} 45' 09.10''$.][^b Latitude $32^{\circ} 51' 27.53''$. Longitude $114^{\circ} 45' 08.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sandy	^b 39 59 10.25	219 54 43.91	4. 2995209
Blizzard	^b 80 54 55.70	260 47 44.70	4. 3208401
Hardy	^b 94 20 50.67	274 10 09.72	4. 4884104
Quartz	^a 165 40 41.19	345 38 23.65	4. 4231629
Clip	^a 209 57 00.53	30 02 27.81	4. 4945347
Ridge	^a 256 13 38.72	76 19 48.46	4. 2607025
Sugarloaf	^a 286 14 08.73	106 22 49.75	4. 4157937
Yuma, azimuth station	^a 322 06 18.04	142 10 39.78	4. 3116694
Pilot	^a 357 44 03.76	177 44 15.19	4. 1430949
Pilot	^b 357 44 01.80	177 44 13.23	4. 1430929

^a From Lake Tahoe, United States standard.^b From Cuyamaca-Tecate, United States standard.

BLIZZARD, SAN DIEGO COUNTY.

On a high point near the center of Sand Hills, about 8 miles a little south of west from Ogilby, a station on Southern Pacific Railroad 16 miles west of Yuma. It is impossible to describe this point very accurately, as the hills are very similar and change more or less with every sand storm.

Signal: A lumber tripod.

Station mark: A 2 by 3 stake set in sand under center of tripod. No bench mark was available when station was occupied, and it is impossible to preserve this point.

[Latitude $32^{\circ} 49' 39.53''$. Longitude $114^{\circ} 58' 22.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gravel	44 06 15.85	224 01 10.68	4.3244724
Hardy	119 13 29.38	299 09 59.81	4.0609667
American	260 47 44.70	80 54 55.70	4.3208401
Pilot Knob	296 23 37.86	116 30 59.56	4.3750165
Sandy	326 34 08.21	146 36 52.18	4.1558855

BRAWLEY, SAN DIEGO COUNTY.

On a low sand hill covered with mesquite brush, in the southeast corner of the town of Brawley.

Signal: A lumber tripod 12 feet high, with target extending 6 feet higher.

Station mark: A standard bench-mark post set 40 inches in the ground under center of signal. (Probably permanent.)

[Latitude $32^{\circ} 58' 26.47''$. Longitude $115^{\circ} 32' 09.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Imperial	10 29 41.16	190 28 49.21	4.1350684
Lucky	66 12 44.58	246 06 12.43	4.3114329
Sunset	280 06 42.20	100 15 10.03	4.3915585
Holtville	323 45 28.93	143 50 23.35	4.3777290

CALEXICO, SAN DIEGO COUNTY.

(Not occupied.)

Station mark: Center of top of water tank in the town of Calexico.

[Latitude $32^{\circ} 39' 53.95''$. Longitude $115^{\circ} 29' 54.51''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Signal Mountain	76 39 39.90	256 32 51.24	4. 3074526
Lucky	139 28 11.20	319 20 27.80	4. 5343827

CAMPO, SAN DIEGO COUNTY.

On a long ridge 6 or 7 miles north-northwest from Campo post-office. To reach station from Campo there is a road to Mr. Hill's ranch, a distance of 2 miles. From this ranch an old wagon road goes up ridge about west to summit. The road has been abandoned and can not be traveled over with wagon, but is a good pack trail.

Signal: A cairn about 8 feet high, built on a large flat rock. There is a large rock which is a little higher than signal, about 200 yards southwest.

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

[Latitude $32^{\circ} 37' 29.95''$. Longitude $116^{\circ} 32' 39.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tecate	69 32 57.82	249 28 18.54	4. 1592400
Cuyamaca	170 47 24.15	350 45 23.49	4. 5582424
Laguna	209 29 00.83	29 33 41.04	4. 4374836
Jacumba	257 08 16.09	77 20 35.08	4. 5633149

COYOTE, SAN DIEGO COUNTY.

On the highest point in the Coyote Mountains, 8 miles southeast from Carrizo Creek spring and about the same distance northwest from Coyote well, the first water on road from Blue Lake to Campo. It is not a very high mountain, but is rough and rocky. It can probably be most easily reached from the Coyote well side.

Station mark: A triangulation tablet cemented in solid rock, under center of a cairn 9 feet high.

[Latitude $32^{\circ} 49' 31.01''$. Longitude $116^{\circ} 00' 52.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jacumba	44 45 14.49	224 40 23.63	4. 2985400
Laguna.....	92 39 59.49	272 27 26.61	4. 5581308
Whale	128 53 57.23	308 44 08.24	4. 5578864
Eagle	184 12 52.70	4 13 18.83	4. 2302702
Lucky.....	252 25 57.37	72 35 01.37	4. 4366284
Signal Mountain	308 01 14.25	128 11 09.34	4. 5614279

CUYAMACA, SAN DIEGO COUNTY.

A station of the United States Coast and Geodetic Survey located on the southern and highest peak of Cuyamaca Mountain, about 60 miles northeast of the city of San Diego. It is best reached from San Diego by taking the Cuyamaca, San Diego and Eastern Railroad to Lakeside, a distance of about 20 miles. From Lakeside a stage runs daily, except Sundays, to Cuyamaca, a distance of about 40 miles. The south peak of mountain is distant about 4 miles from Cuyamaca. There is an old wood road up to within about $1\frac{1}{2}$ miles of summit, and a wagon could go still nearer the station with light loads. The point selected for the station is on the backbone of the large ledge which forms the highest part of the summit. It is not, however, on the highest part of the ledge, but about 10 feet south of the highest point.

Station mark: A copper bolt with a cross on the end, set in hole drilled in rock.

Reference marks: The north copper bolt is 7.72 feet distant from station. The northeast copper bolt is 7.04 feet distant from station. The south copper bolt is 6.27 feet distant from the station.

[Latitude $32^{\circ} 56' 48.64''$. Longitude $116^{\circ} 36' 22.53''$. United States standard.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tecate.....	10 42 49.80	190 40 09.90	4. 6176690
Soledad	79 04 41.88	258 43 39.38	4. 7893855
Santiago.....	134 42 27.17	314 11 52.70	5. 0826613
Whale	251 16 11.33	71 25 40.89	4. 4573560
Laguna.....	301 34 46.62	121 41 29.06	4. 3545285
Campo	350 45 23.49	170 47 24.15	4. 5582424

EAGLE, SAN DIEGO COUNTY.

On a high, bald point in the high foothills on the north side of Carrizo Creek and about 10 miles northeast from the Carrizo Spring, a well-known point on the road between Julian and Yuma. The spring is about 44 miles from Julian and about 40 miles from Imperial. Horses can be ridden within 2 or 3 miles of point by going up a "wash" entering into Carrizo Creek about 3 miles below the spring. Creek does not flow more than 1 mile before it disappears in the sand. There is another flat summit about as high as point used 2 or 3 miles distant to the east.

Station mark: Triangulation tablet cemented in rock under center of cairn.

[Latitude $32^{\circ} 58' 41.14''$. Longitude $116^{\circ} 00' 04.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coyote	41 31 08.83	184 12 52.70	4.2302702
Jacumba	26 09 03.31	206 03 45.76	4.5391935
Laguna	67 47 01.06	247 34 00.49	4.6059486
Whale	101 04 11.80	280 53 55.40	4.4760237
Lucky	289 19 50.00	109 28 28.96	4.4197360
Signal Mountain	325 07 59.34	145 17 29.60	4.6812910

GRAVEL, SAN DIEGO COUNTY.

On the United States and Mexico boundary, 4,068 feet from monument No. 214. Theodolite elevated 25 feet.

Station mark: A standard bench-mark post set 40 inches in the ground under center of tripod and platform. (The ground is solid and mark should be permanent.)

[Latitude $32^{\circ} 41' 27.10''$. Longitude $115^{\circ} 07' 46.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesquite	93 39 02.85	273 34 15.82	4.1306964
Hog	140 20 18.06	320 16 52.70	4.1896933
Hardy	192 31 41.28	12 33 17.48	4.3281747
Blizzard	224 01 10.68	44 06 15.85	4.3244724
Sandy	261 49 37.80	81 57 26.19	4.3580589

HARDY, SAN DIEGO COUNTY.

On a low sand hill on the south side of main sand ridge, about 17 or 18 miles a little south of east from Sunset Spring, and it can probably be most easily reached from that place. The ditch east from Holtville may be closer water. There is no road and either way is through sand. The sand hill on which the signal stands is constantly moving, and the standard bench-mark post, which was set in sand for station mark, may be covered up or blown out of the ground within a very short time.

Signal: A lumber tripod.

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

[Latitude $32^{\circ} 52' 41.74''$. Longitude $115^{\circ} 04' 49.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gravel	12 33 17.48	192 31 41.28	4 3281747
Hog.....	58 34 14.53	238 29 12.31	4. 2302956
Holtville	73 14 59.65	253 05 04.40	4. 4745810
Sunset.....	108 53 49.36	288 47 25.62	4. 2877086
American.....	274 10 09.72	94 20 50.67	4. 4884104
Blizzard	299 09 59.81	119 13 29.38	4. 0609667

HOLTVILLE, SAN DIEGO COUNTY.

On a small sand hill about 15 feet above the general elevation of the ground, about one-half mile south from the town of Holtville and on the south side of the Alamo River.

Signal: A platform 20 feet high with target about 12 feet higher. Theodolite elevated 25 feet.

Station mark: A standard bench-mark post set 40 inches in the ground.

[Latitude $32^{\circ} 48' 01.37''$. Longitude $115^{\circ} 23' 06.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sharp	0 49 13.95	180 49 09.89	4. 1347675
Signal Mountain	57 04 29.68	236 53 59.98	4. 5585846
Imperial	109 25 47.09	289 20 01.32	4. 2451920
Brawley.....	143 50 23.35	323 45 28.93	4. 3777290
Sunset.....	214 17 36.78	34 21 09.15	4. 2563137
Hardy	253 05 04.40	73 14 59.65	4. 4745810
Hog.....	270 55 06.03	90 59 58.74	4. 1480281
Mesquite	317 07 26.77	137 11 04.44	4. 1876380

HOG, SAN DIEGO COUNTY.

On a low, bald sand hill 9 miles east from Holtville and about 5 miles east from the most eastern ditch. There are several sand hills very much like this one within a radius of a mile, but this is probably the highest.

Station mark: A standard bench-mark post set 40 inches in the sand. (Summit of this hill will probably change from time to time.)

[Latitude $32^{\circ} 47' 53.73''$. Longitude $115^{\circ} 14' 06.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesquite	18 00 17.91	197 59 03.27	4.0654886
Sharp	46 49 36.34	226 44 40.06	4.2916431
Holtville	90 59 58.74	270 55 06.03	4.1480281
Sunset	165 39 08.03	345 37 47.15	4.1938152
Hardy	238 29 12.31	58 34 14.53	4.2302956
Gravel	320 16 52.70	140 20 18.06	4.1896933

HOGUE, SAN DIEGO COUNTY.

On a sand hill with mesquite brush on its side, situated about 8 miles a little east of north from Sunset Springs, and is the most western of a row of hills extending from station Sunset to this point, parallel with the main sand hills and south of them.

Signal: A lumber tripod 14 feet high, with target extending 6 feet higher.

Station mark: A standard bench-mark post set 40 inches in the sand (probably permanent).

[Latitude $33^{\circ} 03' 29.35''$. Longitude $115^{\circ} 19' 26.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Holtville	11 21 45.21	191 19 45.19	4.4647396
Hardy	311 09 21.39	131 17 18.58	4.4811025
Sunset	342 03 37.74	162 05 10.61	4.1578776

IMPERIAL, SAN DIEGO COUNTY.

In the northwest corner of the town of Imperial on perfectly flat ground about 300 yards northeast of the large warehouse on west side of railroad and very near and south of the end of the "Y" on the railroad.

Signal: A platform 20 feet high, with target 12 feet higher.

Station mark: A standard bench-mark post set 40 inches in ground under center of target.

[Latitude $32^{\circ} 51' 10.83''$. Longitude $115^{\circ} 33' 44.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Signal Mountain	28 17 27.61	208 12 42.40	4.4625328
Lucky	107 35 03.03	287 29 23.41	4.2319021
Brawley	190 28 49.21	10 29 41.16	4.1350684
Sunset	251 12 04.37	71 21 22.95	4.4509094
Holtville	289 20 01.32	109 25 47.09	4.2451920

JACUMBA, SAN DIEGO COUNTY.

On the highest point of a high, rocky ridge about 7 miles north-northeast from Jacumba, a ranch and store owned by Mr. W. P. Foster on the road from Campo to Imperial. The mountain is on the east side of Jacumba Creek and about east from Teele Mountain, another high point on west side of same creek. From Jacumba horses can be ridden to foot of mountain, and there is a good trail about two-thirds of the distance.

Station mark: A triangulation tablet cemented in solid rock under center of a cairn 8 feet high.

[Latitude $32^{\circ} 41' 52.27''$. Longitude $116^{\circ} 09' 50.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tecate	75 11 55.34	254 54 57.26	4.7069262
Campo	77 20 35.08	257 08 16.09	4.5633149
Laguna	125 28 20.44	305 20 39.78	4.4342291
Whale	158 56 04.52	338 51 08.21	4.5957727
Eagle	206 03 45.76	26 09 03.31	4.5391935
Coyote	224 40 23.63	44 45 14.49	4.2985400
Signal Mountain	280 56 25.30	101 11 09.41	4.6384900

LAGUNA, SAN DIEGO COUNTY.

On probably the highest point in the Laguna range of mountains, near the headwaters of Cottonwood Creek. It can not be reached except on horseback, but animals can be easily ridden to it. The only

people living near by are the Indians on the north side. Mr. Peter McCain lives about 9 miles southeast, and there is a trail from his ranch to the Indian settlement, thence to Laguna settlement, thence to Cuyamaca. The station is about 1.5 miles south from the Indian settlement. There is another peak about 0.25 mile southeast from station almost as high.

Signal: A rock 10 or 12 feet high on top of a ledge of rocks. A small tree was placed in rocks about 12 feet north of station.

Station mark: A triangulation tablet cemented in center of top of rock.

[Latitude $32^{\circ} 50' 23.47''$. Longitude $116^{\circ} 24' 01.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Campo	29 33 41.04	209 29 00.83	4.4374836
Tecate	43 08 57.56	222 59 37.41	4.5969522
Cuyamaca	121 41 29.06	301 34 46.62	4.3545285
Whale	200 37 21.91	20 40 07.76	4.3517246
Eagle	247 34 00.49	67 47 01.06	4.6059486
Coyote	272 27 26.61	92 39 59.49	4.5581308
Jacumba	305 20 39.78	125 28 20.44	4.4342291

LUCKY, SAN DIEGO COUNTY.

On a low, sandy hill, covered with very soft sandstone, about 10 miles a little north of west from Imperial and about 3 miles west of New River bridge near Blue Lake or Silsbu. One can drive within 100 yards of station.

Station mark: A standard bench-mark post, set in ground under center of cairn 8 feet high.

[Latitude $32^{\circ} 53' 58.67''$. Longitude $115^{\circ} 44' 10.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coyote	72 35 01.37	252 25 57.37	4.4366284
Eagle	109 28 28.96	289 19 50.00	4.4197360
Brawley	246 06 12.43	66 12 44.58	4.3114329
Imperial	287 29 23.41	107 35 03.03	4.2319021
Signal Mountain	355 13 45.15	175 14 38.32	4.4885433

MESQUITE, SAN DIEGO COUNTY.

On a sandhill with mesquite brush growing on it about $2\frac{1}{2}$ or 3 miles northeast from monument 217, United States and Mexico boundary. It is the highest of several sandhills in the vicinity.

Signal: A lumber tripod 12 feet high with pole and target extending 7 feet higher.

Station mark: A standard bench-mark post set 40 inches in the sand under center of signal. (Probably permanent.)

[Latitude $32^{\circ} 41' 54.73''$. Longitude $115^{\circ} 16' 24.51''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sharp	77 39 16.65	257 35 35.29	4.0386893
Holtville	137 11 04.44	317 07 26.77	4.1876380
Hog	197 59 03.27	18 00 17.91	4.0654886
Gravel	273 34 15.82	93 39 02.85	4.1306964

PILOT, SAN DIEGO COUNTY.

A station of the United States and Mexico Boundary Commission, on the highest point of a butte of the same name, about 10 miles west of Yuma on the California side of the Colorado River. Reached from Yuma by crossing the river on the ferry and taking road through the Indian reservation to old stage station, where one strikes the Southern Pacific Railroad again. Follow road along south side of railroad for 2 miles, then turn off across country to foot of butte.

Station mark: No mark was put in by the Boundary Commission, and the signal had blown down. A rock monument 6 feet high was built over center, as nearly as it could be determined.

Reference mark: A bronze triangulation tablet cemented in solid rock; true azimuth from rock monument, $242^{\circ} 07'$; distance, 11.3 feet.

[^a Latitude $32^{\circ} 43' 53.83''$. Longitude $114^{\circ} 44' 49.68''$.]

[^b Latitude $32^{\circ} 43' 55.42''$. Longitude $114^{\circ} 44' 47.99''$.]

[^c Latitude $32^{\circ} 43' 56.57''$. Longitude $114^{\circ} 44' 47.07''$.]

To station—	Azimuth,	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sandy	84 06 28.27	264 01 50.97	4.1280182
Blizzard	116 30 59.56	296 23 37.86	4.3750165
American ^c	177 44 13.23	357 44 01.80	4.1430929
American ^b	177 44 15.19	357 44 03.76	4.1430949
Ridge	223 15 29.56	43 21 27.24	4.3984893
Sugarloaf	254 53 04.41	75 01 33.12	4.4037670
Yuma, azimuth station	280 44 17.76	100 48 27.64	4.0882718
Yuma, azimuth station ^a	280 43 45.30	100 47 55.20	4.0882420

^a Yuma data, United States and Mexico Boundary Commission.

^b Lake Tahoe.

^c From Cuyamaca-Tecate United States standard.

SANDY, SAN DIEGO COUNTY.

On the highest point near the southeast end of long range of sand hills, about 1.5 miles northeast from monument 210 on United States and Mexico boundary.

Signal: A lumber tripod.

Station mark: A 2 by 3 inch stake set in sand under center of tripod. No bench mark available at time this station was occupied, and it is impossible to preserve center accurately, as the hill is constantly moving.

[Latitude 32° 43' 11.53". Longitude 114° 53' 19.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gravel	81 57 26.19	261 49 37.80	4.3580589
Blizzard	146 36 52.18	326 34 08.21	4.1558855
American	219 54 43.91	39 59 10.25	4.2995209
Pilot Knob	264 01 50.97	84 06 28.27	4.1280182

SHARP, SAN DIEGO COUNTY.

On the highest point of low sand hills about 8 miles east from Calexico and about one-fourth mile north of the United States and Mexico boundary.

Signal: A lumber tripod 12 feet high.

Station mark: A standard bench-mark post set 40 inches in the sand under center of signal. (This hill is constantly drifting and mark may be covered or blown out of the ground at any time.)

[Latitude 32° 40' 38.67". Longitude 115° 23' 14.39".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Holtville	180 49 09.89	0 49 13.95	4.1347675
Hog	226 44 40.06	46 49 36.34	4.2916431
Mesquite	257 35 35.29	77 39 16.65	4.0386893

SIGNAL MOUNTAIN, LOWER CALIFORNIA, MEXICO.

On the more eastern of the two highest points on Signal Mountain, a well-known mountain about 12 miles from Calexico. It is on the Mexican side of the boundary about 1½ miles below the line. Monument No. 224 is at the foot of mountain.

Station mark: A rock cairn 6 feet at base and 9 feet high. (There is a cairn about 4 feet high on the southwest summit.)

[Latitude 32° 37' 21.29". Longitude 115° 42' 32.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jacumba	101 11 09.41	280 56 25.30	4.6384900
Coyote	128 11 09.34	308 01 14.25	4.5614279
Eagle	145 17 29.60	325 07 59.34	4.6812910
Lucky	175 14 38.32	355 13 45.15	4.4885433
Imperial	208 12 42.40	28 17 27.61	4.4625328
Holtville	236 53 59.98	57 04 29.68	4.5585846

SUNSET, SAN DIEGO COUNTY.

On a sand hill with mesquite brush on it, about 4 miles a little south of east from Sunset Spring, from which place it can be easily reached. The point is about one-half mile east from the line of the "old beach."

Signal: A lumber tripod 14 feet high with targets extending 6 feet higher.

Station mark: A standard bench-mark post set 40 inches in the sand under center of signal. (Probably permanent.)

[Latitude 32° 56' 05.10". Longitude 115° 16' 35.57".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Holtville	34 21 09.15	214 17 36.78	4.2563137
Imperial	71 21 23.28	251 12 04.37	4.4509094
Brawley	100 15 10.03	280 06 42.20	4.3915585
Hogue	162 05 10.61	342 03 37.74	4.1578776
Hardy	288 47 25.62	108 53 49.36	4.2877086
Hog	345 37 47.15	165 39 08.03	4.1938152

TECATE, SAN DIEGO COUNTY.

A station of the United States Coast and Geodetic Survey. It is not on the highest point of the mountain. The highest point is marked by a cairn of stones, and, as one can not see monument 246 from this point, a point southeast, distant about 40 feet, was selected, from which one sees both monuments—246 and 245. To reach station from Potrero, on road from San Diego to Campo, drive south about 6 miles to store and saloon of Mr. Brown, on boundary. Here the old trail made by the Boundary Commission leads to monument 246. The trail was grown up with bushes in 1899, and was very rough. From monument 246 to station, Tecate, a trail had to be cut. Rack animals can be obtained at the ranch of Mr. Manuel Flores.

Station mark: A hole drilled in solid rock.

Reference marks: One in line to Cuyamaca, distant 3.77 feet; one in line to Lion's Head, distant 4.14 feet; one in line to San Miguel, distant 9.81 feet.

[United States standard. Latitude $32^{\circ} 34' 45.99''$. Longitude $116^{\circ} 41' 18.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Miguel	119 15 52.1	299 07 51.4	4.425106
Cuyamaca	190 40 09.9	10 42 49.8	4.617669
Laguna	222 59 37.41	43 08 57.56	4.5969522
Campo	249 28 18.54	69 32 57.82	4.1592400
Jacumba	254 54 57.26	75 11 55.34	4.7069262

WHALE, SAN DIEGO COUNTY.

On the highest point of a high rocky ridge north-northeast from the old Vallicita stage station, on road from Julian to Yuma, and 24 miles from Julian. The point is about 5 miles straight from stage station, and summit is covered with bowlders and small trees. Horses can be ridden up the "wash" to foot of mountain. From this point to summit it is both steep and rough. There is very fair water at the old stage station, but no forage closer than Julian.

Station mark: A triangulation tablet cemented in solid rock under center of a cairn 6 feet high.

[Latitude $33^{\circ} 01' 46.23''$. Longitude $116^{\circ} 18' 56.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Laguna	20 40 07.76	200 37 21.91	4.3517240
Cuyamaca	71 25 40.89	251 16 11.33	4.4573560
Eagle	280 53 55.40	101 04 11.80	4.4760237
Coyote	308 44 08.24	128 53 57.23	4.5578864
Jacumba	338 51 08.21	158 56 04.52	4.5957727

COLORADO.

SECONDARY TRIANGULATION STATIONS.

CLEAR CREEK AND GILPIN COUNTIES.

CENTRAL CITY, IDAHO SPRINGS, AND SILVER PLUME SPECIAL QUADRANGLES.

During the season of 1904 Mr. Frank Tweedy, topographer, located 36 secondary triangulation points for the control of the three special quadrangles mentioned above.

Positions are based upon Central, Democrat, Grindal, and Kingston United States standard datum.

AVON, GILPIN COUNTY.

On a small knob, 0.2 mile northeast of Avon mine.

Station mark: Center of a cairn.

(Latitude $39^{\circ} 47' 39.32''$. Longitude $105^{\circ} 31' 17.39''$.)

BELLEVUE, CLEAR CREEK COUNTY.

On Bellevue Mountain, 1 mile northwest of Idaho Springs.

Station mark: A cairn erected over triangulation tablet cemented in bed rock.

(Latitude $39^{\circ} 45' 50.07''$. Longitude $105^{\circ} 32' 30.03''$.)

BLACKHAWK, GILPIN COUNTY.

Bare hill summit above (south of) Blackhawk (town).

Station mark: A bronze triangulation tablet cemented in solid rock and surrounded by a cairn.

(Latitude $39^{\circ} 47' 29.23''$. Longitude $105^{\circ} 29' 06.81''$.)

BLACKHAWK STATION, GILPIN COUNTY.

Station mark: Chimney of Blackhawk railroad station.

(Latitude $39^{\circ} 48' 07.10''$. Longitude $105^{\circ} 29' 34.21''$.)

CENTRAL CITY, CATHOLIC SEMINARY, GILPIN COUNTY.

Cross on Catholic Seminary on hill southwest of Central City.

Station mark: Center of cross.

(Latitude $39^{\circ} 47' 59.80''$. Longitude $105^{\circ} 30' 49.96''$.)

CORY CITY, CLEAR CREEK COUNTY.

Boarding house of Cory City mine above Silver Plume (town).

(Latitude $39^{\circ} 42' 02.95''$. Longitude $105^{\circ} 43' 43.87''$.)

CROWN POINT, CLEAR CREEK COUNTY

Flagstaff on shaft hoist of Crown Point mine at head of Virginia Canyon, north of Idaho Springs.

Station mark: Center of flagstaff.

(Latitude $39^{\circ} 46' 15.23''$. Longitude $105^{\circ} 32' 22.40''$.)

EAGLE, CLEAR CREEK COUNTY.

High rocky butte at end of ridge in forks of Trail Creek and Clear Creek, opposite mouth of Fall River. Identical with triangulation station of engineers of Idaho Springs and Central City.

Station mark: A cairn.

(Latitude $39^{\circ} 45' 09.52''$. Longitude $105^{\circ} 33' 27.42''$.)

FLIRTATION, CLEAR CREEK COUNTY.

On Flirtation Hill, 0.5 mile south of Idaho Springs.

Station mark: A cairn erected over bronze triangulation tablet cemented in bed rock.

(Latitude $39^{\circ} 44' 05.51''$. Longitude $105^{\circ} 31' 10.78''$.)

FREEDOM, GILPIN COUNTY.

Shaft hoist of Freedom mine, north of Central City.

Station mark: Center of hoist.

(Latitude $39^{\circ} 48' 08.43''$. Longitude $105^{\circ} 30' 27.08''$.)

GRIFFIN'S MONUMENT, CLEAR CREEK COUNTY.

Clifford Griffin's grave monument near 7-30 mine above Silver Plume (town).

Station mark: Center of monument.

(Latitude $39^{\circ} 42' 04.95''$. Longitude $105^{\circ} 44' 25.47''$.)

HIGH MINE PEWABIC, CLEAR CREEK COUNTY.

Shaft hoist of highest mine on south slope of Pewabic Mountains north of Idaho Springs.

Station mark: Center of hoist.

(Latitude $39^{\circ} 46' 02.25''$. Longitude $105^{\circ} 31' 25.17''$.)

HIGH RED, CLEAR CREEK COUNTY.

The most western of two large deserted red-roofed mines on south slope of Pewabic Mountain.

(Latitude $39^{\circ} 45' 45.91''$. Longitude $105^{\circ} 30' 58.96''$.)

IDAHO SPRINGS, CLEAR CREEK COUNTY.

Spire at northeast corner of Idaho Springs.

Station mark: Center of spire.

(Latitude $39^{\circ} 44' 33.85''$. Longitude $105^{\circ} 31' 05.10''$.)

JUSTICE, GILPIN COUNTY.

Shaft hoist of Justice mine 1 mile south of Blackhawk (town).

Station mark: Center of hoist.

(Latitude $39^{\circ} 47' 01.15''$. Longitude $105^{\circ} 29' 22.37''$.)

KNOB ROAD, CLEAR CREEK COUNTY.

Small knob at bend of road to Sun and Moon mine 1.2 miles northeast of Idaho Springs.

Station mark: A cairn.

(Latitude $39^{\circ} 45' 27.00''$. Longitude $105^{\circ} 30' 26.58''$.)

LAKE, GILPIN COUNTY.

On a flat hill 0.5 mile south of Central City and 0.12 mile east of dry lake on divide.

Station mark: A bronze triangulation tablet cemented in solid rock and surmounted by a cairn.

(Latitude $39^{\circ} 47' 33.69''$. Longitude $105^{\circ} 30' 20.86''$.)

LEAVENWORTH, CLEAR CREEK COUNTY.

A bare knob on Leavenworth Mountain 1 mile east of town of Silver Plume and 1 mile south of Georgetown. (Identical with a triangulation station of the mining engineers of Georgetown.)

Station mark: A cairn erected over a bronze triangulation tablet cemented in rock.

(Latitude $39^{\circ} 41' 31.00''$. Longitude $105^{\circ} 42' 13.24''$.)

LONE TREE, GILPIN COUNTY.

Cloth about trunk of lone pine tree on hill 0.5 mile north of Sun and Moon mine.

(Latitude $39^{\circ} 46' 24.65''$. Longitude $105^{\circ} 30' 25.93''$.)

MARYLAND, GILPIN COUNTY.

On summit of Maryland Mountain north of Central City.

Station mark: A bronze triangulation tablet cemented in bed rock surmounted by a cairn.

(Latitude $39^{\circ} 48' 45.01''$. Longitude $105^{\circ} 30' 18.30''$.)

NEVADA, GILPIN COUNTY.

Nevada mine west of Nevadaville.

Station mark: Center of building.

(Latitude $39^{\circ} 47' 47.70''$. Longitude $105^{\circ} 32' 12.01''$.)

NORTHWEST, GILPIN COUNTY.

On a bare hill 1 mile northwest of Central City.

Station mark: Center of a cairn.

(Latitude $39^{\circ} 48' 28.61''$. Longitude $105^{\circ} 31' 28.45''$.)

OLDTOWN, GILPIN COUNTY.

Smokestack of Oldtown mine 0.25 mile east of town of Russell Gulch.

Station mark: Center of smokestack.

(Latitude $39^{\circ} 46' 37.87''$. Longitude $105^{\circ} 31' 53.54''$.)

PAY ROCK MINE, CLEAR CREEK COUNTY.

Smokestack of Pay Rock mine above Silver Plume.

Station mark: Center of smokestack.

(Latitude $39^{\circ} 42' 05.12''$. Longitude $105^{\circ} 43' 28.62''$.)

PENDLETON, CLEAR CREEK COUNTY.

A rock knob on Pendleton Mountain 1.5 miles southwest of town of Silver Plume. The station is on the north edge of ridge at timber line where ridge rises abruptly to the west.

Station mark: A bronze triangulation tablet cemented in bed rock.
(Latitude $39^{\circ} 41' 06.10''$. Longitude $105^{\circ} 44' 14.52''$.)

QUARTZITE, GILPIN COUNTY.

Knob near Alps mine.

Station mark: A bronze triangulation tablet cemented in rock and surmounted by a cairn.

(Latitude $39^{\circ} 47' 19.76''$. Longitude $105^{\circ} 32' 05.32''$.)

RED ROOF, CLEAR CREEK COUNTY.

The chimney of most prominent red-roofed house in group of buildings 0.12 mile southeast of Silver Plume Railroad station.

Station mark: Center of chimney.

(Latitude $39^{\circ} 41' 39.17''$. Longitude $105^{\circ} 43' 18.69''$.)

SARATOGA, GILPIN COUNTY.

Shaft hoist of Saratoga mine 1 mile east of Russell Gulch (town).

Station mark: Center of hoist.

(Latitude $39^{\circ} 46' 55.40''$. Longitude $105^{\circ} 30' 46.28''$.)

SILVER PLUME, CLEAR CREEK COUNTY.

On high granite rock rising from Silver Plume town on the north.

Station mark: A cairn erected over a bronze triangulation tablet cemented in bed rock.

(Latitude $39^{\circ} 41' 50.48''$. Longitude $105^{\circ} 43' 40.63''$.)

SPRING, CLEAR CREEK COUNTY.

On rocky ridge between Spring Creek and Clear Creek, 1.25 miles west of Idaho Springs.

Station mark: A cairn erected over bronze triangulation tablet cemented in bed rock.

(Latitude $39^{\circ} 44' 26.64''$. Longitude $105^{\circ} 32' 20.92''$.)

SUMMIT, CLEAR CREEK AND GILPIN COUNTIES.

On hill 2 miles northeast of Idaho Springs and 0.2 mile east of Summit mine. On boundary line between Clear Creek and Gilpin counties.

Station mark: A cairn erected over bronze triangulation tablet cemented in bed rock.

(Latitude $39^{\circ} 45' 46.06''$. Longitude $105^{\circ} 29' 37.89''$.)

SUN AND MOON MINE, CLEAR CREEK AND GILPIN COUNTIES.

Knob above (east of) Sun and Moon mine on line between Clear Creek and Gilpin counties.

Station mark: A cairn erected over bronze triangulation tablet cemented in rock.

(Latitude $39^{\circ} 45' 57.17''$. Longitude $105^{\circ} 30' 34.36''$.)

TARGET ROCK, GILPIN COUNTY.

On a small rocky knob above Russell Gulch, about 1 mile northeast of Russell Gulch (town).

Station mark: A bronze triangulation tablet cemented in solid rock surmounted by a cairn.

(Latitude $39^{\circ} 47' 14.11''$. Longitude $105^{\circ} 31' 05.79''$.)

TOPEKA, GILPIN COUNTY.

Topeka mine 0.5 mile north of Russell Gulch (town).

(Latitude $39^{\circ} 46' 58.39''$. Longitude $105^{\circ} 32' 03.29''$.)

TERRIBLE, CLEAR CREEK COUNTY.

On north edge of main road 100 yards east of Terrible mine.

Station mark: A bronze triangulation tablet cemented in rock.

(Latitude $39^{\circ} 41' 48.05''$. Longitude $105^{\circ} 44' 32.83''$.)

VIRGINIA BUTTE, CLEAR CREEK COUNTY.

Knob on south end of ridge 0.5 mile north of Idaho Springs. Identical with triangulation station of mining engineers of Central City and Idaho Springs.

Station mark: A cairn.

(Latitude $39^{\circ} 44' 57.10''$. Longitude $105^{\circ} 31' 07.73''$.)

TRIANGULATION STATIONS.

HINSDALE AND MINERAL COUNTIES.

CREEDE AND SAN CRISTOBAL QUADRANGLES.

Two 15-minute quadrangles (including the Creede Special) in southwestern Colorado were controlled by Mr. J. F. McBeth, topographer, who occupied nine new stations and located two points by intersections. Positions are based upon Ouray, Uncompahgre, and Sneffels, United States standard datum.

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BLUFF, MINERAL COUNTY.

On western point of high bluff east of and above the town of Upper Creede. Reached by trail from Lower Creede.

Station mark: A bronze tablet cemented in solid rock, over which a tripod signal was erected.

[Latitude $37^{\circ} 52' 00.5''$. Longitude $106^{\circ} 54' 45.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Luis.....	173 08 32.1	353 07 51.7	4.12780
Bristol	56 56 44.6	236 51 30.9	4.17407

BRISTOL, MINERAL COUNTY.

On the end of the western bluff point of Bristol Head, the southern extremity of a high mesa about 10 miles southwest of Creede and west of the Rio Grande River. The station is directly east of Lake Santa Maria. It may be reached from the northeast with pack and saddle animals.

Station mark: A bronze tablet cemented in rock, over which a cairn $3\frac{1}{2}$ feet in diameter and $5\frac{1}{2}$ feet high was erected.

[Latitude $37^{\circ} 47' 36.0''$. Longitude $107^{\circ} 03' 16.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pyramid	67 08 20.7	246 55 57.5	4.50909
Uncompahgre	130 56 50.9	310 41 50.4	4.67464
San Luis.....	206 51 14.9	26 55 48.7	4.38178

BULL DOG, MINERAL COUNTY.

Near south end of bluff on east side of Bull Dog Hill, about 1 mile southwest of the town of Bachelor and about 2 miles northwest of the town of Lower Creede.

Station mark: A bronze tablet cemented in solid rock, over which a small cairn was erected.

[Latitude $37^{\circ} 52' 14.0''$. Longitude $106^{\circ} 57' 07.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grassy	198 42 43	18 43 24	3.70615
Bluff	276 54 46	96 56 13	3.54501

BUTTE, MINERAL COUNTY.

On a rocky butte, locally known as Dickey Hill, at southeast end of a ridge lying between West Willow and Sunnyside creeks, about 1 mile northwest of the town of Bachelor.

Station mark: A bronze tablet cemented in solid rock, over which a small cairn with flag pole in center was built.

[Latitude 37° 53' 36.9". Longitude 106° 57' 42.6".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grassy	227 37 14	47 38 16	3. 52638
Bluff	304 26 24	124 28 12	3. 72056

GRASSY, MINERAL COUNTY.

Top of bluff at south edge of grassy bench above timber line, between East and West Willow creeks, about 2 miles northeast of the town of Bachelor and 4 miles north of Creede.

Station mark: A bronze tablet cemented in solid rock, over which a tripod signal 10 feet at base and 15 feet high was erected.

[Latitude 37° 54' 50.4". Longitude 106° 56' 01.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bristol	38 32 34. 3	218 28 06. 9	4. 23330
San Luis	181 43 47. 5	1 43 53. 7	3. 90804

LA GARITA, MINERAL AND SAGUACHE COUNTIES.

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: A bronze tablet cemented in rock just beneath surface, over which a cairn 4 feet in diameter and 7 feet high was erected.

[Latitude 37° 55' 04.6". Longitude 106° 50' 27.3".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pyramid	61 36 11. 4	241 15 55. 5	4. 74242
Uncompahgre	107 34 59. 1	287 12 03. 6	4. 75689

SOUTH RIVER, MINERAL COUNTY.

On the summit of South River Peak, situated at the head of Red Mountain Creek, which enters the Rio Grande River from the south at the bend in river about 12 miles southwest of creek, and is at the east side of the east branch of the creek. A road reaches the basin about 1 mile distant from the peak via Red Mountain Creek. From the terminus of this road a trail leads across the divide and to Pagosa Spring.

Station mark: A bronze tablet cemented in rock, over which a cairn $3\frac{1}{2}$ feet in diameter and 6 feet high was erected.

[Latitude $37^{\circ} 34' 27.1''$. Longitude $106^{\circ} 58' 52.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre.....	142 41 49.0	322 24 08.38	4.84240
Ouray.....	214 58 59.4	35 26 57.00	5.06180
San Luis.....			4.66300
Pyramid.....			4.58111
Bristol.....			4.40102

GRAY, HINSDALE COUNTY.

(Not occupied.)

A gray peak on the divide between the Los Pruos River and Wemuche Creek, about 12 miles south of the Rio Grande Pyramid.

Station mark: A rock monument on summit of peak.

[Latitude $37^{\circ} 29' 50.66''$. Longitude $107^{\circ} 22' 32.63''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pyramid.....	175 56 47	355 56 11	4.30751
South River.....	256 08 50	76 23 46	4.55509

UNCOMPAHGRE, HINSDALE COUNTY.

On summit of Uncompahgre Peak, a station of the transcontinental triangulation of the United States Coast and Geodetic Survey.

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	5.0347020
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 08.38	142 41 49.0	4.84240
Pyramid.....	351 57 45.6	172 00 19.5	4.64277
San Luis.....	281 16 04.4	101 35 41.7	4.67717
Bristol.....	310 41 50.4	130 56 50.9	4.67464
La Garita.....	287 12 03.6	107 34 59.1	4.75689

DEL NORTE, RIO GRANDE COUNTY.

(Not occupied.)

Summit of Del Norte Peak.

Station mark: A rock monument.

[Latitude 37° 35' 23.5". Longitude 106° 33' 46.5".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South River.....	87 25 25.0	267 10 07.0	4.56801
San Luis.....	143 47 01.0	323 33 29.6	4.73800

OURAY, SAGUACHE COUNTY.

A station of the United States Coast and Geodetic Survey on the summit of Mount Ouray.

[Latitude 38° 25' 22.20". Longitude 106° 13' 27.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
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 57.00	214 58 59.40	5.06180
San Luis.....	52 11 55.00	231 45 41.70	4.89521

SAN. LUIS, SAGUACHE COUNTY.

On summit of San Luis Peak, about 10 miles north of the town of Creede. Spring Creek heads on the southwest and Cochetopa 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 going up East Willow Creek, there being a wagon road to and beyond a sawmill near timber line. From this point with saddle and pack animals one crosses the divide into the head of Spring Creek and from there on to the peak.

Station mark: A bronze tablet cemented in embedded rock, over which a cairn $3\frac{1}{2}$ feet in diameter and 7 feet high was erected.

[Latitude $37^{\circ} 59' 12.77''$. Longitude $106^{\circ} 55' 50.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bristol	26 55 48.7	206 51 14.9	4.38178
Uncompahgre.....	101 35 41.7	281 16 04.4	4.67717
Ouray	231 45 41.7	52 11 55.0	4.89521
South River			4.66300
Pyramid			4.72430

PYRAMID, SAN JUAN COUNTY.

On the summit of the Rio Grande Pyramid, about 5 miles south of the Rio Grande River, on the divide between Ute Creek (a tributary of the Rio Grande) and the headwaters of the Los Pinos River. The Wemmuche trail passes about 3 miles east of station, from which a blazed trail leads through the woods to timber line on the east side of the peak.

Station mark: A bronze tablet cemented in solid rock, over which a cairn 4 feet in diameter and 6 feet high was erected.

[Latitude $37^{\circ} 40' 47.48''$. Longitude $107^{\circ} 23' 31.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sneffels.....	135 44 50.3	315 30 07.1	4.70181
Uncompahgre.....	172 00 19.5	351 57 45.6	4.64277
South River			4.58111
Bristol			4.50909
San Luis			4.72430

MONTANA.

TRIANGULATION STATIONS.

CHOUTEAU AND VALLEY COUNTIES.

BIG SANDY, BOX ELDER, LONESOME SPECIAL, AND OTHER QUADRANGLES.

During the season of 1904 Mr. Fred McLaughlin connected the triangulation, which had been extended eastward from the Burnham Base to the line Galpin-Nassau of the Missouri River triangulation. This connection was made in Valley County near the junction of the Missouri and Milk rivers.

Later in the season an area of about 1,000 square miles was controlled, extending from a little north of Burnham Base, in Chouteau County, south of Burnham Base, to connect with the line Recess-Ridge of the Missouri River triangulation, then west to beyond the Marias River. The work was done under the supervision of Mr. H. L. Baldwin, jr.; eight old stations were reoccupied, including those of the Missouri River Commission, and eighteen new ones were selected and occupied. 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 upon the astronomic longitude of the school-house and church spire at Chinook, as determined by the United States Coast and Geodetic Survey in the fall of 1903.

BIG SANDY, CHOUTEAU COUNTY.

A prominent point on ridge 3 miles east of Big Sandy Railroad station, 239 feet west of section corner, 0.25 mile northwest of wagon road.

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

[Latitude $48^{\circ} 09' 46.48''$. Longitude $110^{\circ} 01' 49.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mill.....	110 42 44.01	290 36 20.85	4.0550209
Sage.....	153 36 00.51	333 29 27.59	4.3870191
Square.....	202 55 35.70	23 00 21.51	4.3065580
Coulee.....	149 24 57.57	329 21 43.12	4.0243339

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BLACK, CHOUTEAU COUNTY.

On Black Butte, 1.5 miles south of Big Sandy-Marias road and 1 mile east of Black Coulee.

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

Reference marks: A bottle 8 inches underground, true azimuth, $342^{\circ} 58'$; distant 4.85 feet from station; a bottle 8 inches underground, true azimuth, $168^{\circ} 28'$; distant 5.39 feet from station.

[Latitude $48^{\circ} 14' 15.94''$. Longitude $110^{\circ} 32' 37.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Discovery	21 39 36.53	201 36 48.70	4.1008816
Shepard	65 25 32.31	245 16 33.69	4.2151397
Marias	114 44 57.78	294 36 43.08	4.1774275
Lonesome	218 50 04.77	38 55 48.78	4.1799026
High	284 10 46.44	104 20 26.23	4.2190437
Carp	311 34 45.24	131 44 37.28	4.2953139

BOX, CHOUTEAU COUNTY.

On prominent hill about 19 miles west and 5 miles north of Box Elder railroad station.

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

Reference marks: A bottle 8 inches underground, true azimuth, $175^{\circ} 01'$; distant 5.53 feet from station; bottle 8 inches underground, true azimuth, $7^{\circ} 34'$; distant 4.7 feet from station.

[Latitude $48^{\circ} 25' 37.42''$. Longitude $110^{\circ} 22' 50.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lonesome	15 41 56.59	195 40 22.00	3.9835522
Van	232 24 48.85	52 29 58.88	4.0363203
Line	306 21 05.42	126 26 33.79	4.0500828
Reservoir	346 05 58.19	166 06 45.40	3.7329844

BROWN, CHOUTEAU COUNTY.

On a flat hill 12 miles north of Burnham railroad station, near head of Browns Coulee and just west of Cottonwood Coulee.

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

Reference marks: A bottle 8 inches underground, true azimuth, $163^{\circ} 03''$; distant 8.2 feet from station; a bottle 8 inches underground, true azimuth, $347^{\circ} 52'$; distant 8.2 feet from station.

[Latitude 48° 44' 28.46". Longitude 109° 57' 10.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chain Lake.....	23 03 00.90	203 00 16.41	4. 0587203
Mile board 984.....	42 05 54.14	221 56 09.44	4. 3767324
Corral.....	77 56 43.00	257 47 00.38	4. 2096585

CARP, CHOUTEAU COUNTY.

On south end of ridge overlooking the Missouri River Valley, and about 11 miles southwest of Big Sandy railroad station. Two and one-half miles north of railroad grade.

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

Reference marks: Bottle 8 inches underground, true azimuth, 185° 16'; distant 3.5 feet from station; bottle 8 inches underground, true azimuth, 335° 19'; distant 6.4 feet from station.

[Latitude 48° 07' 11.22". Longitude 110° 20' 43.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ridge.....	25 24 48.28	205 20 46.11	4. 1967209
Discovery.....			4. 28938
Black.....	131 44 37.28	311 34 45.24	4. 2953139
High.....	188 16 51.98	8 16 39.35	3. 9606906
Verona.....	249 16 30.18	69 20 22.89	3. 8393100
Recess.....	356 13 08.45	176 13 35.93	4. 0649199

CORRAL, CHOUTEAU COUNTY.

On rolling prairie 10 miles northwest of Kremlin railroad station; 0.75 mile northwest of a small house and sheep corral.

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

Reference marks: Chiseled cross mark on 8 pound rock 10 inches underground, true azimuth, 312° 34'; distant 7.3 feet from station; chiseled cross mark on a 25 pound rock (granite), 6 inches underground, true azimuth, 130° 12'; distant 5.25 feet from station.

[Latitude 48° 42' 38.18". Longitude 110° 10' 06.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mile board 984.....	0 17 35.08	180 17 32.41	4. 1547835
Brown.....	77 56 43.00	257 47 00.38	4. 2096585
Chain Lake.....	302 00 33.07	122 07 30.81	4. 1279905

COULEE, CHOUTEAU COUNTY.

On east bank of Lonesome Lake Coulee, 6 miles southwest of Box Elder railroad station and 2 miles west of railroad track.

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

Reference marks: Bottle 8 inches underground, true azimuth, $174^{\circ} 40'$; distant 5.8 feet from station; bottle 8 inches underground, true azimuth, $358^{\circ} 16'$; distant 5.7 feet from station.

[Latitude $48^{\circ} 14' 41.17''$. Longitude $110^{\circ} 06' 09.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mill.....	45 45 07.24	225 41 58.34	3.8634744
Big Sandy.....	329 21 43.12	149 24 57.57	4.0243339

DISCOVERY, CHOUTEAU COUNTY.

On Discovery Butte, about 5 miles southeast of the junction of Marias River and Black Coulee.

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

Reference marks: A bottle 8 inches underground, true azimuth, $170^{\circ} 33'$; distant 5.62 feet from station; a bottle 8 inches underground, true azimuth, $344^{\circ} 15'$; distant 5.78 feet from station.

[Latitude $48^{\circ} 07' 56.30''$. Longitude $110^{\circ} 36' 22.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Humphrey.....	1 00 30.13	181 00 26.73	3.7297810
Shepard.....	115 27 32.76	295 21 22.35	4.0560413
Black.....	201 36 48.70	21 39 36.53	4.1008816
High.....	249 38 15.87	69 50 42.96	4.3440933

FLAT, CHOUTEAU COUNTY.

On flat prairie about 5 miles south of Kremlin railroad station, 1.5 miles south of wagon road, and 3.5 miles north of Sage Creek.

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

Reference marks: A bottle 8 inches underground, true azimuth, $353^{\circ} 59'$; distant 5.3 feet from station; a bottle 8 inches underground, true azimuth, $179^{\circ} 06'$; distant 5.9 feet from station.

[Latitude 48° 30' 25.46". Longitude 110° 04' 29.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sage	24 38 40.11	204 34 06.01	4. 2573438
Van			4. 15158
Square	330 17 09.63	150 23 56.04	4. 3536683
Laredo			3. 83983

HIGH, CHOUTEAU COUNTY.

On east end of gently sloping ridge 2 miles south of Big Sandy-Marias road and 10 miles west of Big Sandy railroad station.

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

Reference marks: A bottle 8 inches underground, true azimuth, 174° 31'; distant 4 feet from station; a bottle 8 inches underground, true azimuth, 350° 16'; distant 4 feet from station.

[Latitude 48° 12' 03.88". Longitude 110° 19' 40.27".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carp	8 16 39.35	188 16 51.98	3. 9606906
Humphrey	58 05 58.74	237 53 28.53	4. 3901382
Discovery	69 50 42.96	249 38 15.87	4. 3440933
Black	104 20 26.23	284 10 46.44	4. 2190437
Lonesome	157 39 05.60	337 35 09.24	4. 2342733
Line	195 30 17.59	15 33 23.42	4. 2826006
Mill	271 08 13.02	91 15 08.26	4. 0608721
Verona	322 02 35.14	142 05 40.61	3. 9225304

HUMPHREY, CHOUTEAU COUNTY.

On highest point of ridge running east and west, about 3 miles east of the Marias River and 9 miles south of the junction of the Marias River and the Black Coulee. A road runs 0.25 mile west of station.

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

Reference marks: A bottle 8 inches underground, true azimuth, 301° 29'; distant 4 feet from station; a bottle 8 inches underground, true azimuth, 162° 24'; distant 5.95 feet from station.

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[Latitude $48^{\circ} 05' 02.55''$. Longitude $110^{\circ} 36' 27.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shepard	135 13 18.54	315 07 11.66	4.1598755
Discovery	181 00 26.73	1 00 30.13	3.7297810
High	237 53 28.53	58 05 58.74	4.3901382

LAREDO, CHOUTEAU COUNTY.

Nine miles north of Box Elder railroad station, on divide between Big Sandy Creek and Sage Creek. The nearest point of Sage Creek is 1.5 miles southwest of station.

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

Reference marks: A bottle set 8 inches underground, true azimuth, $20^{\circ} 27'$; distant 4.3 feet from station; bottle 8 inches underground, true azimuth, $311^{\circ} 59'$; distant 4.3 feet from station.

[Latitude $48^{\circ} 27' 00.59''$. Longitude $110^{\circ} 02' 13.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sage	45 38 28.45	225 32 13.00	4.1600133
Flat			3.83983
Square	327 42 27.62	147 47 32.40	4.1963374
Big Sandy			4.50442

LINE, CHOUTEAU COUNTY.

On highest part of ridge 11 miles west of Box Elder railroad station.

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

Reference marks: A bottle 8 inches underground, true azimuth, $346^{\circ} 08'$; distant 4.2 feet from station; bottle 8 inches underground, true azimuth, $149^{\circ} 43'$; distant 4.3 feet from station.

[Latitude $48^{\circ} 22' 01.83''$. Longitude $110^{\circ} 15' 31.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
High	15 33 23.42	195 30 17.59	4.2826006
Lonesome	77 25 21.66	257 18 18.96	4.0767943
Reservoir	100 21 55.89	280 17 14.83	3.8957258
Box	126 26 33.79	306 21 05.42	4.0500828
Van	178 16 02.83	358 15 48.20	4.1235384
Sage	278 15 50.51	98 19 31.45	3.7888281
Mill	341 13 05.39	161 16 55.33	4.2957320

LONESOME, CHOUTEAU COUNTY.

On flat ridge about 18 miles northwest of Big Sandy railroad station and 6 miles northeast of Jack Godfrey's ranch.

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

Reference marks: A bottle 8 inches underground, true azimuth, $111^{\circ} 22'$; distant from station, 5.3 feet; bottle 8 inches underground, true azimuth, $296^{\circ} 32'$; distant 3.2 feet from station.

[Latitude $48^{\circ} 20' 37.31''$. Longitude $110^{\circ} 24' 56.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black	38 55 48.78	218 50 04.77	4.1799026
Box	195 40 22.00	15 41 56.59	3.9835522
Reservoir	224 08 09.84	44 10 31.57	3.7485044
Line	257 18 18.96	77 25 21.66	4.0767943
High	337 35 09.24	157 39 05.30	4.2342733

MARIAS, CHOUTEAU COUNTY.

On a small knoll 3 miles north of Marias River, 6 miles west of Black Coulee, and 0.5 mile north of Marias road.

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

Reference marks: A bottle 8 inches underground, true azimuth, $4^{\circ} 47'$; distant 4 feet from station; a bottle 8 inches underground, true azimuth, $180^{\circ} 33'$; distant 4 feet from station.

[Latitude $48^{\circ} 17' 39.35''$. Longitude $110^{\circ} 43' 40.71''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shepard	5 20 55.56	185 20 11.19	4.1200624
Black	294 36 43.08	114 44 57.78	4.1774275

MILL, CHOUTEAU COUNTY.

On rolling prairie 3 miles west of Big Sandy railroad station, just north of road from Big Sandy to Marias River.

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

Reference marks: A bottle 8 inches underground, true azimuth, $135^{\circ} 05'$; distant 4.55 feet from station; a bottle 8 inches underground, true azimuth, $326^{\circ} 41'$; distant 4.74 feet from station.

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[Latitude $48^{\circ} 11' 56.12''$. Longitude $110^{\circ} 10' 23.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Verona.....	45 03 44.78	224 59 55.21	3.9541367
High.....	91 15 08.26	271 08 13.02	4.0608721
Line.....	161 16 55.33	341 13 05.39	4.2957320
Sage.....	179 10 38.74	359 10 29.46	4.2509978
Square.....	231 32 45.11	51 43 54.66	4.3728957
Big Sandy.....	290 36 20.85	110 42 44.01	4.0550209
Coulee.....	225 41 58.34	45 45 07.24	3.8634744

RECESS, CHOUTEAU COUNTY.

A station of the Missouri River Commission, on the left bank on a very prominent bluff, about 1 mile back from the river, at the head of a picturesque valley.

Station mark: An iron post set in the ground.

[Latitude $48^{\circ} 00' 56.06''$. Longitude $110^{\circ} 20' 06.91''$.]

[Latitude $48^{\circ} 00' 49.09''$. Longitude $110^{\circ} 20' 01.91''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ridge.....	70 47 09.56	250 42 40.13	3.9009046
		^a 250 42 40.10	3.9008760
Carp.....	176 13 35.93	356 13 08.45	4.0649199
Verona.....	202 05 50.02	22 09 15.04	4.1802115

^aBy Missouri River Commission.

RESERVOIR, CHOUTEAU COUNTY.

On a slight ridge running north and south, about 16 miles west of Box Elder railroad station and 2 miles southwest of a large alkali well.

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

Reference marks: A bottle 8 inches underground, true azimuth, $168^{\circ} 14'$; distant 4.2 feet from station; a bottle 8 inches underground, true azimuth, $332^{\circ} 31'$; distant 5.1 feet from station.

[Latitude $48^{\circ} 22' 47.48''$. Longitude $110^{\circ} 21' 47.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lonesome.....	44 10 31.57	224 08 09.84	3.7485044
Box.....	166 06 45.40	346 05 58.19	3.7329844
Van.....	211 38 18.95	31 42 45.64	4.1446635
Line.....	280 17 14.83	100 21 55.89	3.8957258

RIDGE, CHOUTEAU COUNTY.

A station of the Missouri River Commission, on the left bank on a very high ridge, about 3 miles from the river. The ridge has a cut face and can be seen from a long distance.

Station mark: An iron post set in the ground.

[Latitude 47° 59' 31.09''. Longitude 110° 26' 09.44''].
[Latitude 47° 59' 24.12''. Longitude 110° 26' 04.38''].^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Carp	205 20 46.11	25 24 48.28	4.1967209
Verona	218 21 32.90	38 29 27.59	4.3274788
Recess	250 42 40.13	70 47 09.56	3.9009046
	^a 250 42 40.10	.....	3.9008760

^a Missouri River Commission.

SAGE, CHOUTEAU COUNTY.

About 9 miles west of Box Elder railroad station, on small ridge on divide south of Sage Creek, 3 miles west of wagon road, 1.5 miles west of deserted house.

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

[Latitude 48° 21' 33.12''. Longitude 110° 10' 35.69''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Line	98 19 31.45	278 15 50.51	3.7888281
Mileboard 984	181 14 00.09	361 14 19.59	4.3944632
Square	279 31 41.98	99 43 01.65	4.2787245
Big Sandy	333 29 27.59	153 36 00.51	4.3870191
Mill	359 10 29.46	179 10 38.74	4.2509978

SHEPARD, CHOUTEAU COUNTY.

On south end of Shepards Ridge about 6 miles southwest of the junction of Marias River and Black Coulee.

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

Reference marks: A bottle 8 inches underground, true azimuth, 0° 19'; distant 5.22 feet from station; a bottle 8 inches underground, true azimuth, 182° 10'; distant 7.63 feet from station.

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[Latitude $48^{\circ} 10' 34.35''$. Longitude $110^{\circ} 44' 40.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marias	185 20 11.19	5 20 55.56	4.1200624
Black	245 16 33.69	65 25 32.31	4.2151397
Discovery	295 21 22.35	115 27 32.76	4.0560413
Humphrey	315 07 11.66	135 13 18.54	4.1598755

VAN, CHOUTEAU COUNTY.

On small ridge about 4 miles south of Gildford railroad station and 3 miles west of Van Alstine's house, which is on Sage Creek.

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

Reference marks: Bottle 8 inches underground, true azimuth, $347^{\circ} 21'$; distant 6.19 feet from station; bottle 8 inches underground, true azimuth, $173^{\circ} 01'$; distant 6.24 feet from station.

[Latitude $48^{\circ} 29' 11.90''$. Longitude $110^{\circ} 15' 50.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reservoir	31 42 45.64	211 38 18.95	4.1446635
Box	52 29 58.88	232 24 48.85	4.0363203
Line	358 15 48.20	178 16 02.83	4.1235384

VERONA, CHOUTEAU COUNTY.

On very prominent knoll about 6 miles southwest of Big Sandy railroad station.

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

Reference marks: A bottle 8 inches underground, true azimuth, $222^{\circ} 47'$; distant 4.4 feet from station; a bottle 8 inches underground, true azimuth, $39^{\circ} 01'$; distant 4.4 feet from station.

[Latitude $48^{\circ} 08' 30.24''$. Longitude $110^{\circ} 15' 31.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coalbanks			4.04123
Recess	22 09 15.04	202 05 50.02	4.1802115
Ridge	38 29 27.59	218 21 32.90	4.3274788
Carp	69 20 22.89	249 16 30.18	3.8393100
High	142 05 40.61	322 02 35.14	3.9225304
Mill	224 59 55.21	45 03 44.78	3.9541367

GALPIN, VALLEY COUNTY.

A station of the Missouri River Commission, on the left bank on divide between Missouri and Milk rivers and on rolling prairie. Station is about 3 miles from river. Lion Butte bears S. $41^{\circ} 13'$ E. (true), and is about 9 miles distant. Tiger Butte bears N. $29^{\circ} 46'$ west true), and is about 5 miles distant.

Station mark: An iron post set in the ground.

[Latitude $48^{\circ} 05' 17.67''$. Longitude $106^{\circ} 26' 06.81''$.^a]

[Latitude $48^{\circ} 05' 24.75''$. Longitude $106^{\circ} 26' 09.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willow	95 48 15.52	275 39 25.12	4.1708246
Tiger Butte	119 42 52.76	299 38 36.81	3.9130999
Porcupine	182 02 34.78	2 02 59.96	4.2909160
Nassau	266 28 10.94	86 33 56.54	3.9834804
		^a 86 34 01.75	3.9834666

^aMissouri River Commission.

NASSAU, VALLEY COUNTY.

A station of the Missouri River Commission, on the left bank, south-westerly from the nearest point of Milk River, 1 mile distant and about 2 miles above junction of the two rivers. Station is on the third ridge northerly from a sheep ranch. Kintyre railroad station bears south $79^{\circ} 04'$ E. (true), and is 8 miles distant from station.

Station mark: An iron post set in ground.

[Latitude $48^{\circ} 05' 43.70''$. Longitude $106^{\circ} 18' 25.58''$.]

[Latitude $48^{\circ} 05' 36.59''$. Longitude $106^{\circ} 18' 22.52''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Galpin	86 33 56.54	266 28 10.94	3.9834804
	^a 86 34 01.75	-----	3.9834666
Tiger	101 48 19.74	281 38 18.09	4.2323317
Porcupine	154 53 27.49	334 48 06.59	4.3207044

^aMissouri River Commission.

TIGER BUTTE, VALLEY COUNTY.

On a prominent butte about 5 miles east of Glasgow railroad station. This is a secondary point located by the Missouri River Commission. Station mark: An iron bench-mark post set 36 inches in the ground.

[Latitude $48^{\circ} 07' 35.99''$. Longitude $106^{\circ} 31' 53.77''$.]

[Latitude $48^{\circ} 07' 29.3''$. Longitude $106^{\circ} 31' 50.4''$.]^a

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willow.....	71 23 38.28	251 19 03.71	3.9058375
Porcupine.....	206 42 24.29	26 47 05.77	4.2387358
Nassau.....	281 38 18.09	101 48 19.74	4.2323317
Galpin.....	299 38 36.81	119 42 52.76	3.9130999

^aMissouri River Commission.

CALIFORNIA-OREGON.

TRIANGULATION STATIONS.

SISKIYOU COUNTY, CAL., JACKSON AND JOSEPHINE COUNTIES, OREG.

GRANTS PASS QUADRANGLE.

In the fall of 1904 Mr. A. I. Oliver occupied nine stations for the control of the Grants Pass quadrangle. Positions are based upon Onion and Sterling stations of the Coast and Geodetic Survey, United States standard datum.

RED BUTTE, SISKIYOU COUNTY, CAL.

On the northernmost of several rocky points, commonly known as Red Buttes. The point is reached by road from Grants Pass up Applegate Run via Watkins post-office to Elbert Branch of Applegate River, thence by trail up Applegate to just beyond Cook and Green creeks; there the trail takes up ridge to left. It is two days travel from Grants Pass. The trail leads to good meadow near ridge top; but animals can not get closer than 1,000 feet of elevation of top.

Signal: A cairn 8 feet high centered over bronze tablet.

Station mark: A bronze tablet cemented in solid rock.

[Latitude $41^{\circ} 55' 49.68''$. Longitude $123^{\circ} 10' 59.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tannen.....	115 08 44.67	295 00 02.04	4.2981507
Greyback.....	152 01 26.24	331 56 17.01	4.3545800
Tallowbox.....	185 11 54.17	5 13 12.77	4.4728695
Sterling.....	248 23 20.02	68 35 14.57	4.4222781

STERLING, JACKSON COUNTY, OREG.

A Coast and Geodetic Survey station, but not on the point commonly known as Sterling, the latter being about 3 miles to southeast of station. A higher point than station, known as Lone Dutchman, lies north 1.5 miles distant. Reached from Grants Pass via Applegate and Ruch post-offices to Little Applegate, up Little Applegate to Crumps ranch at junction of Right and Left Fork; up Right Fork on wagon road about 3 miles, at which point take Cinnibar trail to right. The station then lies 1 mile to east and is open traveling. About 2 miles farther Donomore Flat is reached, which is a good camping place and with feed.

Signal: A tripod 15 feet high centered over tablet.

Station mark: A Coast and Geodetic Survey tablet set in solid rock.

Reference marks: One to south 34.85 meters; one to northwest 20.44 meters.

[Latitude $42^{\circ} 01' 03.94''$. Longitude $122^{\circ} 53' 11.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Red Butte	68 35 14.57	248 23 20.02	4.4222781
Tannen	88 27 16.70	268 06 38.55	4.6292773
Greyback	106 25 27.77	286 08 22.49	4.5641402
Kerby	115 36 10.09	295 13 04.70	4.7204404
Tallowbox	132 23 44.75	312 13 07.02	4.4705344
Grants Pass	143 05 08.94	322 50 20.59	4.7022102
Onion	159 26 08.10	339 12 15.66	4.9034899

BALLY, JOSEPHINE COUNTY, OREG.

On highest summit of bald mountain, commonly known as Bally. It is reached in one day from Grants Pass by wagon toward Wilderville until crossing of Applegate and then by right-hand road to Wurtz's mill. From there good trail leads within 0.25 mile of point. Distance, 8 miles.

Signal: A trimmed tree 20 feet high with braces and wires and two targets of white cloth placed at right angles to each other.

Station mark: A bronze tablet cemented in rock and sunk flush with surface of ground.

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[Latitude 42° 27' 17.58". Longitude 123° 36' 55.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Onion	230 05 01.94	50 20 40.94	4.6148277
Grants Pass	285 32 44.05	105 47 21.61	4.4898691
Greyback	326 41 54.41	146 54 09.89	4.6603314
Kerby	333 47 53.70	153 54 09.42	4.4620608

GRANTS PASS, JOSEPHINE COUNTY, OREG.

On bare point about 4,000 feet high situated about 6 miles south-east of Grants Pass town. It is best reached by road to a gap, thence up point of ridge. No trail, but not much brush. Reached from Grants Pass in four and one-half hours.

Station mark: A bronze triangulation tablet cemented in solid rock on highest point of hill.

Reference marks: A hole 1 inch deep drilled in solid rock 11.2 feet distant southwest; a hole 1 inch deep drilled in solid rock 44.1 feet distant north.

[Latitude 42° 22' 47.19". Longitude 123° 15' 14.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Greyback	9 03 51.09	189 01 31.38	4.4816002
Kerby	44 00 10.12	223 51 49.98	4.3897800
Bally	105 47 21.61	285 32 44.05	4.4898691
Onion	183 15 50.50	3 16 49.28	4.5410819
Sterling	322 50 20.59	143 05 08.24	4.7022102
Tallowbox	337 14 40.82	157 18 50.74	4.3430443

GREYBACK, JOSEPHINE COUNTY, OREG.

On southern and highest summit of well-known mountain of same name; reached by wagon road and trail from Grants Pass. Good camping place 0.5 mile east of monument and 1,000 feet below it.

Signal: A cairn 9 feet high.

Station mark: A bronze triangulation tablet cemented in solid rock under center of monument.

Reference marks: In solid rock, hole and arrow pointing to tablet, one to west and the other to south.

[Latitude 42° 06' 37.03". Longitude 123° 18' 41.92'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tannen.....	32 29 16.92	212 25 42.84	4.1364748
Kerby.....	134 59 52.01	314 53 52.65	4.2395960
Onion.....	185 55 36.49	5 58 55.27	4.8128346
Grants Pass.....	189 01 31.38	9 03 51.09	4.4816002
Tallowbox.....	234 05 18.02	54 11 46.78	4.2150949
Sterling.....	286 08 22.49	106 25 27.77	4.5641402
Red Butte.....	331 56 17.01	152 01 26.24	4.3545800
Lake.....	355 05 03.75	175 05 30.55	4.0310401
Bally.....	146 54 09.89	326 41 54.41	4.6603314

KERBY, JOSEPHINE COUNTY, OREG.

Reached by wagon road from Grants Pass via Dryden post-office, thence up Deer Creek on wagon road 2 miles past Fraks ranch, thence by trail up South Fork of Deer Creek for 4 miles to old cabin, at which point leave creek and follow partially open ridge to west which leads to peak. Nearest water is 1,500 feet lower than peak and due east in small brushy ravine. No feed other than brush.

Signal: Tripod 14 feet high exactly over tablet. Tops of trees forming tripod not trimmed off, thus forming bushy top.

Station mark: A bronze triangulation tablet cemented in rock 5 by 6 by 6 feet on highest point.

Reference marks: A hole 1 inch deep, 1 inch in diameter in rock 1 by 5 by 3 feet, and 5.4 feet to northwest of tablet, with arrow pointing from hole to tablet; another hole, same size, and arrow in same rock, 3.3 feet north of station.

[Latitude 42° 13' 14.56". Longitude 123° 27' 37.22'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tannen.....	348 13 55.02	168 15 59.69	4.3861224
Bally.....	153 54 09.42	333 47 53.70	4.4620608
Onion.....	199 49 50.39	19 59 10.73	4.7458616
Grants Pass.....	223 51 49.98	44 00 10.12	4.3897800
Sterling.....	295 13 04.70	115 36 10.09	4.7204404
Greyback.....	314 53 52.65	134 59 52.01	4.2395960
Tallowbox.....	275 49 14.39	96 01 43.19	4.4100119

ONION, JOSEPHINE COUNTY, OREG.

On high bald point about 18 miles north-northeast of Grants Pass; reached by wagon road via Graves and Placer post-offices. It is best to pack from Placer, distance 10 miles. Trail leaves end of wagon road and follows Graves Creek until crossing Clark Creek, the second creek; thence leave Graves Creek, turning directly to left up ridge and follow trail to forks, at which point take right-hand trail which leads to small mine at prospect. This is directly below summit about 1,500 feet, easy of ascent.

Signal: A tripod 15 feet high, bushy tree in top; 15 feet north of Coast and Geodetic Survey point. There is a spring 200 yards west of signal on hillside. Good water and feed at Onion Spring, about 1 mile to north on top of main ridge.

Station mark: Brass plate in solid rock and copper bolt beneath same.

Reference marks: One to west, 24.62 meters; one to north, 47.22 meters.

[Latitude $42^{\circ} 41' 31.88''$. Longitude $123^{\circ} 13' 47.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grants Pass.....	3 16 49.28	183 15 50.50	4.5410819
Greyback.....	5 58 55.27	185 55 36.49	4.8128346
Kerby.....	19 59 10.73	199 49 50.39	4.7458616
Bally.....	50 20 40.94	230 05 01.94	4.6148277
Sterling.....	339 12 16.66	159 26 08.10	4.9034899

TALLOWBOX, JOSEPHINE COUNTY, OREG.

On the peak known locally as Tallowbox, best reached by wagon road from Grants Pass up Applegate River to Thompson Creek, thence up Thompson Creek to Tallowbox Gulch. No trail to peak, but fairly open ridge from 1 mile up Tallowbox Gulch. Good feed on ridge side near top, and water said to be on top 0.25 mile to east of point. Station can be reached from Tallowbox ranch in Tallowbox Gulch in two hours.

Signal: A trimmed tree wired over tablet.

Station mark: A bronze tablet cemented in solid rock on highest point.

Reference marks: On same rock, one 2 feet northeast and the other 2.6 feet southeast, holes 1 inch deep and arrows drilled pointing to tablet.

[Latitude $42^{\circ} 11' 48.57''$. Longitude $123^{\circ} 09' 02.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Red Butte	5 13 12.77	185 11 54.17	4. 4728695
Greyback	54 11 46.78	234 05 18.02	4. 2150949
Kerby	96 01 43.19	275 49 14.39	4. 4100119
Grants Pass	157 18 50.74	337 14 46.82	4. 3430443
Sterling	312 13 07.02	132 23 44.75	4. 4705344

TANNEN, JOSEPHINE COUNTY, OREG.

A well-known bare peak very close to Oregon-California line. Reached by wagon road from Grants Pass to head of Williamson Creek, thence by trail past Greyback Mountain and along summit of ridge to head of Sucker Creek, down Sucker Creek about 4 miles by trail to small creek. Trail goes up this creek 2 miles to meadow and good camping place. About 1.75 miles from here by trail to peak, which can be reached with animals.

Signal: A cairn 7 feet high and small tree wired in center of same.

Station mark: A bronze tablet cemented in solid rock under center of monument.

[Latitude $42^{\circ} 00' 22.57''$. Longitude $123^{\circ} 24' 01.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kerby	168 15 59.69	348 13 55.02	4. 3861224
Greyback	212 25 42.84	32 29 16.92	4. 1364748
Sterling	268 06 38.55	88 27 16.70	4. 6292773
Lake	264 05 19.53	84 09 20.19	3. 9200263
Red Butte	295 00 02.04	115 08 44.67	4. 2981507

SOUTH DAKOTA.

SECONDARY TRIANGULATION STATIONS.

BUTTE COUNTY.

BELLE FOURCHE PROJECT.

Early in the season of 1904 Mr. R. B. Robertson, field assistant, occupied three primary stations (Castle Rock, Owl Butte, and Susie Peak), thirteen secondary stations and located fifteen other points by intersections. Positions are given on the Rapid City astronomic datum.

BADLANDS, BUTTE COUNTY.

Near the southeast corner of T. 11 N., R. 2 E., on a sharp peak, about the highest of a ridge of "badlands" on the divide between Owl and Indian creeks. The road from Belle Fourche to Camp Crook passes about half a mile to the south of station at a point about 15 miles from Belle Fourche. Station can be seen from this road.

Signal: A lumber tripod 12 feet high.

Station mark: An iron bench-mark post marked " Δ " and set 3 feet in the ground.

[Latitude $44^{\circ} 52' 07.71''$. Longitude $103^{\circ} 48' 32.71''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	240 56 56	61 12 16	4.51338
Number 27.....	296 07 48	116 16 30	4.25864
Sheep Ranch.....	338 46 58	158 48 44	3.96060
North Side.....	7 57 09	187 56 10	4.12508

CASTLE ROCK, BUTTE COUNTY.

A prominent peak in T. 12 N., R. 5 E., Black Hills meridian, 28 miles in air line northeast of Belle Fourche, 12 miles southwest of junction of Sand Creek and South Fork of Moreau River. The summit is a narrow ridge about 150 yards in length, the station being on a knob at the northern end, which is about 10 feet lower than the southern end. Road from Belle Fourche to Slim Buttes passes from southwest to northeast about 2 miles east of peak.

Station mark: A bronze triangulation tablet cemented in a flat rock buried in the ground flush with the surface.

[Latitude $45^{\circ} 00' 38.65''$. Longitude $103^{\circ} 26' 50.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Susie Peak.....	36 58 45.39	216 46 29.57	4.5814773
Wymonkota.....	90 11 12.42	269 44 24.24	4.6971830
Owl Butte.....	321 26 47.25	141 36 30.14	4.4640921
Bear Butte.....	357 49 38.82	177 50 48.88	4.7740756
Monson.....	333 40 20.00	153 47 12.00	4.46189
Dry 2.....	352 23 15.00	172 24 55.00	4.37048
Number 27.....	270 24 47.00	207 18 11.00	4.42777

DOODY, BUTTE COUNTY.

In section 8, T. 9 N., R. 5 W., on the dividing ridge between Indian and Horse creeks, about half a mile southeast of the Doody ranch and 2 miles north-northwest from the junction of said creeks. Station is on the point farthest south, of any consequence, on this ridge.

Signal: A lumber tripod 12 feet high, with targets.

Station mark: An iron bench-mark post, marked " \triangle " and set 3 feet in the ground.

[Latitude $44^{\circ} 45' 37.61''$. Longitude $103^{\circ} 31' 33.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	192 32 55	12 36 14	4. 45481
Owl.....	258 14 52	78 27 53	4. 39584
Tank.....	269 12 55	89 15 19	3. 65424

DOUBLE, BUTTE COUNTY.

In section 25, T. 9 N., R. 5 E., on the point farthest north of a double hill on the divide east of Horse Creek, overlooking Horse Creek. This hill is about $1\frac{1}{2}$ miles northeast of Maas and Milberg's ranch.

Signal: A lumber tripod 12 feet high, with targets.

Station mark: An iron bench-mark post, marked " \triangle " and set 3 feet in the ground.

[Latitude $44^{\circ} 42' 56.42''$. Longitude $103^{\circ} 27' 23.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	181 14 19	1 14 42	4. 51584
Number 27.....	127 49 21	307 43 09	4. 16753
Tank.....	168 48 56	348 48 24	3. 71036
Seven.....	334 45 53	154 47 17	3. 78878
Hough.....	282 36 28	102 39 17	3. 73366

DRY (2), BUTTE COUNTY.

About the center of section 29, T. 10 N., R. 6 E. Station is on the divide between Willow and Dry creeks, about $2\frac{1}{2}$ miles northwest of Paul Kinstler's ranch, and is about $1\frac{1}{2}$ miles N. 20° W. of some small peaks on same divide.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post, marked " \triangle " and set 3 feet in the ground.

218 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

[Latitude 44° 48' 05.08''. Longitude 103° 24' 29.40'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	172 25 01	352 23 21	4. 37048
Owl.....	268 08 48	88 16 50	4. 17739
Number 27.....	88 08 16	268 00 01	4. 18881
Morison.....	285 31 37	105 36 49	4. 00459
Fourmile.....	317 46 50	137 55 20	4. 37637
Wilson.....	353 08 23	173 09 30	4. 24295
Number 7.....	364 34 43	184 34 04	4. 18006
Hough.....	352 14 48	172 15 35	4. 03386

FOURMILE, BUTTE COUNTY.

In section 24, T. 8 N., R. 7 E., on summit of the divide between Fourmile Creek and Bellefourche River; same ridge dividing Fourmile Creek and Willow Creek a little farther north. Station is 600 yards southeast, along summit from point where old Bismarck trail reaches top of divide.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post, marked "△" and set 3 feet in the ground.

[Latitude 44° 38' 33.72''. Longitude 103° 12' 24.04'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dry (2).....	137 55 20	317 46 50	4. 37637
Owl.....	177 08 35	357 08 06	4. 25837
Wilson.....	91 09 24	271 02 01	4. 14295
Simmons.....	63 11 59	243 07 45	3. 95116
B. M.....	106 34 04	286 33 02	3. 30550

MILLER, BUTTE COUNTY.

In section 6, T. 8 N., R. 5 E., a very prominent low butte, about 2 miles north of Bellefourche River and on the divide between Owl Creek and that river, about 3 miles north and 5 miles east of Snoma post-office and 1½ miles northeast of Sorenson's ranch.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post, marked "△" and set 3 feet in the ground.

[Latitude 44° 41' 22.03". Longitude 103° 32' 42.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Castle Rock.....	192 10 43	12 14 51	4. 56266
Owl.....	243 23 35	63 37 24	4. 46155
Twin.....	5 55 59	185 55 48	3. 54056

MORISON, BUTTE COUNTY.

Station is in section 5, T. 9 N., R. 7 E., on a prominent flat-top hill on the divide between Jug Creek, a tributary of Butte Creek, and a branch draining into Willow Creek. A road from Aggie Morison's ranch, going northeast, passes a little to the north of station, about 2½ miles from said ranch.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude 44° 46' 37.21". Longitude 103° 17' 06.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Castle Rock.....	153 47 12	333 40 20	4. 46189
Owl.....	239 01 43	59 04 33	3. 79144
Dry (2).....	105 36 49	285 31 37	4. 00459
Hogback.....	298 28 16	118 31 12	3. 79668

NUMBER 18, BUTTE COUNTY.

In section 18, T. 9 N., R. 4 E., on the divide between Owl and Indian creeks, about 2.5 miles northwest of Owl Creek bridge and 7 miles due north of Snoma post-office. Station is close to where country breaks off abruptly to Owl Creek. Ridge rises to the northwest of station.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post, marked "△" and set 3 feet in the ground.

[Latitude 44° 44' 55.58". Longitude 103° 40' 04.54".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Number 27.....	223 49 08	43 51 52	3. 86864
Shyket.....	326 21 53	148 24 18	3. 91217
Corner.....	230 10 35	50 12 00	3. 42451

220 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

NUMBER 27, BUTTE COUNTY.

In section 27, T. 10 N., R. 4 E., on the farthest south and east of two round hills, lying about 2 miles northeast of the bridge across Indian Creek and 9 miles north and 12 miles east of Belle Fourche.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post, marked "△" and set 3 feet in the ground.

[Latitude 44° 47' 48.24". Longitude 103° 36' 11.75".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock	207 18 17	27 24 53	4.42777
Dry (2)	268 00 01	88 08 16	4.18881
Badlands	116 16 30	296 07 48	4.25864
Double	307 43 09	127 49 21	4.16753
Schoolhouse	118 36 41	298 34 47	3.60708
May	15 45 50	195 44 00	4.10181
Horse	323 36 39	143 39 41	3.98156
Sheep Ranch	87 49 50	267 42 54	4.11368

OWL BUTTE, BUTTE COUNTY.

A lone, bare butte in open prairie about 35 miles northeast of Sturgis, on divide east of Willow Creek. Station is near the center of summit.

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

[Latitude 44° 48' 20.27". Longitude 103° 13' 05.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bear Butte	23 36 51.15	203 28 22.65	4.6012777
Susie Peak	79 32 16.68	259 10 20.70	4.6212654
Castle Rock	141 36 30.14	321 26 47.25	4.4640921
Fourmile	357 08 06.00	177 08 35.00	4.25837
Hogback	358 11 24.00	178 11 30.00	3.79040
Edwards	4 51 22.00	184 50 46.00	4.11865
Willow	42 29 27.00	222 25 14.00	4.06756
Morison	59 04 33.00	239 01 43.00	3.79144
Miller	63 37 24.00	243 23 35.00	4.46155
Shyket	67 15 53.00	246 59 18.00	4.52838
Dry	73 42 32.00	253 35 53.00	4.11312
Doody	78 27 53.00	258 14 52.00	4.39584
Dry (2)	88 16 50.00	268 08 48.00	4.17739
Castle Rock	141 36 30.00	321 26 47.00	4.4640921

SHEEP RANCH, BUTTE COUNTY.

In N. E. $\frac{1}{4}$ sec. 32, R. 3 E., T. 10 N., on the highest part of a flat hill overlooking Owl Creek. Hill is a spur from the divide between Owl and Indian creeks, but drainage from it all flows to Owl Creek, it forming a divide between Owl Creek and a small tributary of that creek. Station is 9 miles north and 4 miles east from the town of Belle Fourche. An old sheep ranch is about a mile southwest of station on the west or farther bank of Owl Creek.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post stamped " Δ ", elevation 3107, and set 3 feet in the ground.

[Latitude $44^{\circ} 47' 31.89''$. Longitude $103^{\circ} 46' 02.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	226 01 11	46 14 44	4.54470
Badlands.....	158 48 44	338 46 58	3.96060
Number 27.....	267 42 54	87 49 50	4.11368

SHYKET, BUTTE COUNTY.

In section 3, T. 8 N., R. 4 E., on a table-land between Belle Fourche River and Owl Creek, overlooking both those streams, and is on the southeast end of the ridge. Station is 3 miles north and 3 miles east of Snoma post-office.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post marked " Δ " and set 3 feet in the ground.

[Latitude $44^{\circ} 41' 15.19''$. Longitude $103^{\circ} 36' 39.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	199 43 29	19 50 24	4.58169
Owl.....	246 59 18	67 15 53	4.52838
Number 18.....	146 24 18	326 21 53	3.91217
Twin.....	303 45 18	123 47 53	3.76576
May.....	89 19 02	269 17 32	3.45228
Horse.....	234 54 16	54 57 37	3.88561
Snoma Butte.....	28 23 32	208 22 04	3.76355
Somerset.....	53 08 23	233 03 02	4.09942

222 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

SIMMONS, BUTTE COUNTY.

Station is in section 31, T. 8 N., R. 7 E., on a low hill, about 4 miles east and 1 mile south of Vale post-office, and is about 1 mile south and a little east of Esmond Simmons's house.

Signal: A lumber tripod, 12 feet high, with targets.

Station mark: An iron bench-mark post marked "△" and set 3 feet in the ground.

[Latitude 44° 36' 23.06''. Longitude 103° 18' 25.79'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wilson	125 59 48	305 56 39	3.86454
Fourmile	243 07 45	63 11 59	3.95116
B. M.	232 36 08	52 39 20	3.88053
Vale Butte.....	66 38 46	246 34 59	3.89136

SUSIE PEAK, BUTTE COUNTY.

A small conical peak near the center of T. 9 N., R. 3 E., Black Hills meridian, situated on east end of a high ridge bearing southeast and northwest, being the divide between Crow and Owl creeks, about 6 miles northeast of the town of Belle Fourche and about 2 miles north of Belle Fourche River.

Station mark: A bronze triangulation tablet cemented in stone sunk flush with surface of ground.

[Latitude 44° 44' 10.08''. Longitude 103° 44' 13.75'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Terry	8 09 49.51	189 05 58.21	4.6616893
Crow Peak	30 34 32.16	210 25 19.14	4.5342997
Warren Peak	63 20 21.79	242 50 33.50	4.7991448
Wymonkota	138 34 02.37	318 19 33.87	4.6099751
Castle Rock	216 46 29.57	36 58 45.39	4.5814773
Deer Ears	236 18 10.00	56 41 49.00	4.72398
Owl Butte	259 10 20.70	79 32 16.68	4.6212654
Bear Butte	318 43 45.57	138 57 09.55	4.5838871
Northside	101 31 42.00	281 27 41.00	3.88631
Badlands	158 55 06.00	338 52 02.00	4.19875
Schoolhouse	219 03 36.00	39 07 22.00	4.04811
Number 27	237 31 36.00	57 37 16.00	4.09895
Shyket	298 17 53.00	118 23 14.00	4.05584
Somervault	0 09 21.00	180 09 30.00	4.11224

WILLOW, BUTTE COUNTY.

In section 24, T. 9 N., R. 6 E., on the divide between Willow and Dry creeks, overlooking Willow Creek, and about 1 mile northwest of Sheffield's ranch.

Station mark: An iron bench-mark post set 3 feet in the ground.

[Latitude $44^{\circ} 43' 41.02''$. Longitude $103^{\circ} 19' 03.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Owl	222 25 14	42 29 27	4.06756
Dry	137 24 27	317 22 01	3.82937
Number 7	50 23 39	230 19 11	4.03653
Edwards	303 22 58	123 26 35	3.90986

WILSON, BUTTE COUNTY.

Station is in section 21, T. 8 N., R. 6 E., on top of a prominent hill about 600 yards south and west of the Wilson schoolhouse, and $1\frac{1}{2}$ miles north and one-half mile east of Vale post-office.

Signal: A lumber tripod 12 feet high, with targets.

Station mark: An iron bench-mark post marked "△" and set 3 feet in the ground.

[Latitude $44^{\circ} 38' 42.35''$. Longitude $103^{\circ} 22' 54.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dry (2)	173 09 30	353 08 23	4.24295
Fourmile	271 02 01	91 09 24	4.14295
Simmons	305 56 39	125 59 48	3.86454
Number 7	124 41 04	304 39 19	3.60312
Vale Butte	9 22 18	189 21 39	3.87451

The following points were not occupied, but were located by inter-sections from two or more stations:

Name.	Latitude.	Longitude.
	° ' "	° ' "
B. M.	44 38 52.41	103 13 51.97
Corner	44 45 50.70	103 38 31.72
Dry	44 46 21.98	103 22 31.57
Edwards	44 41 16.06	103 13 55.69
Hogback	44 45 00.44	103 12 56.30
Horse	44 43 38.22	103 31 53.34
Hough	44 42 18.10	103 23 23.10
May	44 41 14.08	103 38 47.70
Northside	44 44 50.76	103 49 56.58
Schoolhouse (chimney)	44 48 50.98	103 38 53.39
Number 7	44 39 56.23	103 25 24.21
Snoma Butte	44 38 29.82	103 38 44.23
Somervault	44 37 10.60	103 44 15.34
Tank	44 45 39.56	103 28 08.46
Twin	44 39 30.16	103 32 59.02
Vale Butte	44 34 42.93	103 23 49.83

The positions of the following section corners were determined by measuring the azimuth and distance from an occupied triangulation station:

	Latitude.	Longitude.
	° ' "	° ' "
T. 8 N., R. 7 E., sec. 31, quarter corner south side of ..	44 36 19.33	103 18 35.86
T. 8 N., R. 7 E., sec. 24, quarter corner north side of ..	44 38 54.90	103 12 31.02
T. 9 N., R. 5 E., sec. 32, southwest corner	44 41 29.41	103 32 25.12
Closing corner	44 41 29.41	103 32 28.05
T. 9 N., R. 5 E., sec. 25, northwest corner	44 43 13.31	103 27 33.33
T. 9 N., R. 6 E., sec. 24, quarter corner east side of	44 43 39.43	103 19 01.59
T. 9 N., R. 4 E., sec. 18, northeast corner of	44 44 58.71	103 39 44.25
T. 9 N., R. 5 E., sec. 11, quarter corner north side	44 45 49.82	103 28 09.87
T. 9 N., R. 5 E., sec. 8, northeast corner	44 45 49.85	103 31 12.76
T. 9 N., R. 7 E., sec. 5, quarter corner north side of ...	44 46 42.85	103 17 09.55
T. 10 N., R. 4 E., sec. 27, southeast corner	44 47 34.59	103 36 05.05
T. 10 N., R. 3 E., sec. 32, northeast corner	44 47 35.35	103 45 49.87
T. 10 N., R. 6 E., sec. 29, quarter corner north side of ..	44 48 26.57	103 24 29.40

TEXAS.

TRIANGULATION STATIONS.

EL PASO COUNTY.

VANHORN QUADRANGLE.

In the summer of 1904 Mr. Arthur Stiles, topographer, obtained additional control for the Vanhorn quadrangle by occupying two old stations, Chispa and Diablo, and two new stations, Delaware and 7:Heart, from which he located numerous secondary points, by intersections.

Positions are based upon the Sierra Blanca base and astronomic station.

ALLAMOORE, EL PASO COUNTY.

(Not occupied.)

The highest peak in the mountains 1 mile southwest of Allamoore section house and 10 miles west of Vanhorn. Pack animals can be taken to the station from Allamoore. Permanent water in Texas and Pacific Railroad water tank 2 miles west of Allamoore.

Station mark: A bronze triangulation tablet cemented in solid rock under center of rock monument 6 feet high.

Reference marks: A cross mark and the letters "U. S." cut deep in the rock bears N. $14^{\circ} 00'$ E., distant 3.8 feet. Another cross mark cut in the rock bears S. $69^{\circ} 15'$ E., distant 20.6 feet.

[Latitude $31^{\circ} 03' 17.0''$. Longitude $104^{\circ} 58' 46.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Delaware	4. 7672985
Diablo	4. 2301358
7: Heart	4. 7405816

BAYLER, EL PASO COUNTY.

(Not occupied.)

On the highest point in the north end of the Bayler Mountains, about 16 miles north of Vanhorn, and 4 miles southwest of Marley's lower windmills. Pack animals can be taken to the station from northeast side of mountain. Water at lower windmills.

Station mark: The center of a rock monument 6 feet in diameter and 5 feet high.

Reference marks: A bronze triangulation tablet cemented in the solid rock bears N. $18^{\circ} 00'$ W., distant 31.2 feet. A cross mark and the letters "U. S." cut deep in the solid rock bears N. $76^{\circ} 00'$ W., distant 22 feet.

[Latitude $31^{\circ} 14' 32.06''$. Longitude $104^{\circ} 45' 52.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
7: Heart			4. 5101987
Delaware			4. 4784373
Diablo			4. 1799165

CHISPA, JEFF DAVIS COUNTY.

Near El Paso County line, on the highest of the peaks, about 4 miles northwest of Chispa and 3 miles north of Williams's ranch. A wagon can be driven up the main draw from Williams's ranch to bottom of the peak on the south side, and pack animals can go from this point to within 200 feet of station. Nearest water is at Williams's ranch.

Station mark: A cross mark cut deep in a large stone over which is centered a large rock monument.

Reference marks: A bronze triangulation tablet cemented in the solid rock 9.3 feet distant; true azimuth, $129^{\circ} 35'$. A cross mark and the letters "U. S." cut deep in the rock, 10.8 feet distant; true azimuth, $359^{\circ} 15'$.

[Latitude $30^{\circ} 48' 07.73''$. Longitude $104^{\circ} 42' 36.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Diablo	156 01 31.3	335 55 12.1	4. 6810032
Delaware.....	186 07 00.7	6 09 39.8	4. 8820127
7: Heart	211 15 38.0	31 24 20.5	4. 7139576

DIABLO, EL PASO COUNTY.

On the highest south part of the Sierra Diablo, about 14 miles northwest from Vanhorn, about 12 miles northwest of Allamoore and 2 miles north of the Hazel mine. Pack animals can be taken to station from the main canyon on southwest side by following a dim road from point 1.5 miles west of Hazel mine up canyon to a small spring; thence up a cow trail and old log trail on east side of canyon to top of ridge which projects southward from the station. Nearest water is in small spring.

Station mark: A bronze triangulation tablet cemented in solid rock over which is built a rock monument 8 feet high.

Reference marks: A cross mark and the letters "U. S." cut deep in the rock 10.6 feet distant; true azimuth, $76^{\circ} 43'$. Another cross mark cut in the rock 16.5 feet distant; true azimuth, $219^{\circ} 43'$.

[Latitude 31° 11' 50.54". Longitude 104° 54' 52.40'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Delaware	220 44 16.0	40 53 19.0	4.6255468
7: Heart	269 23 26.9	89 38 33.9	4.6660690
Chispa	335 55 12.13	156 01 31.25	4.6810032

JOE MARLEY, EL PASO COUNTY.

(Not occupied.)

On a high, round-topped mesa in the southern end of the Delaware mountains, about 25 miles northeast of Vanhorn, and about 6 miles east of Ed Jones's ranch: Pack animals can be taken to the station from a point on the Toyah and Salt Flat road, about 1 mile east of the 7: Heart gap, at which point road passes 1.5 miles north of station. Water in a tank on the main Toyah road, 8 miles northwest of station, or at Ed Jones's ranch.

Station mark: A bronze triangulation tablet cemented in the solid rock, over which is built a pile of rocks and cedar brush 4 feet high.

Reference marks: A cross mark and letters "U. S." cut deep in solid rock bears S. 79° 30' W., distant 12 feet. Another cross mark cut in rock bears N. 40° 30' W., distant 8.5 feet.

[Latitude 31° 12' 53.24". Longitude 104° 29' 58.81'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
7: Heart	-----	-----	3.8438963
Delaware	-----	-----	4.5091049
Chispa	-----	-----	4.6986507

MEDLEY'S WINDMILL, EL PASO COUNTY.

(Not occupied.)

On the flats, about 1.5 miles northeast of Wild Horse section house and about 8 miles east of Vanhorn. The largest and southernmost of Medley's two home-ranch windmills, about 500 feet south of his residence.

Station mark: Center of windmill tower.

No reference marks.

[Latitude $31^{\circ} 03' 55.1''$. Longitude $104^{\circ} 42' 33.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
7: Heart	4. 4877565
Delaware	4. 6748098
Diablo	4. 3880670

NORTH DIABLO, EL PASO COUNTY.

(Not occupied.)

On the highest point of the Sierra Diablo, on the bluffs overlooking the Salt Flat road and the Figure Two headquarters ranch. Thirty-five miles north of Vanhorn, 12 miles northeast of Bounds "Dagger Tank." A dim road leads from this tank to 0.5 mile south of station.

Station mark: A cross mark cut deep in the rock, over which is a pile of stone 2 feet high and a tree signal.

Reference marks: A bronze triangulation tablet cemented in the solid rock and bearing N. $59^{\circ} 17'$ W., distant 25.6 feet from station mark.

[Latitude $31^{\circ} 26' 51.7''$. Longitude $104^{\circ} 54' 14.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Diablo	4. 4436025
Delaware	4. 4294808
7: Heart	4. 7235100
Chispa	4. 8687802

7: HEART, EL PASO COUNTY.

About 35 miles northeast of Vanhorn and 10 miles north of Boracho. On the highest point of the long bluffs overlooking Toyah and all the country northeast. About 5 miles southeast of 7: Heart Gap and 5 miles from Joe Shea's ranch. Pack animals can be taken to the station from the old Salt road which passes just beneath it on north side. Permanent water at Joe Shea's ranch or Ed Jones's ranch.

Station mark: A bronze triangulation tablet cemented in the solid rock, over the exact center of which is built a rock monument 8 feet high.

Reference marks: A cross mark and the letters "U. S." cut deep in the solid rock bears northeast 14.1 feet; true azimuth, $249^{\circ} 24'$. Another cross mark in the rock bears northwest 10.6 feet; true azimuth, $130^{\circ} 22'$.

[Latitude 31° 12' 03.26". Longitude 104° 25' 41.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chispa	31 24 20.5	211 15 38.0	4.7139576
Diablo	89 38 33.9	269 23 26.9	4.6660690
Delaware	149 25 47.5	329 19 39.8	4.5644395

DELAWARE, EL PASO COUNTY.

On the highest peak of the Delaware Mountains, about 14 miles due east of the Figure Two headquarters ranch, 40 miles northeast of Vanhorn, and 15 miles northwest of Lockett's ranch. Pack animals can easily be taken to the station by following up the smooth ridge from the big tank which lies 7 miles due east. A good wagon road leads from Vanhorn by way of Aden's old dugouts to Aden's dry well, thence north about 1.25 miles to the tank. Nearest water is in tank or at the dugout or in John Well in Salt Flat, about 5 miles west of station.

Station mark: A bronze tablet cemented in the solid rock 3 inches under the surface of the ground, over which is a pile of rocks and cedar brush 5 feet high.

Reference marks: A cross mark and the letters "U. S." cut deep in the rock bears southwest 10.7 feet; true azimuth, 22° 36'. Another cross mark cut in the rock bears northwest 13 feet; true azimuth, 99° 33'.

[Latitude 31° 29' 08.20". Longitude 104° 37' 28.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chispa	6 09 39.8	186 07 00.7	4.8820127
Diablo	40 53 19.0	220 44 16.0	4.6255468
7: Heart	329 19 39.8	149 25 47.5	4.5644395

SQUARE MESA, EL PASO COUNTY.

(Not occupied.)

On a high, square-top, cap-rock mesa in the west side of the Delaware Mountains about 28 miles northeast of Vanhorn, 10 miles north of Bean's ranch, and 7 miles southeast of Freeman's well in Canon's pasture. Pack animals can be taken to station from north end of mesa. Water in Freeman's well.

Station mark: A bronze triangulation tablet cemented in the solid rock, over which is centered a rock monument 6 feet high.

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Reference marks: A cross mark and the letters "U. S." cut deep in the rock bears S. $30^{\circ} 35'$ E., distant 6.4 feet. Another cross mark cut in the rock bears N. $25^{\circ} 00'$ E. from station mark, distant 9.0 feet.

[Latitude $31^{\circ} 22' 15.21''$. Longitude $104^{\circ} 37' 50.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
7: Heart.....	4. 4308612
Delaware.....	4. 1049368
Diablo.....	4. 5207042

PLATEAU, EL PASO COUNTY

(Not occupied.)

Sixteen and a half miles east of Vanhorn.

Station mark: Center of section house on north side of Texas and Pacific Railroad track.

Reference marks: None.

[Latitude $31^{\circ} 03' 45.9''$. Longitude $104^{\circ} 33' 28.2''$.]

To station—	Azimuth.	Back Azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
7: Heart.....	4. 2941549
Delaware.....	4. 6749697
Diablo.....	4. 5699588

VANHORN, EL PASO COUNTY.

The steeple of the Presbyterian Church in the village of Vanhorn.
Station mark: Center of steeple above belfry.

[Latitude $31^{\circ} 02' 39.6''$. Longitude $104^{\circ} 50' 05.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
7: Heart.....	4. 6295681
Chispa.....	4. 4643875
Delaware.....	4. 7252920

WILD HORSE, EL PASO COUNTY.

(Not occupied.)

About 8 miles east of Vanhorn.

Station mark: Center of section house on north side of Texas and Pacific Railroad track.

[Latitude $31^{\circ} 03' 04.2''$. Longitude $104^{\circ} 41' 53.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
7: Heart			4. 4861950
Delaware			4. 6872816
Diablo			4. 4190261

WYLIE MOUNTAIN, EL PASO COUNTY.

(Not occupied.)

The highest point on the southwest rim of the Wylie Mountains, about 7 miles southeast of Vanhorn and 6 miles southwest of Wild Horse section house. Pack animals can be taken to station from either place.

Station mark: Center of a rock monument 5 feet high.

Reference marks: A triangulation tablet cemented in the solid rock bears S. $41^{\circ} 32'$ E., distant 29.4 feet. A cross mark and the letters "U. S." cut deep in the rock bears N. $35^{\circ} 30'$ W., distant 9 feet.

[Latitude $30^{\circ} 58' 38''.0$. Longitude $104^{\circ} 44' 58.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
7: Heart			4. 5959053
Diablo			4. 4630561

WYOMING.

TRIANGULATION STATIONS.

BIG HORN AND FREMONT COUNTIES.

KIRWIN AND OTHER QUADRANGLES.

During the season of 1904 Mr. R. B. Robertson, field assistant, extended triangulation from the stations Wise, Franks, and Squaw, previously located from Ranchester base and the Sheridan and Yellowstone Lake mean astronomic position eastward, connecting with

stations Warner, Antelope, and Hyatt, established from the same base.

During the progress of this work 23 new and 6 old stations were occupied, and 14 points were located by intersection.

ANTELOPE, BIGHORN COUNTY.

On the highest of the grassy hills between Ten Sleep and Broken Back creeks; 2 miles east of a small sawmill on the Dry Fork of Broken Back Creek, 4 miles east of "Pole Patch" and 15 miles north-east of Ten Sleep post-office. Road from Ten Sleep post-office and "Pole Patch" following up Broken Back Creek passes 1 mile west of station, and when road first gets on the divide between Broken Back and Ten Sleep creeks, it is about 1 mile north of signal.

Station mark: Copper bolt cemented into a limestone rock, over which is centered a rock monument.

[Latitude 44° 10' 25.16". Longitude 107° 16' 38.77".] ^a

[Latitude 44° 10' 25.06". Longitude 107° 16' 38.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warner	30 32 23.69	210 26 05.45	4.3773785
	" 30 32 00.46	210 25 42.28	4.3773627
Devil	40 52 18.43	220 39 58.73	4.5595237
Hyatt	95 43 31.90	275 29 22.27	4.4346483
	" 95 43 15.02	275 29 05.35	4.4346392
Number 1	335 50 42.41	155 58 12.50	4.5482649

^a From Ranchester base via Cloud Peak.

BADLAND, BIGHORN COUNTY.

(Not occupied.)

On Badland Peak, a sharp peak on the divide between Nowater and Nowood creeks, the only peak of any consequence between Devil and Honeycomb triangulation stations and on same divide. Can be best reached from Nowood side.

Station mark: A very small pile of stone on summit of peak.

[Latitude 43° 51' 35.73". Longitude 107° 33' 26.67".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Devil	170 27 43.98	350 27 05.39	3.8745949
Warner	215 52 08.84	35 57 31.09	4.2471630

BANNON, BIGHORN COUNTY.

(Not occupied.)

On the highest point of a north and south rock ridge about 5 miles southwest of Meeteetse.

Station mark: A large rock monument.

[Latitude $44^{\circ} 05' 53.00''$. Longitude $108^{\circ} 52' 43.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wise	142 29 04.14	322 21 51.22	4. 3546505
Squaw	266 44 26.66	86 57 07.40	4. 3864629

BIGHORN, BIGHORN COUNTY.

About 10 miles from Thermopolis on the most prominent peak of the main ridge on the north side of Kirby Creek, 3 miles from it and 2 miles from Bighorn River. Covered with cedar and pine. From Thermopolis take Casper road to Kirby Creek, then road down river 4 miles; a wood road goes halfway up peak, and there is a dim trail to summit. Easily reached from north side.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet high.

[Latitude $43^{\circ} 47' 42.39''$. Longitude $108^{\circ} 06' 35.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon	10 12 32.05	190 09 05.92	4. 5785696
Red	44 08 47.34	223 59 14.14	4. 4265685
Padlock	81 03 10.92	260 46 43.28	4. 5096836
Grass	104 52 24.78	284 33 01.42	4. 5887724
Squaw	133 18 31.42	312 59 09.26	4. 7090854
Olwen	184 07 23.77	4 08 16.94	4. 3757933
Honeycomb	272 26 59.03	92 46 50.79	4. 5860154
Kirby	332 47 17.09	152 51 28.76	4. 2514928

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BLACK MOUNTAIN, BIGHORN COUNTY.

(Not occupied.)

A well-known point at head of south fork of Nowater Creek and near head of Lake Creek, a tributary of Kirby Creek.

[Latitude $43^{\circ} 38' 42.58''$. Longitude $107^{\circ} 42' 11.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' ''	° ' ''	Meters.
Deranch	16 21 36.79	196 20 19.69	3.9496860
Kirby	91 55 52.05	271 43 12.66	4.3921552

COTTONWOOD, BIGHORN COUNTY.

On a ridge slightly above timber line at the head of main fork of Cottonwood Creek. It is difficult to reach from the north and east, but it might be reached by taking road from Ilo post-office to sawmill high up on Grass Creek, thence along ridge between Gooseberry and Grass creeks. Also reached by road to head of Enos Creek, thence along ridge between Enos and Grass creeks.

Station mark: A bronze triangulation tablet cemented in rock, over which a cairn 7 feet high was erected.

[Latitude $43^{\circ} 49' 18.39''$. Longitude $109^{\circ} 03' 46.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' ''	° ' ''	Meters.
Muddy	32 41 13.69	212 35 40.93	4.3002287
Wiggins	90 01 54.07	269 47 10.42	4.4551263
Franks	125 18 40.68	305 07 14.99	4.4316966
Wise	181 06 18.81	1 06 48.21	4.6870035
Squaw	230 32 33.06	50 52 52.56	4.7040942
Grass	259 50 35.74	80 10 49.21	4.5990271
Putney	277 12 53.62	97 26 28.40	4.4236815
Owl	310 52 39.29	131 07 33.64	4.5843002

CROSBY, BIGHORN COUNTY.

On a high, shell-rock peak at head of Horse Creek of Wood River and a branch of Grey Bull River, about 1.5 miles from Kirwin. Station may be reached by trail from Kirwin; also a trail up Horse Creek and an open ridge from the head of creek to station.

Station mark: A stone set in ground level with surface and marked "U. S.

△ over which a cairn of rock 7 feet high was erected.
G. S."

[Latitude 43° 52' 40.01''. Longitude 109° 19' 55.07'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wiggins	47 41 43.82	227 38 10.44	3.9688235
Peak	115 45 29.23	295 38 00.43	4.2048098
Franks	177 09 13.30	357 08 58.82	3.9717717

DERANCH, BIGHORN COUNTY.

On the most prominent peak on Lyesite Mountain at the head of Lake Creek, a tributary of Kirby Creek. Road goes up one fork of Bridger Creek almost to station. Deranch post-office is about 7 miles south of station. Peak is timbered on the Lake Creek side and smooth and grassy on the Bridger Creek side. Water in both creeks.

Signal: A rock cairn 8 feet high built around a small pine tree.

Station mark: A bronze triangulation tablet set in stone which was placed in ground under center of signal.

[Latitude 43° 34' 05.67''. Longitude 107° 44' 03.23'']

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon	72 06 05.85	251 47 08.90	4.5911836
Kirby	112 55 33.71	292 44 11.96	4.3811117
Honeycomb	199 25 15.59	19 29 28.37	4.3956133
Mahogany	254 14 08.07	74 29 11.35	4.4843181

DEVIL, BIGHORN COUNTY.

On Devil Peak, a conspicuous peak about 10 miles southwest of Ten Sleep post-office, near the head of the north fork of Nowater Creek, on the divide between Nowater Creek and Nowood Creek, and on the eastern edge of the badlands known as the Honeycomb, at the head of Little Cottonwood Creek. Can be reached best from Ten Sleep post-office by going south along road for 7 or 8 miles until road bears east, thence across country in a southwest direction. No attempt should be made to approach station from south, west, or north, but only from Nowood Creek above Ten Sleep post-office.

Station mark: A bronze tablet set in stone embedded in ground level with surface, over which a small pole tripod was centered. A few stones were piled over station mark, one of which was marked "U. S.

△
G. S."

[Latitude 43° 55' 35.12". Longitude 107° 34' 22.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Honeycomb	16 06 47.67	196 04 21.36	4.2308524
Olwen	102 35 07.14	282 13 38.09	4.6271725
Hyatt	173 28 37.12	353 26 49.24	4.4817734
Antelope	220 39 58.73	40 52 18.43	4.5595237
Warner	239 07 34.04	59 13 35.11	4.1305128
Number 1	276 59 18.33	97 19 05.30	4.5854240

ENOS, BIGHORN COUNTY.

(Not occupied.)

A double-topped foothill, well timbered, especially on north side, situated at the head of Enos Creek; a tributary of Gooseberry Creek and Elk Creek, also head near station. There is a road from Ilo post-office to a sawmill 2 miles south of station, also a road from Dickey's ranch to the head of Enos Creek and a trail from there to station.

Signal: A tripod made of poles.

Station mark: A bronze triangulation tablet set in stone which was sunk in ground under center of signal.

[Latitude 43° 53' 32.89". Longitude 108° 57' 30.10".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wise	169 41 13.12	349 37 20.42	4.6175365
Squaw	231 40 40.45	51 56 38.98	4.5923247

FLAGSTAFF, BIGHORN COUNTY.

(Not occupied.)

On a flat-topped hill known as Monument Hill about 1 mile north of and visible from the town of Thermopolis and overlooking the cemetery. There has been a monument or cairn on the summit of hill, but the point located was a flagstaff wedged in crevice of rock at edge of bluff toward Thermopolis.

[Latitude $43^{\circ} 39' 43.15''$. Longitude $108^{\circ} 13' 05.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kirby	273 36 05.48	93 44 46.00	4. 2286798
Canyon	354 47 50.89	174 48 53.56	4. 3541277

GRASS, BIGHORN COUNTY.

On a peak of the dividing ridge between Cottonwood and Grass creeks and about 3 miles southwest of Ilo post-office, from which the signal is visible. Take road up Grass Creek for 1.5 miles, then a good ridge to the left heading toward the highest point in sight.

Signal: A small pine tree set 2 feet in ground and braced with cedar posts.

Station mark: In ground under center of top of tree or where braces meet, not where tree goes in the ground.

Reference mark: A bronze triangulation tablet set in large boulder placed in ground centered under eccentric position of instrument, 5.1 feet north of tree.

[Latitude $43^{\circ} 53' 01.61''$. Longitude $108^{\circ} 34' 35.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Putney	51 22 49.16	231 16 11.28	4. 2158835
Cottonwood	80 10 49.21	259 50 35.74	4. 5990271
Squaw	180 15 18.81	0 15 22.42	4. 4004984
Bighorn	284 33 01.42	104 52 24.78	4. 5887724
Padlock	339 20 51.88	159 23 46.31	4. 2036418

HONEYCOMB, BIGHORN COUNTY.

On the highest point of a grassy ridge at the upper end of a divide between two of the main prongs of Nowater Creek, and at the south-east edge of the Honeycombs. Station is within a mile of divide between Nowater and Nowood creeks; about 7 miles north 4° east from Hartman's cabin on Nowater. Water at Minnick's cabin 1.5 miles above Hartman's. Take Black Mountain road from Nowood.

Signal: A tripod 7 feet high made of cedar posts.

Station mark: A bronze triangulation tablet cemented in stone placed in ground under center of signal.

[Latitude $43^{\circ} 46' 45.39''$. Longitude $107^{\circ} 37' 53.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Deranch	19 29 28.37	199 25 15.59	4.3956133
Kirby	65 13 37.82	244 58 01.77	4.5253072
Bighorn	92 46 50.79	272 26 59.02	4.5860154
Olwen	124 52 53.03	304 33 52.11	4.6501826
Devil	196 04 21.36	16 06 47.67	4.2308524
Warner	214 59 03.58	35 07 30.55	4.4537081

HYATT, BIGHORN COUNTY.

On the east end of a high prominent black ridge, divide between Paint Rock and Nowood creeks; about 5 miles south of Hyattsville. Spratt's ranch road passes in a low gap about 0.5 miles east of station. This road branches south from Hyattsville.

Station mark: A copper bolt cemented into a river boulder, which is buried flush with ground over which is a small pile of slate rock.

[Latitude $44^{\circ} 11' 51.18''$. Longitude $107^{\circ} 36' 57.44''$.]

[Latitude $44^{\circ} 11' 51.18''$. Longitude $107^{\circ} 36' 57.76''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Olwen	61 06 59.31	240 47 15.06	4.6364139
Antelope	275 29 22.27	95 43 31.90	4.4346483
	^a 275 29 05.35	95 43 15.02	4.4346392
Warner	327 01 02.83	147 08 52.73	4.4415953
	^a 327 00 40.96	147 08 30.98	4.4415938
Devil	353 26 49.24	173 28 37.12	4.4817734

^a From Ranchester base via Cloud Peak.

KIRBY, BIGHORN COUNTY.

On a prominent peak at the head of a small creek which joins the Bighorn River between Thermopolis and Bighorn Hot Springs. Station is about 5 miles from Kirby Creek and 9 miles east of Thermopolis. Follow road east 5 miles from Bighorn bridge until one-half mile beyond where water is crossed and take trail up main gulch.

Station mark: A bronze triangulation tablet cemented in rock under a cairn 8 feet high.

[Latitude $43^{\circ} 39' 08.04''$. Longitude $108^{\circ} 00' 31.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon	34 50 35.25	214 42 58.50	4.4163571
Red	83 03 19.33	262 49 35.61	4.4307262
Bighorn	152 51 28.75	322 47 17.08	4.2514928
Honeycomb	244 58 01.77	65 13 37.82	4.5253072
Deranch	292 44 11.96	112 55 33.72	4.3811117

MAHOGANY, BIGHORN COUNTY.

On the highest point of Mahogany Butte, a prominent spur from the main mountain forming a perpendicular bluff on the side of Nowood Creek; about 5 miles down the creek from Nowood post-office. Road from Nowood to Redbank and Big Trails passes directly under station. Take this road from Nowood post-office to a point where it crosses a creek on a bridge, then take trail to right.

Station mark: A bronze triangulation tablet cemented in solid rock, over which a cairn 8 feet high is centered.

[Latitude $43^{\circ} 38' 32.10''$. Longitude $107^{\circ} 22' 13.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Deranch	74 29 11.34	254 14 08.07	4.4843181
Honeycomb	125 58 26.19	305 47 36.38	4.4145173

NEEDLES, BIGHORN COUNTY.

(Not occupied.)

"Washakie Needles," a well-known high rocky peak at the head of Owl Creek, near the farthest north corner of Shoshone Reservation. Probably best reached from head of South Owl Creek. This is the most prominent point in the Shoshone Range.

[Latitude 43° 44' 53.63''. Longitude 109° 12' 01.80''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cottonwood	233 30 37.52	53 36 20.00	4.13854
Muddy	357 57 10.48	177 57 20.00	3.93671

NUMBER 1, NEAR LINE OF BIGHORN AND JOHNSON COUNTIES.

On a rocky point of the Bighorn and Powder River divide, at the head of Otter Creek, a tributary of the Bighorns, and of Red Fork of Powder River. Station is 1.5 miles north of Young Brothers' sheep-dipping vats and 0.25 mile northwest of wagon road which runs along top of divide.

Station mark: A cairn 5 feet high.

Reference mark: A bronze tablet cemented in solid rock centered under eccentric position of instrument, 4.6 feet distant from station.

[Latitude 43° 52' 59.79''. Longitude 107° 05' 50.63''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Devil.....	97 19 05.30	276 59 18.32	4.5854240
Antelope	155 58 12.50	335 50 42.40	4.5482649

NUMBER 2, ON LINE BETWEEN BIGHORN AND JOHNSON COUNTIES.

(Not occupied.)

Very close to divide between Bighorn and Powder rivers, and probably in Bighorn County. Cahoots prospect cabin is about a mile southwest. A road from Helman ranch near Bigtrails post-office passes under this ridge, and cairn is visible from the road for several miles west.

Station mark: A cairn 10 feet high.

[Latitude 43° 46' 05.83''. Longitude 107° 07' 57.83''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Devil.....	116 33 18.20	296 15 00.62	4.5967291
Warner	135 58 16.02	315 45 58.39	4.5330259

OLWEN, BIGHORN COUNTY.

On a flat ridge about 5 miles west of Worland post-office and same distance north of Olwen post-office. On the dividing ridge between Gooseberry and Fifteen Mile creeks. There is a double round hill about 0.75 mile southwest of station.

Signal: A tripod made of cottonwood poles.

Station mark: A bronze triangulation tablet cemented in a rock buried in ground, level with surface, over which were placed a few round stones.

[Latitude 44° 00' 30.13". Longitude 108° 05' 19.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bighorn	4 08 16.93	184 07 23.76	4.3757933
Padlock	49 31 50.27	229 14 27.55	4.6458453
Squaw	106 20 30.32	286 00 12.59	4.6083708
Hyatt	240 47 15.06	61 06 59.31	4.6364139
Devil	282 13 38.09	102 35 07.14	4.6271725
Honeycomb	304 33 52.11	124 52 53.03	4.6501826

PADLOCK, BIGHORN COUNTY.

On the divide between Cottonwood and Owl creeks, about 2.5 miles northeast of the Padlock ranch, which is about 17 miles from Thermopolis and 12 miles from Embar, and just across Owl Creek from the road between Thermopolis and Embar.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 8 feet high.

[Latitude 43° 44' 56.97". Longitude 108° 30' 23.42".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Owl	42 55 22.94	222 47 13.24	4.3684450
Putney	104 18 06.60	284 08 34.91	4.2803062
Grass	159 23 46.31	339 20 51.88	4.2036418
Squaw	172 12 15.64	352 09 24.45	4.6072575
Olwen	229 14 27.55	49 31 50.27	4.6458453
Bighorn	260 46 43.28	81 03 10.93	4.5096836
Red	316 22 14.77	136 29 07.91	4.2886167

PEAK ON LINE BETWEEN BIGHORN AND FREMONT COUNTIES.

On a sharp peak on the divide between Grey Bull and Wind River at the head of the middle branch of Wiggins Fork of Wind River, about 11 miles (air line) north 67° west from Kirwin post-office. Station can best be reached from Wiggins Fork.

Station mark: A bronze tablet set in soft rock of which top of hill is composed, over which cairn 7 feet high was erected.

Reference mark: A sharp column of yellow rock, true azimuth, $262^{\circ} 24'$, distant 300 feet; a rock in place in hillside facing signal marked "R. \triangle P.," true azimuth, $304^{\circ} 03'$, distant 45.6 feet.

[Latitude $43^{\circ} 56' 25.14''$. Longitude $109^{\circ} 30' 42.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Round	49 17 20.19	229 07 12.17	4.4129986
Franks	260 08 45.46	80 16 00.12	4.1514187
Crosby	295 38 00.43	115 45 29.23	4.2048098
Wiggins	330 09 42.97	150 13 38.04	4.1827389

PUTNEY, BIGHORN COUNTY.

On a foothill 2 miles north of Cottonwood Creek and about 3 miles northeast of Veed Putney's ranch, at the Cottonwood Creek crossing of the Meeteetse-Embar road. Take road down Cottonwood Creek about a mile, then take trail north.

Station mark: A bronze triangulation tablet cemented in rock placed in ground under center of a cairn 8 feet high.

[Latitude $43^{\circ} 47' 28.76''$. Longitude $108^{\circ} 44' 09.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cottonwood	97 26 28.40	277 12 53.62	4.4236815
Grass	231 16 11.28	51 22 49.16	4.2158835
Owl	353 07 24.64	173 08 45.63	4.3417487
Spar	51 46 57.56	231 36 20.86	4.4196386
Muddy	70 16 13.00	249 57 06.67	4.5962388

RAMSHORN, FREMONT COUNTY.

(Not occupied.)

A very prominent, well-known jagged peak at the head of Little Horse Creek and probably on dividing ridge between Horse Creek and Del Noir River.

[Latitude 43° 43' 22.60". Longitude 109° 43' 32.56".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wiggins	246 06 41.26	66 19 28.80	4.4332391
Coulee	298 26 09.20	118 43 18.71	4.5806452

RICHARDS, BIGHORN COUNTY.

On a prominent peak at the source of two main forks of West Kirby Creek, about 5 miles nearly south of Richards' ranch on West Kirby Creek. The peak is very conspicuous and shows against the sky line in most directions, although a rock ridge of probably higher altitude lies a mile or so to the south.

Signal: A cairn 5 feet high built around a small tree.

Station mark: A bronze tablet in soft concrete 2 feet under ground.

[Latitude 43° 29' 29.59". Longitude 107° 54' 12.92".]

To station—	Asimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon	81 25 34.81	261 13 38.15	4.3743964
Kirby	154 34 48.08	334 30 27.04	4.2960484

SPAR, BIGHORN COUNTY.

On the most eastern bare point of a ridge forming the divide between South Owl Creek and one of its small tributaries, about 1.5 miles north of South Owl Creek Canyon. Station is about 3 miles a little west of south of an old sawmill location on road from Embar post-office to the head of South Owl Creek and about 3 miles southeast of the highest point on this road. By going up a ridge to the south of this high point in road and thence east along summit of ridge the station may be easily reached.

Station mark: A bronze tablet set in solid rock over which a tripod of poles was erected.

244 PRIMARY TRIANGULATION AND PRIMARY TRAVERSE.

[Latitude $43^{\circ} 38' 40.92''$. Longitude $108^{\circ} 59' 31.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cottonwood	163 48 06.18	343 45 09.36	4.3115353
Putney	231 36 20.86	51 46 57.56	4.4196386

SQUAW, BIGHORN COUNTY.

The larger or western of two buttes, locally known as "Squaw Teats," in the badlands near the head of Fifteen Mile Creek. A round-up road leaves the settlement on the Grey Bull near Charles Dodge's ranch and goes up Long Hollow to the head of a branch of Fifteen Mile Creek, and then down that creek to the springs.

Station mark: Copper bolt sunk into a large bowlder under a rock monument.

"U. S.

Reference mark: $\begin{matrix} + \\ \text{G. S.} \end{matrix}$ chiseled on rock 13.20 feet south of station.

[Latitude $44^{\circ} 06' 36.39''$. Longitude $108^{\circ} 34' 30.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grass	0 15 22.42	180 15 18.81	4.4004984
Cottonwood	50 52 52.56	230 32 33.06	4.7040942
Franks Peak	75 12 00.96	254 40 12.39	4.8014691
Marquette	108 26 49.24	287 58 11.09	4.7605901
Wise	113 42 57.94	293 23 03.10	4.6184007
Elk	134 25 31.15	314 10 57.01	4.5894892
Fenton	172 54 28.31	352 53 20.08	4.2451364
Tatman	201 48 32.91	21 53 08.97	4.3732480
Dorsey	245 56 32.04	66 10 29.43	4.4656453
Olwen	286 00 12.59	106 20 30.32	4.6083708
Bighorn	312 59 09.25	133 18 31.41	4.7090854
Padlock	352 09 24.45	172 12 15.64	4.6072575

FRANKS PEAK, BIGHORN COUNTY.

The highest peak on the divide between Grey Bull and Wood rivers, at the head of Wiggins (or Jack) and Franks creeks. About 12 miles southwest from Colonel Pickett's ranch on the Grey Bull Valley to the Chicago tunnel at the foot of peak on the head of Wiggins Creek; the best way, and the one used by the mine people, starts in at Anderson's ranch and goes up Wiggins Creek.

Station mark: Copper bolt sunk into a large stone centered under a rock monument.

[Latitude 43° 57' 43.25''. Longitude 109° 20' 15.94''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wiggin.....	22 19 43.65	202 16 24.56	4. 2276430
Peak.....	80 16 00.12	260 08 45.46	4. 1827389
Younts.....	93 17 24.58	272 55 26.74	4. 6270432
Pickett.....	167 35 58.67	347 32 58.12	4. 4287274
Marquette.....	190 14 40.64	10 17 56.17	4. 5443432
Wise.....	214 39 32.23	34 51 30.12	4. 6045327
Squaw.....	254 40 12.39	75 12 00.96	4. 8014691
Cottonwood.....	305 07 14.99	125 18 40.68	4. 4316966
Crosby.....	357 08 58.82	177 09 13.30	3. 9717717

WISE, BIGHORN COUNTY.

On a small hill on the Meeteetse River, about 8 miles south of Frost ranch on Stage Creek, 4 miles north of Wise post-office on Meeteetse Creek, about 500 feet east of Meeteetse-Red Lodge stage road and about one-fourth mile northeast of intersection of that road with a road leading to a sawmill on Meeteetse Creek.

Station mark: Copper bolt sunk in solid rock, over which is centered a large rock monument.

[Latitude 44° 15' 34.05''. Longitude 109° 03' 04.59''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cottonwood.....	1 06 48.21	181 06 18.81	4. 6870035
Franks Peak.....	34 51 30.12	214 39 32.23	4. 6045327
Marquette.....	94 55 01.44	274 46 17.59	4. 2228535
Cedar.....	160 21 21.38	340 16 26.88	4. 4420796
Elk.....	224 03 33.58	44 08 55.72	4. 1669415
Fenton.....	268 28 38.59	88 47 26.80	4. 5546437
Squaw.....	293 23 03.10	113 42 57.94	4. 6184007

THERMOPOLIS, BIGHORN COUNTY.

(Not occupied.)

A conspicuous low peak, covered with cedar brush, causing it to appear black, situated about 3 miles east of the town of Thermopolis. The peak is visible from the town, and lies slightly south of the line of Main street projected.

Station mark: An aluminum bench-mark tablet cemented in solid rock, over which a pole tripod was erected.

[Latitude $43^{\circ} 38' 37.58''$. Longitude $108^{\circ} 08' 56.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon	9 50 44.56	189 48 55.62	4.3177988
Kirby	265 11 43.40	85 17 31.84	4.0550435

WARNER, BIGHORN COUNTY.

On highest hill with scrub cedar on north slope 1 mile west of Nowood Creek, 3 miles south of junction of Nowood and Ten Sleep creeks. Two miles south of Mark H. Warner ranch on Nowood Creek.

Station mark: A copper bolt cemented into a large sandstone over which is centered a 6-foot rock monument.

[Latitude $43^{\circ} 59' 19.39''$. Longitude $107^{\circ} 25' 42.35''.^a$][Latitude $43^{\circ} 59' 19.33''$. Longitude $107^{\circ} 25' 42.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Devil	59 13 35.11	239 07 34.04	4.1305128
Hyatt	147 08 52.73	327 01 02.83	4.4415953
	a 147 08 30.98	327 00 40.96	4.4415935
Antelope No. 2	210 26 05.45	30 32 23.69	4.3773787
	a 210 25 42.28	30 32 00.46	4.3773627

 a From Ranchester base via Cloud Peak.

CANYON, FREMONT COUNTY.

In the Wind River or Shoshone River Indian Reservation; on a prominent grassy peak overlooking the Bighorn River, and forming the bluff to canyon on the west side of that river. This peak is between Muddy Creek on the south, Red Canyon on the north, and Bighorn River on the east, being the nearest point of Owl Creek range to river. Station bears S. 10° E., distant 13 miles from Thermopolis. Water at head of Red Canyon.

Station mark: Middle of trunk of live pine tree 9 feet above ground.

Reference mark: A bronze triangulation tablet cemented in a large boulder, compass bearing from mark to signal N. 12° W., distant 18 feet.

[Latitude $43^{\circ} 27' 33.87''$. Longitude $108^{\circ} 11' 34.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bighorn	190 09 05.92	10 12 32.04	4.5785696
Kirby	214 42 58.50	34 50 35.25	4.4163571
Deranch	251 47 08.90	72 06 05.85	4.5911836

COULEE, FREMONT COUNTY.

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 and between that creek and a tributary to it. Peak is covered with timber toward the top and is easily reached from any side.

Station mark: A bronze tablet set in stone in place, over which a cairn 8 feet high was erected.

Reference marks: "R \triangle P" cut in two stones firm in ground; one distant 14.9 feet, and the other 15.2 feet from station mark.

[Latitude $43^{\circ} 32' 33.42''$. Longitude $109^{\circ} 18' 40.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
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

MUDDY, FREMONT COUNTY.

On the highest peak at the heads of Muddy Creek, South Fork of Owl Creek, and Crow Creek, 5 miles nearly due south of the Washakie Needles and across the south fork of Owl Creek from them. Wagon road from Embar post-office up South Owl Creek reaches to within a few miles of station. Wagon may also be taken up Crow Creek from the Wind River side to a point directly under the peak.

Station mark: A bronze tablet set in the soft rock, of which peak is composed and under center of cairn 7 feet high.

Reference marks: Boulder marked "R \triangle P" 11.1 feet distant from signal; boulder marked "R \triangle P" 30 feet distant from signal.

[Latitude $43^{\circ} 40' 13.71''$. Longitude $109^{\circ} 11' 48.12''$.]

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

OWL, FREMONT COUNTY.

In the Wind River or Shoshone River Indian Reservation, on the most prominent point of the Owl Creek Mountains, the divide between Muddy and Owl creeks, and at the head of Red Creek, a tributary of Owl Creek. There is a road from Embar post-office to the timber at the head of the east fork of the west or main fork of Red Creek. This road starts up the main Red Creek and goes about 7 miles, from the end of which the station is about 2 miles south, on the highest of several rocky points.

Station mark: A bronze tablet set in stone over which a cairn 7 feet high was erected.

Reference marks: "R + P" on solid rock, distant 23.5 feet from station; "R + P" on solid rock, distant 15.6 feet from station.

[Latitude $43^{\circ} 35' 42.13''$. Longitude $108^{\circ} 42' 12.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Muddy	102 03 42.10	281 43 16.93	4.6093288
Cottonwood	131 07 33.63	310 52 39.29	4.5843002
Putney	173 08 45.63	353 07 24.64	4.3417487
Padlock	222 47 13.24	42 55 22.94	4.3684450
Red	263 57 05.91	84 12 07.60	4.4694565

RED, FREMONT COUNTY.

In the Wind River or Shoshone River Indian Reservation, on a prairie hill which slopes gradually to the northwest and has bluffs on the south and east sides. The hill is on the divide between Mud Creek and Red Canyon and is about 9 miles from Thermopolis by wagon road. The Thermopolis and Lander road passes about one-half mile south of station, and signal is visible from this road.

Station is about 2.5 miles north of Nostrum's ranch in Red Canyon.

Station mark: An aluminum bench-mark tablet wedged in crack in solid rock under center of a cairn 8 feet high.

[Latitude $43^{\circ} 37' 20.69''$. Longitude $108^{\circ} 20' 25.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Owl	84 12 07.60	263 57 05.91	4.4694565
Padlock	136 29 07.91	316 22 14.77	4.2886167
Bighorn	223 59 14.13	44 08 47.33	4.4265685
Kirby	262 49 35.61	83 03 19.33	4.4307262

ROUND, FREMONT COUNTY.

On the highest part of a round hill on top of a high mesa forming the divide between Horse Creek and the Du Noir River, about 5 miles north 20° west from the Ramshorn Mountain.

Station mark: A bronze tablet set in a piece of red lava rock placed in ground over which a cairn 8 feet high was erected.

[Latitude $43^{\circ} 47' 17.23''$. Longitude $109^{\circ} 45' 19.64''$.]

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

STEAMBOAT, FREMONT COUNTY.

(Not occupied.)

The farthest south of two rocky points on divide between Bear Creek and North Fork of Wind River. This is a very prominent point.

[Latitude $43^{\circ} 43' 39.88''$. Longitude $109^{\circ} 23' 50.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wind River	24 51 49.06	204 46 47.00	4.36878
Coulee	339 38 01.05	159 41 35.00	4.30088

WIGGINS, FREMONT COUNTY.

On the summit of a sharp, white peak on the divide between Wiggins Fork and Bear Creek, both tributaries of the Wind River. Peak is about 8 miles from Kirwin post-office. Trail leads up Wood River nearly to source, crosses a low saddle about 3 miles above Kirwin on to the head of Bear Creek, follows down this creek to the first large branch coming in from the west, crosses this branch, and follows up ridge to station. Peak shows sharp and white and can not be mistaken.

Station mark: A bronze tablet in loose rock 1 foot under surface, over which is a stone, level with surface and marked

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centered under a cairn 6 feet high.

Reference marks: 1. A stone level with surface marked “ $R\triangle P$ elevation 12164,” distant 10.9 feet from station. 2. A stone set firmly in the ground marked “ $R\triangle P$,” distant 11.5 feet from station.

[Latitude $43^{\circ} 49' 16.91''$. Longitude $109^{\circ} 25' 03.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Round	82 22 54.06	262 08 51.95	4.4384404
Peak	150 13 38.03	330 09 42.97	4.1827389
Franks Peak	202 16 24.56	22 19 43.65	4.2276430
Crosby	227 38 10.44	47 41 43.82	3.9688235
Cottonwood	269 47 10.42	90 01 54.06	4.4551263
Muddy	313 13 46.63	133 22 56.30	4.3881458
Coulee	343 35 45.83	163 40 09.89	4.4826008

WIND RIVER, FREMONT COUNTY.

On a sharp prairie peak at the Wind River side of a flat prairie ridge lying between and close to the junction of Wind River, Horse Creek, Wiggins Fork, and North Fork of Wind River. Station is about 5 miles down Wind River from Dubois post-office and about 2 miles north of Wind River, and can be easily reached from the stage road where it crosses Wiggins Fork.

Station mark: A bronze tablet cemented in stone in place over which a cairn 7 feet high was erected.

Reference marks: "RΔP" cut in two firmly embedded stones, distant 8.6 feet and 30 feet from station.

[Latitude 43° 32' 12.38''. Longitude 109° 31' 08.51''].]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wiggins.....	194 28 58.28	14 33 10.28	4.4964534
Coulee	261 33 34.32	81 42 09.32	4.2296220



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