

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

RESULTS

OF

PRIMARY TRIANGULATION AND PRIMARY TRAVERSE

FISCAL YEAR 1903-04

BY

SAMUEL S. GANNETT



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1904



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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C., July 29, 1904.

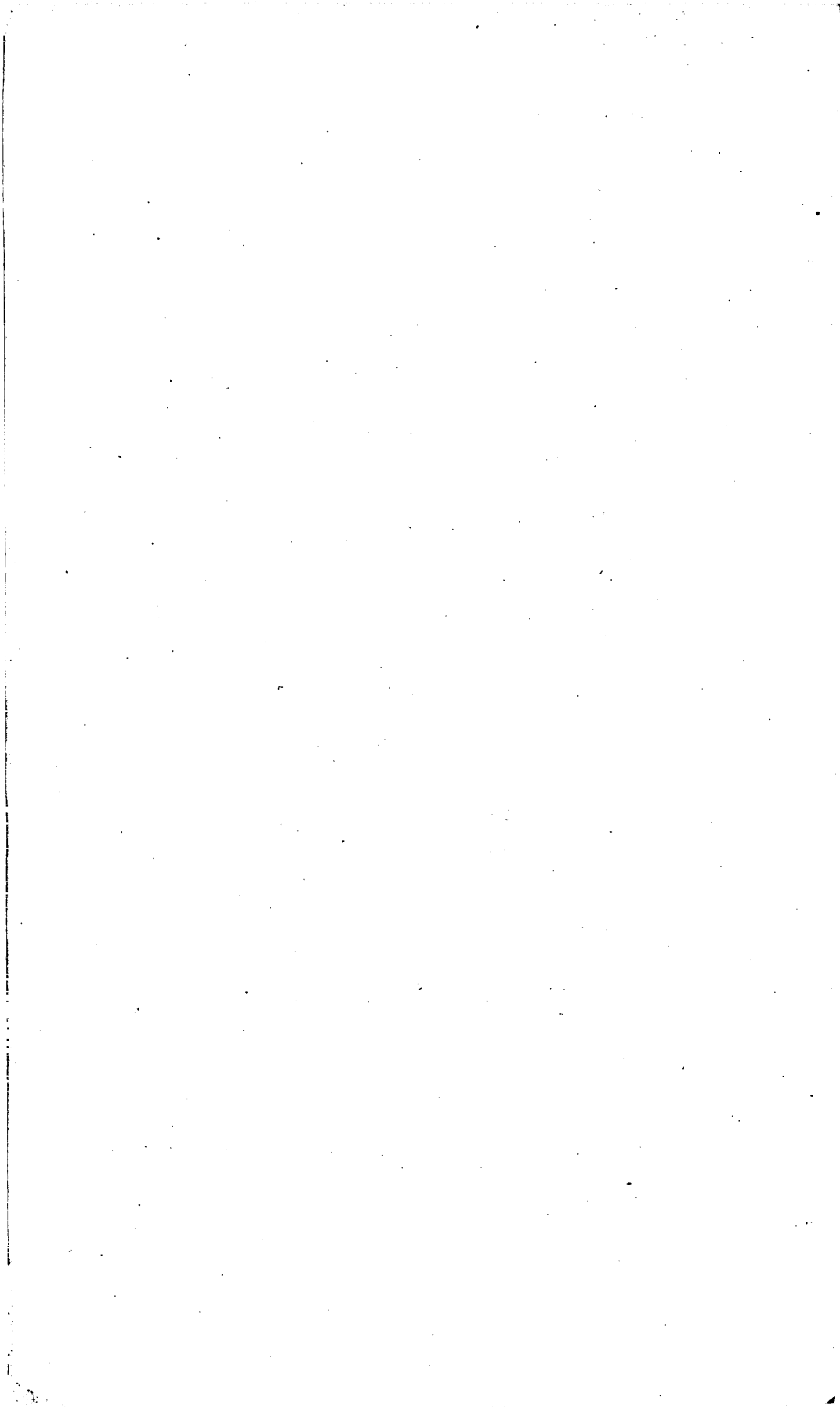
SIR: I have the honor to transmit herewith, in form for publication, the results of the primary triangulation and primary traverse executed by the United States Geological Survey during the fiscal year 1903-4.

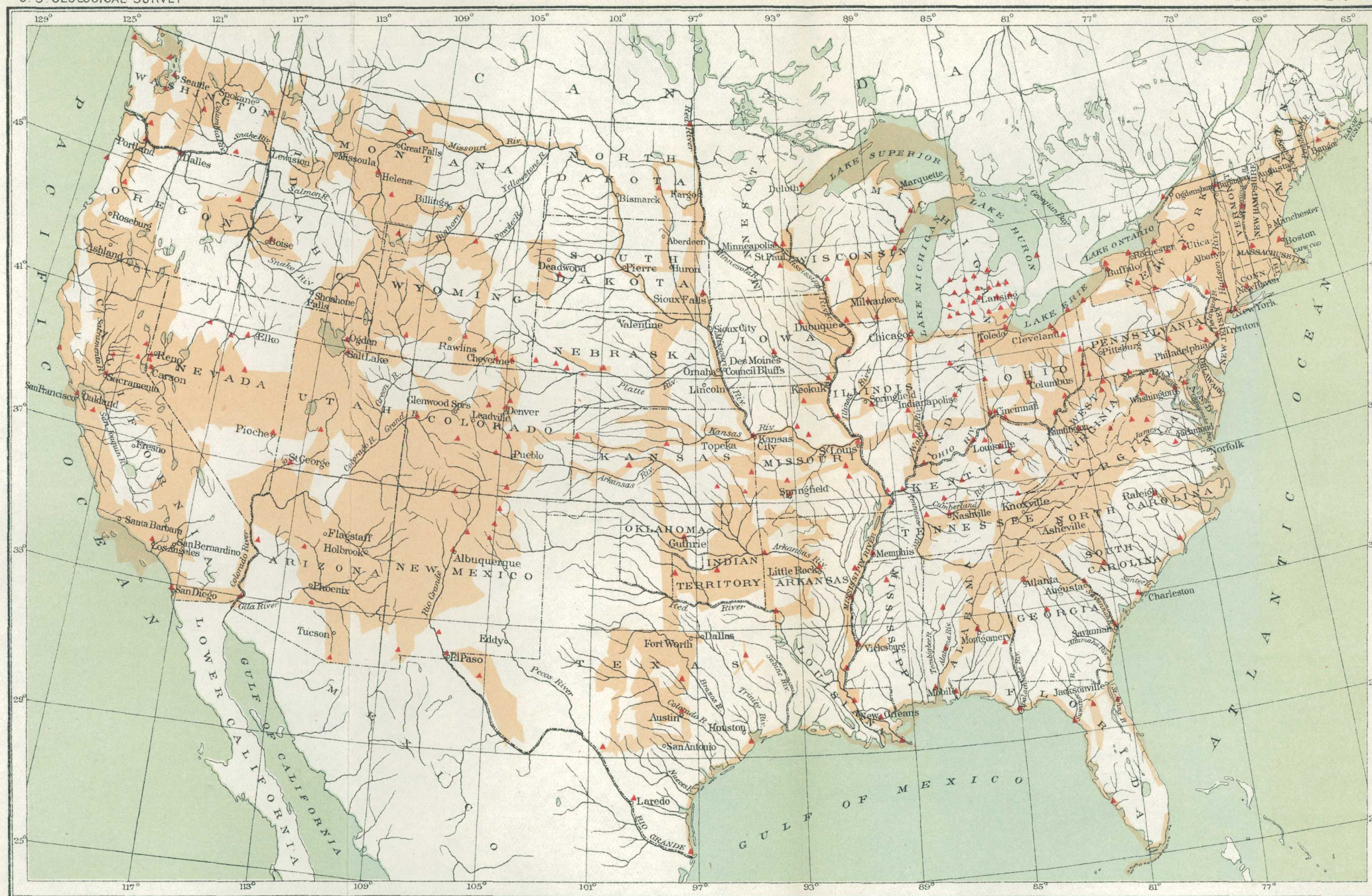
The results were computed by Messrs. George T. Hawkins, C. F. Urquhart, H. L. Baldwin, jr., R. H. Chapman, Sledge Tatum, E. L. McNair, J. R. Ellis, L. Scott Smith, D. H. Baldwin, C. B. Kendall, J. F. McBeth, and Arthur Stiles.

Very respectfully,

S. S. GANNETT,
Geographer,
In charge Triangulation and Computing Section.

Hon. CHARLES D. WALCOTT,
Director United States Geological Survey.





MAP SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL

to April 30, 1904

Areas tinted are controlled by triangulation or traverse

▲ Astronomic station

100 0 100 200 300 400 500 600 MILES

JULIUS BIEN & CO. LITH. N.Y.

RESULTS OF PRIMARY TRIANGULATION AND PRIMARY TRAVERSE, FISCAL YEAR 1903-4.

By SAMUEL S. GANNETT.

SUMMARY.

Summary of published results, 1903-4: Triangulation and primary traverse.

Locality.	Triangulation stations.	Traverse stations.
EASTERN DIVISION.		
Alabama		167
Georgia		83
Illinois-Indiana		42
Illinois		38
Kansas		153
Kentucky		262
Louisiana		41
Maryland		139
Michigan		35
Illinois		34
Missouri		189
New York	4	213
North Dakota		48
North Dakota-Minnesota		177
Ohio		801
Pennsylvania	13	192
Vermont-New York	10	
Virginia		78
West Virginia	28	
Wisconsin		73
WESTERN DIVISION.		
Arizona	92	
California	10	108
Colorado	20	
Montana	82	
Oregon	20	
Texas	21	
Utah	8	
Washington	61	
Wyoming	30	
Total	399	2,873

EASTERN DIVISION OF TOPOGRAPHY.

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

ALABAMA.

PRIMARY TRAVERSE.

Blount, Jefferson, and St. Clair counties; Birmingham quadrangle.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. Oscar Jones, topographer. The line starts at Warnock Knob triangulation station, United States Coast and Geodetic Survey, and follows highways along north edge of quadrangle to Bremen, Ala., thence south via highways along west edge of quadrangle to Adamsville; thence southeast along Kansas City, Memphis and Birmingham Railroad to Ensley; thence along public road to Birmingham; thence along the Southern Railway to Leeds and north over public highways along east edge of quadrangle via Cahaba triangulation station of United States Coast and Geodetic Survey, closing on Warnock Knob. A line was also run from Bangor south over the Louisville and Nashville Railroad to Birmingham. Positions are given on United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Warnock Knob triangulation station, U. S. Coast and Geodetic Survey	33 59 48.24	86 41 51.84
Section line north and south	33 58 42.5	86 42 35.3
Bangor, 4 miles east of; forks of road, bronze tablet cemented in solid rock at northwest corner of.....	33 58 51.6	86 42 52.8
Forks of road to Nectar.....	33 58 28.5	86 44 01.0
Forks of road	33 58 35.0	86 44 31.4
Bangor, crossroads 300 feet west of railroad station	33 58 28.8	86 45 23.3
Crossing of Bremen road and Louisville and Nashville Railroad, 62 feet west of right of way, iron post No. 2..	33 58 06.2	86 45 34.6
Mulberry bridge, south end of.....	33 58 11.7	86 46 30.6
Junction of Garden City road; to Garden City, 4 miles...	33 58 19.7	86 46 40.1
Section corner	33 58 19.1	86 46 48.1
Section corner	33 58 19.4	86 47 50.8
Quarter section corner.....	33 58 19.8	86 48 21.5
Forks of road	33 58 43.7	86 49 09.5
Forks of road	33 58 56.5	86 50 06.1
Forks of road, to Blount Springs, 6 miles.....	33 58 48.0	86 50 58.5
Forks of road at church	33 58 24.2	86 52 25.3

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Section line.....	33	57	33.5	86	52	06.7
Forks of road, Arkadelphia, 6½ miles	33	56	46.0	86	52	12.5
Forks of road	33	55	18.8	86	53	16.5
Forks of road, Bremen, 9 miles.....	33	55	47.7	86	53	57.7
Forks of road	33	57	38.5	86	53	51.4
Forks of road	33	58	27.0	86	53	49.8
Store, center of road in front of	33	58	46.6	86	54	28.0
Forks of road	33	59	01.3	86	55	27.6
New Prospect, schoolhouse, forks of road at.....	33	59	22.4	86	55	57.3
Forks of road	34	00	01.5	86	56	07.2
Forks of road	34	00	15.2	86	56	45.0
Bremen, forks of road at.....	33	59	51.4	86	58	05.6
Bremen, iron post No. 4, NE. fence corner, forks of road, Arkadelphia and Garvins Point	33	59	25.4	86	58	19.7
Forks of road	33	59	08.9	86	57	24.0
Forks of road	33	58	29.0	86	56	50.8
Box schoolhouse, center of road opposite.....	33	57	34.3	86	57	04.1
Quarter section corner, stone.....	33	56	46.4	86	56	31.7
Forks of road, top of mountain.....	33	55	50.0	86	56	45.3
Forks of road on ¼ section line, Bremen, 6 miles.....	33	55	34.8	86	56	32.5
Crossroads on ¼ section line, to Arkadelphia, 1½ miles....	33	54	55.0	86	56	32.4
Forks of road	33	53	55.5	86	56	27.8
Forks of road, signboard, "Arkadelphia, 2 miles".....	33	53	16.5	86	56	18.5
Forks of road, signboard, "Jasper, 28 miles".....	33	52	29.6	86	56	15.9
Hanby Mills; bridge over Mulberry Fork of Black War- rior River, bronze tablet set in southeast corner of north abutment of	33	52	21.6	86	55	23.1
Sloan post-office, center of road in front of	33	51	37.7	86	56	15.4
Church, forks of road at	33	51	12.0	86	56	45.2
Section corner stone.....	33	50	53.3	86	57	18.0
Walker and Blount counties, county line, east and west on section line	33	50	40.7	86	57	29.6
Forks of road	33	49	59.6	86	58	06.0
Little Vine church, center of road, 85 feet west of	33	48	57.1	85	59	02.9
Forks of road	33	48	24.9	86	58	22.4
Forks of road	33	47	05.6	86	58	16.9
Forks of road	33	46	36.7	86	58	22.5
Church, forks of road at.....	33	45	47.0	86	58	53.8
Forks of road at house	33	45	25.7	86	59	22.7
Robbins crossroads, bronze tablet cemented in solid rock, 68 feet east of crossroads.....	33	44	04.9	86	59	40.9
Forks of road	33	43	02.2	86	59	23.5
Louisville and Nashville Railroad, forks of road at.....	33	42	13.3	86	58	50.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of iron bridge over creek.....	32 41 37.0	86 58 23.7
Crossroads.....	33 1 03.3	86 58 17.3
Linns crossing, eastern stone pier, overhead bridge of Louisville and Nashville Railroad.....	33 40 37.4	86 58 00.6
Southern Railway crossing.....	33 40 30.0	86 57 58.2
Forks of road.....	33 39 36.0	86 57 59.5
Forks of road.....	33 39 00.5	86 58 10.6
Section line, south boundary section 17.....	33 58 22.1	86 58 31.6
Grayville, forks of road at.....	33 37 41.6	86 58 23.6
Forks of road.....	33 36 56.3	86 58 14.1
Adamsville station, 0.75 mile northwest of, bronze tablet cemented in solid rock at Kansas City, Memphis and Birmingham Railroad crossing, a sign crossing board bears (mag.) S. 78° ½ E.; distance, 84.4 feet.....	33 36 30.6	86 57 48.9

Geographic positions along the Kansas City, Memphis and Birmingham Railroad between Adamsville and Ensley.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Adamsville, signal board.....	33 36 01.3	86 57 20.2
Overhead bridge.....	33 35 19.1	86 56 49.3
Road crossing.....	33 33 56.0	86 56 11.3
Booker City, road crossing at.....	33 33 28.6	86 55 27.9
Road crossing.....	33 32 43.3	86 55 17.5
Road crossing.....	33 32 11.7	86 53 58.2
Pratt City station, 510 feet west of, road crossing on Kansas City, Memphis and Birmingham Railroad.....	33 31 30.7	86 53 08.7
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

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ensley, center of F and Seventeenth streets.....	33 30 50.0	86 53 41.0
Ensley, street corner and Birmingham road.....	33 30 38.9	86 52 26.8
Section line.....	33 30 46.3	86 51 57.9
Crossroads at end of electric line.....	33 30 41.8	86 50 58.0
Birmingham, Eighth avenue and Twentieth street.....	33 31 17.9	86 48 35.9
Birmingham, Eighth avenue and Twenty-sixth street...	33 31 30.8	86 48 08.7

Geographic positions along Southern Railway between Birmingham and Leeds.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Avondale station, street crossing just south of	33 31 35.3	86 46 34.0
Woodlawn station, road crossing 200 feet east of	33 32 14.1	86 45 09.5
Irondale Union station, street crossing 200 feet east of ...	33 32 17.9	86 42 26.7
Weems station, road crossing 1 mile west of	33 32 35.2	86 40 41.3
Southern Railway and Seaboard Air Line Railway, over- head crossing	33 33 23.3	86 39 49.2
Weems station, Central of Georgia Railway, road cross- ing 1 mile east of	33 33 45.2	86 39 03.8
Road crossing	33 33 13.7	86 37 04.2
Louck station, road crossing at	33 33 28.3	86 36 45.9
Cahaba River, east abutment of Southern Railway bridge over	33 32 58.3	86 35 21.0
Henryellen station, center of track in front of	33 33 17.8	86 34 20.4
Road crossing	33 32 50.1	86 33 43.9
Leeds, 0.6 mile west of; 615 feet west of trestle over East Cahaba River, in limestone 35 feet north of Southern Railway track, bronze tablet stamped "Prim. Trav. Sta. No. 9, elev. 627 feet"	33 32 53.2	86 32 56.6
Leeds station, Southern Railway, 120 feet west of; road crossing	33 32 37.8	86 32 23.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson-St. Clair County line	33 33 19.5	86 31 50.8
Leeds, 1.5 miles east of; opposite Cedar Grove Church, in large rock, bronze tablet stamped "Elev. 644 feet" ..	33 33 28.2	86 31 39.1
Road forks, west and north to Springville, 40 feet north- east to large oak tree painted "Elev. 642 feet," 10 feet northwest to signboard	33 33 53.6	86 31 30.9
Road forks east and south, 35 feet north to pine tree painted "Elev. 658 ft."; 10 feet south to small oak tree ..	33 34 23.4	86 31 33.1
Road forks southeast and south to Leeds, 10 feet east to rail fence; 50 feet south to oak tree painted "Elev. 702 ft."	33 35 29.0	86 31 37.4
Big Black Creek, center of	33 35 43.9	86 31 56.2
Three corners, road to northeast	33 35 50.6	86 32 05.8
Road forks, north to Springville, west to Trussville	33 36 11.2	86 32 31.1
Road forks to west, 10 feet south to pine tree painted "Elev. 689 ft."	33 37 09.8	86 31 55.0
Seaboard Air Line Railway crossing	33 37 40.2	86 31 30.3
Crossroads, 25 feet west to front gate of yard	33 37 57.3	86 31 21.8
Road forks to south and southeast	33 38 47.2	86 30 41.5
Road forks to northeast and north	33 39 32.2	86 30 27.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road forks (second class) east and southeast, at southwest corner of cornfield.....	33 40 12.4	86 30 26.8
Road forks to south and southeast, 15 feet east to pine tree with signboard "Leeds 10 miles," 40 feet west to old forked snag	33 40 48.5	86 30 39.0
Church, road forks to southeast, 40 feet south to pine stump, 25 feet north to hickory tree	33 41 30.9	86 30 30.4
Milepost C 120, at road crossing 2,020 feet south of, bronze tablet No. 10 cemented in concrete 18 inches below surface of rail in center of track of Alabama Great Southern Railroad, signboard bears S. 76° ½ W. distant 15.5 feet.....	33 42 25.2	86 30 57.2
Birmingham and Springville road junction, road northwest, 25 feet north to bridge, 10 feet southeast to oak tree	33 44 09.4	86 30 08.9
Cahaba, triangulation station U. S. Coast Survey	33 44 47.09	86 31 32.91
Crossroad.....	33 45 10.6	86 31 59.6
Crossroad.....	33 44 48.3	86 32 48.8
Ayres, forks of road at	33 44 02.7	86 33 42.5
Forks of road	33 44 02.6	86 34 14.1
Forks of road	33 45 01.2	86 35 33.9
Creek crossing	33 44 37.1	86 36 31.1

Geographic positions along the Birmingham Mineral Railway between Palmer and Chepultepec.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Palmer station, 0.5 mile north of; crossing of road and Birmingham Mineral Railway	33 44 18.4	86 38 52.5
Village Springs station, center of track opposite signal post.....	33 45 58.3	86 37 57.3
Remlap station, center of	33 48 55.2	86 35 59.8
Watseka flag station, road crossing at.....	33 49 46.8	86 34 57.6
Road crossing.....	33 50 28.4	86 34 17.4
Road crossing.....	33 51 02.0	86 33 44.8
Road crossing.....	33 51 36.0	86 33 09.3
Road crossing.....	33 52 56.0	86 31 21.8
Road crossing.....	33 53 30.6	86 30 47.6
Chepultepec station, in masonry culvert 3,590 feet south of, 1,420 feet south of milepost L 419, in top of course of stone and on west side of track, bronze tablet No. 11.	33 53 58.6	86 30 18.6
Chepultepec station, road crossing 110 feet south of	33 54 17.5	86 29 43.0

Geographic positions along highways between Chepultepec and Warnock Knob.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Chepultepec, crossroad crossing	33 54 42.9	86 30 33.6
Forks of road, Morris Mill 1 mile (signboard)	33 55 10.1	86 31 34.8
Top of Sand Mountain, forks of road in gap	33 55 34.7	86 32 22.2
Forks of road	33 56 10.1	86 32 37.1
Crossroad	33 56 44.2	86 33 00.6
Forks of road, Blountville and Bangor	33 57 27.9	86 33 41.2
Forks of road	33 57 18.4	86 34 37.6
Tidewell, 0.5 mile north of; junction Blountville and Bangor roads	33 57 14.6	86 35 13.3
Forks of road	33 57 04.7	86 36 45.0
Forks of road	33 57 13.4	86 37 31.9
Locust Fork of Black Warrior River, center of wooden bridge over	33 57 22.8	86 37 34.4
Crossroads	33 57 36.0	86 38 21.8
Forks of road at church	33 57 37.8	86 38 59.8
Forks of road	33 57 31.9	86 39 38.0
Forks of road	33 57 35.9	86 41 26.1
Forks of road	33 57 57.8	86 41 58.7

Geographic positions along the Louisville and Nashville Railroad between Bangor and Birmingham.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossing of Bremen road and Louisville and Nashville Railroad, iron post No. 2; 62 feet west of right of way, S. 65° W. from crossing	33 58 06.2	86 45 34.6
Road crossing	33 57 19.0	86 46 11.6
Blount Springs station	33 55 56.8	86 47 45.2
Pumphouse, road crossing at	33 55 29.0	86 48 22.0
Creek crossing	33 54 36.5	86 49 35.8
Reeds station, road crossing at	33 52 45.9	86 50 39.7
Road crossing	33 51 59.9	86 49 57.8
Road crossing	33 50 58.2	86 49 37.9
Linton box station, branch road to Coaldale	33 50 11.7	86 48 52.5
Road crossing	33 49 49.7	86 48 59.4
Warrior station, center of signal	33 48 52.5	86 48 31.1
Seloca, road crossing at	33 47 30.4	86 49 05.7
Locust Fork of Black Warrior River, bronze tablet No. 3, cemented in north abutment of bridge over	33 47 05.5	86 49 10.2
Kimberly, road crossing at	33 46 23.3	86 48 44.6
Morris station	33 44 51.1	86 48 32.0
Brickyard, road crossing at	33 43 53.4	86 47 52.1

Geographic positions along the Louisville and Nashville Railroad between Bangor and Birmingham—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Haygood crossing, signboard	33 42 20.1	86 47 26.1
Road crossing	33 41 48.8	86 47 23.8
Cunningham station, signal board of telegraph station ...	33 40 30.0	86 46 18.5
Newcastle, signal	33 38 49.6	86 46 12.6
Lehman flag station, signboard	33 37 48.4	86 47 03.6
Black Creek, telegraph station at	33 37 01.3	86 47 07.2
Hughes siding, flag station	33 36 10.3	86 47 13.4
Gardners Mills, flag station	33 35 17.8	86 47 31.0
Road crossing	33 34 28.4	86 47 19.4
Boyles station, signal	33 33 00.0	86 47 24.2
Crossing of Louisville and Nashville and Central of Georgia railroads	33 31 57.0	86 47 27.6
Birmingham, Eighth avenue and Twenty-sixth street....	33 31 30.8	86 48 08.7

GEORGIA.

PRIMARY TRAVERSE.

Elbert, Lincoln, McDuffie, Oglethorpe, Taliaferro, and Wilkes counties; Wilkes quadrangle.

During April and May, 1903, a line of primary traverse was run by Mr. E. L. McNair, topographer, for the control of the Wilkes quadrangle. The line starts at the United States Coast and Geodetic Survey triangulation station, Rose Hill, about 1 mile south of Middleton, on the Seaboard Air Line Railway, and follows highways southeasterly to about latitude 34° ; thence westerly to Vesta and Salmon post-office, in Oglethorpe County; thence southerly near meridian 83° to Philomath, and thence southeasterly to Crawfordville. From Crawfordville the line follows the Georgia Railroad to Barnett and Washington, and then via highways northerly to Tignall triangulation station. Another line begins at Sharon on the Georgia Railroad and runs easterly along highways to Wrightsboro; thence northerly near meridian $82^{\circ} 30'$ via Amity, Loco, and Lincolnton to Lisbon, at the junction of the Broad and Savannah rivers; thence westerly near parallel 34° to a point near the beginning of the first line.

A spur line about 4 miles long was run westward from Loco to Lincolnton triangulation station of the United States Coast and Geodetic Survey. Positions are given on the United States standard datum.

Geographic positions along highways from Rose Hill triangulation station, United States Coast and Geodetic Survey, to Crawfordville.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Rose Hill, U. S. Coast and Geodetic Survey triangulation station	34	05	01.42	82	45	33.33
Forks of road	34	04	06.80	82	44	37.7
Crossroads	34	03	10.2	82	44	36.5
Flatwoods Academy, 650 feet south of road east of	34	01	22.6	82	43	48.1
Crossroads	33	59	24.6	82	43	54.0
Bell's ferry bridge, crossroads 1 mile north of	33	59	17.5	82	46	26.7
Forks of road	33	58	18.2	82	49	00.6
Forks of road	33	57	48.9	82	51	30.4
Crossroads	33	57	09.0	82	53	52.6
Crossroads	33	56	27.4	82	55	11.8
Vesta post-office, forks of road at	33	57	23.6	82	56	22.7
Vesta post-office, southwest corner of porch of store	33	57	23.6	82	56	23.7
Forks of road	33	57	00.4	82	57	52.8
Salmon post-office, forks of road 75 feet west of Tiller's store	33	56	40.5	82	59	39.6
Forks of road	33	55	24.7	82	57	49.0
Crossroads, near sawmill	33	54	04.6	82	57	25.6
Forks of road	33	53	17.7	82	57	38.8
Forks of road	33	50	51.3	82	58	15.6
Forks of road opposite white church	33	50	13.2	82	58	40.8
Forks of road	33	49	15.4	83	00	27.7
Forks of road, junction with Nashville and Lexington road	33	48	24.7	83	00	41.6
Crossroads, 1,900 feet south of Tuggle schoolhouse	33	46	03.1	83	02	10.2
Forks of road	33	45	07.7	83	01	58.4
Philomath post-office	33	43	32.2	82	59	13.6
Forks of road	33	42	54.3	82	58	02.3
Opposite church on right	33	41	09.2	82	56	07.1
Forks of road, to Washington	33	39	46.5	82	54	56.8
Lyneville, three corners at	33	38	09.3	82	55	51.1
Creek crossing	33	37	15.6	82	55	08.5
Forks of road	33	35	47.8	82	55	24.6
Crawfordville, tower of court-house	33	33	20.7	82	53	55.4

Geographic positions along the Georgia Railroad from Crawfordville to Barnett.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crawfordville, street crossing.....	33 33 25.2	82 54 01.5
Crawfordville station, semaphore post.....	33 33 15.2	82 53 35.0
Road crossing.....	33 32 59.5	82 52 34.3
Opposite milepost 61.....	33 31 30.9	82 50 58.7
Road crossing.....	33 31 05.5	82 49 46.1
Barnett station, center of track opposite west end of	33 30 33.2	82 48 39.4

Geographic positions along a branch of the Georgia Railroad from Barnett to Washington.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 2.....	33 32 01.2	82 48 04.8
Sharon station, opposite semaphore post.....	33 33 33.1	82 47 46.3
Hillman station, road crossing at.....	33 36 03.3	82 47 53.8
Road crossing.....	33 37 14.5	82 47 10.9
Road crossing.....	33 38 56.0	82 46 22.1
Road crossing.....	33 39 46.5	82 46 02.3
Road crossing at water tank.....	33 41 44.7	82 45 23.6
Road crossing.....	33 43 11.2	82 45 31.5

Geographic positions along highways from Washington to Tignall.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Washington, southwest corner of public square.....	33 44 12.8	82 44 22.9
Creek crossing.....	33 46 18.2	82 44 48.1
Forks of road at church.....	33 47 34.2	82 45 29.6
Armstrong post-office and store.....	33 48 36.0	82 45 46.2
Forks of road.....	33 51 15.8	82 44 33.4
Tignall Baptist Church, U. S. Coast and Geodetic Survey station	33 52 01.5	82 44 19.0

Geographic positions along highways from Sharon to Wrightsboro.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Nye post-office, crossroads	33 34 09.4	82 45 10.2
Opposite signpost at forks of road	33 34 30.8	82 42 17.4
Crossroads	33 34 00.0	82 40 30.4
Forks of road	33 33 40.5	82 38 57.3
Crossroads	33 34 10.7	82 37 01.7
Wrightsboro, monument of Dr. E. C. Hawes in church-yard	33 33 01.6	82 34 21.3

Geographic positions along highways from Wrightsboro to Lincolnton.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wrightsboro, three corners	33 33 01.3	82 34 08.2
Wrightsboro, southwest corner of wall under Oscar Williams's store	33 33 01.1	82 34 06.7
Anthony post-office, crossroads	33 35 15.3	82 32 33.4
Creek crossing	33 36 49.3	82 31 29.8
Tatham post-office, $\frac{3}{4}$ mile north of, forks of road	33 38 24.2	82 31 44.8
Creek crossing	33 37 27.6	82 29 49.8
Three corners	33 36 58.9	82 29 19.3
Raysville, south end of approach to iron bridge over Little River	33 38 36.4	82 28 36.8
Amity post-office, four corners at	33 40 32.7	82 29 24.1
Crossroads	33 42 59.9	82 28 49.0
Forks of road	33 46 02.3	82 28 05.9
Lincolnton, crossroads	33 47 20.1	82 28 34.9
Lincolnton, southeast corner of court-house	33 47 33.4	82 28 45.6

Geographic positions along highways from Lincolnton to Lisbon.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hollinshead store, forks of road at	33 48 11.5	82 28 20.8
Forks of road	33 50 06.4	82 28 33.9
Crossroads	33 50 41.7	82 29 10.9
Goshen post-office crossroads, 500 feet north of	33 51 49.0	82 30 28.7
Forks of roads	33 53 11.8	82 31 26.9
Crossroads, 75 feet north of Fishing Creek	33 54 54.9	82 33 13.9
Forks of road	33 55 45.7	82 33 54.2
Lisbon, northwest corner of Dr. B. J. Dubose's store	33 57 23.3	82 34 22.70
Lisbon, southwest corner of R. L. Cade's brick store	33 57 24.3	82 34 22.3

Geographic positions along highways from Lisbon westward via Huguenot to point on line near Rose Hill triangulation station.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads, road right to Elberton.....	33 59 15.2	82 36 02.5
Huguenot, opposite post-office and store	33 59 21.8	82 37 13.9
Forks of road	33 59 52.9	82 38 53.8
Creek crossing	33 59 49.5	82 41 22.6

ILLINOIS-INDIANA.

PRIMARY TRAVERSE.

Gallatin and White counties (Ill.), Posey County (Ind.); Newhaven quadrangle.

The following geographic positions were located by primary traverse in 1903 by Mr. J. R. Ellis. The line starts from an adjusted traverse position at Mannie and follows highways, south to border of quadrangle; thence west to northwest corner of quadrangle; thence south along west border of quadrangle to Ridgeway; thence east to Uniontown, Ky., connecting at the latter place with spur line from Henderson, Ky.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mannie, road crossing at.....	38 02 10.5	88 02 45.9
T. 6 S., Rs. 10 and 11 E., corner secs. 1, 6, 7, and 12.....	38 01 29.2	88 02 29.8
T. 6 S., Rs. 10 and 11 E., quarter corner between secs. 13 and 18	38 00 02.6	88 02 30.3
T. 6 S., R. 10 E., quarter corner between secs. 23 and 26.....	37 58 52.3	88 04 10.3
T. 6 S., R. 10 E., corner secs. 22, 23, 26, and 27	37 58 52.9	88 04 42.7
T. 6 S., R. 10 E., corner secs. 21, 22, 27, and 23	37 58 53.4	88 05 49.7
Emma, crossroads at church in north part of.....	37 58 53.7	88 07 11.7
Emma, T road south at	37 58 40.7	88 07 08.5
Emma, crossroads 0.75 mile south of	37 58 01.4	88 07 13.3
T. 6 S., R. 10 E., corner secs. 29, 30, 31, and 32.....	37 58 02.0	88 08 03.0
T. 6 S., Rs. 9 and 10 E., corner secs. 25, 30, 31, and 36....	37 58 02.7	88 09 08.6
T. 6 S., R. 9 E., corner secs. 25, 26, 35, and 36	37 58 02.8	88 10 14.8
T. 6 S., R. 9 E., corner secs. 26, 27, 34, and 35	37 58 03.2	88 11 21.5
T. road north	37 58 03.8	88 14 08.2
Range line road at T road east	37 57 51.0	88 15 09.8
Road at T road east	37 57 51.0	88 15 48.3
Tps. 6 and 7 S., Rs. 8 and 9 E., corner secs. 31, 36, 1, and 6.....	37 57 11.2	88 15 48.2
T. 7 S., Rs. 8 and 9 E., corner secs. 7, 12, 13, and 18.....	37 55 27.1	88 15 43.9
T. 7 S., Rs. 8 and 9 E., corner secs. 13, 18, 19, and 24.....	37 54 36.0	88 15 43.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 7 S., Rs. 8 and 9 E., corner secs. 19, 24, 25, and 30.....	37 53 43.6	88 15 43.1
T. 7 S., Rs. 8 and 9 E., corner secs. 25, 30, 31, and 36....	37 52 50.1	88 15 44.3
T road west.....	37 52 23.6	88 15 53.2
T road west.....	37 51 30.0	88 15 02.5
T road east.....	37 50 38.4	88 14 45.7
T road east.....	37 49 47.8	88 14 48.0
T road east.....	37 48 54.8	88 14 46.6
Ridgeway, crossroads 0.5 mile east of.....	37 48 02.2	88 14 46.9
T. 8 S., R. 9 E., corner secs. 29, 30, 31, and 32.....	37 47 35.8	88 14 47.1
T. 8 S., R. 9 E., corner secs. 28, 29, 32, and 33.....	37 47 34.5	88 13 40.5
T. 8 S., R. 9 E., corner secs. 27, 28, 33, and 34.....	37 47 32.9	88 12 33.5
T. 8 S., R. 9 E., corner secs. 26, 27, 34, and 35.....	37 47 33.4	88 11 29.9
T. 8 S., R. 9 E., corner secs. 25, 26, 35, and 36.....	37 47 33.7	88 10 24.2
T road south.....	37 47 33.6	88 09 16.4
T. 8 S., R. 10 E., quarter corner between secs. 30 and 31..	37 47 33.0	88 08 45.3
Intersection of northwest and southeast road and road east to Sandy Ford.....	37 47 24.1	88 08 07.7
Intersection of roads at mouth of lane just east of sawmill..	37 47 03.2	88 06 14.8
Schoolhouse, T road east about 2,000 feet south of.....	37 48 07.5	88 05 49.4
Schoolhouse, T road south at house about 3,000 feet north of.....	37 48 47.4	88 05 19.2
POSEY COUNTY, IND.		
Old ferry landing, top of left bank of Wabash River, about 0.33 mile above junction with Ohio River.....	37 48 25.6	88 01 45.2
Neiderst post-office, T road east about 0.75 mile west of..	37 48 19.3	88 01 13.7
T. 8 S., R. 14 W., corner secs. 20, 21, 28, and 29.....	37 48 18.9	88 00 05.9
T road north, just west of Murphy's farm.....	37 47 40.3	87 59 00.6

ILLINOIS.

PRIMARY TRAVERSE.

Gallatin, Hamilton, Saline, and White counties; Eldorado quadrangle.

The line starts from adjusted traverse position at Ridgeway and follows Baltimore and Ohio Southwestern Railroad south to point about 1 mile northwest of Cypress Junction, thence along Louisville and Nashville Railroad through Equality, Eldorado, and Broughton to point 0.5 mile south of Dale, thence along north border of quadrangle by public highways, connecting with adjusted traverse position about 5 miles east of Norris City.

Geographic positions along the Baltimore and Ohio Southwestern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ridgeway, street crossing Baltimore and Ohio Southwestern Railroad at station.....	37 47 59.0	88 15 36.9
Road crossing east and west.....	37 46 19.5	88 15 17.7
Bartley, east and west road crossing.....	37 45 17.3	88 15 09.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north.....	37 43 58.8	88 14 59.0
T. 9 S., R. 9 E., corner secs. 17, 18, 19, and 20.....	37 43 58.9	88 14 48.2

Geographic positions along the Louisville and Nashville Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south.....	37 43 46.1	88 17 03.8
Road crossing north and south.....	37 43 49.9	88 18 10.5
Equality, road crossing north and south just west of water tank.....	37 44 00.6	88 20 23.2
Equality, road crossing north and south 180 feet west of station.....	37 43 58.4	88 20 57.8
T. 9 S., R. 7 E., quarter corner between secs. 12 and 13..	37 44 53.3	88 22 53.8
Road crossing east and west.....	37 46 11.6	88 24 04.4
Road crossing north and south.....	37 47 25.5	88 25 06.2
Road crossing north and south.....	37 47 59.0	88 25 42.5
Eldorado, crossing Louisville and Nashville and Big Four railroads.....	37 48 53.8	88 26 04.1
Road crossing east and west.....	37 50 09.3	88 26 24.3
T. 8 S., R. 7 E., quarter corner between secs. 9 and 16...	37 50 09.2	88 26 14.3
Road crossing east and west.....	37 51 14.9	88 26 33.1
Road crossing east and west.....	37 52 19.7	88 26 41.8
Francis Mills, road crossing.....	37 53 38.5	88 26 52.2
Road crossing east and west.....	37 54 30.9	88 26 59.2
T. 8 S., R. 7 E., corner secs. 16, 17, 20, and 21.....	37 54 30.9	88 27 06.5
Road crossing east and west.....	37 55 12.0	88 27 06.4
Broughton, road crossing 500 feet north of station.....	37 56 15.9	88 27 35.5
Road crossing east and west near spur head block.....	37 57 41.9	88 28 23.3
Road crossing east and west.....	37 58 27.4	88 28 48.6
Dale, road crossing 0.5 mile south of.....	37 59 06.7	88 29 10.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north.....	37 59 06.4	88 28 03.7
T road south at quarter corner.....	37 58 53.7	88 27 21.7
Road south.....	37 58 54.0	88 25 30.6
T. 6 S., R. 7 E., corner secs. 22, 23, 26, and 27.....	37 58 54.4	88 24 36.1
T. 6 S., R. 7 E., corner secs. 23, 24, 25, and 26.....	37 58 54.7	88 23 30.0
T. 6 S., Rs. 7 and 8 E., corner secs. 19, 24, 25, and 30.....	37 58 56.5	88 22 24.2
T. 6 S., R. 8 E., corner secs. 19, 20, 29, and 30.....	37 58 56.2	88 21 18.1
T. 6 S., R. 8 E., corner secs. 20, 21, 28, and 29.....	37 58 56.1	88 20 12.3
T. 6 S., R. 8 E., corner secs. 21, 22, 27, and 28.....	37 58 56.0	88 19 06.1
T. 6 S., R. 8 E., corner secs. 22, 23, 26, and 27.....	37 58 56.2	88 18 00.0
T. 6 S., R. 8 E., corner secs. 23, 24, 25, and 26.....	37 58 56.5	88 16 54.2
T. 6 S., Rs. 8 and 9 E., corner secs. 19, 24, 25, and 30.....	37 58 56.3	88 15 48.5

KANSAS.

PRIMARY TRAVERSE.

Montgomery, Neosho, and Wilson Counties; Independence quadrangle.

The following geographic positions were determined from primary traverse in 1903 by Mr. George T. Hawkins. The line starts from the United States Geological Survey triangulation station Caney, in Indian Territory, and follows highways to Caney, Kans.; thence east along Missouri Pacific Railway to Coffeyville; thence north along Atchison, Topeka and Santa Fe Railway to Thayer, where connection was made with traverse position established in 1902; thence along highways to Neodesha, thence along St. Louis and San Francisco Railway to Fredonia; thence along Missouri Pacific Railway to Elk City; thence along Atchison, Topeka and Santa Fe Railway to Havana via Independence; thence along highways to Caney triangulation station.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Caney, triangulation station.....	36 58 43.64	95 59 29.83
Caney, Caney bridge, west of.....	37 00 33.5	95 57 27.7
Caney, "Santa Fe" station, road crossing at.....	37 00 35.7	95 56 29.0

Geographic positions along the Missouri Pacific Railway between Caney and Coffeyville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Caney, Missouri Pacific and Atchison, Topeka and Santa Fe railways, crossing of.....	37 01 15.6	95 56 28.6
Caney, Missouri Pacific station, road crossing east of	37 01 14.4	95 56 12.0
Caney, 0.5 mile east of road crossing north and south.....	37 01 16.3	95 55 39.9
Road crossing north and south.....	37 01 22.5	95 54 34.6
Road crossing east and west.....	37 01 26.7	95 54 18.7
Creek, north and south road crossing west of.....	37 01 36.6	95 53 29.4
Oil well, 100 yards west of, road crossing.....	37 02 14.3	95 52 24.6
Milepost 44, north and south road crossing 50 feet west of.	37 02 20.1	95 51 19.1
Milepost 43, north and south road crossing 200 feet west of.....	37 02 25.1	95 50 14.4
Tps. 34, 35, S., Rs. 14, 15 E., corner of.....	37 02 15.7	95 49 09.1
Tps. 34, 35, S., R. 15 E., corner secs. 31, 32, 5 and 6.....	37 02 14.9	95 48 01.7
Tps. 34, 35, S., R. 15 E., corner secs. 4, 5, 32, 33.....	37 02 14.7	95 46 56.3
Milepost 39, north and south road crossing 50 feet east of.	37 02 16.9	95 45 51.6
Milepost 38, north and south road crossing 350 feet east of.	37 02 39.1	95 44 46.5
Road crossing.....	37 03 06.9	95 43 29.9
Deering, road crossing 100 feet east of.....	37 03 17.1	95 42 35.1
Deering, road crossing 0.5 mile southeast of.....	37 03 06.2	95 42 13.4
T road north.....	37 02 13.1	95 40 25.4
T road south.....	37 02 12.1	95 40 12.3
Milepost 32, north and south road crossing 800 feet west of.....	37 02 01.8	95 39 20.6
Milepost 31, north and south road crossing 800 feet west of.....	37 01 52.1	95 38 15.3
Coffeyville, Missouri Pacific Railway station, road crossing 400 feet west of.....	37 01 50.9	95 37 18.0
Coffeyville, Missouri Pacific and "Santa Fe" railways, crossing of.....	37 01 50.8	95 36 53.4

Geographic positions along the Atchison, Topeka and Santa Fe Railway between Coffeyville and Thayer.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Coffeyville; Atchison, Topeka and Santa Fe Railway station, road crossing south of	37 02 11.6	95 36 47.3
Road crossing east and west and telephone line.....	37 02 36.6	95 36 40.0
Coffeyville; Atchison, Topeka and Santa Fe and Missouri, Kansas and Texas railways, crossing of.....	37 02 43.3	95 37 38.0
Mileposts 170 and 171, east and west road crossing between	37 03 56.0	95 36 16.7
T. 34 S., Rs. 16, 17 E., corner secs. 18, 19, 24, 13.....	37 04 48.2	95 36 06.2

Geographic positions along the Atchison, Topeka and Santa Fe Railway between Coffeyville and Thayer—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 34 S., Rs. 16, 17 E., corner secs. 7, 18, 13, 12	37 05 40.7	95 36 05.4
Mileposts 167 and 168, east and west road crossing between	37 06 32.5	95 35 57.8
Mileposts 166 and 167, east and west road crossing between	37 07 24.4	95 35 53.9
Mileposts 165 and 166, east and west road crossing between	37 08 16.2	95 35 50.0
Liberty, road crossing at	37 09 20.6	95 35 37.8
Mileposts 163 and 164, east and west road crossing between	37 09 59.5	95 35 16.8
Mileposts 162 and 163, east and west road crossing between	37 10 50.4	95 34 49.2
T. 33 S., R. 17 E., corner secs. 5, 6, 7, and 8	37 11 40.6	95 34 33.1
Tp. line, east and west road crossing on	37 12 31.7	95 33 54.1
Road crossing east and west and telegraph line	37 13 25.1	95 33 32.7
Mileposts 158 and 159, east and west road crossing between	37 14 19.1	95 33 26.9
Mileposts 157 and 158, east and west road crossing between	37 14 45.4	95 33 24.1
T. 32 S., R. 17 E., corner secs. 16, 17, 20, 21	37 15 11.6	95 33 18.5
Cherryvale station, road crossing north of	37 16 09.3	95 33 03.5
Cherryvale, Atchison, Topeka, and Santa Fe and St. Louis and San Francisco railways, crossing of	37 16 25.1	95 32 59.4
Cherryvale; 0.5 mile north of, east and west road crossing ..	37 16 55.3	95 32 51.4
Creek, east and west road crossing north of	37 18 38.7	95 32 19.6
T. 31 S., R. 17 E., quarter corner between secs. 15 and 22 ..	37 20 25.2	95 31 43.5
T. 31 S., R. 17 E., corner secs. 15, 16, 21, 22	37 21 18.4	95 31 10.9
Milepost 150, north and south road crossing 0.25 mile north of	37 21 27.5	95 31 11.7
Milepost 149, east and west road crossing, 600 feet north of	37 22 11.8	95 30 53.8
Morehead station, road crossing 100 feet south of	37 23 05.2	95 30 32.3
Milepost 147, east and west road crossing 0.25 mile north of	37 23 56.6	95 30 11.6
Red mail box, east and west road crossing at	37 24 48.6	95 29 49.6
Mileposts 144 and 145, north and south road crossing between	37 25 51.7	95 29 21.3
Mileposts 142 and 143, east and west road crossing between	37 27 26.7	95 28 51.3
Tp. line, road crossing on	37 28 19.1	95 28 28.1
Thayer station, road crossing 200 feet south of	37 29 19.2	95 28 12.0
Thayer station	37 29 21.3	95 28 12.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 29 and 30 S., Rs. 17 and 18 E., corner of	37 28 19.0	95 29 19.5
T. 30 S., R. 17 E., corner secs. 2, 3, 10, 11.....	37 27 27.4	95 31 31.2
T. 30 S., R. 17 E., corner secs. 3, 4, 9, 10.....	37 27 26.8	95 32 36.6
T. 30 S., R. 17 E., corner secs. 4, 5, 8, 9.....	37 27 26.8	95 33 42.1
Reserve stone.....	37 27 27.0	95 34 13.1
T. 30 S., R. 17 E., corner secs. 5, 6, 7, 8.....	37 27 26.2	95 34 46.3
Schoolhouse, north and south road crossing at.....	37 27 26.2	95 35 19.3
T. 30 S., Rs. 16, 17 E., corner secs. 1, 6, 7, 12	37 27 26.4	95 35 49.5
T road north.....	37 27 26.7	95 36 22.3
T. 30 S., R. 16 E., corner secs. 1, 2, 11, 12.....	37 27 27.0	95 36 55.1
T. 30 S., R. 16 E., corner secs. 2, 3, 10, 11.....	37 27 27.6	95 38 00.6
T. 30 S., R. 16 E., corner secs. 10, 11, 14, 15.....	37 26 35.3	95 38 00.5
T. 30 S., R. 16 E., corner secs. 9, 10, 15, 16.....	37 26 35.9	95 39 06.0
T. 30 S., R. 16 E., corner secs. 15, 16, 21, 22.....	37 25 43.4	95 39 05.8
T road east.....	37 25 04.4	95 39 14.7
T road north.....	37 24 43.6	95 39 15.0

Geographic positions along the St. Louis and San Francisco Railroad between Neodesha and Fredonia.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Neodesha, Main street crossing.....	37 25 05.4	95 41 15.2
Neodosha, Missouri Pacific Railway crossing	37 25 07.2	95 41 16.9
Milepost 403, east and west road crossing 700 feet south-east of.....	37 25 57.1	95 42 03.5
Junction of roads, north and south road crossing 150 feet south of	37 26 19.8	95 42 24.6
Milepost 404, east and west road crossing 1,000 feet south-east of.....	37 26 37.1	95 42 40.7
Milepost 405, east and west road crossing 250 feet north of.	37 27 29.7	95 43 29.7
Dunn's store, road crossing at.....	37 28 00.4	95 44 01.0
Mileposts 408 and 409, road crossing halfway between ...	37 28 23.6	95 46 43.9
Milepost 409, road crossing 0.25 mile north west of.....	37 28 44.8	95 47 29.8
Road crossing.....	37 29 05.2	95 48 34.7
Road crossing east and west (stone wall on west).....	37 30 17.1	95 49 15.1
Road crossing north and south.....	37 30 39.5	95 49 27.2
Road crossing east and west.....	37 30 56.8	95 49 36.5

Geographic positions along the Missouri Pacific Railway between Fredonia and Elk City.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 13, east and west road crossing	37 30 57.9	95 50 39.3
Milepost 14, east and west road crossing	37 30 05.4	95 50 48.7
Milepost 15, east and west road crossing 200 feet south of.	37 29 12.6	95 50 47.9
Tps. 29 and 30 S., R. 14 E., quarter corner between secs. 2 and 35, east and west road crossing	37 28 19.5	95 50 34.6
Tps. 29 and 30 S., R. 14 E., quarter corner between secs. 2 and 11, east and west road crossing	37 26 34.6	95 50 34.5
Tps. 29 and 30 S., R. 14 E., quarter corner between secs. 11 and 14, east and west road crossing at.....	37 25 47.3	95 50 35.1
Milepost 21, east and west road crossing 600 feet south of.	37 24 02.9	95 50 46.9
Lafontaine, 100 feet north of road crossing	37 23 54.9	95 50 50.9
Lafontaine, station, road crossing south of	37 23 49.6	95 50 53.5
T. 30 S., R. 14 E., corner between secs. 34 and 35	37 23 10.5	95 51 07.4
Mileposts 22 and 23, north and south road crossing be- tween	37 22 56.2	95 51 20.2
Milepost 23, east and west road crossing one-third mile south of	37 22 17.8	95 51 39.4
T. 31 S., R. 14 E., quarter corner between secs. 10 and 15.	37 21 25.7	95 51 52.8
T. 31 S., R. 14 E., quarter corner between secs. 15 and 22.	37 20 33.6	95 51 52.8
Costello, 2 miles southwest of, corner of road.....	37 19 41.1	95 52 04.8
House, north and south road crossing at	37 18 55.6	95 52 25.4
T. 31 S., R. 14 E., corner secs. 27, 28, 33, 34	37 18 48.8	95 52 25.9
T. 31 S., R. 14 E., center of sec. 33	37 18 23.1	95 52 57.9
Road crossing east and west.....	37 17 56.7	95 53 22.4
Road crossing north and south.....	37 17 48.1	95 53 30.4
Atchison, Topeka and Santa Fe Railway, crossing of	37 17 44.7	95 53 33.6

Geographic positions along the Atchison, Topeka and Santa Fe Railway between Elk City and Havana.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south and telephone line.....	37 17 52.8	95 52 25.9
Tps. 31 and 32 S., R. 14 E., corner secs. 2, 3, 34, 35.....	37 17 56.1	95 51 19.7
Mileposts 175 and 174, north and south road crossing be- tween	37 17 42.4	95 50 14.3
Milepost 172, north and south road crossing 0.25 mile west of	37 16 55.9	95 48 09.2
Crane, road crossing at.....	37 16 46.8	95 47 48.4
Schoolhouse, east and west road crossing 600 feet west of.	37 16 10.3	95 47 23.0
Road crossing east and west.....	37 15 04.6	95 46 31.1
Road crossing north and south (U. S. 889 feet)	37 14 47.3	95 45 54.2

Geographic positions along the Atchison, Topeka and Santa Fe Railway between Elk City and Havana—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west.....	37 14 24.7	95 44 36.5
T. 32 S., R. 15 E., quarter corner between secs. 23 and 26..	37 14 24.8	95 44 32.3
Milepost 167, north and south road crossing 200 feet west of.....	37 14 13.4	95 43 59.9
Milepost 167, east and west road crossing 600 feet east of..	37 14 11.2	95 43 53.1
Independence, Missouri Pacific and Atchison, Topeka and Santa Fe railways, crossing of	37 14 03.8	95 43 30.4
Road crossing east and west.....	37 13 32.3	95 43 59.7
Tps. 32 and 33 S., R. 15 E., corner secs. 2, 3, 34, 35.....	37 13 19.1	95 44 12.0
Road crossing east, west, and south.....	37 12 40.7	95 44 48.2
T. 33 S., R. 15 E., quarter corner between secs. 3 and 10..	37 12 01.5	95 45 26.6
Milepost 170, east and west road crossing 400 feet north of..	37 11 35.1	95 45 50.0
Road crossing east and west.....	37 11 22.0	95 46 02.3
T. 33 S., R. 15 E., corner secs. 9, 10, 15, 16.....	37 10 56.2	95 46 26.6
Cluster of oil wells, north and south road crossing near..	37 10 21.9	95 46 59.7
Road crossing east and west.....	37 09 50.7	95 47 42.1
Road crossing north and south	37 09 34.9	95 48 04.6
Bolton, road crossing at.....	37 09 23.9	95 48 20.7
Bolton, east and west road crossing one-third mile south of..	37 09 11.6	95 48 37.6
Road crossing north and south.....	37 08 49.8	95 49 08.8
Milepost 176, east and west road crossing 1,000 feet south of.....	37 08 19.8	95 49 51.5
Road crossing north and south (U. S. 874 feet)	37 07 38.8	95 51 19.3
Road crossing east and west.....	37 07 28.6	95 51 52.8
Wayside, crossing at.....	37 07 18.9	95 52 24.8
Road crossing north and south (U. S. 849 feet)	37 06 59.3	95 53 30.2
Milepost 180, east and west road crossing 0.25 mile north-east of.....	37 06 40.1	95 54 14.2
Milepost 180, north and south road crossing 600 feet south-west of	37 06 32.9	95 54 33.6
Road Crossing north and south	37 05 57.7	95 55 47.3
Road crossing east and west.....	37 05 48.4	95 55 58.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Havana, Vulcan Hotel, at street corner	37 05 27.9	95 56 44.1
T. 34 S., R. 13 E., corner secs. 13, 14, 23, 24.....	37 04 56.1	95 56 44.1
T. 34 S., R. 13 E., corner secs. 24, 25, 26, 23.....	37 04 03.8	95 56 44.4
T. 34 S., R. 13 E., corner secs. 25, 26, 35, 36.....	37 03 11.7	95 56 44.7
Tps. 34 and 35 S., R. 13 E., corner secs. 1, 2, 35, 36.....	37 02 19.4	95 56 44.4
Cherokee Strip, east and west line of, stone on	37 02 03.1	95 56 44.4
Caney, road crossing northwest of	37 01 17.3	95 56 44.5
Elk City, road crossing at.....	37 17 47.5	95 54 39.1
T. 31 S., Rs. 13 and 14 E., quarter corner west side sec. 31..	37 18 24.0	95 55 40.3

KENTUCKY.

PRIMARY TRAVERSE.

Anderson, Fayette, Franklin, Grant, Henry, Owen, Scott, and Woodford counties;
Frankfort quadrangle.

The following geographic positions were determined from primary traverse by Mr. J. R. Ellis, topographic aid, in 1904. The line starts from United States Coast and Geodetic Survey triangulation station, court-house dome, at Williamstown and follows the Cincinnati, New Orleans and Texas Pacific Railway to Lexington; thence west along Southern Railway to Lawrenceburg; thence north and east along highways near borders of quadrangle, and is tied to starting point at Williamstown. A line was also run over the Frankfort and Cincinnati Railway from Hatton via Frankfort to Georgetown.

Geographic positions along the Cincinnati, New Orleans and Texas Pacific Railway between Williamstown and Lexington.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Williamstown, court-house dome, U. S. Coast and Geodetic Survey triangulation station	38 38 12.5	84 33 39.4
Williamstown, road crossing just south of	38 37 52.7	84 34 02.5
Williamston, east and west overhead road crossing at south end long siding.....	38 37 04.2	84 34 15.0
Steel bridge, overhead east and west road crossing.....	38 36 14.7	84 34 25.7
Steel bridge No. 10, overhead east and west road crossing.....	38 35 53.1	84 34 28.4
Road crossing east and west just east of T road east.....	38 34 48.6	84 34 50.6
Mason station.....	38 34 24.4	84 35 09.3
Mason, east and west road crossing at south end siding ..	38 33 54.9	84 35 17.3
Pike crossing north and south.....	38 32 56.9	84 35 25.4

Geographic positions along the Cincinnati, New Orleans and Texas Pacific Railway between Williamstown and Lexington—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Overhead crossing northeast and southwest	38	32	20.2	84	34	47.1
Blanchet, overhead crossing near north end of siding	38	31	27.0	84	34	30.2
Blanchet station	38	31	10.3	84	34	18.4
Corinth, overhead road crossing 1 mile north of	38	30	20.2	84	33	46.7
Corinth, bench-mark post stamped "Prim. Trav. Sta. No. 14" in south corner of R. T. Shaw's front yard; southeast corner Shaw's house bears S. 19° 45' W., distant 80.7 feet; telephone pole bears S. 16° 30' E., distant 37.5 feet; south corner yard fence bears S. 16° 30' E., distant 4 feet	38	29	39.9	84	33	42.5
Road crossing northeast and southwest	38	29	34.3	84	33	29.5
Milepost 288	38	28	47.4	84	33	06.3
Milepost 287, road crossing east and west	38	27	59.5	84	32	47.7
Overhead road crossing northeast and southwest	38	27	38.5	84	32	10.2
Hinton, road crossing at	38	27	23.4	84	31	49.9
Overhead road crossing (iron bridge)	38	26	54.6	84	31	35.4
Harrison-Scott county line, overhead east and west road crossing at	38	25	59.1	84	31	42.0
Bridge No. 13, center of	38	24	02.4	84	32	08.5
Sadieville, bench-mark post stamped "Prim. Trav. Sta. No. 15," in northwest corner of G. B. Johnson's yard; northwest corner of Johnson's house bears S. 66° E., distant 32.9 feet; northeast corner station platform bears S. 86° 30' W., distant 62 feet; southwest corner of Elizabeth Theobald's house bears N. 74° 15' E., distant 21.2 feet	38	23	28.1	84	32	11.4
Sadieville, road crossing under trestle	38	23	22.3	84	32	15.5
Road crossing east and west under railway	38	22	00.9	84	32	14.2
Road crossing east and west under railway	38	20	40.5	84	31	45.9
Milepost 277, road crossing east and west under railway ..	38	20	03.0	84	31	36.7
Road crossing east and west (private)	38	19	27.2	84	31	39.4
Rogers Gap, bench-mark stamped "Prim. Trav. Sta. No. 16," set in T. B. Milner's stable lot, 3.8 feet north of northeast corner of stable; north corner of railway station bears S. 28° 15' E., distant 99.2 feet; tile culvert bears S. 59° 45' E., distant 70.2 feet	38	18	14.4	84	32	15.5
Rogers Gap, road crossing at	38	18	12.7	84	32	14.8
Milepost 274, private road crossing 870 feet south of	38	17	23.5	84	32	25.3
Kinkaid, east and west road crossing	38	16	25.2	84	32	55.1
Private road crossing east and west	38	15	48.6	84	33	14.8
Milepost 271, private road crossing near	38	15	10.0	84	33	21.5
Semaphore No. 65 d, private road crossing east and west ..	38	14	24.4	84	33	23.8
Private road crossing	38	13	34.7	84	33	11.8
Georgetown, overhead road crossing 0.5 mile north of	38	13	00.4	84	32	54.4

Geographic positions along the Cincinnati, New Orleans and Texas Pacific Railway between Williamstown and Lexington—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Georgetown, bench mark post stamped "Prim. Trav. Sta. No. 17," in vacant lot owned by Mrs. T. B. Sinclair; southeast corner of Sinclair's store bears N. 35° 30' E., distant 5.7 feet; northeast corner Catherine Conley's house bears S. 4° 30' E., distant 23.3 feet; cross cut in north foundation stone to water tank bears S. 24° 55' E., distant 152.2 feet.....	38 12 27.5	84 32 53.5
Georgetown station, road crossing 850 feet south of	38 12 06.1	84 32 58.0
Milepost 266	38 10 56.1	84 32 31.1
Trestle No. 21, road crossing under	38 10 11.7	84 32 31.9
Donerail, north and south road crossing 1 mile north of ..	38 09 51.0	84 32 27.4
Donerail, north and south road crossing	38 08 58.7	84 32 09.8
Pike crossing northwest and southeast	38 07 59.2	84 31 52.1
Overhead road crossing, northeast and southwest.....	38 07 36.7	84 31 48.7
Bridge No. 650, road crossing under	38 02 03.9	84 51 53.3
Lawrenceburg, road crossing Court street (west rail).....	38 02 07.2	84 53 37.4
Glendale, road crossing.....	38 06 20.6	84 31 33.6
Hittenyer, road crossing under trestle	38 05 11.4	84 31 12.8
Leestown pike, crossing of	38 03 39.1	84 30 59.3

Geographic positions along the Southern Railway between Lexington and Lawrenceburg.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lexington, bench mark post stamped "Prim. Trav. Sta. No. 18," on property owned by Tom Smith, 2.5 feet north of gatepost at entrance to place, near Smith's rock quarry, 1 mile north of S. & C. station, and about 250 feet west of S. & C. track and 1,000 feet southeast of Pepper's distillery; powder magazine bears S. 87° 05' E., distant 98.7 feet; cross cut in northeast corner to foundation to west end of trestle on Southern Railway bears S. 15° W., distant 125.9 feet.....	38 03 14.2	84 30 55.8
Trestle No. 859, road crossing under.....	38 03 11.8	84 31 50.9
Old stone house, private crossing near	38 03 29.7	84 32 34.1
Paynes station, road crossing northwest and southeast, 600 feet east of	38 03 28.7	84 33 39.0
Van Meter station board	38 03 38.0	84 35 23.0
Milepost 82, private road crossing at.....	38 03 52.0	84 35 45.6
Elkchester, hole drilled in top of limestone post 36 by 8 by 5 inches, set 30 inches in the ground on property owned by C. C. Patrick, opposite railway station; southwest corner station bears N. 53° 25' E., distant 66.7 feet; cross cut on northeast corner foundation to wagon bridge bears S. 54° 30' W. distant 138.4 feet.....	38 04 18.4	84 37 09.0
Bridge, private road crossing under	38 04 00.0	84 37 43.9
Milepost 78, north and south road crossing at	38 03 24.5	84 39 20.9

Geographic positions along the Southern Railway between Lexington and Lawrenceburg—
Continued.

Station,	Latitude.	Longitude.
	° ' "	° ' "
Waiting shed, road crossing at	38 03 30.2	84 41 20.6
Versailles, northeast and southwest road crossing 0.75 mile east of	38 03 38.9	84 43 05.7
Versailles, bench mark post stamped "Prim. Trav. Sta. No. 20," on land owned by Belle Hunter; north corner post to lot bears N. 16° W., distant 12.7 feet; nail in Boise d'Arc tree bears S. 43° E., distant 4.4 feet; top to automatic gate bears N. 1° 15' E., distant 25.6 feet ..	38 03 23.9	84 43 50.8
Versailles, crossing McCracken pike at.....	38 03 22.9	84 43 52.4
Versailles, east and west road crossing 1 mile west of....	38 03 11.5	84 44 40.0
Private road crossing north and south	38 02 43.6	84 45 41.5
Milner, road crossing north and south 1 mile east of....	38 02 17.8	84 47 19.8
Milner, road crossing east and west near west switch block.	38 02 01.3	84 48 28.7
Trestle No. 68.5, north and south road crossing under ...	38 01 55.6	84 49 09.5
Trestle No. 67.7, private road crossing under.....	38 02 07.7	84 49 48.2
Tyrone, road crossing under trestle 66.0	38 02 13.1	84 50 59.6
Tyrone, bench mark post stamped "Prim. Trav. Sta. No. 21," in east part of field on north side of Southern Railway, just off right of way; west corner of station bears N. 36° 30' E., distant 36.4 feet; south corner to back yard bears N. 37° 30' W., distant 177.7 feet; tall cedar post at point where wire fence joins railway fence bears N. 34° E., distant 5.7 feet.....	38 02 11.7	84 51 01.9
Bridge No. 65, road crossing under	38 02 03.9	84 51 53.3
Lawrenceburg, road crossing at Court street (west rail) ..	38 02 07.2	84 53 37.4

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road northwest, 25 feet north to 3-prong locust tree, 30 feet west to corner post of wire and rail fence	38 01 58.6	84 54 42.2
T pike northeast, 30 feet east to corner post wire and rail fence, 80 feet north to center of culvert.....	38 01 35.5	84 56 42.8
Road south from pike at sharp turn, 50 feet south to center of bridge, 15 feet west to corner rail fence	38 01 02.9	84 58 03.3
Creek southeast, center of covered bridge over	38 00 56.6	84 59 06.7
Gudgel, blue limestone post, 28 by 8 by 6 inches, with hole drilled and "U. S. G. S." cut in top in front yard of house of Lizzie Burgess, 1.2 feet from front fence, 19 feet west of gate; corner of buggy shed bears N. 77° 30' W. distant 26.6 feet	38 00 34.7	84 59 27.6
Covered bridge, west end of	38 00 41.0	84 59 40.4
Browns store, crossroads, 0.75 mile south of, 27 feet southeast to corner of rail fence, 40 feet northwest to east end water gap	38 01 33.4	85 00 26.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Browns store, T road northwest at, 35 feet to store, 25 feet north to gate post	38 02 14.2	85 00 53.5
Corinth church, northeast corner of	38 02 40.3	85 00 37.4
Intersection Alton pike, V. E. Perry's mail box bears S. 65° W. 35 feet	38 03 10.8	85 00 58.5
Scales owned by Jeff Young, center of pike opposite.....	38 04 25.6	85 00 01.4
T pike south, 25 feet southwest to corner rail fence, 12 feet north to hickory stump.....	38 04 19.8	84 58 51.0
Intersection of roads, 30 feet northwest to corner of rail fence, 57 feet north to small black oak tree.....	38 04 39.0	84 58 29.0

Geographic positions along Southern Railway near Avenstoke.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Avenstoke, north and south road crossing 1.33 miles east of	38 05 34.2	84 59 16.5
Private road crossing north and south	38 05 58.3	84 59 49.4
Avenstoke, road crossing north and south	38 06 28.0	85 00 01.6
Avenstoke, bench mark post stamped "Prim. Trav. Sta. No. 23," in west corner of W. H. Murphy's front yard; west corner house bears N. 79° 50' E., distant 44.6 feet; east corner general store bears N. 59° W., distant 91 feet; southwest corner platform to well bears N. 20° 45' W., distant 42.3 feet	38 06 29.2	85 00 01.4

Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Avenstoke, center of bridge over Benson Creek, 1 mile north of	38 07 33.0	84 59 30.8
Graftonburg, T road south, 30 feet southwest to east corner N. W. Gibbs' store, 27 feet south to telephone pole at corner of yard	38 09 22.6	85 00 45.0
Road north.....	38 10 10.1	85 00 59.5
Gate across public road.....	38 10 37.1	84 01 22.2
Will Smith's house, 300 feet north, white oak tree 10 inches in diameter, triangular cross cut in east face of tree	38 11 16.1	85 01 60.2
Hatton, 0.75 mile south of; intersection 700 feet south of cemetery, 15 feet northwest to cedar tree 6 inches in diameter north side of road.....	38 12 50.4	85 00 37.7
Hatton, 0.5 mile south of, intersection of pike and dirt roads, 20 feet northeast to post at corner of picket fence, 18 feet south to hickory tree.....	38 13 14.2	85 00 36.5

Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hatton, bench mark post stamped "Prim. Trav. Sta. No. 24," in front yard of G. W. Stockton's tenement house, opposite Roberts & Wright's general store on north side of Louisville and Nashville Railway, southeast corner brick chimney to house bears N. 3° 10' E., distant 78.5 feet, nail in sycamore tree on railway property bears S. 33° E., distant 29.8 feet. Lower hinge to front yard gate bears S. 86° 30' W., distant 23.5 feet ...	38 13 35.4	85 00 23.6
Hatton, intersection of pikes 1 mile northeast of; 35 feet southeast to telephone pole, 45 feet northwest to telephone pole	38 13 38.3	84 59 34.7
T road east, 30 feet southeast to Wash. Vaughn's mail box, 21 feet northeast to corner of yard fence.....	38 14 41.76	84 59 44.5
Rogers store, center of pike opposite.....	38 15 17.8	84 59 47.6
Jacksonville, 0.75 mile east of; T pike south, 21 feet southeast to cross cut on fence post, 15 feet southwest to cross cut on post	38 16 28.1	84 59 49.5
Jacksonville, T road west in north part of, 9 feet west to J. N. Wilbur's mail box, 15 feet east to cross cut on rail fence.....	38 16 44.9	85 00 46.0
Intersection of roads, 30 feet south to W. D. Duncan's mail box, 30 feet northwest to corner stone wall to front yard	38 17 19.5	85 00 49.9
T road east to Scrabble post-office, 18 feet southwest to cross cut on hickory tree, 24 feet northeast to E. L. Hupper's mail box	38 19 13.4	85 00 10.3
Franklin, Henry, Shelby counties, corner of, nail in cross painted on corner post to barbed wire fence about 400 feet north of road intersection at Backbone Creek.....	38 20 19.4	84 59 42.1
Franklin-Henry county line	38 20 32.0	84 58 54.0
Thurman's store, primary station No. 27, bench mark post in east corner of Jack Thurman's front yard, cross cut on southeast corner to Jacob Thurman's residence bears N. 42° E., 33.3 feet distant, cross cut on southeast foundation corner to store bears S. 67° 15' W., distant 80.1 feet, corner post to southeast corner yard bears S. 72° 50' E., distant 11.7 feet	38 20 37.5	84 58 00.0
Grub Ridge Church, intersection of roads at, 33 feet northeast to nail in west face of white oak tree, 30 feet southwest to crosscut on east face of stump.....	38 22 13.0	84 57 50.3
Intersection of roads	38 23 12.3	84 57 33.0
Pot Ripper Creek, road intersection at, 900 feet southwest of Lucy Hall's residence.....	38 24 12.1	84 57 47.5
Lockport, intersection of roads 1 mile south of, 18 feet south to cross cut on corner fence post, 21 feet west to corner fence post.....	38 25 16.7	84 57 49.5
Lockport, Bridge and Main streets, 37 feet southeast to iron pump, 40 feet south to corner yard fence	38 26 12.4	84 57 56.8
Gratz, road intersection 0.5 mile southwest of.....	38 28 10.2	84 57 42.0

Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gratz, 0.5 mile southwest of; primary traverse station No. 28, bench mark post set in E. T. Shannon's front yard, at forks of roads, southeast corner of Shannon's house bears N. 39° 45' W., distant 43 feet, horseshoe nailed to walnut trees bears N. 71° 45' E., distant 11.8 feet	38 28 11.0	84 57 42.7
Gratz, Main and Brown streets	38 28 24.6	84 57 14.1
Intersection of pike and dirt road	38 28 39.3	84 56 08.2
Crossroads southeast, about 400 feet south of junction of Savern Creek and Mint Spring Branch	38 28 01.0	84 54 50.4
E. H. Sparks' front yard gate, of residence of, on Savern Creek	38 27 53.6	84 53 29.1
Intersection of pike and dirt road south near Victor Wilburt's residence	38 27 17.2	84 51 46.9
Ep, road intersection $\frac{1}{2}$ mile south of; 40 feet east to cross cut on corner fence post, 24 feet to cross cut on corner post	38 27 39.4	84 50 34.7
Greenups Baptist Church, primary traverse station No. 29, bench mark post in front yard of church, 4 feet south of retaining wall, nail in cross cut on east face of beech tree 3 feet in diameter bears N. 85° 45' W., distant 70.2 feet, northeast corner of church bears S. 3° 45' E., distant 30.7 feet	38 27 19.2	84 50 14.3
Greenups schoolhouse, crossroads at, 30 feet southeast to Shipp's mail box, 15 feet northeast to southwest corner of tollgate house	38 27 07.9	84 49 34.0
Hester, intersection of Monterey-Owenton and Georgetown pikes	38 27 48.0	84 46 36.7
Old tollgate house, pike intersection	38 28 17.2	84 45 25.1
Smith's schoolhouse, T road east, 30 feet northeast to cross on corner fence post	38 28 52.8	84 44 36.7
Breck post-office, primary traverse station No. 30, bench mark post in northeast corner J. H. Davis's front yard, southwest corner post-office bears S. 89° 30' E., 9.3 feet distant; southwest corner J. H. Davis's residence bears S. 35° E., distant 73.5 feet	38 29 19.1	84 44 14.6
Pike intersection (old location of Breck post-office)	38 29 45.2	84 44 07.8
Lusby's mills, pike intersection 1 mile south of, near A. L. Lockhardt's residence	38 30 46.2	84 43 17.6
Lusby's mills, west end of covered bridge	38 31 47.4	84 43 13.6
East gatepost to road, through Riley Kimvan's farm	38 32 21.6	84 42 13.6
Clegg, road intersection 0.25 mile northwest of	38 33 07.7	84 41 34.6
William Glenn's farm, white oak tree used as gatepost at entrance to, cross cut on tree	38 34 06.1	84 40 14.1
Lawrenceville, crossing of pikes at, 40 feet northeast to southwest corner blacksmith shop, 45 feet northwest to L. B. Hollbrook's mail box	38 34 05.3	84 39 00.2
T. S. Scroggs's mail box	38 35 18.2	84 38 24.2

Geographic positions along highways from Avenstoke via Hatton, Gratz, and Breck to Williamstown—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Heekin, T road northwest at, 18 feet southeast to north corner of platform at store, 40 feet north to cross on telephone pole.....	38 36 01.5	84 36 52.7
Road northwest, 12 feet southeast to cross on telephone pole, 35 feet north to R. W. Vance's mail box.....	38 36 29.4	84 36 16.7
Williamstown, 2 miles south of; pike intersection; 24 feet northwest to James Penwick's mail box, 40 feet northeast to front yard gate.....	38 37 43.1	84 36 03.3

Geographic positions along the Frankfort and Cincinnati Railway between Hatton and Georgetown.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pike crossing northeast and southwest.....	38 13 31.7	85 00 08.6
Milepost 36, 1,060 feet east of; road crossing east and west.....	38 12 48.9	84 59 02.5
Benson station, road crossing east and west, 80 feet northwest of.....	38 12 25.2	84 57 37.2
Pike crossing north and south.....	38 12 32.5	84 56 16.3
Road crossing.....	38 12 41.5	84 55 50.5
Road crossing east and west.....	38 12 49.2	84 55 11.3
Kennebec station, road crossing east and west.....	38 12 28.8	84 54 46.5
West Frankfort, pike crossing northwest and southeast west of water tank.....	38 12 14.0	84 53 07.9
Frankfort, primary traverse station No. 25, bench mark post set in west corner of capitol grounds, 4.5 feet distant to corner fence post, 230.6 feet to west corner post porch of capitol building.....	38 11 59.7	84 52 38.8
Overhead road crossing, north and south.....	38 12 32.1	84 50 44.8
Sedmanstown, road crossing at.....	38 13 13.6	84 49 10.6
Elkhorn station, road crossing at Boles Bros. stables (private).....	38 13 08.6	84 47 58.6
Road crossing, east and west.....	38 14 08.4	84 46 47.1
Road crossing, north and south at T road north.....	38 15 00.9	84 46 12.6
Switzer, pike crossing east and west, 1,100 feet southwest of station.....	38 15 10.1	84 45 25.3
Lead works, road crossing at.....	38 15 51.6	84 44 26.5
Bridge, road crossing under.....	38 15 52.6	84 43 00.6
Stamping Ground, primary traverse station No. 26, bench mark post in front yard to Doctor Reilly's residence; east corner of foundation to house bears S. 57° 10' W., 120.7 feet distant; east corner of J. R. Russell's house and jewelry repair shop bears N. 36° W., distant 24.53 feet. The post is 2 feet south of Frankfort and Cincinnati Railway right of way.....	38 16 13.6	84 41 11.3
Stamping Ground, Frankfort pike crossing near west end of switch.....	38 16 15.1	84 41 13.1
Pike crossing, north and south.....	38 15 33.7	84 40 31.1

Geographic positions along the Frankfort and Cincinnati Railway between Hatton and Georgetown—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Duvall, pike crossing north and south	38 14 49.3	84 38 27.6
Road crossing, north and south under trestle.....	38 14 29.8	84 37 28.2
Johnson station, pike crossing at	38 14 25.6	84 35 48.9
Private road crossing, east and west	38 13 35.9	84 35 05.5
Private overhead road crossing, north and south.....	38 13 15.3	84 34 16.7

Daviess, Henderson, and Ohio counties; Calhoun and Sutherland quadrangles.

The following geographic positions were determined from primary traverse in 1903 and 1904 by Mr. J. R. Ellis, topographic aid. The line starts from adjusted position at Owensboro and follows Illinois Central Railroad to Philpot; thence follows highways to Nocreek and is tied to adjusted position there.

Geographic positions along the Illinois Central Railroad between Owensboro and Philpot.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Owensboro station	37 46 01.5	87 06 40.5
Owensboro, just east of, crossing of Illinois Central and Louisville and Nashville railroads	37 46 11.4	87 05 34.8
Road crossing, private, northeast and southwest	37 45 08.8	87 04 52.0
Road crossing, private, north and south	37 44 55.6	87 03 37.3
Oakridge, road crossing at	37 44 31.5	87 02 22.5
Wagon bridge, road crossing at	37 43 40.5	87 00 35.3
Spur, road crossing at	37 43 42.9	86 59 25.6

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Philpot, aluminum tablet cemented in top of sandstone post in south corner of J. B. Compton's yard. The north face of large black oak bears S. 31° E., distant 21 feet. The south corner of J. B. Compton's residence bears N. 52° E., distant 26.6 feet. Post marked "primary traverse station No. 1"	37 43 47.9	86 58 48.4
T road southwest.....	37 43 12.9	86 58 03.8
T road west, 20 feet northwest is corner post of bridge and barbed-wire fence. Arrow cut on post showing direction of traverse	37 42 35.3	86 58 19.5
T road east, 30 feet northeast to old walnut tree, 110 feet south to tall dead tree	37 42 05.0	86 58 29.6
Miller's mill road, at T road north, 12 feet east to sign-board	37 41 09.5	86 58 47.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads, 20 feet west is guide post, 28 feet north of large stone.....	37 40 27.6	86 58 23.8
Harrison schoolhouse, T road east; 15 feet west to corner of fence post, 45 feet east to mail box.....	37 39 55.4	86 58 01.1
The Chapel, road south at; 15 feet west to mail box, 10 feet north to east end of small box culvert.....	37 39 12.3	86 57 22.2
Laffoon post-office, center of road in front of.....	37 38 26.0	86 56 30.8
Laffoon post-office, 0.25 mile southeast of, forks of road, 40 feet north to dead white-oak tree, 80 feet south to bridge.....	37 38 12.1	86 56 17.9
Panther Creek, center of bridge over, line between Daviess and Ohio counties.....	37 37 45.6	86 56 32.9
Primary traverse station No. 2, aluminum tablet cemented in sandstone post. Station is 15 feet southwest of T road north at J. T. Brasheard's residence and blacksmith shop on south side of road, 3 feet from picket fence. A black gum tree 16 inches in diameter with cross on east side bears due west, distance 10 feet. Southwest corner post of Brasheard's yard fence bears N. 38° 45' E., distant 32 feet.....	37 37 09.8	86 56 30.2
T road east, 33 feet south to black gum tree, 22 feet west-southwest to gatepost, and is 600 feet northeast of Sturrett's store.....	37 36 47.5	86 55 57.1
Westerfield, 0.25 mile north of, intersection of roads.....	37 36 00.5	86 55 45.0
Westerfield, crossroads at, 35 feet north to door of King's store, 30 feet northwest to small silver poplar tree in front of post-office.....	37 35 41.9	86 55 39.4
Westerfield, 0.66 mile south of, top of small hill.....	37 35 07.1	86 55 36.9
T road east to Taffy, 25 feet northeast to south end of culvert 27 feet southeast to tall corner fence post.....	37 34 32.8	86 55 24.8
T road northeast, 400 feet north of Chapman residence, 30 feet north to gatepost, 33 feet east to corner rail fence..	37 33 05.6	86 56 15.1
Branch, T road east at, 30 feet north to corner of picket fence, 42 feet south to corner of picket fence.....	37 32 23.8	86 56 00.5
T road east, 12 feet east to corner post of picket fence, 15 feet west to stump.....	37 31 51.0	86 56 03.4
Intersection of Owensboro and Hartford and Miller's mill roads, 33 feet northwest to telephone post at small bridge, 15 feet to south corner of bridge.....	37 30 49.3	86 56 39.5
Breda post-office, intersection of Hartford and Owensboro road and road to Nocreek post-office, 20 feet east to elm tree 14 inches diameter, 50 feet southeast to telephone pole.....	37 30 25.8	86 56 48.1
Nocreek, church, 0.5 mile north of, T. road east, 260 feet north of turn in road.....	37 29 14.6	86 57 17.1
Nocreek post-office, T road south at, primary traverse station No. 3. Hole drilled in top of sandstone post in northeast corner of J. P. Foster's farm. Station is 2.5 feet west of large mulberry tree at fence corner. Southwest corner of porch to Nocreek post-office bears N. 46° 35' E., distant 85 feet. Corner stone at T road north bears N. 50° 45' W., distant 50.8 feet. Post marked "U. S.".....	37 28 58.0	86 57 10.4

This line starts from the Henderson astronomic pier and follows public highways via Delaware, Cleopatra, and Glenville to Utica.

Geographic positions along highways between Henderson and Utica.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Henderson, astronomic pier.....	37 50 24.80	87 35 26.10
T road southwest	37 47 03.2	87 30 13.3
Crossroads.....	37 44 32.6	87 26 53.9
Euterpe post-office, T road at	37 42 59.1	87 26 34.6
Crossroads.....	37 42 21.5	87 25 28.6
Delaware; Henderson and Delaware road, at road north, ½ mile northwest of.....	37 41 32.1	87 24 48.6
Delaware; Delaware and Salem Church road, at T road northwest, ¾ mile southeast of.....	37 40 34.6	87 23 50.8
T road south.....	37 39 00.9	87 21 13.5
Salem Baptist Church, northeast corner of.....	37 38 18.1	87 20 01.1
Puyear schoolhouse, T road west at	37 37 44.2	87 19 00.0
Cleopatra, T road south at	37 37 23.9	87 17 36.9
Schoolhouse, T road north at.....	37 36 32.7	87 17 07.6
Guffy post-office, crossroads at	37 36 19.3	87 15 11.3
T road south.....	37 36 19.6	87 13 28.8
Glenville, T road at church, near.....	37 35 43.8	87 11 29.1
T road south.....	37 35 19.5	87 10 29.6
Crossing of Glenville and Livermore and Glenville and Utica roads	37 35 05.5	87 09 40.9
Utica, T road north at	37 36 16.2	87 06 49.9

Union and Webster counties; Sebree quadrangle.

The following geographic positions were obtained from primary traverse run in 1904 by Mr. J. R. Ellis. The line starts from Elmwood, Ky., and follows the Louisville and Nashville Railroad to Slaughterville, thence by public highways via Vanderburg to West Vanderburg, thence along Illinois Central Railroad to Lisman. From Lisman the line follows public highways via Free Union, Luzon, Tilden, and Herman to Waverly, where it is tied to point located by primary traverse in 1902.

Geographic positions along the Louisville and Nashville Railroad between Elmwood and Slaughterville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Elmwood, road crossing at.	37 31 42.7	87 29 24.8
Bridge No. 195, over creek.	37 30 57.8	87 29 22.3
Slaughterville station, 120 feet north of, road crossing ...	37 29 27.0	87 29 47.1
Slaughterville, aluminum tablet cemented in top of limestone monument 25 by 6 by 8 inches, set 23 inches in the ground, and located in southwest corner of Dr. W. C. Casby's yard, 7 feet east of corner of yard fence, 23 feet northeast to bay window and is 18 inches north of south fence to yard; stamped "Prim. Trav. Sta. No. 4" ..	37 29 26.4	87 30 00.9

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Slaughterville, 0.66 mile west of; intersection of roads, 20 feet south to corner of yard fence, 20 feet south to corner post of small lot.	37 29 23.9	87 30 46.1
T road west.	37 29 11.8	87 31 15.7
Road northeast, 15 feet north to stump, 17 feet south to tree at intersection of 3 fences.	37 29 12.2	87 32 57.6
Intersection of Henderson and Madisonville road and road to Vanderburg at Woods's house (log), 45 feet northeast to front gate, 33 feet west to locust tree.	37 29 06.7	87 33 22.8
Dim road east.	37 28 56.9	87 33 31.2
T lane south, 30 feet southwest to cherry tree at corner of fence, 20 feet northeast to double walnut tree.	37 28 45.5	87 34 11.0
Road north at small bridge 1,400 feet east of James's saw-mill, 10 feet west to center of small bridge at east mouth to lane.	37 28 38.7	87 35 15.4
T road northeast, 12 feet east to center of small bridge, 33 feet to corner of rail and picket fence.	37 28 20.0	87 36 27.6
Deer Creek, T road northwest, 265 feet west of bridge over, 18 feet south to picket fence, 35 feet north to large birch tree.	37 28 19.2	87 36 57.5
Road east, 18 feet south to telephone pole, 35 feet east to tree at corner of picket fence.	37 29 16.2	87 38 04.3
Vanderburg, bronze tablet cemented in top stone terrace step to C. H. Edwards's front walk, N. 5° E. and 35 feet to center of front door of residence, N. 78° 15' W. and 28 feet to black locust tree 15 inches in diameter, 5.8 feet south to front gate; stamped "Prim. Trav. Sta. No. 5" ..	37 29 19.5	87 38 31.8
Vanderburg, intersection of roads at blacksmith shop, 27 feet southwest to sycamore tree in middle of road, 28 feet northeast to west corner of shop.	37 29 19.9	87 38 37.0

Geographic positions along the Illinois Central Railroad between West Vanderburg and Lisman.

Station.	Latitude.	Longitude.
	° ' "	° ' "
West Vanderburg, Illinois Central Railroad crossing at ..	37 29 04.1	87 41 31.3
Road crossing northeast and southwest, 360 feet east of milepost 15.....	37 28 32.4	87 41 51.9
Road crossing east and west.....	37 28 26.9	87 42 31.0
Lisman station, road crossing 120 feet west of.....	37 28 13.5	87 43 45.3
Lisman and Free Union road crossing.....	37 28 28.5	87 44 32.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lisman, 1 mile northwest of, crossroads.....	37 28 57.0	87 45 00.5
Crossroads, Lisman and Clay road and Dixon and Clay road, 30 feet southwest to black gum tree, 48 feet south to corner of picket and rail fence	37 29 21.7	87 45 22.9
Lisman, 2 miles north of, aluminum tablet cemented in top of sandstone post 6 by 8 by 24 inches, set in ground; in northeast part of George Wilson's front yard, at intersection of Dixon and Clay roads, east corner of north chimney of Wilson's house bears S. 82° W.; large white oak tree in front yard bears S. 11° 15' W.; distant 49 feet; northeast corner front fence bears S. 69° 30' E., distant 33 feet; tablet stamped "Prim. Trav. Sta. No. 6".....	37 29 43.8	87 44 44.3
Caney Creek, center of bridge over	37 30 57.6	87 45 26.5
Free Union, 0.5 mile west of; intersection of roads, 40 feet west to wire fence corner, 60 feet east to telephone pole	37 31 33.3	87 45 38.1
Free Union, center of bridge over Craborchard Creek....	37 31 34.3	87 45 00.9
Henderson's tobacco factory, T road north at 20 feet northwest to arrow cut on corner of board fence, 18 feet southwest to west corner of factory.....	37 31 43.0	87 43 57.0
T road west	37 32 05.0	87 43 42.7
Luzon post-office, crossroads at, 15 feet northeast to telephone pole, 15 feet west to large stone at east corner of post-office porch.....	37 32 42.9	87 43 22.1
Lane southwest.....	37 34 10.5	87 42 26.9
Road southeast at top of hill, corner stone in middle of road at, 12 feet west to stump 22 feet southeast to rail fence corner	37 34 44.2	87 42 26.8
Jones' tobacco factory, T road west about 450 feet south of, 24 feet southwest to rail fence corner, 21 feet northwest to corner of rail and wire fence.....	37 35 01.9	87 42 24.6
Tilden, 0.5 mile south of, center of bridge over creek at forks of roads.....	37 35 53.1	87 42 11.0
Tilden, T road north at; 18 feet northeast to corner of Jopps' front yard fence, 40 feet south to northwest corner of Townsend's store	37 36 20.2	87 42 40.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Highland church, crossroads at, 20 feet northeast to front of church, 45 feet northwest to center of small bridge..	37 36 28.7	87 43 13.4
Road south through woods, 30 feet west to center of bridge over branch.....	37 36 46.4	87 43 55.8
Intersection of Morganfield and Madisonville and Uniontown road; west 20 feet is corner post to picket fence, northeast 20 feet is corner of rail fence.....	37 36 52.4	87 44 29.0
County line, 25 feet west of, bronze tablet cemented in sandstone post 7 by 8 by 25 inches, set 22 inches in ground in south corner of A. J. Kennedy's farm on inside of fence, 4 feet northeast of corner post. South 30° 10' west and 72 feet distant from station is north corner of north chimney to tenant house on L. R. Higginson's farm. South 20° west and 90 feet distant is black gum tree.....	37 37 24.3	87 45 10.9
Kennedy church, crossroads at, 27 feet southwest to A. J. Kennedy's mail box, 40 feet northwest to H. V. Tilly's mail box.....	37 37 41.5	87 45 17.5
Anderson Creek, 2,000 feet northwest of, road intersection 20 feet northwest to R. O. Cromwell's mail box, 21 feet northeast to corner of wire and picket fence.....	37 38 21.7	87 45 50.9
Herman post-office, T road northwest at, 4 feet east to large stump, 30 feet north to southeast corner of post-office.....	37 39 10.4	87 45 30.2
Herman post-office, 1.25 miles northwest of, T road southeast.....	37 39 47.1	87 46 34.4
T road northwest, 20 feet east to corner of orchard fence, 26 feet north to gatepost.....	37 40 33.5	87 47 09.6
Waverly, 1 mile southeast of; road intersection, 17 feet east to J. B. Austin's mail box.....	37 41 47.7	87 48 23.5
Waverly, T road northwest in southeast part of, 35 feet west to corner of wire fence, 35 feet northwest to telephone pole.....	37 42 21.3	87 48 41.0
Waverly, in garden in north corner of H. T. Willet's front yard, in sandstone post, bronze tablet stamped "Prim. Trav. Sta. No. 8," 3 feet from fence corner....	37 42 42.9	87 48 48.1
Waverly, road crossing 55 feet west of station.....	37 42 45.5	87 48 46.1

LOUISIANA.

PRIMARY TRAVERSE.

East and West Baton Rouge, East and West Feliciana, and Pointe Coupee parishes; Bayou Sara quadrangle.

During the month of December, 1903, 81 miles of primary traverse were run by Mr. E. L. McNair, topographer, beginning at St. Francisville and following the Yazoo and Mississippi Valley Railway (Woodville Branch) northward to Laurel Hill; thence northeast and east via

public roads to Norwood on the Yazoo and Mississippi Valley Railroad; thence south along this railway to Baton Rouge; thence northeasterly via public road to Comite post-office.

Positions are based upon the Baton Rouge datum as given in the report of the Chief of Engineers for 1887, Part IV, page 2783.

Geographic positions along Woodville Branch of Yazoo and Mississippi Valley Railroad between St. Francisville and Laurel Hill.

Station.	Latitude.	Longitude.
	° ' "	° ' "
St. Francisville, cross on Catholic church	30 46 33.3	91 23 22.8
Bains flag station, road crossing 1.5 miles south of	30 48 34.1	91 23 16.5
Bains flag station, road crossing 700 feet south of	30 49' 46.2	91 23 06.9
Catalpa flag station, road crossing 0.6 mile north of	30 51 44.1	91 22 08.7
Brothers flag station.....	30 53 23.4	91 21 02.1
Milepost 14, road crossing 350 feet south of	30 55 30.9	91 20 08.0
Laurel Hill station, north end of	30 57 14.9	91 20 23.8

Geographic positions along highways between Laurel Hill and Norwood.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Laurel Hill, 1.75 miles northeast of, crossing of West Fork of Thompsons Creek	30 58 10.1	91 19 13.5
Laurel Hill, 3.5 miles northeast of, forks of road near store	30 59 08.0	91 17 58.9
Louisiana-Mississippi State line, four corners near D. E. Perkins's store	31 00 00.3	91 17 16.4
Thompsons Creek, 0.4 mile west of, forks of second-class road	31 00 05.2	91 15 13.9
Thompsons Creek, 1 mile east of, forks of road, north, south, and southwest	31 00 30.0	91 13 54.8
Church, forks of road, 0.25 mile northeast of	30 59 04.8	91 13 34.9
Forks of road, roads east, west, and south near cabins...	30 58 18.3	91 12 48.5
East Fork of Thompsons Creek, 0.6 mile east of, forks of road, signboard, "Store 1 mile"	30 58 09.2	91 10 59.6
Norwood, 4 miles west of, four corners at Cauty Stanley's house	30 57 48.1	91 09 18.7
Norwood, 1.25 miles west of, forks of road.....	30 58 44.5	91 07 05.5

Geographic positions along Yazoo and Mississippi Valley Railroad between Norwood and Baton Rouge.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Norwood station, road crossing 350 feet north of.....	30 58 06.2	91 06 15.8
Norwood, I. D. Norwood's brick store, bronze tablet in northeast corner of.....	30 58 07.6	91 06 17.5
Norwood, road crossing 2 miles south of.....	30 56 25.3	91 06 20.5
Wilson station, street crossing 350 feet north of.....	30 55 12.0	91 06 57.5
Milepost 120.....	30 53 42.3	91 07 35.3
Gayden station, road crossing at.....	30 52 12.8	91 08 02.3
McManus station, road crossing 170 feet south of.....	30 50 01.4	91 08 07.1
Ethel station.....	30 47 26.8	91 07 51.9
Head block of switch, 450 feet south of milepost 110.....	30 45 02.2	91 08 12.5
Slaughter station, street crossing 125 feet north of.....	30 43 07.8	91 08 34.6
Milepost 105, road crossing 1,900 feet north of.....	30 41 06.4	91 08 58.1
Zachary station.....	30 38 57.0	91 09 23.1
Baker station, road crossing 3,500 feet north of.....	30 36 05.1	91 09 56.4
Baker station.....	30 35 30.5	91 10 03.0
Maryland siding, road crossing at.....	30 33 09.0	91 10 30.4
Scotland station, road crossing at.....	30 31 28.5	91 10 49.8
Scotland, road crossing 0.6 mile south of.....	30 30 56.1	91 10 56.0
Baton Rouge station, 1.75 miles north of, road crossing near end of siding.....	30 28 19.4	91 11 17.3
Baton Rouge, round brick chimney on State penitentiary.....	30 27 04.2	91 10 55.6

Geographic positions along public road between Baton Rouge and Comite.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Baton Rouge, Cowboys' Exchange, road north at.....	30 27 14.9	91 10 00.7
Three corners, road north.....	30 28 11.6	91 07 38.9
Three corners, road north.....	30 29 04.7	91 05 21.7
Comite store and post-office, 300 feet southwest of, a marble post 30 by 6 by 3 inches set 22 inches in the ground, "G. S." cut on top of post.....	30 30 25.7	91 01 58.5
Comite store and post-office, 160 feet northeast of, a marble post 30 by 6 by 3 inches set 28 inches in ground. "G. S." cut in top of post. Posts are 453 feet apart, azimuth between them 214° 25' 35".....	30 30 29.4	91 01 55.5

MARYLAND.

PRIMARY TRAVERSE.

Caroline and Queen Anne counties; Barclay quadrangle.

The following geographic conditions were determined from primary traverse in 1903 by Mr. C. B. Kendall, field assistant. The line starts from Hartley triangulation station, United States Coast and Geodetic Survey and runs west along highways to the Delaware-Maryland line, connecting with Switzer's farm boundary post, thence north and west along border of quadrangle to point near northwest corner of same, thence south along west border of quadrangle to Hope triangulation station, United States Coast and Geodetic Survey, thence south to border of quadrangle and east along same, tying to adjusted traverse position 2 miles north of Greensboro. Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hartley triangulation station, U. S. Coast and Geodetic Survey	39 10 48.86	75 40 17.80
Road south at three corners	39 11 02.0	75 40 56.4
Four corners, 70 feet northeast to corner of dwelling, 25 feet to mail box	39 11 33.1	75 42 02.5
Four corners	39 11 24.4	75 43 10.0
Negro schoolhouse, three corners at, 60 feet southwest to corner of schoolhouse, 33 feet southeast to dwelling	39 10 52.3	75 44 14.3
Three corners, 20 feet north to large tree on hedge line, 40 feet south to mail box on hedge line	39 12 01.0	75 44 47.2
Switzer's farm, state line boundary post	39 11 59.3	75 45 09.3
Three corners at negro schoolhouse, 54 feet west to east corner of school, 60 feet to chestnut tree	39 13 34.3	75 44 14.5
Bourke's Corners, 30 feet northwest to mail box, 40 feet to southwest corner of Bourke's store	39 13 51.7	75 44 34.1
Center of bridge over stream	39 14 47.6	75 45 00.9
Hazel's schoolhouse, three corners at, 36 feet southwest to face of oak tree, 4 feet north to line stone, 68 feet northwest to corner of schoolhouse	39 15 38.3	75 44 43.6
Road to north, three corners at, 25 feet east to corner of fence, end of hedge, 30 feet to corner of picket fence	39 15 18.3	75 46 46.0
Four corners, 40 feet northwest to mock orange tree, 35 feet northeast to corner of hedge fence	39 15 17.5	75 48 48.9
Fork to north, three corners at	39 15 22.9	75 49 51.9
Millington, east edge of Sassafras street at junction with Cypress street	39 15 29.3	75 50 18.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Four corners, 25 feet southwest to telegraph pole, 30 feet northwest to gate post.....	39 15 05.0	75 50 56.7
Queen Mills, east edge of road at Forks, 450 feet south of.....	39 14 52.0	75 51 49.8
Four corners, 20 feet northwest to corner of hedge, 40 feet southeast to telephone pole.....	39 14 37.5	75 52 37.4
Road to south at three corners.....	39 14 15.0	75 53 52.0
Cemetery, four corners at, 32 feet northeast to corner post of iron fence, 33 feet northwest to corner post of wood fence.....	39 13 54.5	75 54 52.4
McGwines, three corners just west of, 30 feet northeast to mail box, 30 feet northwest to stump.....	39 13 10.0	75 57 13.0
Maple Creek drain bridge, three corners 215 feet west of, 59 feet southeast to nail in sweet gum tree, 56 feet southwest to nail in fence post.....	39 12 39.1	75 59 01.7
Three corners, 25 feet northwest to corner fence post, 50 feet southeast to cedar tree.....	39 11 19.7	75 59 20.7
Four corners, 22 feet northeast to corner of fence 60 feet northwest to large oak tree.....	39 10 06.5	75 59 02.7
Road to west, 3 corners at, 20 feet northwest to corner of fence, 30 feet east to cedar tree.....	39 09 16.7	75 58 54.0
Church Hill, junction of Main and Walnut streets at, 27 feet southeast to lamp-post, 32 feet northeast to telephone pole.....	39 08 32.2	75 59 08.4
Three corners, 28 feet east to sycamore tree, 50 feet south to cedar tree.....	39 07 50.4	75 58 34.7
Four corners, 38 feet northwest to fence corner, 22 feet southeast to pear tree.....	39 06 44.0	75 58 34.6
Three corners, 25 feet southwest to pear tree, 42 feet north to corner post of wire fence.....	39 05 24.1	75 58 45.2
Ashland station, center of road crossing Philadelphia, Wilmington and Baltimore Railroad.....	39 04 43.2	75 58 38.7
Road crossing, center of track at.....	39 03 51.9	75 59 27.4
Carvell station, nail at northwest corner of road crossing.....	39 02 49.5	76 00 18.1
Hope triangulation station, U. S. Coast and Geodetic Survey.....	39 02 33.3	75 59 18.1
Hope, four corners at, 36 feet north to post of stoop at store, 60 feet south to walnut tree.....	39 02 30.1	75 58 10.8
Three corners.....	39 01 52.0	75 57 57.1
Ruthsburg, four corners at, 57 feet northwest to nail in post at corner of shop, 35 feet southeast to nail in post at corner of fence.....	39 00 12.3	75 57 29.7
Norman schoolhouse, forks of road.....	39 00 33.5	75 56 12.4
Bridge over Masons Branch, four corners, 280 feet east of, 27 feet northwest to pine tree.....	39 00 14.7	75 54 39.2
Negro cabin, three corners near, 5 feet east to large kick-ory tree.....	39 01 06.8	75 52 38.2
Lockman schoolhouse, three corners 1,500 feet east of....	39 00 49.5	75 51 50.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Three corners, 32 feet west to big stone, 44 feet south to old stump	39 00 41.7	75 50 56.4
New house, east edge of road at, three corners 150 feet west of, 18 feet northeast to oak tree.....	39 00 14.0	75 49 19.4
Schoolhouse, three corners 500 feet east of	39 00 38.9	75 48 31.6
Greensboro, three corners about 2 miles north of, 30 feet northwest to cedar tree, 50 feet southwest to peach tree	39 00 05.1	75 47 33.9
Sewells Mills, three corners at	38 59 46.3	75 46 48.5
Three corners	38 59 43.7	75 45 29.1
Schelther's farm, State line boundary post.....	38 59 48.3	75 44 10.9

Caroline and Talbot counties; Denton quadrangle.

The following geographic positions were determined from primary traverse in 1903 by Mr. C. B. Kendall, field assistant. Starting at Schelther's farm boundary post, on the Delaware-Maryland State line, the line follows highways south along east border of quadrangle to southeast corner, thence west along south border of same, connecting with adjusted traverse position at Bethlehem. Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Boyces Mills, three corners just west of	38 59 21.3	75 45 52.7
Schoolhouse, four corners at, 50 feet southeast to oak tree, 83 feet northwest to large pine tree	38 57 47.5	75 45 55.3
Sawmill, four corners at, 21 feet south to old stump, 29 feet west to nail in stake	38 56 08.5	75 46 36.0
Gilton Camp grounds, 75 feet northeast to corner of school, 40 feet west to hickory tree	38 55 15.5	75 45 20.7
Jopps Corners, 11 feet south to corner post wire fence, 39 feet north to apple tree	38 54 16.6	75 46 25.6
Forks of road, 25 feet west to pine tree, 27 feet northeast to J. P. Warren's mail box	38 53 05.8	75 46 36.8
Anthony's Mills, forks of road, 30 feet west to persimmon tree, 68 feet east to southwest corner of mill	38 52 41.0	75 47 19.5
Hobbs, forks of road at Ames Church just northwest of, 90 feet northwest to southeast corner of church	38 51 45.5	75 47 17.3
Hobbs station, center of Queen Anne's Railroad track at road crossing, 55 feet east of	38 51 35.6	75 47 06.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Andersontown, three corners 0.25 mile north of, 32 feet southwest to telephone pole, 14 feet east to old stump..	38 50 27.8	75 47 06.8
Andersontown, forks of road at schoolhouse, 75 feet southeast to schoolhouse.....	38 50 04.8	75 46 43.3
Four corners, 27 feet southwest to corner post, 51 feet northwest to telephone pole.....	38 48 50.7	75 47 00.7
Concord, three corners just east of.....	38 48 06.2	75 47 10.5
Three corners, 25 feet southeast to mail box, 36 feet northwest to corner post of wire fence.....	38 46 46.2	75 47 17.0
Chestnut Grove Church, three corners 600 feet east of, 115 feet west to bridge over Wolf Pit Branch.....	38 45 22.3	75 47 15.2
Three corners, 30 feet northeast to pine tree, 25 feet west to cedar tree.....	38 45 15.2	75 47 55.3
American Corners, four corners at, 44 feet south to corner of Redman & Sons' store, 36 feet northwest to Towers' store.....	38 46 03.4	75 49 09.9
American Corners, four corners 1 mile west of, 20 feet north to corner fence post, 40 feet west to pole fence...	38 46 03.0	75 50 30.9
Forks of road, 20 feet east to mulberry tree, 45 feet west to forked pine tree.....	38 45 58.9	75 51 22.4
Three corners, 18 feet southwest to mail box, 50 feet north to sycamore tree.....	38 45 43.0	75 52 41.8
Three corners, 35 feet east to apple tree, 10 feet west to cedar tree.....	38 45 20.4	75 53 23.9
Four corners.....	38 45 51.0	75 54 41.7
Henerys' store, 4 corners at, 30 feet south to corner of store, 36 feet west to cedar tree.....	38 45 34.8	75 55 31.3

Anne Arundel, Howard, Montgomery, and Prince George counties; Laurel quadrangle.

The following geographic positions were determined from primary traverse in 1903 by Mr. C. B. Kendall, field assistant.

The line starts from adjusted primary traverse position at Ellicott City and follows Baltimore and Ohio Railroad to Annapolis Junction, thence to Odenton via Annapolis, Washington and Baltimore Railroad, thence to Bowie via Pennsylvania Railroad. From Bowie the line follows highways along south border of quadrangle to southwest corner of same and north to Stabler triangulation station, United States Coast and Geodetic Survey. From Stabler the line follows highways north along west border of quadrangle to adjusted primary traverse position at Glenelg. Positions are given on the United States standard datum.

Geographic positions along the Baltimore and Ohio Railroad between Ellicott City and Annapolis Junction.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ilchester, east track, opposite station	39 14 58.2	76 45 54.5
Orange Grove, east track, opposite station	39 14 30.2	76 44 56.7
Vineyard, west track, over road crossing	39 13 54.7	76 44 07.5
Avalon station, south track at road crossing	39 13 44.1	76 43 19.3
Relay station, opposite east entrance to telegraph office ..	39 13 23.2	76 42 45.4
Elkridge station, east track at road crossing	39 12 55.1	76 42 38.8
Hanover station, north track at road crossing	39 11 32.9	76 43 27.5
Smith's sand bank, west track at road crossing	39 11 08.7	76 44 32.0
Dorsey station, west track at road crossing	39 10 41.4	76 44 52.5
Montevideo station, west track at road crossing	39 09 44.9	76 46 02.7
Jessups station, point between tracks at road crossing....	39 09 06.2	76 46 35.6
Annapolis Junction, road crossing 400 feet southwest of station	39 07 30.5	76 47 28.7

Geographic positions along the Annapolis, Washington and Baltimore Railroad between Annapolis Junction and Odenton.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing	39 06 46.0	76 46 39.1
Portland station, road crossing at	39 05 38.3	76 45 54.6
Admiral station, road crossing at post-office	39 05 22.3	76 44 09.9
Odenton crossing of Philadelphia, Baltimore and Washington and Annapolis, Washington and Baltimore railroads	39 05 14.5	76 42 23.1

Geographic positions along the Philadelphia, Baltimore and Washington Railroad between Odenton and Bowie.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Trestle No. 10, road crossing under	39 03 55.5	76 43 45.7
Patuxent station, road crossing under trestle	39 03 17.9	76 44 11.4
Siding, east track at road crossing	39 02 25.9	76 44 43.6
Arundel station, west track 100 feet north of	39 01 57.9	76 45 12.7
Road crossing (east track)	39 01 03.7	76 45 54.7
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

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bowie, three corners near stone residence in northwest part of	39 00 38.7	76 46 56.0
White house, three corners, 300 feet east of	39 00 34.7	76 48 05.9
Three corners, telegraph road, 45 feet south to oak tree, 55 feet northwest to wild cherry tree.....	39 00 25.2	76 48 38.4
Forks of road to west at row of cedars	39 00 46.0	76 49 14.8
Three corners, 22 feet south to fence post, 40 feet north to pear tree	39 00 56.8	76 50 53.9
Four corners, 40 feet southeast to oak tree, 43 feet southwest to corner of dwelling.....	39 01 10.6	76 51 30.7
Forks of road, 15 feet east to forks of oak, 30 feet northwest to forks of oak	39 00 40.7	76 52 45.8
Forks of road to east, 200 feet east of stream.....	39 00 19.9	76 53 41.0
Four corners, 35 feet southeast to pine tree, 18 feet northwest to old stump	38 59 46.6	76 54 06.9
Branchville, road crossing.....	38 59 55.5	76 55 14.1
Blacksmith shop, three corners at	38 59 54.2	76 55 55.1
Forks, 15 feet south to oak tree, 40 feet northwest to gatepost	39 00 08.8	76 57 58.0
Avenel post-office, three corners.....	39 00 15.1	76 58 52.4
Avenel post-office, four corners, 1 mile southwest of, 31 feet northwest to nail in telephone pole, 30 feet to nail in cedar tree	38 59 58.6	76 59 44.6
Four corners, 30 feet east to north stone gatepost, 23 feet west to corner of Labyrinth's real-estate office.....	39 01 13.1	77 00 47.1
Burnt Mills post-office, forks of road, 300 feet south of ...	39 01 50.8	77 00 19.2
Junction of W. C. A. pike and Bladensburg road at No. 2 tollgate	39 02 26.5	76 59 28.6
Three corners, 15 feet west to oak tree, 40 feet east to mail box	39 03 19.0	76 59 44.2
Colesville, four corners	39 04 33.9	77 00 07.7
Blacksmith shop, forks of road, 25 feet southeast to telephone pole, 35 feet southwest to telephone pole	39 05 21.6	77 00 00.3
Cloverly post-office, three corners, 53 feet west to corner of dwelling, 60 feet south to cherry tree	39 06 43.1	76 59 42.8
Stabler triangulation station, U. S. Coast and Geodetic Survey	39 07 17.7	76 59 06.5
Browns Corners, forks of road	39 07 21.5	76 59 20.4
Ednor, four corners at, 45 feet southwest to corner of post-office, 35 feet north to corner of tollgate No. 3.....	39 08 09.7	76 59 42.3
Three corners at road west, 30 feet east to telephone pole, 35 feet northwest to telephone pole	39 08 34.2	77 00 01.5
Ashton, four corners at, 25 feet northwest to large chestnut tree, 55 feet southwest to pump	39 08 57.8	77 00 45.7
Brinklow, three corners at, 15 feet west to telephone pole, 45 feet west to maple tree.....	39 09 59.8	77 00 56.7
Three corners, 30 feet northeast to old stump, 25 feet southeast to poplar tree.....	39 10 37.8	77 00 19.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Top of hill, forks of road west	39 11 34.8	76 59 30.7
Small stream, forks of road	39 12 15.1	76 59 01.8
Three corners at chestnut tree	39 13 19.0	76 58 29.1
Dayton, four corners at, 45 feet southwest to telephone pole, 27 feet east to large tree opposite Howard's store..	39 14 22.6	76 59 14.0
Dayton, three corners 400 feet west of post-office, 20 feet north to cedar tree, 15 feet east to fence	39 14 29.3	76 59 23.3
Glenelg post-office, three corners 650 feet east of, 25 feet north to corner post fence, 35 feet south to corner of picket fence	39 15 47.0	76 59 56.5
Glenelg post-office, southeast corner stone, foundation Providence M. E. Church	39 15 37.2	77 00 37.1

Anne Arundel County; Relay quadrangle.

Starting at Odenton the line follows the Annapolis, Washington and Baltimore Railroad to Annapolis, connecting with dome of state house, United States Coast and Geodetic Survey triangulation station. Positions given on United States standard datum.

Geographic positions along the Annapolis, Washington and Baltimore Railroad between Odenton and Annapolis.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sappington, road crossing at	39 04 45.5	76 41 09.1
Gambrills station, road crossing at	39 04 07.4	76 40 06.0
Millersville station, road crossing at	39 03 23.8	76 38 57.2
Waterbury station, road crossing at	39 02 51.0	76 37 26.3
Crownsville, road crossing at	39 01 33.6	76 36 02.8
Vacant store, road crossing at	39 00 55.1	76 34 37.8
Inglehart station, road crossing northwest of	39 00 41.3	76 34 02.0
Road crossing	39 00 00.8	76 33 15.8
Camp Parole, road crossing	38 58 57.1	76 31 59.7
Annapolis, road crossing 250 feet west of tank	38 58 45.9	76 30 22.6
Annapolis, junction of Northwest and Washington streets.	38 58 51.1	76 29 48.9
Annapolis state house triangulation station, U. S. Coast and Geodetic Survey	38 58 43.49	76 29 28.17

MICHIGAN.

PRIMARY TRAVERSE.

Macomb and Oakland counties; Detroit quadrangle.

The following geographic positions were determined from primary traverse in 1903 by J. R. Ellis, topographic aid. The line starts from an adjusted position at Novi and follows east along public highways to Lake St. Clair, thence south to Windmill Point triangulation station. Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Novi, Pere Marquette Railroad crossing south of village ..	42	28	32.9	83	28	31.3
T. 1 N., R. 8 E., corner secs. 10, 11, 14, 15	42	29	39.6	83	28	34.4
T. 1 N., R. 8 E., corner secs. 11, 12, 13, 14	42	29	45.0	83	27	24.1
T. 1 N., Rs. 8 and 9 E., corner secs. 7, 12, 13, 18	42	29	48.2	83	26	10.4
T. 1 N., R. 9 E., corner secs. 7, 8, 17, 18	42	29	50.4	83	25	02.2
T. 1 N., R. 9 E., corner secs. 8, 9, 16, 17	42	29	52.1	83	23	52.1
T. 1 N., R. 9 E., corner secs. 9, 10, 15, 16	42	29	54.1	83	22	41.7
T. 1 N., R. 9 E., corner secs. 10, 11, 14, 15	42	29	56.1	83	21	31.5
T. 1 N., R. 9 E., corner secs. 11, 12, 13, 14	42	29	57.8	83	20	21.1
T. 1 N., Rs. 9 and 10 E., corner secs. 7, 12, 13, 18	42	29	59.3	83	19	10.6
Crossroads	42	30	02.9	83	17	07.2
T. 1 N., R. 10 E., corner secs. 9, 10, 15, 16	42	30	04.4	83	15	43.2
T. 1 N., R. 10 E., corner secs. 10, 11, 14, 15	42	30	06.0	83	14	31.1
T. 1 N., R. 10 E., corner secs. 11, 12, 13, 14	42	30	07.8	83	13	21.4
T. 1 N., Rs. 10 and 11 E., corner secs. 7, 12, 13, 18	42	30	09.4	83	12	11.2
T. 1 N., R. 11 E., corner secs. 7, 8, 17, 18	42	30	10.6	83	11	02.3
Cemetery corners, crossroads at corner secs. 9, 10, 15, 16, T. 1 N., R. 11 E.	42	30	14.5	83	08	42.2
T. 1 N., R. 11 E., corner secs. 10, 11, 14, 15	42	30	14.5	83	07	30.4
T. 1 N., R. 11 E., corner secs. 11, 12, 13, 14	42	30	16.0	83	06	21.1
T. 1 N., Rs. 11 and 12 E., corner secs. 7, 12, 13, 18	42	30	17.8	83	05	08.5
T. 1 N., R. 12 E., corner secs. 7, 8, 17, 18	42	30	19.5	83	04	03.3
T. 1 N., R. 12 E., corner secs. 8, 9, 16, 17	42	30	21.1	83	02	47.9
T. 1 N., R. 12 E., corner secs. 9, 10, 15, 16	42	30	22.6	83	01	42.4
T. 1 N., R. 12 E., corner secs. 10, 11, 14, 15	42	30	24.6	83	00	25.1
T. 1 N., R. 12 E., corner secs. 11, 12, 13, 14	42	30	26.7	82	59	14.6
T road north	42	30	29.8	82	58	23.7
Grand Trunk Railway, road crossing at	42	30	31.6	82	57	38.5
Utica Gravel road, at North and South road	42	30	33.7	82	56	10.3
T. 1 N., R. 13 E., corner secs. 9, 10, 15, 16	42	30	35.8	82	54	30.5
T. 1 N., R. 13 E., T road north, near corner secs. 10, 11, 15, 16	42	30	37.7	82	52	49.8
Roseville post-office, crossroads about 3 miles east of	42	28	38.4	82	53	21.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° " "
Euclid Beach (signboard) road west just north of.....	42 27 54.3	82 53 08.7
Half Way House, T road west at	42 26 09.3	82 52 34.3
Jefferson avenue, at road west	42 24 25.5	82 53 13.0
Grosse Point post-office, Jefferson avenue T street north at.	42 23 11.0	82 54 05.0
United States Lake Survey triangulation station Windmill Point light-house	42 21 29.95	82 55 48.85

MISSOURI.**PRIMARY TRAVERSE.**

St. Louis County; St. Louis quadrangle.

The following geographic positions were determined from traverse by Mr. George T. Hawkins, topographer, in 1903. The line starts from the United States Coast and Geodetic Survey triangulation station, standpipe in north St. Louis, follows highways through Wellston and Pattonville to the St. Louis, Kansas City and Colorado Railroad, thence to Creve Coeur, thence along Missouri Pacific Railway 4 miles toward St. Louis, thence southward along highways to Barrett, thence along Missouri Pacific Railway through tunnel, thence along St. Louis and San Francisco Railroad across the Meramec River, thence by wagon road to Forder triangulation station, United States Coast and Geodetic Survey.

Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Standpipe, U. S. Coast and Geodetic Survey	38 40 13.6	90 12 30.1
Wellston, crossing St. Charles road and city limits.....	38 40 31.1	90 17 08.0
Eden school ground, road north at southeast corner of ..	38 40 49.9	90 17 43.4
End of car line, road south at.....	38 41 08.2	90 18 18.4
Rosa post-office, road south at	38 41 55.1	90 19 41.3
Road south	38 42 09.6	90 20 09.2
Road south	38 42 21.8	90 20 32.1
Road south	38 42 56.0	90 21 35.3
Road south	38 43 43.6	90 23 01.7
Road south	38 44 04.2	90 23 38.4
Pattonville, four corners.....	38 44 24.5	90 24 13.5
T road south.....	38 45 03.2	90 25 34.8
Road south	38 44 36.9	90 26 15.0
Forks of road.....	38 44 08.6	90 27 49.0

Geographic positions along the St. Louis, Kansas City and Colorado Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south	38 43 52.9	90 28 34.9
Road crossing north and south	38 43 40.4	90 29 10.6
Road crossing	38 42 52.6	90 29 40.1
Creve Coeur station	38 41 50.9	90 29 55.0

Geographic positions along the Missouri Pacific Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, road crossing at	38 41 16.6	90 28 34.5
Road crossing over railway northwest of station (no name) ..	38 40 37.1	90 28 00.9
Road crossing southeast of station	38 39 58.1	90 26 53.2
Missouri Pacific Railway and ballast road, crossing of....	38 39 51.3	90 26 37.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads	38 39 18.8	90 26 37.9
Crossroads	38 38 28.9	90 26 38.5
Pike and ballast roads, crossing of	38 37 52.5	90 26 39.0
Road east	38 37 05.9	90 26 39.8
Des Peres, Manchester and Ballasts road at	38 36 11.9	90 26 40.8
Blacksmith shop, road north at	38 36 08.0	90 27 46.2
Crossroads	38 35 46.9	90 28 28.7

Geographic positions along Missouri Pacific and St. Louis and San Francisco railroads.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tunnel, road crossing near west end of, Missouri Pacific Railway	38 33 59.8	90 28 13.4
Valley Park, road crossing south of Frisco station at....	38 32 56.2	90 29 28.2
Valley Park, road crossing $\frac{1}{2}$ mile south of	38 32 29.7	90 29 42.0

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, T road north at.....	38 31 25.1	90 29 11.6
Road south	38 31 24.6	90 28 21.8
Fenton, T road one-third mile west of	38 30 43.9	90 26 37.0
Fenton, four corners at	38 30 47.2	90 26 08.6
Road south	38 31 29.1	90 23 46.7
T road east	38 31 46.4	90 23 21.5
Sappington, crossroads one-half mile south of	38 31 44.7	90 22 47.5
Store, crossroads at.....	38 31 27.4	90 21 26.5
Road south	38 31 10.3	90 20 33.0
St. Johns Church, corner of road at	38 30 50.9	90 20 13.7
Mehlville, four corners at.....	38 30 21.4	90 19 32.4
Road north	38 30 06.9	90 18 26.0
Crossroads	38 30 08.2	90 17 51.5
Forder triangulation station, U. S. Coast and Geodetic Survey	38 30 39.6	90 17 31.4

ILLINOIS.**PRIMARY TRAVERSE.**

Madison and St. Clair counties; St. Louis quadrangle.

The following geographic positions were determined from primary traverse for the control of the St. Louis quadrangle by Mr. George T. Hawkins, topographer, in 1903. This line starts from United States Coast and Geodetic Survey triangulation station Sugarloaf, and follows highways northward to Peters, Illinois; thence along Toledo, St. Louis and Western Railroad to East St. Louis; thence along the St. Louis Terminal Railway around East St. Louis to where the Mobile and Ohio Railroad starts south; thence along the St. Louis, Iron Mountain and Southern Railway to a point nearly west from United States Coast and Geodetic Survey triangulation station Dryer; thence along highways to Dryer triangulation station.

A spur leaves this line nearly east of Granite City, Illinois, and runs to the corner of Twenty-first and L streets, Granite City.

Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sugarloaf triangulation station, U. S. Coast and Geodetic Survey	38 42 05.3	90 00 27.5
Three roads, junction of	38 42 23.8	90 00 43.9
Road west	38 42 58.4	90 00 38.9
Road east	38 43 49.2	90 00 12.8

Geographic positions along the Toledo, St. Louis and Western Railroad between Peters and Madison.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Peters, crossing of Toledo, St. Louis and Western Railroad at	38 44 30.7	90 00 07.4
Road crossing east and west	38 44 17.0	90 01 02.4
Road and telephone line crossing	38 44 01.6	90 02 09.6
Stallings, road crossing at	38 43 35.2	90 03 34.3
Road crossing north and south	38 43 17.1	90 04 32.2
Barco, road crossing at	38 43 02.6	90 05 05.5
Horseshoe Lake, road crossing at	38 42 45.9	90 05 38.6
Granite City, crossing Toledo, St. Louis and Western Railroad and street-car line 2 miles east of	38 42 10.7	90 06 37.7
Road crossing	38 41 27.2	90 07 34.9
Madison, road crossing at (Illinois Central station)	38 40 31.7	90 08 48.0
Toledo, St. Louis and Western and St. Louis Terminal railroads, crossing of	38 39 39.0	90 09 32.2

Geographic positions along the St. Louis Terminal Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Toledo, St. Louis and Western and St. Louis Terminal railroads crossing, road crossing one-half mile nearly south of	38 39 15.4	90 09 25.2
East St. Louis, crossing First street	38 38 32.0	90 08 33.6
East St. Louis, crossing Ohio and Mississippi Railway	38 38 13.9	90 08 02.8
East St. Louis, street crossing 700 feet east of last	38 38 13.0	90 07 54.8
East St. Louis, crossing Louisville and Nashville Railroad	38 37 31.6	90 07 48.6
East St. Louis, crossing Rock road	38 37 07.4	90 08 02.7
East St. Louis, crossing St. Louis avenue	38 36 38.7	90 08 14.0
East St. Louis, crossing Southern Railway	38 36 24.4	90 08 33.3

Geographic positions along the St. Louis, Iron Mountain and Southern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Large frame house, private road crossing at	38 34 51.7	90 09 57.2
Road crossing north and south	38 34 22.2	90 10 22.1
Cemetery, north and south road crossing at	38 33 54.6	90 10 45.2
Dupo station, north and south road crossing 600 feet northeast of	38 32 39.5	90 11 48.4
Road crossing	38 31 12.1	90 12 37.7
Road crossing	38 30 30.8	90 12 57.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, forks of road at	38 29 44.2	90 12 39.1
Dryer triangulation station, U. S. Coast and Geodetic Survey	38 30 06.3	90 11 54.3

Geographic positions along highways (spur line).

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north	38 41 54.3	90 07 18.9
T road west near street-car line	38 42 07.5	90 07 19.4
Roads northeast and southwest	38 42 07.2	90 07 53.5
Granite City, corner Twenty-first and L streets	38 41 56.2	90 08 32.2

MISSOURI.

PRIMARY TRAVERSE.

Jefferson, St. Francois, Ste. Genevieve, and Washington counties; Bonnetterre and Farmington quadrangles.

The following geographic positions were determined by primary traverse in 1903 by J. R. Ellis, topographic aid. Starting at Sulphur Springs triangulation station of United States Mississippi River Commission; the line follows the St. Louis, Iron Mountain and Southern Railway to Riverside, thence along the Mississippi River and Bonnetterre Railway to Silverspring, thence west on wagon road to latitude 38° and longitude 90° 45', thence south through Potosi to Caledonia, thence east on wagon road to Bismarck, thence along St. Louis,

Iron Mountain and Southern Railway to Delassus, thence along public highway to point near southeast corner of quadrangle and north to Bloomsdale, thence west along public highway through French Village to Tunnel station, connecting with original line at this point. A spur line from northeast corner of quadrangle runs northeast, connecting with Magnolia triangulation station of the United States Mississippi River Commission.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Sulphur Springs triangulation station, United States Mississippi River Commission	38 19 41.1	90 22 30.4
Bushberg station, St. Louis, Iron Mountain and Southern Railway	38 18 12.1	90 22 32.0

Geographic positions along the Mississippi River and Bonnetterre Railway, between Riverside and Silverspring.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing, overhead	38 13 39.9	90 22 40.1
Festus station, east and west road crossing south of.	38 13 04.6	90 23 01.2
Road crossing east and west	38 12 13.7	90 23 26.6
Ste. Genevieve station, road crossing 250 feet southwest of.	38 10 50.3	90 23 30.3
Road crossing east and west	38 08 55.4	90 24 02.2
Plattin station, road crossing 50 feet north of	38 07 52.9	90 24 38.6
Road crossing north and south (private)	38 06 43.8	90 25 38.8
T. 39 N., R. 5 E., quarter corner between secs. 11, 14	38 06 04.7	90 26 34.3
Trestle, road crossing under	38 05 17.7	90 27 43.3
Road crossing northwest and southeast	38 04 25.7	90 28 06.6
Milepost 19, road crossing at	38 03 21.7	90 28 35.3
Valles Mines, road crossing east and west at	38 02 29.3	90 29 51.3
T. 38 N., R. 5 E., corner secs. 5, 6, 7, 8	38 01 42.1	90 30 29.5
Silverspring, road crossing east and west	37 59 59.4	90 31 33.8

Geographic positions along highways..

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads.....	37 59 49.8	90 32 46.6
Corner sections (no number).....	38 00 06.9	90 33 52.3
T road north, lane south.....	38 00 40.1	90 34 42.5
T road north.....	38 00 42.1	90 35 50.6
T 38 N., R. 4 E., corner secs. 17, 18, 19, and 20.....	38 00 25.9	90 37 12.6
T road northwest.....	37 59 57.6	90 38 27.0
Road north.....	37 59 43.8	90 39 35.3
Cadet, T road north, about 0.75 mile northeast of.....	37 59 07.0	90 40 54.0
Whites, Iron Mountain Railway at road crossing at.....	37 58 49.7	90 42 16.8
Selby and Mineral Point and Shibbeloth roads, crossing of.....	37 58 05.5	90 43 31.9
Road north and south.....	37 57 57.6	90 44 38.2
Potosi and Old Mines road and 3 notch road north, intersection of.....	37 57 58.3	90 45 49.1
Potosi and Selby and Potosi and Old Mines roads, crossing of.....	37 56 42.8	90 46 04.6
Potosi, South Meridian stone at.....	37 56 12.5	90 47 16.8
Potosi, crossing of Missouri and High streets.....	37 56 11.0	90 47 16.3
Road east.....	37 55 33.4	90 45 59.6
T. 39 N., Rs. 2 and 3 E., corner secs. 19, 30, 25, and 24 ..	37 54 15.7	90 45 29.2
Road southeast.....	37 53 25.6	90 44 16.0
Road northeast and southwest.....	37 52 52.2	90 43 05.4
Potosi and Irondale and Potosi and Hunters Mill roads, crossing of.....	37 52 28.0	90 42 55.1
Caledonia and Irondale road and road southwest, intersection of.....	37 51 00.7	90 43 53.2
Road east and west.....	37 50 23.3	90 44 56.4
Potosi and Caledonia and Irondale and Caledonia roads, crossing of.....	37 49 05.4	90 46 34.4
T road west.....	37 47 28.6	90 46 41.2
Caledonia, T. road west, 0.25 mile north of.....	37 46 01.6	90 46 22.3
Road northwest.....	37 46 25.3	90 44 44.9
Caledonia and Irondale road and road to Bismarck, intersection of.....	37 46 50.9	90 42 42.9
Road southwest.....	37 45 51.1	90 41 31.5
Road north.....	37 45 18.9	90 39 44.0
Washington and St. Francois county line, crossroads at ..	37 45 30.1	90 38 38.9

Geographic positions along the St. Louis, Iron Mountain and Southern Railway between Bismarck and Delassus.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bismarck station, street crossing 210 feet southeast of....	37 46 05.4	90 37 33.4
T. 35 N., R. 4 E., corner secs. 5, 6, 7, and 8	37 45 50.9	90 37 29.3
Road crossing north and south	37 45 35.4	90 36 40.4
Road crossing northwest and southeast (private).....	37 44 33.1	90 35 27.7
Milepost 81, private road crossing northwest and southeast near	37 46 04.3	90 33 00.7
Loughboro, road crossing north and south at.....	37 46 37.5	90 31 02.6
Bridge No. 843, road crossing north and south 1,000 feet east of.....	37 46 28.2	90 29 44.9
Doe Run Junction, crossing of Mississippi River and Bonnetterre Railway	37 46 19.7	90 29 20.6
Delassus station, road crossing at.....	37 45 43.4	90 27 26.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Farmington, crossing of Main street and Cosey avenue...	37 46 49.7	90 25 33.8
Farmington, intersection of Ste. Genevieve and St. Marys roads, 1 mile east of	37 46 37.2	90 24 08.9
T. 35 N., R. 4 E., quarter corner between secs. 4, 5.....	37 45 59.1	90 23 00.1
T. 35 N., R. 4 E., quarter corner between secs. 3, 4.....	37 45 58.3	90 21 52.8
T. 35 N., R. 4 E., quarter corner between secs. 2, 3.....	37 45 58.9	90 20 45.1
Road north	37 45 55.0	90 18 27.5
Y road north	37 47 06.1	90 17 49.5
T road south.....	37 48 38.7	90 18 15.0
T road east	37 49 35.0	90 18 25.1
T. 36 N., Rs. 6 and 7 E., corner secs. 7, 12, 13, and 18 ...	37 49 56.1	90 18 30.0
Jonca Creek, iron bridge over.....	37 50 36.6	90 17 06.9

Geographic positions along the Missouri Southern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossing, Missouri Southern Railroad and Ste. Genevieve wagon road	37 51 35.0	90 16 15.9
Crossing, Missouri Southern Railroad and Ste. Genevieve wagon road	37 52 33.4	90 13 36.1
Weingarten, road crossing at.....	37 53 15.4	90 12 52.1
Missouri Southern Railroad and Ste. Genevieve wagon road east and west, crossing of	37 54 03.2	90 12 48.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road at corner of field	37 54 51.7	90 12 55.8
Road northeast and southwest	37 56 06.6	90 13 23.1
Establishment Creek, forks of road just east of	37 58 59.1	90 12 35.6
Bloomsdale, crossroads at	38 00 28.5	90 13 04.7
Y road east	38 01 01.9	90 14 20.2
Junction of Goose and Fourche a Du Close creeks (and also Y road northeast)	37 59 52.4	90 16 27.5
Lawrenceton, intersection of Ste. Genevieve and Crystal City roads one-third mile north of	37 58 15.0	90 18 06.9
Intersection of roads at corner of field	37 57 53.2	90 19 58.8
Road west near top of hill	37 58 07.1	90 20 52.9
T. 38 N., R. 4 E., corner secs. 27, 28, 33, and 34	37 58 11.9	90 21 44.4
French Village, intersection of roads at	37 58 21.8	90 23 21.5
French Village, Valles Mines road, and St. Louis road, crossing of	37 58 33.3	90 24 50.7
Road east	37 59 12.0	90 25 42.0
Road northwest	37 59 24.6	90 26 52.6
French Village, north and south roads, crossing of	38 00 00.8	90 28 36.0
French Village and Vales Mines road, and road west to Tunnel, intersection of	38 00 42.9	90 29 18.6
Crossroads	38 00 46.2	90 30 13.1

Spur line from northeast corner of quadrangle to Magnolia triangulation station, United States Mississippi River Commission.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Establishment Creek, T road, southeast at	38 02 24.5	90 10 17.1
Magnolia triangulation station, United States Mississippi River Commission	38 02 42.5	90 08 38.7

St. Francois and Ste. Genevieve counties; Farmington quadrangle.

The following geographic positions were determined by Mr. Sledge Tatum, topographer, in 1904. Line starts from adjusted position 1 mile east of Farmington, determined in 1903, and follows highways north to adjusted position 1.5 miles west of French Village.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Farmington, forks of road 1 mile east of	37 46 37.2	90 24 08.9
Farmington, aluminum bench-mark tablet in south front of foundation of court-house, west side of entrance, 2 feet above ground, stamped elevation 917 feet	37 46 48.1	90 25 13.9
Road east	37 48 16.8	90 25 03.5
Farmington Junction, Missouri Southern Railroad crossing, east and west	37 49 53.1	90 25 11.3
Road west	37 51 05.9	90 25 19.9
Three Rivers Baptist Church, tablet stamped "Prim. Trav. Sta. No. 35" cemented in solid rock on east side of St. Louis road, 60 feet north of crossroads and 1,200 feet west of church	37 51 42.4	90 25 20.6
Road west	37 52 34.4	90 25 18.6
Road east	37 53 21.2	90 25 08.5
Road west	37 54 10.6	90 24 58.8
Doctor Scott's house, road east, 1,000 feet north of	37 54 39.8	90 24 54.6
Terre Bleu Creek, center of bridge over	37 55 10.8	90 25 02.3
Jaydee post-office, bench-mark tablet stamped "Prim. Trav. Sta. No. 60" cemented in foundation corner of west wall, Chapman's residence	37 55 35.1	90 25 00.0
Road west	37 56 10.4	90 24 59.0
Road east to French Village	37 57 40.1	90 25 01.4
De Soto road, French Village is east 1.5 miles; De Soto is west 18 miles; St. Louis is north 55 miles	37 58 33.3	90 24 50.7

Washington County; Potosi quadrangle.

The following geographic positions were determined from primary traverse in 1904 by Mr. Sledge Tatum, topographer. The line starts from a point in Potosi established by Mr. Ellis in 1903, and follows highways west, south, and east along border of quadrangle:

Geographic positions along highways.

Stations.	Latitude.	Longitude.
	° ' "	° ' "
Potosi; Missouri and High streets, crossing of	37 56 11.0	90 47 16.3
Road south	37 56 48.4	90 47 57.6
Road south	37 57 25.1	90 48 37.3
Door of Public Hall, road north	37 59 17.3	90 50 59.0
T. 38 N., R. 1 E., secs. 35 and 36, quarter corner between	37 58 30.3	90 53 08.0
Crossroads	37 58 30.0	90 53 51.1
William Smith's house, 140 feet east of, west side of branch, 60 feet west of spring house, cemented in solid rock, bronze tablet stamped "Prim. Trav. Sta. No. 79"	37 58 46.4	90 55 02.2
Road north	37 59 32.4	90 55 58.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads.....	37 59 52.7	90 56 46.4
Road north.....	38 00 28.1	90 57 31.4
At top of hill, dim crossroad, mark in red paint on tree "U. S. G. S. Sta. 145".....	37 59 39.8	90 59 02.8
Floyd and Undine post-offices, between; on summit of divide cemented in solid rock on north side of road, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 167".....	37 58 21.7	90 59 32.3
Singer's house, road east at.....	37 57 34.8	90 58 08.4
Floyd post-office, intersection Berryman and Potosi roads, 700 feet west of.....	37 57 13.9	90 57 06.4
Wooden bridge over creek.....	37 56 40.2	90 58 10.7
Church, 800 feet east of, road to Potosi.....	37 55 21.2	90 59 02.9
T road.....	37 55 16.9	90 59 44.8
Sawmill, 300 feet southeast of road west.....	37 53 34.9	90 59 50.5
Road west, on east side of north and south road, cemented in solid rock, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 297".....	37 52 42.3	90 59 36.4
Dim road east.....	37 51 38.1	90 58 46.9
Potosi and Palmer road east.....	37 51 00.5	90 59 13.6
T road.....	37 50 21.8	90 59 45.7
Road west.....	37 50 18.4	91 00 54.2
Road west.....	37 49 39.4	91 01 23.6
Road west.....	37 48 28.3	91 01 39.0
Crossroads, trees blazed and marked with red paint, ce- mented in solid rock, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 394".....	37 47 40.7	91 01 14.3
George Dickens's house, T road at.....	37 46 54.5	91 00 53.5
Road west.....	37 46 44.6	91 00 22.5
Road north.....	37 46 44.9	90 58 13.1
Road north.....	37 46 41.1	90 56 32.7
Road south.....	37 46 43.1	90 55 07.8
Sunlight post-office.....	37 46 55.4	90 54 14.3
H. E. Johnson's house, 500 feet south of; 2.5 miles west of Belgrade, on east bank of creek, cemented in solid rock, bronze bench-mark tablet stamped "Prim. Trav. Sta. No. 498".....	37 46 46.5	90 52 38.8
Belgrade post-office.....	37 47 15.9	90 51 01.5
T. 35 N., R. 2 E., secs. 4 and 5, on line between.....	37 46 44.5	90 50 20.7
Crossroads.....	37 46 20.2	90 49 38.8
Caledonia, road south, about 2.5 miles west of.....	37 45 59.2	90 49 02.7
Caledonia, intersection of Main street and Irondale road..	37 45 50.7	90 46 21.7
Caledonia, in front of Methodist Church, in large sand- stone step, aluminum tablet stamped "923 St. Louis" and "Prim. Trav. Sta. No. 540" (elevation 923.011 feet).	37 45 48.4	90 46 21.8

NEW YORK.

TRIANGULATION STATIONS.

Alleghany County; Belfast quadrangle.

Additional control for this quadrangle was obtained by Mr. E. L. McNair, topographer, who located two new stations from Belfast and Davis triangulation stations. Positions are given on the United States standard datum.

BELFAST, ALLEGANY COUNTY.

Situated in lot 10, in southwest corner of town of Belfast, about 8 miles southwest of Belfast village, 4 miles northwest of Friendship, and about 2 miles east of Black Creek post-office; 8 feet north of road from Black Creek to Transit Bridge.

Station mark: A copper bolt set in granite post 4 feet long by 6 inches square, marked "U. S. G. S. 477 N. Y."

[Latitude 42° 15' 18.33." Longitude 78° 10' 56.92."]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clarksville.....	4 14 33.4	184 13 56.6	4.2311051
Learn	84 30 43.1	264 20 40.1	4.3150995
Gordon.....	156 59 41.60	336 57 16.72	4.1005250
Davis	170 14 49.30	350 12 21.46	4.4706017
Lowe.....	241 51 42.55	62 00 20.24	4.3003731
Alma.....	328 17 19.3	148 24 10.2	4.4279013
Ward	272 59 18.3	93 11 57.9	4.4139142

DAVIS, ALLEGANY COUNTY.

Located in the northern part of Centerville Township, about 2 miles north of Centerville village, on land owned by Milton Davis.

Station mark: A bronze triangulation tablet cemented in solid rock under center of signal.

[Latitude 42° 31' 02.22". Longitude 78° 14' 36.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carpenter	176 40 39.24	356 40 09.55	4.2363363
Felch	227 29 55.55	47 38 39.19	4.3784343
Nunda	258 10 54.79	78 25 47.18	4.4878673
Lowe.....	311 01 42.98	131 12 49.93	4.4770941
Belfast	350 12 21.46	170 14 49.30	4.4706017
Gordon.....	359 41 47.04	179 41 49.78	4.2436337

GORDON, ALLEGANY COUNTY.

Located on a bare knoll in the town of Rushford, about $2\frac{1}{2}$ miles south of Rushford village. It is 34 feet north of the center of east-west road and 15 feet south of center of stone pile marking site of former house. Land owned by Mrs. Gordon, of Rushford.

Station mark: A marble post 33 by 8 by 8 inches set 31 inches in the ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude $42^{\circ} 21' 34.29''$. Longitude $77^{\circ} 14' 32.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Davis	179 41 49.78	359 41 47.04	4. 2436337
Lowe.....	275 29 45.15	95 40 48.36	4. 3548994
Belfast	336 57 16.72	156 59 41.60	4. 1005250

LOWE, ALLEGANY COUNTY.

Located in the southwest corner of town of Birdsall, about $3\frac{1}{2}$ miles northeast of Angelica. The hill is mostly cleared, but view to north and northeast is cut off by higher hills. Land owned by S. P. Lowe, of Angelica.

Station mark: A marble post 18 by 6 by 6 inches set 10 inches below surface of ground, in top of which is cemented a bronze triangulation tablet.

Reference mark: A marble post 33 by 8 by 8 inches set 30 inches in the ground, in top of which is cemented a bronze triangulation tablet; the letters R. P. cut in top of post. It stands 2 feet south of fence line and 4 feet south of maple tree. True azimuth from station $168^{\circ} 06' 30''$; distance 94.4 feet.

[Latitude $42^{\circ} 20' 22.84''$. Longitude $78^{\circ} 58' 07.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Belfast	62 00 20.24	241 51 42.55	4. 3003731
Gordon.....	95 40 48.36	275 29 45.15	4. 3548994
Davis	131 12 49.93	311 01 42.98	4. 4770941

PRIMARY TRAVERSE.

Erie, Genesee, and Wyoming counties; Attica quadrangle.

The following geographic positions were determined by primary traverse run in 1903 by Mr. E. L. McNair, topographer: The line begins at Attica triangulation station and runs west and south to

Orangeville Center, thence west through Varysburg to Wales Center, thence north through Alden to Murrays Corners and Falkirk triangulation station, thence east through East Pembroke to Willow Bend Inn and Batavia triangulation station, thence south from Willow Bend Inn through Alexander to point of starting. Positions are given on United States standard datum.

Geographic positions along highways from Orangeville Center to Wales Center.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Orangeville Center, four corners.....	42 45 00.6	78 14 55.5
Orangeville Center, 1.5 miles west of, four corners.....	42 45 21.1	78 16 43.1
Varysburg post-office, in street opposite.....	42 45 41.6	78 18 47.2
Varysburg station, road crossing 150 feet south of.....	42 45 59.7	78 19 10.5
Varysburg station, 1 mile west of, four corners.....	42 46 13.1	78 20 14.3
Varysburg station, 1.5 miles west of, road north.....	42 46 13.6	78 21 09.8
North Sheldon, four corners at.....	42 46 12.8	78 23 20.4
Dorshide's hotel, 1.25 miles east of, four corners.....	42 46 11.6	78 25 08.4
Dorshide's hotel, road north.....	42 46 10.6	78 26 32.5
Iron highway bridge, 400 feet east of, road north.....	42 46 11.0	78 29 09.3
Wales Center, covered bridge, 1.5 miles east of, forks of road.....	42 46 05.0	78 31 19.1

Geographic positions along highways from Wales Center via Alden to Murrays Corners.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wales Center, 2.25 miles northeast of, forks of road.....	42 47 25.9	78 29 54.4
Williston, 2.5 miles south of, T road north.....	42 47 25.8	78 30 57.7
Williston, 1.25 miles south of, creek crossing.....	42 48 35.7	78 31 01.4
Williston, T road at.....	42 49 39.0	78 31 00.2
Williston, 1 mile east of, four corners.....	42 49 39.7	78 29 47.7
Alden, 4.25 miles south of, four corners.....	42 50 32.9	78 29 48.3
Iron bridge over Cayuga Creek, T road at west end of....	42 51 27.3	78 30 20.2
Alden, 1.25 miles south of, road east.....	42 52 42.1	78 29 49.0
Alden station, Erie Railway, road crossing.....	42 53 48.0	78 29 47.5
Alden station, Lackawanna Railway, road crossing.....	42 55 20.7	78 29 39.6
Crittenden station, New York Central Railway, road crossing 250 feet south of.....	42 56 33.8	78 29 15.7
Crittenden station, 1 mile north of, road east.....	42 57 15.3	78 28 42.8
Murrays Corners, 2 miles south of, road west.....	42 58 31.3	78 28 41.8
Murrays Corners, four corners.....	42 59 53.6	78 28 39.9

Geographic positions along highways from Murrays Corners via East Pembroke east to Willow Bend Inn.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Richville, four corners at	42 59 51.1	78 26 07.0
Richville, 1.5 miles east of, four corners	42 59 34.8	78 24 22.5
Batavia and Tonawanda Railway crossing, 0.5 mile west of, road south	42 59 41.8	78 22 30.8
Batavia and Tonawanda Railway crossing, 0.5 mile east of, road north	42 59 48.7	78 21 21.0
East Pembroke, 0.75 mile west of, road north	42 59 50.4	78 19 39.7
East Pembroke, road south at	42 59 43.7	78 18 36.2
Willow Bend Inn, 0.6 mile west of, road south	43 00 03.2	78 15 40.2
Willow Bend Inn, road north at	43 00 19.0	78 15 02.3

Geographic positions along highways from road corner 0.6 mile west of Willow Bend Inn south to Orangeville Center.

Station.	Latitude.	Longitude.
	° ' "	° ' "
New York Central Railway crossing	42 58 57.8	78 15 35.1
Lehigh Valley Railroad crossing, 1 mile south of, four corners	42 57 21.2	78 75 25.9
Alexander, 2 miles north of, Lackawanna Railway crossing	42 55 47.5	78 15 27.2
Alexander, 0.75 mile north of, road west	42 54 38.2	78 14 57.5
Alexander, main four corners at	42 54 04.5	78 15 26.0
New York Central Railway, Batavia and Attica branch, crossing about 0.6 mile north of F. W. Stevens's house	42 52 31.7	78 15 29.6
Attica, 1 mile east of, forks of road at cheese factory	42 51 42.9	78 15 38.1
Cheese factory, 1.75 miles south of, road west	42 50 14.6	78 15 09.0
Attica Center, 0.75 mile west of, four corners	42 48 55.8	78 14 58.4
Orangeville Center, 3 miles north of, four corners	42 47 36.9	78 14 56.1
Orangeville Center, 1.5 miles north of, four corners	42 46 17.8	78 14 55.6

Erie County; Depew quadrangle.

The following geographic positions were determined by primary traverse run in 1903 by Mr. E. L. McNair, topographer. The line begins at Murrays Corners, about 2 miles south of Falkirk triangulation station, and runs west to Williamsville, thence south to Orchard Park, thence east to Wales Center, and is tied to point located by primary traverse the same season. Positions are given on United States standard datum.

Geographic positions along highways from Murrays Corners to Williamsville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Grant Club pole, 0.75 mile west of, road north.....	42 59 48.7	78 31 03.1
Clarence, 1.5 miles east of, four corners.....	42 59 27.8	78 33 07.8
Clarence, 0.5 mile east of, road north.....	42 58 56.0	78 34 38.5
Clarence station, West Shore Railway, crossing about 400 feet west of	42 58 53.6	78 35 15.1
Clarence, 1.5 miles northwest of, four corners.....	42 59 17.7	78 36 27.4
Four corners.....	42 59 17.7	78 37 03.2
Four corners.....	42 59 18.9	78 38 50.5
Four corners.....	42 59 20.6	78 39 44.1
Transit road, junction with	42 59 21.3	78 41 49.7
Williamsville, 2.25 miles northeast of T road north	42 58 39.7	78 43 16.0
Williamsville, road south, 800 feet west of stone bridge...	42 57 44.7	78 44 49.2

Geographic positions along highways from Williamsville south to Orchard Park.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Williamsville, 1 mile south of, road east	42 56 56.7	78 44 41.3
Williamsville, 2.75 miles south of, junction with east and west road.....	42 55 44.6	78 44 39.0
New York Central Railway crossing.....	42 54 14.8	78 45 16.0
Lehigh Valley Railway, 0.75 mile south of, road west....	42 53 07.0	78 45 17.4
Gardenville, 1 mile north of, four corners.....	42 52 06.2	78 45 16.1
Gardenville, four corners at.....	42 51 18.2	78 45 17.8
Gardenville station, Pennsylvania Railroad, 1,800 feet south of, four corners.....	42 50 22.0	78 45 15.6
Ebenezer restaurant, four corners at	42 49 48.8	78 45 13.9
T road corners	42 48 40.5	78 44 42.8
Websters corners, 1.75 miles north of, road west.....	42 48 14.0	78 45 20.3
Webster, four corners	42 46 54.0	78 44 47.0
Orchard Park, four corners, 41 feet southeast of Briggs Bros.' store.....	42 46 02.7	78 44 39.2

Geographic positions along highways from Orchard Park to Wales Center.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Orchard Park, 1 mile south of, four corners	42 45 03.6	78 44 53.4
Orchard Park station, 1.5 miles southeast of, Buffalo, Rochester and Pittsburg Railway crossing	42 45 02.8	78 43 51.3
Buffalo, Rochester and Pittsburg Railway crossing, 2.5 miles west of, four corners	42 45 10.7	78 40 53.9
Cazanova Creek, center of covered bridge over	42 45 14.6	78 39 08.8
Four corners	42 45 40.0	78 38 37.9
East Aurora, Main street crossing Pennsylvania Railroad ..	42 46 04.0	78 36 44.6
East Aurora, Main street crossing, 1.75 miles east of, four corners	42 46 02.0	78 34 41.2
Forks of road	42 46 04.1	78 33 08.9
Wales Center, southeast corner of church	42 46 06.8	78 32 02.0
Wales Center, Dr. Wells Faber's monument in church yard	42 46 06.5	78 32 03.1

Oneida and Oswego counties; Mexico and Kasoag quadrangles.

The following geographic positions were determined by primary traverse run by Mr. E. L. McNair, topographer. The line starts at Central Square Methodist Church, a position determined by the New York State Survey, and runs westward along New York, Ontario and Western Railway to Pennellville, thence north via highways to Dyke triangulation station on Lake Ontario, thence eastward via highways through Fernwood to South Albion, thence south via West Amboy to Constantia, thence west along New York, Ontario and Western Railway to Central Square.

A second line was started at Constantia, running east along New York, Ontario and Western Railway to Cleveland, thence north and east via highways to Camden, thence north and east via Williamston to South Albion. A line was also run between Williamston and West Amboy, connecting with Amboy triangulation station.

Positions are given on the United States standard datum.

Geographic positions from Central Square west along New York, Ontario and Western Railway to Pennellville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Central Square M. E. Church triangulation station	43 17 13.5	76 08 45.88
Central Square station, crossroads 600 feet west of	43 16 39.9	76 08 42.8
Caughdenoy station	43 16 47.8	76 12 34.8
Pennellville, crossroads 0.25 mile east of	43 16 54.4	76 15 50.8

Geographic positions along highway—Pennellville north to Lake Ontario.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pennellville, crossroads about 2 miles north of	43 18 25.3	76 15 06.1
Road east	43 20 28.2	76 14 33.4
Mexico, three corners 2 miles north of	43 22 00.9	76 14 29.9
Five corners	43 23 49.1	76 15 24.9
Road west	43 25 18.5	76 15 01.0
Three corners	43 36 46.8	76 14 22.6
Mexico station, railway crossing just west of	43 28 12.2	76 14 17.5
Three corners	43 29 39.8	76 14 39.2
Arthur post-office, five corners	43 29 42.4	76 14 55.3
Arthur, five corners 1 mile northeast of	43 30 19.3	76 13 56.9

Geographic positions along highways from Arthur eastward to South Albion.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Arthur, four corners 3.25 miles east of	43 29 13.0	76 11 09.2
Fernwood post-office, 0.75 mile southwest of, four corners ..	43 29 07.9	76 09 24.2
Fernwood station, railway crossing 250 feet south of	43 29 41.1	76 08 41.8
Fernwood, 2.5 miles east of, four corners	43 29 05.7	76 05 52.8
Dugway, three corners in front of hotel	43 27 40.6	76 04 55.4
Howardville, forks of road	43 27 39.8	76 03 41.4
South Albion, four corners	43 28 02.0	76 00 46.5

Geographic positions along highways from South Albion south to Constantia.

Station.	Latitude.	Longitude.
	° ' "	° ' "
South Albion, 2 miles south of, road west	43 26 12.1	76 00 57.4
Three corners	43 25 25.1	76 00 13.4
Road east	43 24 24.5	75 59 42.2
West Amboy, three corners	43 23 04.9	75 59 07.8
Four corners	43 22 36.4	75 56 14.6
Four corners	43 23 25.3	75 55 38.8
North Constantia, four corners	43 20 33.3	75 59 51.3
Four corners	43 18 21.5	76 00 49.9
Creek crossing	43 17 04.7	75 59 50.8
Constantia station, railroad crossing 350 feet east of	43 15 02.6	76 00 03.0

Geographic positions along New York, Ontario and Western Railway from Constantia to Central Square.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing	43 16 02.4	76 02 48.7
West Monroe station	43 16 33.4	76 04 07.2
Central Square station, railroad crossing	43 16 39.8	76 08 34.4

Geographic positions along New York, Ontario and Western Railway—Constantia to Cleveland.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing	43 14 57.5	75 57 54.3
Bernhards station	43 14 46.2	75 55 59.0
Road crossing	43 14 21.1	75 53 46.9
Cleveland station	43 14 10.8	75 52 53.5

Geographic positions along highways—Cleveland to Camden.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Cleveland station, 0.75 mile north of, road west	43 14 45.6	75 52 33.3
Church, four corners at	43 16 12.4	75 51 21.3
One mile east of church, three corners	43 15 59.6	75 50 20.8
Road east	43 17 01.0	75 49 21.5
Road north	43 17 28.4	75 46 54.6
Four corners	43 17 17.2	75 46 05.3
Four corners	43 18 36.6	75 45 26.9
Camden, Rome, Watertown and Ogdensburg Railway crossing	43 19 49.5	75 44 56.0

Geographic positions along highways—Camden to South Albion.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Camden, 2 miles northwest of, four corners	43 21 32.3	75 45 28.2
Road west	43 23 15.3	75 46 00.7
Forks of road	43 24 09.7	75 46 30.4
Road west	43 25 28.9	75 47 41.4
Four corners	43 25 38.6	75 49 50.5
Four corners	43 25 43.1	75 51 56.1
Williamston, 0.75 mile southeast of, three corners	43 25 21.8	75 52 17.1
Road north	43 26 30.4	75 55 18.3
Forks of road	43 27 13.6	75 56 14.8
Road southeast	43 27 44.9	75 57 56.1
Four corners	43 28 13.2	75 59 28.2

Geographic positions between Williamston and West Amboy.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Williamston, 1 mile east of, road west	43 24 35.5	75 54 42.9
Amboy triangulation station, four corners 0.5 mile west of	43 23 25.3	75 55 38.8
Amboy Center, 0.75 mile northeast of, four corners	43 22 36.4	75 56 14.6

St. Lawrence County; Brierhill, Massena, Ogdensburg, and Waddington quadrangles.

The following geographic positions on United States standard datum were determined by Mr. E. L. McNair, topographer, in May, 1904. The line starts at Ogdensburg light-house, located by triangulation of the United States Lake Survey, follows highways southward to Black Lake; thence along west shore of that lake to latitude $44^{\circ} 30'$; thence northward to Morristown Point triangulation station of the United States Lake Survey. Another line runs from Edwardsville eastward via Depeyster to Dekalb; thence northward via Rensselaer Falls and Woodbridge Corners to Jinks triangulation station of the United States Lake Survey. This line was also connected with Canton water tower, previously located by triangulation.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ogdensburg light-house, United States Lake Survey Δ...	44 41 52.44	75 30 14.71
Ogdensburg, intersection of Pine street and New York avenue	44 41 07.3	75 29 39.5
Ogdensburg, 2.25 miles south of, road west, telephone line.	44 39 35.7	75 29 46.2
Ogdensburg, 3.75 miles south of road forks to southeast...	44 38 13.2	75 30 25.8
Galilee M. E. Church, road northeast.....	44 36 37.1	75 30 21.5
Edwardsville, 6 miles northeast of, forks of road at small bridge near red schoolhouse.....	44 34 56.8	75 30 19.3
Edwardsville, 4 miles northeast of, road northwest at little red schoolhouse.....	44 33 45.4	75 32 06.2
Edwardsville, 2.8 miles northeast of, road northwest.....	44 33 09.8	75 33 16.4
Edwardsville, 1.6 miles northeast of, road northwest.....	44 32 27.6	75 34 19.3
Edwardsville, four corners at.....	44 31 20.9	75 35 35.0
Edwardsville, 2.2 miles southwest of, house of Nathan Bush, 36 feet north of northwest corner of, large rock in place, bronze tablet stamped "Prim. Trav. Sta. No. 53"	44 30 06.3	75 37 33.3
Brierhill post-office, 2 miles southeast of, at schoolhouse, road northeast	44 30 41.8	75 38 41.0
Brierhill station, 0.25 mile south of, crossing Rome, Watertown and Ogdensburg railroad.....	44 31 09.7	75 39 38.7
Brierhill post-office, 800 feet north of, road east.....	44 32 03.9	75 39 46.1
St. Lawrence cheese factory, four corners	44 32 27.8	75 41 15.5
St. Lawrence cheese factory, 1.25 miles northeast of, four corners	44 33 00.2	75 40 06.0
Morristown station, 0.75 mile south of, forks of road	44 34 45.0	75 38 30.7
Morristown station, road crossing at	44 35 15.9	75 39 02.2
Morristown Point triangulation station United States Lake Survey, drill hole in ledge of rock; the latter has broken off and fallen partly in the river; apparently 7 feet out of place	44 35 55.61	75 38 33.16

Geographic positions along highways between Edwardsville, via Depeyster, and Dekalb.

Station.	Latitude.	Longitude.
	° ' "	° ' "
W. H. Mitchell's house, T road corner.....	44 31 45.5	75 34 09.8
Bolton district schoolhouse, road opposite.....	44 31 50.3	75 32 30.4
G. C. Clarke, center of road opposite house	44 32 42.3	75 30 31.2
Warren district white school, road north.....	44 32 54.8	75 30 04.1
Kings Corners (Kokomo post-office).....	44 33 38.1	75 27 33.8
Depeyster, four corners.....	44 33 09.1	75 26 08.1
John McNeil's house, road southwest.....	44 32 19.6	75 26 44.8

Geographic positions along highways between Edwardsville, via Depeyster, and Dekalb—
Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Mud Lake, in bowlder 7 feet west of center of road, 101 feet from northwest corner of Thomas Townsend's house, 99 feet from southeast corner of Oliver Perry's house, 260 feet north of road turning east, bronze triangulation tablet stamped "Prim. Trav. Sta. No. 87." ..	44 30 49.8	75 27 51.1
B. H. Hurlburt's house, road north.....	44 31 10.3	75 25 22.3
Depeyestertown, school district No. 3, forks of road at red schoolhouse.....	44 31 34.2	75 24 22.5
Forks of road, road south.....	44 31 15.3	75 23 34.2
Dekalb, 1 mile west of Oswegatchie River bridge at, 600 feet southeast of house of Horace Streeter, 50 feet north of road, in solid rock, bronze triangulation tablet stamped "Prim. Trav. Sta. No. 135"	44 30 26.1	75 21 32.7
Dekalb, Oswegatchie River, west end of iron bridge over.	44 30 05.6	75 20 44.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rensselaer Falls, 4.6 miles southeast of, George Baxter's house, center of road opposite.....	44 32 01.8	75 16 16.1
Rensselaer Falls, 5.7 miles southeast of, 968 feet north of railroad crossing, 300 feet north of four corners, in solid rock, 7 feet west of center of road, a bronze bench mark tablet stamped "Prim. Trav. Sta. No. 13"	44 31 06.2	75 15 43.0

Geographic positions along the Rome, Watertown and Ogdensburg Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing.....	44 31 50.6	75 14 28.1
Milepost 128, road crossing 900 feet northeast of.....	44 33 47.9	75 12 45.9
Grass River, bridge over, first road crossing south of railroad.....	44 35 14.8	75 10 45.2

Geographic positions along highways between Canton and Woodbridge Corners.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Canton water tower.....	44 35 41.4	75 09 47.3
Canton City Hall, 1.75 miles northwest of, roads west....	44 36 14.8	75 12 12.8
John W. Davis's house, mail box in front of.....	44 36 52.3	75 13 04.6
Woodbridge Corners, F. O. Norton's house, four corners 1.2 miles southeast of.....	44 37 28.2	75 14 05.3

Geographic positions between Dekalb and Jinks triangulation station of the United States Lake Survey via Rensselaer Falls and Woodbridge Corners.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Coopers Falls, forks of road 200 feet east of white house..	44 31 04.7	75 20 17.9
Isaac Piercy, opposite house of, road south.....	44 31 54.3	75 18 45.1
Rome, Watertown and Ogdensburg Railroad, crossing of.	44 32 21.0	75 17 42.4
Canton and Dekalb schoolhouse district No. 17, four corners at schoolhouse.....	44 32 48.7	75 17 00.8
Rensselaer Falls, 2.5 miles southeast of, road northeast...	44 33 35.7	75 17 41.5
Rome, Watertown and Ogdensburg Railroad crossing....	44 34 10.8	75 18 09.5
Rensselaer Falls, four corners.....	44 35 23.0	75 19 13.2
Woodbridge Corners, in flat boulder 6 feet long, 4 feet wide, 1 foot high, in pasture of F. O. Norton, 85 feet northeast of center of road, 60 feet southeast of stone wall, 305 feet west of west end of Mr. Norton's house, bronze bench mark tablet stamped "Prim. Trav. Sta. No. 219".....	44 38 02.8	75 15 16.3
Woodbridge Corners, 1 mile west of, road south.....	44 38 11.6	75 16 27.9
Woodbridge Corners, 1.7 miles northwest of, T corner....	44 38 44.1	75 16 55.5
Lisbon school district No. 22, T corner at Lawrence school.....	44 39 51.2	75 15 03.2
Lisbon school district No. 26, T corner at Lockwood school.	44 40 58.1	75 16 04.9
Lisbon school district No. 8, four corners at Morey Ridge school.....	44 41 54.8	75 14 23.2
Milepost 107, Ogdensburg and Lake Champlain Railway, road crossing 2,000 feet east of.....	44 43 33.6	75 16 27.3
Veitchs four corners (schoolhouse).....	44 45 05.2	75 14 14.1
Road northeast.....	44 45 47.9	75 13 31.1
Wells four corners, near George Wagoner's house.....	44 47 02.0	75 14 28.7
Road forks.....	44 48 16.2	75 14 12.8
Big Sucker Brook, center of bridge over.....	44 48 41.2	75 15 14.0
Union Church, four corners at.....	44 48 48.0	75 15 23.5
Four corners.....	44 49 35.3	75 15 56.3
Jinks triangulation station, United States Lake Survey, dressed stone post, top being 1 foot below surface of ground, chiseled cross on boulder 200 feet to north, chiseled cross on boulder 178 feet to west.....	44 50 12.27	75 15 54.62

Geographic positions along highways between Madrid and Massena.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Madrid station, Ogdensburg and Lake Champlain Railway, road crossing 285 feet west of	44 44 10.1	75 08 52.8
Madrid, McCall's hotel, four corners, 215 feet south of	44 44 54.2	75 07 58.9
Madrid, 0.7 mile northeast of, three corners	44 45 20.6	75 07 35.7
Cheese factory, road northwest at	44 47 37.8	75 07 11.8
Chamberlains, four corners	44 49 39.6	75 06 10.9
Forks of road	44 50 09.8	75 06 05.0
Chases Mills, four corners	44 50 56.8	75 04 52.1
Road north	44 52 11.4	75 03 28.3
Louisville town, school district No. 2, T corner 0.25 mile west of schoolhouse	44 54 11.7	75 03 22.6
Louisville, 1 mile northwest of, road southeast	44 54 32.4	75 01 45.3
Louisville town, school district No. 4, four corners at schoolhouse	44 54 56.2	74 59 55.2
Road southeast	44 55 17.6	74 58 16.0
Louisville town, brick schoolhouse No. 5, road northwest at	44 55 26.8	74 56 50.6
Road northwest	44 56 00.7	74 54 50.7
Massena Springs, corner Main and Phillips streets, in corner of W. H. Hodge's clothing store, bench mark tablet stamped "Elevation 205 feet"	44 55 58.2	74 53 35.2
Massena station, Rome, Watertown and Ogdensburg Railway, road crossing, 350 feet south of	44 54 53.1	74 53 15.9

NORTH DAKOTA.**PRIMARY TRAVERSE.**

Ransom, Richland, and Sargent counties; Wyndmere quadrangle.

The following geographic positions were determined from primary traverse by Mr. Sledge Tatum, topographer, in 1904. The line begins at the crossing of the range line with the "Soo" Railway, 1 mile east of Hankinson; thence runs west along this railway to a point 1 mile west of Lidgerwood; thence south on section line about 0.5 mile to Great Northern Railway; thence west on that railway to Rutland; thence north via Milnor to northwest corner of quadrangle; thence eastward along highways on section lines to Colfax. At the latter place it was tied to a point previously located by primary traverse. A spur line was run from the starting point mentioned above, south and west to Hankinson triangulation station of the United States Coast and Geodetic Survey. The comparative values of the position of the latter being as follows:

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hankinson triangulation station, Coast and Geodetic Survey, United States standard.....	46 02 16.01	96 57 04.83
Hankinson triangulation station from Jamestown, N. Dak., astronomic station via Fargo	46 02 18.42	96 56 54.77
Difference	2.41	10.06

The following positions are on the Jamestown, N. Dak., astronomic datum, and are consistent with those in the eastern part of the State, previously published:

Geographic positions along the "Soo" Railway between Hankinson and Lidgerwood.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hankinson, 1 mile east of; crossing of range line and "Soo" Railway	46 04 15.9	96 53 04.6
Hankinson, Main street crossing	46 04 21.2	96 53 57.5
North and south road crossing on section line	46 04 42.0	96 59 16.6
North and south road crossing on section line; 12 feet north of track, 16 feet west of center of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 15"	46 04 48.6	97 01 46.0
North and south road crossing on section line	46 04 52.3	97 04 14.9
Lidgerwood station, 300 feet east of; foot of Main street...	46 04 45.6	97 08 57.1

Geographic positions along the Great Northern Railroad between Lidgerwood and Rutland.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lidgerwood, 1.4 miles southwest of; road on section line crossing Great Northern Railroad; 12 feet north of track, 14 feet east of center of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 30"	46 04 21.7	97 10 27.9
North and south road on section line; 160 feet west of culvert No. 48	46 04 22.5	97 12 57.4
Geneseo station, north and south road, 600 feet west of (quarter section corner)	46 04 23.7	97 16 39.4
Geneseo, 1 mile west of; north and south road; 12 feet north of track, 16 feet west of center of road; iron bench-mark post stamped "Prim. Trav. Sta. No. 42"	46 04 24.1	97 17 54.3
North and south road on section line	46 04 30.4	97 20 24.6
Cayuga, Main street on line between Rs. 53-54	46 04 37.6	97 22 53.6
Cayuga, 1 mile west of; 12 feet north of track, 14 feet west of center of north and south road on section line; iron bench-mark post stamped "Prim. Trav. Sta. No. 53"	46 04 30.5	97 24 08.9
Rutland, 2 miles east of; north and south road on section line	46 03 47.8	97 27 46.7
Rutland station, 100 feet west of; Main street on line between Rs. 54-55	46 03 20.4	97 30 22.4

Geographic positions along highways on public-land lines.

Station.	Latitude.	Longitude.
T. 130 N., Rs. 54-55 W., corner secs. 7, 18, 12, and 13; iron bench-mark post stamped "Prim. Trav. Sta. No. 68," set 30 feet southeast of corner.....	° ' " 46 04 52.2	° ' " 97 30 21.9
Perry, 400 feet east of grain elevator "Soo" Railway	46 06 19.5	97 30 01.6
Perry, 2 miles east of; north and south road on section line crossing "Soo" Railway	46 06 08.8	97 27 53.0
T. 131 N., R. 54 W., corner secs. 28, 29, 32, and 33	46 08 17.1	97 27 53.3
T. 131 N., R. 54 W., corner secs. 16, 17, 8, and 9	46 10 01.0	97 27 53.1
T. 131 N., R. 54 W., corner secs. 4, 5, 8, and 9; iron bench-mark post stamped "Prim. Trav. Sta. No. 88," set 17 feet northeast of this corner.....	46 10 53.4	97 27 54.1
T. 132 N., R. 54 W., corner secs. 16, 17, 20, and 21	46 14 22.4	97 27 54.2
Milnor water tank, road crossing 70 feet west of	46 15 32.6	97 27 26.1
Milnor station, bridge on Main street, 0.25 mile north of.	46 15 51.6	97 27 38.6
Ransom and Sargent county line	46 16 57.0	97 27 55.3
T. 132 N., R. 54 W., closing corner secs. 4 and 5 on standard parallel; iron bench-mark post stamped "Prim. Trav. Sta. No. 104," set 30 feet northeast of corner	46 16 57.0	97 27 55.3
T. 133 N., R. 54 W., corner secs. 9, 10, 15, and 16	46 20 26.0	97 28 01.8
T. 134 N., R. 54 W., corner secs. 33, 34, 27, and 28	46 23 01.1	97 28 01.6
T. 134 N., R. 54 W., corner secs. 15, 16, 21, and 22	46 24 45.9	97 28 01.2
T. 134 N., R. 54 W., corner secs. 3, 4, 9, and 10	46 26 30.7	97 28 02.6
T. 135 N., R. 54 W., corner secs. 27, 28, 33, and 34	46 28 15.6	97 27 58.0
T. 135 N., R. 54 W., corner secs. 21, 22, 27, and 28; iron bench-mark post stamped "Prim. Trav. Sta. No. 134," set 30 feet southeast of.....	46 29 07.1	97 27 56.2
Venlo grain elevator, 500 feet southeast of; crossing "Soo" Railway on line between secs. 22 and 27, azimuth of railway 312° 56'	46 29 06.6	97 27 13.3
T. 135 N., R. 54 W., corner secs. 23, 24, 25, and 26	46 29 06.5	97 25 27.3
T. 135 N., R. 53 W., corner secs. 20, 21, 28, and 29	46 29 04.9	97 21 41.8
T. 135 N., R. 53 W., corner secs. 21, 22, 27, and 28	46 29 05.1	97 20 26.1
T. 134 N., R. 53 W., corner secs. 1, 2, 11, and 12	46 26 27.4	97 17 56.5
T. 134 N., R. 52 W., corner secs. 5, 6, 7, and 8; at cross roads; iron bench-mark post stamped "Prim. Trav. Sta. No. 165"	46 26 26.0	97 15 27.6
T. 134 N., R. 52 W., corner secs. 3, 4, 9, and 10	46 26 27.1	97 12 56.1
T. 134 N., R. 52 W., north and south road, corner to secs. 1, 2, 11, and 12.....	46 26 27.2	97 10 25.5
T. 135 N., R. 52 W., corner secs. 25, 26, 35, and 36	46 28 11.1	97 10 25.4
T. 135 N., R. 51 W., corner secs. 29, 30, 31, and 32	46 28 11.1	97 07 55.0
T. 135 N., R. 51 W., corner secs. 27, 28, 33, and 34	46 28 11.0	97 05 24.3
T. 135 N., R. 51 W., corner secs. 25, 26, 35, and 36	46 28 11.5	97 02 53.5
T. 135 N., R. 50 W., corner secs. 29, 30, 31, and 32; iron bench-mark post set at northwest corner of sec. 32, stamped "Prim. Trav. Sta. No. 194"	46 28 11.4	97 00 25.8

Geographic positions along highways on public-land lines—Continued.

Stations.	Latitude.	Longitude.
	° ' "	° ' "
T. 135 N., R. 50 W., corner secs. 27, 28, 33, and 34	46 28 11.5	96 57 54.8
T. 135 N., Rs. 49 and 50 W., corner secs. 25, 30, 31, and 36.	46 28 11.5	96 54 08.6
Collfax, in north part of, east and west road crossing Great Northern Railroad	46 28 11.8	96 52 27.1

NORTH DAKOTA—MINNESOTA.

PRIMARY TRAVERSE.

Cass and Richland counties (N. Dak.) and Clay and Wilkie counties (Minn.); Fargo quadrangle.

The following geographic positions were established from primary traverse in 1902 by Mr. George T. Hawkins, topographer, and are supplementary to those published on pages 141-143, Bulletin No. 216. The line starts from adjusted position at Fargo and follows Northern Pacific Railway to Warren, thence by highways to Kindred, thence along Great Northern Railroad to south border of quadrangle.

Geographic positions along the Great Northern Railroad between Fargo and Warren.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 139 N., R. 49 W., secs. 10, 11, 14, and 15, east and west road crossing near corner of	46 51 37.7	96 50 12.1
T. 139 N., R. 49 W., secs. 15, 16, 21, and 22, east and west road crossing near corner	46 50 46.5	96 51 28.9
T. 139 N., R. 49 W., secs. 15, 16, 21, and 22, north and south road crossing near corner	46 50 41.8	96 51 35.9
T. 139 N., R. 49 W., quarter corner between secs. 21 and 28, east and west road crossing	46 49 55.0	96 52 05.0
Osgood, T. 139 N., R. 49 W., on section line between secs. 28 and 33, road crossing	46 49 03.0	96 52 29.5
Tps. 138 and 139 N., R. 49 W., near corner secs. 32, 33, 4, and 5, east and west road crossing	46 48 10.6	96 52 53.9
T. 138 N., R. 49 W., on line between secs 8 and 17, east and west road crossing	46 46 26.6	96 53 42.6
T. 138 N., R. 49 W., near corner secs. 17, 18, 19, and 2, Horance station, east and west road crossing	46 45 34.6	96 54 06.9
T. 138 N., R. 50 W., near quarter corner between secs. 24 and 25, east and west road crossing	46 44 43.4	96 56 06.4
T. 138 N., R. 50 W., on line between secs. 25 and 26, north and south road crossing	46 44 34.3	96 56 41.2
T. 138 N., R. 50 W., near quarter corner between secs. 26 and 27, north and south road crossing	46 44 14.2	96 57 57.9
Warren, north and south road crossing	46 43 34.2	97 00 29.6

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 138 and 137 N., R. 50 W., corner secs. 32, 33, 4, and 5, four corners	46 42 59.2	97 00 29.2
T. 137 N.; R. 50 W., corner secs. 4, 5, 8, and 9, four corners	46 42 05.7	97 00 29.5
T. 137 N., R. 50 W., corner secs. 8, 9, 16, and 17, four corners	46 41 13.5	97 00 30.0
T. 137 N., R. 50 W., corner secs. 16, 17, 20, and 1, four corners	46 40 21.1	97 00 30.1
T. 137 N., R. 50 W., corner secs. 20, 21, 28, and 29, four corners	46 39 28.9	97 00 30.1

Geographic positions along the Great Northern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 136 N., R. 50 W., near corner secs. 4, 5, 8, and 9, east and west road crossing	46 36 53.4	96 59 28.3
T. 136 N., R. 50 W., near quarter corner between secs. 9 and 16, east and west road crossing	46 35 46.0	96 58 33.8
T. 136 N., R. 50 W., near corner secs. 15, 16, 21, and 22, east and west road crossing	46 34 42.8	96 57 42.7
East and west road crossing	46 34 17.0	96 57 21.7
T. 136 N., R. 50 W., near corner secs. 26, 27, 34, and 35, east and west road crossing	46 33 24.9	96 56 39.5
Tps. 135 and 136 N., R. 50 W., quarter corner between secs. 2 and 35, east and west road crossing	46 32 32.6	96 55 57.3
T. 135 N., R. 50 W., near corner secs. 1, 2, 11, and 12, east and west road crossing	46 30 47.2	96 54 32.3
T. 135 N., R. 50 W., on line between secs. 12 and 13, north and south road crossing	46 30 20.6	96 54 10.8
T. 135 N., R. 49 and 50 W., quarter corner between secs. 13 and 18, east and west road crossing	46 29 56.0	96 53 50.8

This line starts from a point at south border of quadrangle and follows the Great Northern Railroad north, connecting with original position at Fargo.

Geographic positions along the Great Northern Railroad.

Station.	Latitude.	Longitude.
MINNESOTA.		
	° ' "	° ' "
T. 135 N., R. 48 W., on line between secs. 9 and 10, north and south road crossing.....	46 31 06.2	96 43 01.8
Tps. 135 and 136 N., R. 48 W., near quarter corner between secs. 4 and 33, east and west road crossing.....	46 32 07.0	96 43 20.5
T. 136 N., R. 48 W., near quarter corner between secs. 28 and 33, east and west road crossing.....	46 33 26.2	96 43 44.8
T. 136 N., R. 48 W., on line between 21 and 28, east and west road crossing.....	46 34 18.4	96 44 00.9
T. 136 N., R. 48 W., near corner secs. 16, 17, 20, and 21, east and west road crossing.....	46 35 10.5	96 44 16.9
T. 136 N., R. 48 W., on line between secs. 8 and 17, east and west road crossing.....	46 36 02.8	96 44 33.1
T. 136 N., R. 48 W., near quarter corner between secs. 5 and 8, east and west road crossing.....	46 36 54.9	96 44 44.9
Tps. 136 and 137 N., R. 48 W., near quarter corner between secs. 5 and 33, east and west road crossing, Clay and Wilkie county line.....	46 37 45.8	96 44 44.8
T. 137 N., R. 48 W., near quarter corner between secs. 28 and 33, east and west road crossing.....	46 38 38.1	96 44 44.7
Comstock station, road crossing 350 feet south of.....	46 39 30.8	96 44 44.6
T. 137 N., R. 48 W., near quarter corner between secs. 16 and 21, east and west road crossing.....	46 40 22.6	96 44 44.5
T. 137 N., R. 48 W., near quarter corner between secs. 9 and 16, east and west road crossing.....	46 41 14.4	96 44 44.5
T. 137 N., R. 48 W., near quarter corner between secs. 4 and 9, east and west road crossing.....	46 42 07.1	96 44 44.4
Tps. 137 and 138 N., R. 48 W., near quarter corner between secs. 4 and 33, east and west road crossing.....	46 42 57.2	96 44 44.3
T. 138 N., R. 48 W., near quarter corner between secs. 28 and 33, east and west road crossing.....	46 43 49.1	96 44 44.3
T. 138 N., R. 48 W., near quarter corner between secs. 21 and 28, east and west road crossing.....	46 44 41.8	96 44 43.7
T. 138 N., R. 48 W., near quarter corner between secs. 16 and 21, east and west road crossing.....	46 45 33.5	96 44 43.1
T. 138 N., R. 48 W., near quarter corner between secs. 9 and 16, east and west road crossing.....	46 46 25.8	96 44 42.5
T. 138 N., R. 48 W., near quarter corner between secs. 4 and 9, east and west road crossing.....	46 47 17.9	96 44 41.9
Tps. 138 and 139 N., R. 48 W., near quarter corner between secs. 4 and 33, east and west road crossing.....	46 48 11.0	96 44 41.2
T. 139 N., R. 48 W., near quarter corner between secs. 28 and 23, east and west road crossing.....	46 49 02.6	96 44 41.7
T. 139 N., R. 48 W., near quarter corner between secs. 21 and 28, east and west road crossing.....	46 49 55.6	96 44 42.2
T. 139 N., R. 48 W., near quarter corner between secs. 16 and 21, east and west road crossing.....	46 50 48.4	96 44 42.6
T. 139 N., R. 48 W., near quarter corner between secs. 9 and 16, east and west road crossing.....	46 51 40.4	96 44 43.1

Cass and Traill counties (N. Dak.) and Norman County (Minn.); Hillsboro quadrangle (North Dakota) and Ada quadrangle (Minnesota-North Dakota).

The following geographic positions in North Dakota and Minnesota were determined from primary traverse by Mr. George T. Hawkins, topographer, in 1903. The line starts from adjusted position at Fargo, N. Dak., and follows the Northern Pacific Railway westward to Wheatland, thence northward along Great Northern Railroad to Portland, thence eastward along wagon road on section lines to Rolette, Minn., and is tied to adjusted position at that place.

Another line starts from Fargo and follows main line of Great Northern Railroad to township line 7 miles north of Hillsboro and is connected with the line along north edge of quadrangle.

Geographic positions along the Northern Pacific Railway between Fargo and Wheatland.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing Main street and Northern Pacific Railway.	46 52 25.5	96 47 08.9
Road crossing north and south	46 52 37.1	96 50 18.1
Road crossing north and south	46 52 42.3	96 51 44.2
Road crossing north and south	46 52 46.4	96 52 50.8
T. 139 N., Rs. 49 and 50 W., secs. 1 and 6, quarter corner between	46 52 55.3	96 55 18.5
Road crossing north and south	46 53 00.4	96 56 43.1
Road crossing north and south	46 53 05.0	96 57 59.4
Tps. 139 and 140 N., R. 50 W., corner secs. 4, 5, 32, and 33.	46 53 25.1	97 00 32.0
Road crossing north and south	46 53 18.7	97 01 46.3
Tps. 139 and 140 N., Rs. 50 and 51 W., corner of	46 53 24.6	97 03 02.5
Green, road crossing at	46 53 34.0	97 06 05.5
Tps. 139 and 140 N., R. 51 W., corner secs. 3, 4, 33, and 34	46 53 24.8	97 06 51.1
Road crossing north and south	46 53 41.2	97 08 07.7
T. 140 N., Rs. 51 and 52 W., quarter corner between secs. 31 and 36	46 53 49.9	97 10 36.3
Casselton station, road crossing east of	46 53 56.7	97 12 33.4
Casselton, crossing Northern Pacific and Great Northern railroads at	46 53 58.8	97 13 09.3
Road crossing north and south	46 54 03.2	97 14 24.7
Road crossing north and south	46 54 07.6	97 15 40.9
T. 140 N., Rs. 52 and 53 W., corner secs. 25, 30, 31, and 36.	46 54 14.6	97 18 03.7
Road crossing north and south	46 54 20.2	97 19 19.9
T. 140 N., R. 53 W., corner secs. 22, 23, 26, and 27	46 55 06.3	97 20 35.5
T. 140 N., R. 53 W., corner secs. 14, 15, 22, and 23	46 55 58.5	97 20 35.2

Geographic positions along the Great Northern Railroad between Wheatland and Portland.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing north and south	46	57	25.6	97	21	52.4
Tps. 140 and 141 N., R. 53 W., corner secs. 4, 5, 32, and 33..	46	58	37.0	97	23	10.0
Road crossing east and west.....	46	59	29.3	97	23	10.5
Road crossing east and west.....	47	00	21.2	97	23	10.2
T. 141 N., R. 53 W., corner secs. 16, 17, 20, and 21	47	01	13.2	97	23	09.9
Road crossing east and west.....	47	02	05.8	97	23	09.6
T. 141 N., R. 53 W., corner secs. 4, 5, 8, and 9	47	02	57.5	97	23	09.8
Tps. 141 and 142 N., R. 53 W., corner secs. 4, 5, 32, and 33..	47	03	49.5	97	23	08.9
Road crossing east and west.....	47	04	41.7	97	22	58.4
Road crossing east and west.....	47	05	33.9	97	23	05.2
Erie, crossing 400 feet south of station	47	06	51.9	97	23	15.5
Erie, sec. corner 0.5 mile north of	47	07	18.1	97	23	06.7
Road crossing east and west on township line	47	09	03.6	97	23	28.3
Road crossing east and west.....	47	09	56.0	97	23	49.1
Road crossing east and west.....	47	10	48.2	97	24	10.1
T. 143 N., R. 53 W., corner secs. 15, 16, 20, and 21	47	11	40.5	97	24	25.1
T. 143 N., R. 53 W., corner secs. 8, 9, 16, and 17	47	12	32.3	97	24	25.3
T. 143 N., R. 53 W., corner secs. 4, 5, 8, and 9	47	13	24.9	97	24	25.6
Tps. 143 and 144 N., R. 53 W., corner secs. 4, 5, 32, and 33.	47	14	17.1	97	24	25.9
T. 144 N., R. 53 W., corner secs. 28, 29, 32, and 33	47	15	09.2	97	24	26.2
T. 144 N., R. 53 W., corner secs. 16, 17, 20, and 21	47	16	53.6	97	24	26.8
T. 144 N., R. 53 W., corner secs. 8, 9, 16, and 17.....	47	17	45.6	97	24	27.1
T. 144 N., R. 53 W., corner secs. 4, 5, 8, and 9	47	18	37.9	97	24	27.4
Tps. 144 and 145 N., R. 53 W., corner secs. 4, 5, 32, and 33.	47	19	24.6	97	24	27.7
T. 145 N., R. 53 W., corner secs. 32, 33, 28, and 29	47	20	16.8	97	24	28.0
Clifford, road crossing south of station	47	20	49.8	97	24	28.2
T. 145 N., R. 53 W., corner secs. 20, 21, 28, and 29.....	47	21	08.8	97	24	28.3
T. 145 N., R. 53 W., corner secs. 20, 21, 16, and 17.....	47	22	00.9	97	24	28.5
T. 145 N., R. 53 W., corner secs. 8, 9, 16, and 17	47	22	53.2	97	24	30.2
Road crossing east and west.....	47	23	45.4	97	24	17.4
Road crossing east and west on township line	47	24	37.8	97	23	58.1
Road crossing east and west.....	47	25	29.9	97	23	38.9
T. 146 N., R. 53 W., corner secs. 22, 23, 26, and 27	47	26	22.3	97	23	12.5
Road crossing east and west.....	47	28	06.0	97	22	41.0
Road crossing east and west.....	47	28	58.0	97	22	21.7
Tps. 146 and 147 N., R. 53 W., corner secs. 1, 2, 35, and 36.	47	29	51.7	97	21	55.6
Tps. 146 and 147 N., R. 53 W., corner secs.....	47	29	51.6	97	20	38.6
Mayville, road crossing north of station.....	47	29	59.2	97	19	20.1

Geographic positions along section-line roads between Mayville, N. Dak., and Rolette, Minn.

Station.	Latitude.	Longitude.
NORTH DAKOTA.		
	° ' "	° ' "
Tps. 146 and 147 N., R. 52 W., corner secs. 3, 4, 33, and 34.	47 29 50.2	97 16 51.2
Tps. 146 and 147 N., R. 52 W., corner secs. 2, 3, 34, and 35.	47 29 49.5	97 15 34.7
Tps. 146 and 147 N., Rs. 52 and 51 W., corner of.....	47 29 49.2	97 13 01.1
Tps. 146 and 147 N., R. 51 W., corner secs. 4, 5, 32, and 33.	47 29 49.3	97 10 31.1
Tps. 146 and 147 N., R. 51 W., corner secs. 2, 3, 34, and 35.	47 29 49.1	97 07 57.0
Tps. 146 and 147 N., R. 51 W., corner secs. 1, 2, 35, and 36.	47 29 49.5	97 06 40.2
Tps. 146 and 147 N., Rs. 50 and 51 W., corner of.....	47 29 49.8	97 05 23.2
Road crossing line between Ts. 146 and 147 and Great Northern Railroad.....	47 29 50.0	97 04 31.9
Tps. 146 and 147 N., R. 50 W., corner secs. 5, 6, 31, and 32.	47 29 50.0	97 04 03.6
Tps. 146 and 147 N., R. 50 W., corner secs. 4, 5, 32, and 33.	47 29 50.2	97 02 46.5
Tps. 146 and 147 N., R. 50 W., corner secs. 3, 4, 33, and 34.	47 29 50.1	97 01 29.1
Tps. 146 and 147 N., R. 50 W., corner secs. 2, 3, 34, and 35.	47 29 49.7	97 00 12.1
Tps. 146 and 147 N., R. 50 W., corner secs. 1, 2, 35, and 36.	47 29 49.3	96 58 55.0
Tps. 146 and 147 N., Rs. 49 and 50 W., corner of.....	47 29 49.5	96 57 38.6
Tps. 146 and 147 N., R. 49 W., corner secs. 5, 6, 31, and 32.	47 29 49.4	96 56 21.2
Tps. 146 and 147 N., R. 49 W., corner secs. 4, 5, 32, and 33.	47 29 49.4	96 55 03.8
Tps. 146 and 147 N., R. 49 W., corner secs. 3, 4, 33, and 34.	47 29 49.3	96 53 46.8
Tps. 146 and 147 N., R. 49 W., corner secs. 2, 3, 34, and 35.	47 29 49.2	96 52 30.0
T. 146 N., R. 49 W., corner secs. 2, 3, 11, and 12.....	47 28 58.2	96 52 29.7
T. 146 N., R. 49 W., corner secs. 11, 12, 13, and 14.....	47 28 05.7	96 52 30.4
Red River, west end of bridge over.....	47 27 36.5	96 51 05.5
MINNESOTA.		
T. 146 N., R. 48 W., corner secs. 16, 17, 20, and 21.....	47 27 17.2	96 47 28.4
T. 146 N., R. 48 W., corner secs. 15, 16, 21, and 22.....	47 27 17.1	96 46 11.8
T. 146 N., R. 48 W., corner secs. 14, 15, 22, and 23.....	47 27 17.2	96 44 53.8
T. 146 N., R. 48 W., corner secs. 13, 14, 23, and 24.....	47 27 17.3	96 43 36.6
T. 146 N., Rs. 47 and 48 W., corner secs. 13, 18, 19, and 24.	47 27 17.4	96 42 21.8
T. 146 N., R. 47 W., corner secs. 17, 18, 19, and 20.....	47 27 17.3	96 41 04.2
T. 146 N., R. 47 W., corner secs. 16, 17, 20, and 21.....	47 27 17.2	96 39 51.2
T. 146 N., R. 47 W., corner secs. 14, 15, 22, and 23.....	47 27 18.1	96 37 14.1
T. 146 N., R. 47 W., corner secs. 17, 18, 19, and 20.....	47 27 18.5	96 33 21.8

Geographic positions along the Great Northern Railroad, between Fargo and a point 7 miles north of Hillsboro.

Station.	Latitude.	Longitude.
NORTH DAKOTA.		
	° ' "	° ' "
Fargo, section corner 2.33 miles northwest of.....	46 53 21.6	96 49 03.4
Road crossing east and west.....	46 55 59.0	96 50 43.2
Tps. 140 and 141 N., R. 49 W., corner secs. 4, 5, 32, and 33.....	46 58 33.9	96 52 38.8
T. 141 N., R. 49 W., corner secs. 20, 21, 28, and 29.....	47 00 18.6	96 53 55.7
Road crossing east and west.....	47 01 11.1	96 54 30.1
T. 141 N., R. 49 W., corner secs. 7, 8, 17, and 18.....	47 02 10.1	96 55 12.3
Road crossing east and west.....	47 02 56.1	96 55 46.5
Road crossing east and west on township line.....	47 03 49.5	96 56 11.3
T. 141 N., R. 49 W., corner secs. 25, 30, 31, and 36.....	47 04 41.7	96 56 26.2
Road crossing east and west.....	47 05 33.8	96 56 49.6
Road crossing east and west.....	47 06 26.3	96 57 08.9
Road crossing east and west.....	47 07 18.3	96 57 28.1
T. 142 N., R. 50 W., corner secs. 1, 2, 11, and 12.....	47 08 10.5	96 57 40.9
Gardner, road crossing east and west at south end of siding at.....	47 08 36.9	96 57 57.0
Road crossing east and west.....	47 09 54.8	96 58 25.8
Road crossing east and west.....	47 10 46.8	96 58 45.0
T. 143 N., R. 50 W., corner secs. 14, 15, 22, and 23.....	47 11 39.7	96 58 58.4
Road crossing east and west.....	47 12 31.4	96 59 23.6
Road crossing east and west.....	47 13 23.6	96 59 42.9
Grandin, road crossing at.....	47 14 08.6	96 59 59.5
T. 144 N., R. 50 W., corner secs. 27, 28, 33, and 34.....	47 14 51.1	97 00 12.2
Road crossing east and west.....	47 16 01.0	97 00 41.1
Road crossing east and west.....	47 16 52.8	97 01 00.3
Road crossing east and west.....	47 17 45.0	97 01 19.7
T. 144 N., R. 50 W., corner secs. 4, 5, 8, and 9.....	47 18 37.5	97 01 37.0
Road crossing east and west on township line.....	47 19 23.1	97 01 56.0
Road crossing east and west.....	47 20 15.4	97 02 15.4
Road crossing east and west.....	47 21 07.1	97 02 34.6
T. 145 N., R. 50 W., corner secs. 16, 17, 20, and 21.....	47 21 59.3	97 02 49.4
Road crossing east and west.....	47 22 51.9	97 03 13.6
Road crossing east and west.....	47 23 44.1	97 03 25.9
Hillsboro, crossing (road) at station.....	47 24 09.2	97 03 30.4
Goose River, road crossing 0.25 mile north of.....	47 25 02.2	97 03 40.0
Road crossing east and west.....	47 26 20.4	97 03 54.1
T. 146 N., R. 50 W., corner secs. 17, 18, 19, and 20.....	47 27 12.6	97 04 05.9
Road crossing east and west.....	47 28 04.9	97 04 13.0
Road crossing east and west.....	47 28 57.1	97 04 22.4

OHIO.

PRIMARY TRAVERSE.

Ashtabula County; Andover and Jefferson quadrangles.

The following geographic positions were determined by primary traverse run by Mr. C. B. Kendall, field assistant, during the summer of 1903. The line begins at Andover triangulation station of the United States Lake Survey, near Andover, and runs northwesterly along Lake Shore and Michigan Southern Railway to Jefferson, thence west via highways to the eighty-first meridian, thence south to parallel $41^{\circ} 30'$, thence east to milepost 33 on Ohio-Pennsylvania State line. A line was run south from Jefferson along meridian $80^{\circ} 45'$ to parallel $41^{\circ} 30'$, and another east from Jefferson to milepost 15 on Ohio-Pennsylvania State line. A tie was also made to United States Lake Survey stations—Thompson, in northeastern Geauga County, and Mesopotamia, in northwestern Trumbull County. Positions are given on the United States standard datum.

Geographic positions along Lake Shore and Michigan Southern Railway between Leon and Jefferson.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Leon, road crossing 1,000 feet north of.....	41 39 24.2	80 36 59.0
Dorset station, low grade line crossing.....	41 41 29.7	80 40 31.1
Jefferson station, 300 feet south of center of east siding at street crossing.....	41 44 17.3	80 45 41.2
Road crossing.....	41 42 40.8	80 42 47.4

Geographic positions along highways from Jefferson west to the eighty-first meridian.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson, 2.5 miles west of; three corners.....	41 45 08.4	80 47 57.6
Austinburg, four corners at.....	41 46 18.3	80 51 17.4
Austinburg, 2.5 miles west of; four corners.....	41 46 01.9	80 53 59.9
Forks of road, road northeast.....	41 45 46.3	80 55 17.5
Harpersfield Center, four corners at.....	41 45 33.2	80 56 47.8
Residence of J. H. and L. D. Fowler, four corners at....	41 45 33.2	81 00 10.2

Geographic positions along eighty-first meridian between parallels 41° 45' and 41° 30'.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Three corners.....	41	44	33.6	80	59	47.2
Mill Creek, center of bridge over.....	41	42	45.4	80	59	32.0
Four corners.....	41	41	54.7	80	59	35.6
Special school district No. 2, four corners at.....	41	41	24.4	81	00	58.8
Four corners.....	41	40	41.3	81	00	58.6
Folley's four corners	41	39	57.7	81	00	59.0
Catholic Church, three corners just south of	41	38	30.4	81	00	59.4
Trumbull Creek, center of iron highway bridge	41	38	08.2	81	00	09.9
Hartsgrove school district No. 4, three corners	41	37	58.7	80	59	32.4
Four corners.....	41	37	08.7	80	59	32.3
Four corners at signpost "Hartsgrove 2 miles".....	41	36	19.8	80	59	32.3
Schoolhouse district No. 7, four corners at	41	36	30.7	80	59	32.3
Three corners, south edge of east and west road.....	41	33	50.3	80	59	30.3
Stoneville, 0.25 mile west of; four corners.....	41	33	14.2	80	57	47.1
Windsor Mills, three corners at top of hill near church ..	41	32	06.7	80	57	44.7
Windsor Mills, south end of covered highway bridge over Phelps Creek	41	31	58.3	80	57	50.8
Three corners, forks to east	41	31	22.7	80	57	54.7
Iona post-office, four corners at	41	30	30.7	80	58	22.6

Geographic positions between Iona and Mesopotamia triangulation station.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
County line, four corners at.....	41	30	31.1	81	00	11.4
Three corners, forks to west	41	28	44.9	81	00	11.9
Four corners, center road of Middlefield Township	41	27	31.3	81	00	12.4
Mesopotamia triangulation station.....	41	26	59.75	80	59	53.15

Geographic positions along parallel 41° 30' between meridian 81° and milepost 33 on Ohio-Pennsylvania State line.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Four corners.....	41	30	30.2	80	56	21.1
Forks of road to northwest	41	30	30.0	80	55	16.6
Grand River, center of covered bridge over	41	30	18.1	80	54	28.0
Four corners.....	41	29	20.6	80	53	49.4
Schoolhouse, four corners at	41	29	20.3	80	52	46.3
Four corners on State road.....	41	29	20.5	80	52	05.7
Orwell, 1 mile south of, four corners.....	41	31	16.1	80	52	04.6

Geographic positions along parallel 41° 30' between meridian 81° and milepost 33 on Ohio-Pennsylvania State line—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pennsylvania Railroad crossing	41 31 16.0	80 50 53.3
Three corners, road to north	41 31 16.2	80 49 47.1
Three corners	41 31 20.0	80 48 36.8
Three corners	41 31 19.6	80 47 26.6
Three corners	41 30 52.0	80 46 42.8
Schoolhouse, three corners at ^a	41 30 51.9	80 45 17.6
Wade schoolhouse, 0.75 mile west of, three corners, fork to south	41 30 54.4	80 44 12.2
Wade schoolhouse, 0.75 mile south of, three corners	41 30 23.0	80 43 22.3
Four corners	41 30 22.7	80 41 06.7
Three corners	41 30 38.2	80 39 58.6
White schoolhouse, three corners at	41 30 31.3	80 38 52.1
Four corners	41 30 35.4	80 37 22.4
Stanhope creamery, 0.6 mile north of, three corners	41 30 24.2	80 36 20.3
Stanhope creamery, three corners at Pennsylvania Railroad crossing	41 29 54.1	80 36 17.1
Pennsylvania Railroad crossing, 0.5 mile east of, four corners	41 29 54.3	80 35 50.2
Four corners	41 29 55.5	80 34 12.8
Stratton Creek, center of bridge over	41 29 56.0	80 33 28.0
Cornelian, four corners at	41 29 34.9	80 31 50.7
Ohio-Pennsylvania State line, milepost 33	41 29 34.0	80 31 09.6

^aReference marks: Eight feet east to fence line; 168 feet northwest to southeast corner of schoolhouse; 55 feet southwest to nail in root of maple tree.

Geographic positions along highways from Jefferson south to parallel 41° 30'.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson station, 0.6 mile south of, fork of road to south-east	41 43 53.0	80 45 51.7
Lenox, 1 mile north of, four corners	41 41 40.7	80 45 42.2
Lenox, four corners at	41 40 47.8	80 45 41.3
Township line, New Lyme and Lenox, four corners at	41 38 35.4	80 45 39.1
Three corners, road east	41 37 27.3	80 45 47.1
Four corners	41 36 17.8	80 45 46.9
Four corners	41 35 44.0	80 46 49.2
South New Lyme, four corners near hotel	41 34 56.1	80 46 35.8
Four corners	41 33 26.7	80 46 12.8
Colebrook, four corners at	41 32 08.8	80 45 45.4

Geographic positions along highways from Jefferson east to milepost 15 on Ohio-Pennsylvania State line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jefferson, Lake Shore and Michigan Southern Railway, 1.37 miles east of, forks of road to southeast.....	41 44 17.4	80 44 04.3
Forks of road	41 45 06.5	80 43 34.8
Lake Shore and Michigan Southern Railway low-grade line, crossing.....	41 45 03.8	80 42 18.8
Four corners	41 45 04.5	80 41 07.8
Giddings post-office, four corners at	41 45 05.4	80 40 04.0
Gould post-office, three corners at church just north of..	41 45 07.4	80 37 22.0
Creek, center of bridge over.....	41 45 03.9	80 36 05.7
Pierpont, three corners at soldiers' monument.....	41 45 08.4	80 34 13.4
Pierpont, 1.75 miles west of, four corners.....	41 45 09.4	80 32 05.5
Milepost 15, Ohio-Pennsylvania State line, three corners near.....	41 45 09.7	80 31 10.3
Milepost 15	41 45 12.9	80 31 10.0

Medina and Summit counties; Akron and Medina quadrangles.

The following geographic positions were obtained from primary traverse in 1904 by Mr. C. B. Kendall, field assistant. The line starts from adjusted traverse position at Lodi, follows highways northward to Grafton triangulation station of the United States Lake Survey, thence east to Hudson, and is tied to Western Reserve Observatory at that place.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Lodi, junction of main line Baltimore and Ohio Railroad with branch from the south, point is 75 feet west of tool house	41 01 39.3	82 01 04.6
Lodi, in stone step at northeast corner Taylor Inn, bronze tablet stamped "Prim. Trav. Sta. No. 4"	41 02 00.3	82 00 45.8
North and south road at fork to southwest, west edge of, 30 feet southeast to telegraph pole, 40 feet west to telegraph pole	41 04 00.6	82 01 29.8
Three corners, road to east, west edge north and south road at, 30 feet to William Gusinger's mail box, 40 feet southeast to corner front yard	41 04 37.2	82 01 29.2
Chatham Center, in northeast corner of end of Academy Hall, bronze tablet stamped "Prim. Trav. Sta. No. 23A"	41 06 06.2	82 01 29.0
Chatham Center, four corners 1 mile north of, 40 feet northwest to sign post, 40 feet southeast to mail box...	41 06 44.6	82 01 27.8
Litchfield, road crossing 300 feet west of Northern Ohio Railway station	41 09 29.9	82 01 24.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Litchfield, stone in center of park, said to be center of township	41 10 04.0	82 01 23.3
Medina and Lorain county line, three corners road to east.	41 11 55.8	82 01 25.8
Schoolhouse, four corners, at 40 feet northeast to corner of school-yard fence, 35 feet southeast to telephone pole.	41 12 26.7	82 01 25.8
Grafton Δ station, 0.5 miles southeast of, crossing Cleveland, Lorain and Wheeling Railway, near four corners.....	41 12 25.9	81 59 02.2
Grafton triangulation station, U. S. Lake Survey.....	41 12 44.0	81 59 37.0
Grafton, four corners 1 mile northwest of, 31 feet northeast to nail in mail-box post, 34 feet west to nail in telegraph pole	41 13 20.0	82 00 13.2
Four corners, 45 feet southeast to corner hedge fence, 50 feet northwest to corner fence post marked with brass tacks	41 14 13.8	82 00 11.8
Lorain and Medina counties, three corners, road to north between	41 14 14.6	81 57 29.4
Liverpool, in north wall Lutheran church, 1 foot left of entrance, bronze tablet stamped "Prim. Trav. Sta. No. 62A"	41 14 13.8	81 55 38.3
Liverpool, road crossing 200 feet south of station of Cleveland, Lorain and Wheeling Railway	41 14 14.5	81 54 29.9
Four corners, 45 feet southeast to telegraph pole, 40 feet northwest to signboard	41 14 15.2	81 52 42.4
Three corners, road to north, 35 feet northwest to maple tree, 40 feet northeast to maple tree	41 14 17.0	81 49 25.8
Four corners, township line between Hinckley and Brunswick townships, 25 feet northeast to pump, 20 feet southeast to elm tree	41 14 17.5	81 47 06.6
Four corners, 40 feet northwest to fence corner, 40 feet northeast to maple tree near corner of house	41 14 17.9	81 45 52.7
Hinckley, four corners, 400 feet west of, in north end of west abutment of iron bridge, bronze tablet stamped "Prim. Trav. Sta. No. 87"	41 14 18.4	81 44 47.6
Three corners road to south, 45 feet west of bridge.....	41 14 22.2	81 43 43.1
Four corners, 20 feet south to signpost, reads "Hinckley, 2 miles; Richfield, 3 miles; Ragatton, 5 miles; Granger, 5 miles"	41 14 22.8	81 42 10.6
West Richfield, aluminum tablet, stamped "Prim. Trav. Sta. No. 106A." 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
Richfield, four corners at, 50 feet northeast to cedar tree painted 1148, 35 feet southeast to corner of store	41 14 23.4	81 38 17.3
Furnace Run, east end of bridge, 5 feet north of T. B. M., a chiseled cross and square painted T. B. M. 913.....	41 14 25.4	81 36 51.2
Three corners, road to south at fork to left, 60 feet northwest to telegraph pole, 40 feet southwest to large rock..	41 14 44.1	81 35 27.1
Peninsular, four corners at, 8 feet south to Soldiers' Monument.....	41 14 29.3	81 33 19.2

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Peninsular, aluminum tablet, stamped "Prim. Trav. Sta. No. 138A," elevation 711, Cleveland, in north wall at northwest corner of town hall	41 14 27.8	81 32 53.4
Three corners, second class road to south, 25 feet southeast to mail box, 35 feet southwest to corner fence post.	41 14 07.9	81 31 39.4
Chittenden station, crossing A. B. & C. Electric Railroad at	41 13 56.6	81 29 38.5
Hudson, center of Western Reserve Academy Observatory	41 14 37.6	81 26 14.9

Cuyahoga, Geauga, and Lake counties; Mentor and Painesville quadrangles.

The following geographic positions were determined by Mr. C. B. Kendall, field assistant, in June, 1904. The line starts at Warrensville triangulation station, United States Lake Survey, follows highways eastward via Chester and Claridon triangulation stations, and is tied to a point 1 mile west of Iona, located by primary traverse in 1903. Another line was run northward along the meridian of $81^{\circ} 15'$ and connected with Painesville church spire, located by the United States Lake Survey. Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Warrensville triangulation station, U. S. Lake Survey....	41 28 39.01	81 30 11.96
North Woodland, four corners	41 29 10.1	81 29 52.3
Three corners, road to north, 20 feet north to telephone pole, 25 feet south to high fence	41 29 31.0	81 28 36.9
Orauga Hill Church, four corners, 35 feet northwest to telephone pole	41 29 30.1	81 26 18.2
Mayfield, street-car station on State road, 35 feet south to center of car track, 40 feet south to northwest corner of street-car station	41 31 12.0	81 26 19.7
Gates Mill, in coping stone of west end of south abutment of bridge over Chagrin River, aluminum tablet stamped "Primary Traverse Station No. 22A." Elevation, "729 Cleveland"	41 31 02.9	81 24 13.5
Three corners, road to south, 35 feet northwest to telephone pole, 60 feet south to signpost "Chester Cross-roads, 2.5 miles; Cleveland, 16 miles; Chagrin Falls, 7 miles"	41 31 10.5	81 23 27.1
Scotland station, center of trolley car track, 50 feet northwest of	41 31 20.3	81 21 33.4
Chester triangulation station, U.S. Lake Survey. No station or reference marks could be found. Approximate location of center identified by ruins of observation tripod	41 32 02.7	81 21 16.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
Chesterland post-office, H. C. Cottrell & Sons' store, in west wall at northwest corner of stone foundation, bronze tablet stamped "Primary Traverse Station, No. 37A." Elevation, "1,217 Cleveland"	41 31 19.0	81 20 15.4
Chesterland post-office, four corners, 1 mile east of, 35 feet southeast to signpost, 25 feet northeast to mail box	41 31 17.6	81 18 48.1
Four corners, 30 feet east to signpost, 40 feet northwest to corner fence post, 35 feet south to corner fence post.	41 31 17.1	81 16 55.0
Fowlers Mill, in coping stone at north end of west abutment of bridge over Chagrin River west of, stamped "Primary Traverse Station No. 51A." Elevation, "1,111 Cleveland"	41 31 31.4	81 15 39.2
Fowlers Mill, 1 mile east of, four corners, 50 feet northeast to signpost, 25 feet southeast to telephone pole.	41 31 42.8	81 14 36.5
Munson Township, school district No. 6, four corners at brick schoolhouse	41 31 45.4	81 13 00.1
Munson Township, school district No. 6, southeast corner of brick schoolhouse	41 31 46.2	81 13 01.2
Munson-Newberry, town line between	41 30 00.8	81 12 58.7
Munson Township, four corners, 50 feet northeast to small apple tree, 30 feet southwest to telephone pole	41 29 41.2	81 13 02.3
North Newberry, four corners, 60 feet north west to southeast corner of house, 50 feet southeast to telephone pole	41 29 42.9	81 11 37.2
Alderman's mill, four corners, 20 feet north to mail box, 25 feet south to telephone pole	41 29 51.6	81 09 50.1
Three corners, road north, 20 feet south to telephone pole	41 29 49.8	81 07 37.2
East Claridon, 1.5 miles southwest of, four corners, 34 feet northwest to nail in maple tree, 23 feet southwest to nail in tree	41 31 12.9	81 07 32.5
Claridon triangulation station, U. S. Lake Survey	41 30 39.38	81 07 05.33
Baltimore and Ohio Railroad, center of track at road crossing	41 30 18.6	81 06 07.0
Four corners, 300 feet west of bridge, 45 feet south to 3-pronged cherry tree, 75 feet north to dead oak tree.	41 30 04.2	81 04 17.2
Huntsburg, 2 miles south of, four corners, 50 feet northeast to maple tree, 30 feet southeast to signpost, Huntsburg, 2 miles, Middlefield, 4 miles	41 30 35.1	81 03 06.4
Huntsburg, 2.5 miles south of, 0.5 mile east of four corners, in corner stone at south end of west abutment of steel bridge over branch of Phelps Creek, bronze tablet stamped "Primary Traverse Station, No. 122"	41 30 35.2	81 02 37.3
Ashtabula-Geauga county line, four corners, 1.75 miles west of Iona	41 30 31.1	81 00 11.4

Geographic positions along highways from a point 1 mile east of Fowlers Mill to Painesville.

Station.	Latitude.	Longitude.
Chardon, 1 mile southeast of, forks of road, 25 feet east to signpost.....	41 33 43.2	81 12 04.6
Chardon, in first stone of banister to west end of stone steps to south entrance to court-house, aluminum tablet stamped "Primary Traverse Station, No. 14".....	41 34 57.2	81 12 12.2
White church, four corners at, 45 feet southeast to maple tree, 35 feet southwest to telephone pole.....	41 37 35.1	81 13 12.8
Concord station, Baltimore and Ohio Railroad, center of main track and road crossing.....	41 39 55.1	81 13 18.2
Concord, in large stone at east end of culvert, 250 feet north of Baltimore and Ohio Railroad, bronze tablet stamped "Elevation, 987, Cleveland".....	41 39 57.3	81 13 18.7
Concord Center, four corners, 30 feet northeast to maple tree, 45 feet southwest to maple tree.....	41 40 28.0	81 13 27.9
Painesville, 1 mile south of, three corners and forks of road to southwest, 45 feet northeast to yard fence, 35 feet southeast to maple tree.....	41 42 24.1	81 14 20.1
Painesville, First Congregational Church spire, located by triangulation of U. S. Lake Survey.....	41 43 25.76	81 14 43.37
Painesville, intersection of East Main and North State streets.....	41 43 33.5	81 14 28.7
Painesville, Episcopal Church spire, located by triangulation of U. S. Lake Survey.....	41 43 40.98	81 14 35.16

ALLEN, AUGLAIZE, BUTLER, CLARK, CLINTON, DARKE, FAYETTE, FRANKLIN, GREENE, HAMILTON, MADISON, MERCER, MIAMI, MONTGOMERY, PREBLE, VAN WERT, AND WARREN COUNTIES; BROOKVILLE, CELINA, DAYTON, GREENVILLE, HAMILTON, LONDON, LIMA, MASON, MIDDLETOWN, ST. HENRY, SOUTH CHARLESTON, SPRINGFIELD, VAN WERT, WEST MANCHESTER, AND WILMINGTON QUADRANGLES.

The following geographic positions were determined from primary traverse in 1903 by Mr. Geo. T. Hawkins, topographer. The line starts from the adjusted position of crossing of the Pennsylvania and Toledo and Ohio Central railways about 5 miles northwest of Columbus, follows Toledo and Ohio Central Railway southeast to edge of Columbus, thence along Pennsylvania Railroad to London, thence along "Big Four" Railway to Springfield, thence along the Erie and "Big Four" railways to Dayton, thence along the Pennsylvania Railroad and the Dayton and Union Railroad to Greenville, thence along Cincinnati Northern Railroad to Haviland, and is connected with lines run in 1901.

This work was supplemented by 430 miles of primary traverse run by Mr. J. R. Ellis, topographic aid, along public highways, following the parallels and meridians bounding 15-minute quadrangles as closely as possible. The lines are tied and adjusted to positions located by Mr. Hawkins's line.

Geographic positions along the Pennsylvania Railroad from a point 5 miles northwest of Columbus to London.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Toledo and Ohio Central and Pennsylvania railroads northwest of Columbus, crossing of.....	40 00 04.5	83 05 57.4
Sullivant road crossing, 0.75 mile north of	39 57 58.9	83 04 38.8
Pike and telephone road crossing.....	39 57 55.1	83 05 43.5
Milepost 6, road crossing 400 feet west of.....	39 57 51.7	83 06 40.5
Milepost 8, road crossing 200 feet east of	39 57 44.3	83 08 47.3
Mileposts 8 and 9, road crossing between	39 57 42.1	83 09 27.6
Alton, road crossing at	39 57 40.3	83 10 00.9
Pike and telephone road crossing northwest and south-east	39 57 33.2	83 12 12.0
Overhead road crossing	39 57 27.5	83 13 57.3
Pike and telephone road crossing.....	39 57 16.8	83 15 16.6
West Jefferson station, road crossing at	39 56 48.6	83 16 08.9
West Jefferson, National road crossing.....	39 56 40.3	83 16 23.9
Milepost 19; north and south road crossing 350 feet west of.	39 55 08.5	83 20 34.5
Milepost 20, north and south road crossing 100 feet east of.	39 54 49.1	83 21 31.0
Milepost 22, north and south road crossing 0.25 mile west of.	39 54 01.7	83 23 48.4
London, crossing of "Big Four" Railway.....	39 53 04.7	83 26 33.5

Geographic positions along the "Big Four" Railway between London and Springfield.

Station.	Latitude.	Longitude.
	° ' "	° ' "
London, road crossing west of station.....	39 53 03.2	83 26 45.6
London, High street crossing	39 53 01.5	83 37 08.8
Gravel road crossing	39 53 16.4	83 30 01.0
Myers, road crossing 0.25 mile west of.....	39 53 25.3	83 31 45.3
Dirt road crossing	39 53 30.7	83 33 12.5
Gravel road and telephone road crossing.....	39 53 37.8	83 35 13.6
Plattsburg, pike crossing at	39 53 43.8	83 36 40.8
Gravel road and telephone road crossing.....	39 53 51.5	83 38 20.5
Brooks, road crossing at	39 54 02.0	83 40 35.0
Oxtobys, road crossing at.....	39 54 07.2	83 41 43.2
Pike and telephone road crossing.....	39 54 16.3	83 43 47.9
Overhead road crossing	39 54 22.2	83 44 40.0
Detroit Southern Railroad, crossing of.....	39 54 31.4	83 45 53.5
Gravel road crossing	39 54 33.0	83 46 15.8
Detroit Southern Railroad, crossing of.....	39 54 37.4	83 46 33.5
Springfield, Limestone street-car line, crossing of.....	39 55 20.2	83 48 31.0
Springfield, National road crossing	39 55 35.3	83 50 32.3
Overhead road crossing.....	39 55 10.1	83 51 41.6

Geographic positions along the Erie Railway between Durbin and milepost 376.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Durbin, milepost 369	39 54 42.5	83 53 21.7
Snyderville, road crossing	39 54 04.7	83 54 48.1
Enon, road crossing	39 53 22.6	83 56 08.6
Mileposts 375 and 376, road crossing half way between...	39 51 53.1	83 59 38.6
Mileposts 376 and 377, road crossing half way between...	39 51 28.1	84 00 37.9

Geographic positions along the "Big Four" Railway between Osborn and Dayton.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Osborn station, road crossing 1 mile north of	39 51 11.6	84 01 11.9
Osborn, road crossing north of station	39 50 39.2	84 01 58.8
Osborn, road crossing north and south	39 50 33.9	84 02 05.7
Gravel road and telephone road crossing at	39 49 43.4	84 03 04.8
Simms, road crossing at	39 48 35.8	84 04 23.9
Pike and telephone road crossing, east and west	39 47 12.9	84 06 42.6
Harshman, road crossing at	39 46 54.8	84 07 14.7
Street car trestle, road crossing at	39 46 41.2	84 08 22.9
Dayton, Third street car track, crossing of	39 45 40.3	84 10 55.5
Dayton, first street car line east of station, crossing of	39 45 18.8	84 11 32.4

Geographic positions along the Pennsylvania Railroad between Dayton and Dodson.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Dayton, Germantown street, crossing of	39 45 04.1	84 12 24.0
Dayton, Third street car line, crossing of	39 45 20.6	84 12 57.2
Wagon bridge crossing, at north end of	39 46 01.5	84 14 09.9
Road crossing, north and south	39 46 26.7	84 15 12.5
Cincinnati, Hamilton and Dayton Railway, crossing of ...	39 46 44.2	84 15 55.9
Milepost 35, road crossing 500 feet west of	39 47 23.0	84 17 33.0
Trotwood, road crossing north and south at	39 47 50.1	84 18 40.6
Milepost 33, road crossing $\frac{1}{2}$ mile west of	39 48 17.4	84 19 48.9
Mileposts 31 and 32, road crossing between	39 48 43.5	84 20 53.9
Airhill, road crossing north and south	39 49 10.5	84 22 01.0
Mileposts 29 and 30, road crossing north and south between...	39 49 38.4	84 23 10.2
Brookville station, road crossing 200 feet west of	39 50 13.1	84 24 36.9
Milepost 27, road crossing north and south	39 50 33.6	84 25 28.4
Dodson, road crossing north and south	39 51 02.1	84 26 40.1

Geographic positions along the Dayton and Union Railroad between Bachman and Greenville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bachman, crossing of National road	39 51 46.4	84 27 29.0
Wengerlawn, road crossing east and west	39 52 26.2	84 27 58.9
Wrights, road crossing	39 53 20.4	84 28 40.0
Gillispie's road crossing	39 53 55.1	84 29 06.0
West Baltimore, road crossing	39 54 12.6	84 29 19.0
Mileposts 20 and 21, north and south road crossing between ..	39 54 41.5	84 29 40.6
Gordon, street car line and road, crossing of	39 55 58.0	84 30 37.7
Milepost 23, east and west road crossing 1,000 feet north of ..	39 56 49.8	84 31 16.5
Mileposts 24 and 25, east and west road crossing between ...	39 57 41.5	84 31 55.8
Mileposts 25 and 26, east and west road crossing between ...	39 58 33.6	84 32 35.2
Arcanum, crossing "Big Four" Railway	39 59 16.3	84 33 07.5
Arcanum, road crossing east and west	39 59 19.8	84 33 10.1
Iron bridge, road crossing east and west	40 00 19.2	84 33 54.6
Mileposts 28 and 29, road crossing between	40 01 00.3	84 34 25.2
Delisle, road crossing at	40 01 10.9	84 34 33.0
Jaysville, road crossing east and west at	40 02 55.4	84 35 50.0
Mileposts 32 and 33, road crossing between	40 03 47.9	84 36 29.0
Mileposts 34 and 35, road crossing between	40 05 16.7	84 37 33.3

Geographic positions along the Cincinnati Northern Railroad between Greenville and Haviland.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Greenville, Dayton and Union, and Pennsylvania railroads, crossing of	40 05 43.5	84 37 38.2
Greenville, crossing north of Dayton and Union station ..	40 05 58.8	84 37 40.0
Greenville, crossing of Dayton and Union Railroad	40 06 30.1	84 38 23.3
Road crossing northwest and southeast	40 07 19.6	84 38 47.6
Road crossing east and west	40 08 10.2	84 38 47.8
Road crossing east and west	40 09 02.8	84 38 48.0
Church, road crossing 500 feet west of	40 09 55.6	84 38 47.9
Meekers, crossing Pennsylvania and Dayton and Union railroads at	40 10 16.6	84 38 47.9
House, road crossing east and west, 200 feet southeast of ..	40 11 35.1	84 38 37.0
Road crossing east and west	40 12 27.9	84 38 24.9
Ansonia, crossing "Big Four" and Dayton and Union railroads at	40 12 43.4	84 38 24.9
Road crossing east and west	40 13 31.4	84 38 35.2
Bridge, east and west road crossing west of	40 15 02.5	84 38 34.7

Geographic positions along the Cincinnati Northern Railroad between Greenville and Haviland—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Oak Tree, east and west road crossing 150 feet southwest of.	40	15	54.4	84	38	32.6
Rossville, east and west road crossing at	40	16	46.6	84	38	22.8
Road crossing east and west	40	17	38.8	84	38	37.6
Trestle, road crossing under railway at south end of	40	18	31.2	84	38	37.1
Road crossing east and west	40	19	23.7	84	38	36.6
New Weston, road crossing at	40	20	15.8	84	38	36.2
Gilbert, road crossing at	40	21	07.6	84	38	36.1
Road crossing east and west	40	21	59.8	84	38	36.1
Road crossing east and west	40	23	32.9	84	38	36.1
Road crossing east and west	40	24	25.3	84	38	36.1
St. Henry, road crossing at	40	25	05.0	84	38	36.1
Road crossing east and west	40	26	10.8	84	38	36.1
Baradees, road crossing at	40	27	03.3	84	38	36.0
Road crossing east and west	40	27	55.9	84	38	16.3
Coldwater, road crossing at	40	28	47.9	84	37	38.4
Blind siding, road crossing east and west, 200 feet south of.	40	30	07.5	84	36	32.1
Pike crossing east and west	40	31	39.5	84	35	05.5
Celina, main road crossing in southwest part of	40	32	46.0	84	34	35.8
Cemetery, road crossing east and west at	40	33	38.1	84	34	39.8
Road crossing east and west	40	34	30.6	84	35	09.5
Road crossing east and west	40	35	49.8	84	35	53.8
Schoolhouse, east and west road crossing, 0.25 mile west of.	40	36	42.3	84	36	23.7
Road crossing east and west	40	37	34.8	84	36	53.8
Tana, road crossing east and west at	40	38	01.0	84	37	08.9
Schoolhouse, road crossing 800 feet west of	40	39	19.3	84	37	52.7
Road crossing east and west	40	40	38.1	84	38	33.4
Rockford, road crossing at	40	41	27.2	84	38	43.6
Road crossing northeast and southwest	40	41	53.5	84	38	42.0
Road crossing north and south	40	42	54.3	84	38	16.7
Schoolhouse, road crossing east and west, 0.25 mile east of.	40	44	33.3	84	37	34.0
Pipeline and road crossing, east and west	40	45	25.9	84	37	11.3
Ohio City, Toledo, St. Louis and Western Railroad, crossing of	40	46	13.2	84	36	51.9
Ohio City, crossing telephone line and street	40	46	18.6	84	36	49.7
Road crossing east and west	40	47	11.2	84	36	28.4
Road crossing east and west	40	48	03.6	84	36	07.0
Road crossing east and west 100 feet west of pike	40	49	22.3	84	35	27.1
Road crossing east and west	40	50	14.8	84	35	26.7
Van Wert, crossing of main road in southwest part of	40	51	55.2	84	35	27.0
Van Wert, Pennsylvania Railroad, crossing of	40	52	20.4	84	35	19.1
Road crossing east and west	40	54	11.2	84	34	53.2

Geographic positions along the Cincinnati Northern Railroad between Greenville and Haviland—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge, east and west road crossing 300 feet west of.....	40 55 03.4	84 34 53.5
Bridge, east and west road crossing 400 feet west of.....	40 56 21.9	84 34 54.1
Cavett station, road crossing at.....	40 56 48.0	84 34 54.3
Road crossing east and west.....	40 57 40.4	84 34 54.7
Sawmill, east and west road crossing at.....	40 58 32.6	84 34 55.1
Scott, east and west road crossing at.....	40 59 25.0	84 34 55.3
East and west road crossing.....	41 00 17.5	84 34 55.4
Haviland, Findlay, Fort Wayne and Western and Cincinnati and Northern railroads, crossing at.....	41 01 08.0	84 34 56.0

Madison County; London quadrangle.

This line starts from an adjusted position 4 miles north of West Jefferson and follows public highways as near as possible along the north and west borders of the London quadrangle, connecting with adjusted position at Sedalia.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
West Jefferson, 4 miles north of, T road southwest at schoolhouse.....	39 59 53.5	83 15 50.9
T road northeast.....	39 59 17.7	83 17 02.5
Cregor schoolhouse, T road southwest at.....	39 59 54.6	83 17 30.9
T road northeast.....	39 58 50.4	83 19 39.3
Gillivan post-office, crossroads at.....	39 59 19.0	83 20 13.4
Little Darby Creek, center of bridge.....	39 58 18.4	83 21 23.8
Urbana pike and pike northeast and southwest, crossing of.....	39 57 59.7	83 21 45.5
Deer Creek, Jefferson and Monroe townships, stone monument between.....	39 58 15.3	83 22 15.4
Road north.....	39 58 29.6	83 22 42.0
Crossroads.....	39 58 46.6	83 23 32.0
Schoolhouse, crossroads at.....	39 59 35.6	83 25 14.3
Tradersville, crossroads 2 miles northeast of.....	40 01 02.8	83 27 56.6
Tradersville, intersection of roads 1 mile northeast of....	40 00 24.2	83 28 52.2
Tradersville, crossroads at.....	40 00 00.7	83 29 54.9
Road southeast.....	39 59 14.8	83 29 52.1
Y road southeast.....	39 57 17.3	83 30 20.5
Covered bridge, center of.....	39 56 45.5	83 30 09.2
Summerford, crossroads at.....	39 56 01.5	83 29 30.9

Geographic positions along highways—Continued.

Location.	Latitude.	Longitude.
	° ' "	° ' "
Summerford, T road south $\frac{1}{2}$ mile west of	39 56 00.0	83 30 04.9
Tile factory, private road west at	39 54 59.5	83 30 27.3
T road west	39 54 26.0	83 30 28.8
State fishery, T road north at	39 53 45.5	83 30 32.5
"Big Four" Railway, gravel road crossing of: Azimuth of R. R. 276° 21'	39 53 16.4	83 30 01.0
South Charleston and London pike, T road north at	39 52 10.6	83 29 40.9
Union and Paint townships, stone monument between	39 51 09.5	83 29 45.7
Pennsylvania Railroad, north and south road crossing ...	39 52 02.1	83 29 37.2
T road north	39 50 34.5	83 29 49.1
Walnut Run, intersection of pike 1 mile north of	39 50 59.3	83 27 57.6
Walnut Run, crossing of pikes at	39 50 06.7	83 27 54.9
T road west	39 47 22.2	83 28 28.7
Creighton schoolhouse, T road east at	39 45 20.1	83 28 53.8
Sedalia, cross streets at	39 44 00.5	83 28 36.7

Butler and Hamilton counties; Hamilton and Mason quadrangles.

Additional control for the Hamilton and Mason quadrangles was obtained by J. R. Ellis, topographic aid, who ran a line via highways, approximately on the meridian of 84° 30' between Carthage and Trenton, established by him in 1902.

Geographic positions along highways.

Location.	Latitude.	Longitude.
	° ' "	° ' "
Carthage, crossing of Fifth street and Cincinnati, Hamilton and Dayton Railroad	39 11 54.5	84 28 56.9
Hartwell, Clark avenue, east	39 13 18.9	84 28 22.6
Parkplace, Allen avenue, west	39 14 32.7	84 28 15.5
T. 3 N., R. 1 E., corner secs. 4, 5, 10, 11, Sullivan road, east	39 15 28.9	84 28 09.7
Springdale, Banklick road, east and west	39 17 13.8	84 29 04.9
Butler and Hamilton county line, road east	39 18 06.9	84 29 04.9
Jones, crossing of road and Cincinnati, Hamilton and Dayton Railroad	39 19 20.3	84 29 37.5
Flockton, crossing of road and Pennsylvania Railroad ...	39 21 08.7	84 29 25.6
Hamilton and Princeton pike, east and west	39 23 22.9	84 28 48.6
Flenner's Corners, road northeast and southwest	39 24 58.1	84 28 29.9
Wooddale, road intersection	39 25 58.4	84 28 31.5
Tps. 4 and 5 N., Rs. 3 and 4 E., corner of	39 28 51.0	84 28 35.8

Darke, Miami, Montgomery, and Preble counties; Brookville quadrangle.

This line starts from adjusted position about 4 miles southwest of Troy and follows public highways and "Big Four" Railway to northwest corner of quadrangle, thence south along border of quadrangle and connects with traverse line of Mr. George T. Hawkins at Baltimore, thence south to southwest corner of quadrangle, connecting with adjusted position.

Geographic positions along highways.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 4, R. 6, corner secs. 4, 5, 8, and 9, crossroads near	39	59	44.6	84	13	19.9
T. 4, R. 5, corner secs. 5, 6, 7, and 8.....	39	59	43.0	84	14	19.7
Tps. 4 and 6, Rs. 5 and 6, corner secs. 1, 6, 7, and 12.....	39	59	42.0	84	15	27.7
Burkett pike crossing, "Big Four" Railway	39	59	41.9	84	15	49.0
T. 6, R. 5, corner secs. 2, 3, 10, and 11.....	39	59	40.5	84	17	41.9
Burkett pike crossing, on curve, "Big Four" Railway ..	39	59	39.7	84	18	36.6
Ludlow Falls station, T road east, 0.5 mile south of.....	39	59	37.9	84	20	08.6
Ludlow Falls station, road crossing 160 feet west of.....	39	59	50.7	84	20	14.2
Road crossing north and south near mile post 316: Azimuth of railroad 97° 18'	39	59	31.8	84	21	40.7
Laura station, pike crossing 1 mile east of	39	59	31.5	84	23	34.4
Laura station, road crossing north and south at.....	39	59	25.4	84	24	30.6
T. 7, R. 4, corner secs. 3, 4, 9, and 10.....	39	59	32.5	84	25	38.2
Section line road crossing north and south	39	59	19.3	84	26	47.0
Section line crossing north and south	39	59	18.8	84	27	54.0
Pittsburg, township line road crossing north and south, Pittsburg azimuth of tangent, "Big Four" Railway, 89° 26'	39	59	18.2	84	29	14.3
Tps. 7 and 8, Rs. 3 and 4, corner secs. 7, 12, 13, and 18...	39	58	36.2	84	29	13.2
Germany, schoolhouse, crossroads about 900 feet east of..	39	57	45.1	84	28	49.3
Crossroads	39	57	19.2	84	28	48.6
Schoolhouse No. 6, T road south at.....	39	56	01.5	84	28	59.3
Crossroads at line between Darke and Montgomery coun- ties.....	39	59	07.5	84	28	58.1
Baltimore, Tps. 6 and 7, Rs. 3 and 4 E., corner secs 1, 6, 12, and 7	39	54	12.6	84	29	06.5
Dayton and Union Railroad, at county line crossing	39	53	55.1	84	29	06.0
Tps. 6 and 7, Rs. 3 and 4 E., corner secs. 7, 12, 13, and 18.	39	53	20.1	84	29	05.0
Tps. 6 and 7, Rs. 3 and 4 E., corner secs. 13, 18, 19 and 24: Azimuth of Pennsylvania Railroad 0.5 mile north of national road, 297° 27'	39	52	27.7	84	29	03.6
Crossing National road and county line road.....	39	51	36.5	84	29	02.2
Tps. 6 and 7, Rs. 3 and 4 E., corner secs. 25, 30, 31, and 36.	39	50	42.6	84	29	00.9
Tps. 5, 6, and 7, Rs. 3 and 4 E., corner secs. 1, 6, 31, and 36.	39	49	50.2	84	28	59.8

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 5 and 6, Rs. 3 and 4 E., quarter corner between secs. 7 and 12.....	39 48 37.2	84 28 58.1
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 7, 12, 13, and 18..	39 48 11.2	84 28 57.5
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 13, 18, 19, and 24..	39 47 18.7	84 28 56.3
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 19, 24, 25, and 30..	39 46 26.9	84 28 55.0
Tps. 5 and 6, Rs. 3 and 4 E., corner secs. 25, 30, 31, and 36..	39 45 34.4	84 28 53.9

Miami and Montgomery counties; Dayton quadrangle.

This line starts from a located point near Byron and follows public highways along south, west, and north borders of quadrangle, connecting at Dayton with line run by Mr. George T. Hawkins, and tied to position at northwest corner of Springfield quadrangle.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Beaver Creek schoolhouse, T road south, $\frac{1}{2}$ mile north of.....	39 46 04.2	84 00 43.4
Beaver Creek schoolhouse, T road south, $\frac{2}{3}$ mile south of.....	39 45 11.1	84 00 47.6
T. 3, R. 7, quarter corner between secs. 22 and 28.....	39 45 13.2	84 01 28.6
T. 3, R. 7, quarter corner between secs. 28 and 34.....	39 45 17.2	84 02 38.2
Big Woods schoolhouse, crossroads at.....	39 45 19.3	84 03 14.3
T road north.....	39 45 24.4	84 04 37.4
Montgomery-Greene county line, at Fifth street road....	39 45 29.7	84 06 00.9
Cincinnati, Hamilton and Dayton Railroad at Fifth street road crossing.....	39 45 34.7	84 07 18.7
East Dayton, intersection Smithville road and Huffman avenue.....	39 45 27.7	84 08 18.6
Dayton, crossing of Huffman and Linden avenues.....	39 45 32.2	84 09 32.6
Dayton, crossing of Dayton and Union Railroad and Third street.....	39 45 40.3	84 10 55.5
Dayton, crossing of Third and Main streets.....	39 45 34.7	84 11 30.3
Dayton, intersection of Salem and Oxford avenues in northwest part of.....	39 46 09.4	84 12 40.9
Dayton, intersection Salem avenue and Catalpa drive....	39 46 56.9	84 13 31.7
T. 2, R. 6, corner secs. 17, 18, 19, and 20.....	39 47 27.7	84 14 06.0
T. 2, R. 6, corner secs. 7, 8, 17, and 18.....	39 48 20.6	84 14 05.9
Shiloh church, crossroads at.....	39 49 11.4	84 14 07.4
Tps. 2, 3, 4, and 5, Rs. 5 and 6, corner secs. 31, 36, 1 and 6..	39 50 01.4	84 15 15.2
T. 3, R. 6, quarter corner between secs. 30 and 31.....	39 50 53.8	84 14 44.0
Spanker, crossroads at.....	39 51 33.0	84 14 42.3

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Spanker, T road east, 1 mile north of.....	39 52 16.6	84 14 43.1
Crossing National road and north and south road.....	39 53 13.4	84 14 43.6
T. 3, R. 6, quarter corner between secs. 6 and 7.....	39 54 28.3	84 14 45.1
Tps. 3 and 4, R. 6, quarter corner between secs. 6 and 31 and line between Montgomery and Miami counties.....	39 55 20.2	84 14 46.2
T. 4, R. 6, quarter corner between secs. 31 and 32.....	39 55 47.0	84 14 12.8
Schoolhouse No. 5, intersection of northeast and south- west road and road south.....	39 56 56.2	84 14 14.6
Troy, crossroads 5 miles southwest of.....	39 57 57.9	84 13 39.1
Troy, crossroads 4 miles southwest of.....	39 58 51.5	84 13 20.4
T. 4, R. 6, corner secs. 9, 10, 15, and 16.....	39 58 52.3	84 12 17.4
Schoolhouse No. 11, crossroads near.....	39 58 53.5	84 11 08.1
Lost Creek, center of bridge over.....	39 59 07.4	84 09 40.9
Grayson, road crossing "Big Four" Railway azimuth 312° 40'.....	39 59 44.9	84 08 39.3
Ragtown, T road south at.....	40 00 04.2	84 07 29.5
T. 2, R. 10, corner secs. 14, 15, 20, and 21.....	39 59 57.4	84 05 47.2
T. 2, R. 10, corner secs. 8, 9, 14, and 15.....	39 59 53.4	84 04 39.1
T. 2, R. 10, corner secs. 2, 3, 8, and 9.....	39 59 49.1	84 03 31.6
Alcony, crossroads 1 mile east of.....	40 00 34.0	84 02 33.6
Alcony, T road south, 2 miles east of.....	40 00 07.8	84 01 12.8
Crossroads.....	39 59 42.4	84 00 02.5

Darke County; Greenville quadrangle.

This line starts from adjusted position at Pittsburg and follows highways north, along east border of quadrangle to northeast corner of same; thence west along highways to northwest corner of quadrangle; thence south along highways, connecting with adjusted position 2 miles north of New Madison.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Pittsburg, road crossing "Big Four" Railway.....	39 59 18.2	84 29 14.3
T. 8 N., Rs. 3 and 4 E., corner secs. 1, 6, 7, and 12.....	39 59 28.6	84 29 14.6
Tps. 7, 8, and 9 N., Rs. 3 and 4 E., corner secs. 1, 6, 31, and 36.....	40 00 23.1	84 29 16.3
Tps. 8 and 9 N., Rs. 3 and 4 E., corner secs. 25, 30, 31, and 36.	40 01 15.6	84 29 17.8
Tps. 8 and 9 N., Rs. 3 and 4 E., cornersecs. 19, 24, 25, and 30.	40 02 07.9	84 29 19.4
Tps. 8 and 9 N., Rs. 3 and 4 E., cornersecs. 13, 18, 19, and 24.	40 03 00.5	84 29 21.1

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 8 and 9 N., Rs. 3 and 4 E., corner secs. 7, 12, 13, and 18.	40 03 53.0	84 29 22.8
Tps. 8 and 9 N., Rs. 3 and 4 E., corner secs. 1, 6, 7, and 12.	40 04 45.2	84 29 24.3
Tps. 8, 9, and 10 N., Rs. 3 and 4 E., corner secs. 1, 6, 31, and 36.	40 05 43.2	84 29 26.1
Gettysburg, crossing Main street and north and south road.	40 06 42.0	84 29 44.4
Gettysburg, crossroads 0.5 mile north of	40 07 21.9	84 29 50.9
Pennsylvania Railroad at north and south road crossing, 400 feet east of milepost 87, azimuth 103° 20'	40 08 38.8	84 29 53.1
Oakland church; T road south, 0.25 mile east of.	40 09 07.5	84 29 53.6
Oakland church, T road east, 1 mile north of	40 09 57.4	84 30 03.9
Webster crossroads, 1 mile west of	40 10 53.0	84 30 04.8
T. 11 N., R. 3 E., quarter corner between secs. 25 and 36.	40 11 45.5	84 30 10.2
T. 11 N., R. 3 E., quarter corner between secs. 24 and 25.	40 12 38.0	84 30 11.2
T. 11 N., R. 3 E., corner secs. 23, 24, 25, and 26, 4,000 feet north of last; "Big Four" Railway azimuth=84° 37'	40 12 37.2	84 30 46.0
T. 11 N., R. 3 E., corner secs. 13, 14, 23, and 24.	40 13 29.8	84 30 47.4
Versailles, crossing Versailles and Brock pike and north and south road 2 miles northwest of	40 14 26.4	84 30 48.6
Frenchtown, crossroads 0.5 mile east of	40 14 48.5	84 30 49.2
Frenchtown, T road south 0.5 mile west of.	40 14 47.1	84 32 15.9
Frenchtown, crossroads 2 miles west of	40 14 45.3	84 34 00.6
T road south.	40 15 21.1	84 35 24.7
Schoolhouse No. 6, T road west at.	40 15 28.3	84 35 57.6
T. 13 N., R. 2 E., quarter corner between secs. 1 and 2	40 15 28.1	84 36 52.3
T road east, near quarter corner between secs. 2 and 3, T. 13 N., R. 2 E.	40 15 28.4	84 38 10.9
Cincinnati Northern Railroad at east and west road crossing.	40 15 02.5	84 38 34.7
T. 13 N., R. 2 E., corner secs. 3, 4, 9, and 10.	40 15 02.5	84 39 08.8
T. 13 N., R. 2 E., quarter corner between secs. 8 and 9	40 14 36.3	84 40 17.5
T. 13 N., R. 2 E., quarter corner between secs. 7 and 8, crossroads near.	40 14 36.7	84 41 36.3
T. 13 N., Rs. 1 and 2 E., quarter corner between secs. 7 and 12.	40 14 37.1	84 42 32.5
T. 13 N., R. 1 E., quarter corner secs. 11 and 12.	40 14 40.6	84 43 40.7
T. 13 N., R. 1 E., corner secs. 11, 12, 13, and 14.	40 14 14.3	84 43 40.4
T. 13 N., R. 1 E., corner secs. 13, 14, 23, and 24.	40 13 21.8	84 43 39.9
T. 13 N., R. 1 E., corner secs. 23, 24, 25, and 26; 900 feet south of this, "Big Four" Railway azimuth=84° 29'	40 12 29.3	84 43 39.2
T. 13 N., R. 1 E., corner secs. 25, 26, 35, and 36; one-half milesouth of this, Pennsylvania Railroad azimuth=103° 19'	40 11 36.7	84 43 39.2
Tps. 12 and 13 N., R. 1 E., quarter corner secs. 1, 2, 35, and 36.	40 10 43.7	84 43 39.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 12 N., Rs. 1 and 2 E., quarter corner secs. 1, 6, 7, and 12.....	40 09 55.5	84 42 29.2
T. 12 N., Rs. 1 and 2 E., quarter corner secs. 7 and 18.....	40 09 02.6	84 42 28.3
Coaltown, center of bridge 0.25 mile west of.....	40 08 04.0	84 42 22.2
Coaltown, T road east 1.5 miles southwest of.....	40 07 17.6	84 42 26.5
Greenville and Spartansburg and Coaltown and New Manchester pikes, crossing of.....	40 05 41.8	84 42 24.8
Greenville and Winchester and Coaltown and New Manchester pikes, crossing of.....	40 06 23.4	84 42 25.5
T. 11 N., Rs. 1 and 2 E., corner secs. 1, 6, 7, and 12.....	40 04 38.5	84 42 23.4
T. 11 N., R. 1 E., corner secs. 1, 2, 11, and 12.....	40 04 38.2	84 43 30.4
T. 11 N., R. 1 E., corner secs. 11, 12, 13, and 14.....	40 03 45.7	84 43 29.5
T. road west.....	40 02 33.7	84 43 27.4
T. 11 N., R. 1 E., corner secs. 25, 26, 35, and 36.....	40 01 08.3	84 43 25.8

Geographic positions along the "Big Four" Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Charles station, road crossing 1 mile southeast of.....	40 00 15.7	84 42 37.0
Pike crossing north and south under trestle.....	40 00 05.4	84 42 18.4
Pennsylvania Railroad, crossing of.....	39 59 23.0	84 41 02.3

Allen and Auglaize counties; Lima quadrangle.

This line, run by Mr. J. R. Ellis, starts from adjusted position at Kemp station and follows south along public highways to southwest corner of quadrangle, thence east on public highways along south border of quadrangle to Santa Fe, thence north on public highways to adjusted position at Westminster station.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Kemp station, azimuth of railroad $267^{\circ} 26'$	40 43 25.6	84 13 27.6
Kemp station, crossroads 0.5 mile south of.....	40 42 52.9	84 13 23.3
T. 4 S., Rs. 5 and 6 E., corner secs. 7, 12, 13, and 18.....	40 42 01.9	84 13 22.7
T. 4 S., Rs. 5 and 6 E., corner secs. 13, 18, 19, and 24.....	40 41 09.6	84 13 22.3
T road west.....	40 40 17.4	84 13 21.9
T. 4 S., R. 6 E., quarter corner between secs. 29 and 30..	40 39 51.6	84 12 13.0
Hume, azimuth of Lake Erie and Western Railroad, $228^{\circ} 45'$, crossroads 0.5 mile south of.....	40 39 12.2	84 12 12.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 5 S., R. 6 E., corner secs. 5, 6, 7, and 8	40 37 41.4	84 12 11.9
T. 5 S., R. 6 E., corner secs. 7, 8, 17, and 18	40 36 48.8	84 12 11.2
T road east	40 35 56.3	84 12 10.7
T. 5 S., R. 6 E., quarter corner between secs. 19 and 20..	40 35 29.9	84 12 10.4
Wapakoneta, crossing of Blackhoof and Auglaize streets ...	40 34 14.6	84 11 46.2
Wapakoneta, Piqua pike at crossroads 1 mile south of	40 33 18.8	84 11 55.7
Schoolhouse, crossroads at	40 32 00.2	84 12 09.3
T road west	40 31 07.7	84 12 09.1
Schoolhouse, road east, one-third mile north of	40 30 41.3	84 12 13.0
Church, crossroads one-fifth mile north of	40 29 48.8	84 12 37.0
Cincinnati, Hamilton and Dayton Railroad, at east and west crossing, azimuth of railroad 175° 48'	40 29 48.9	84 11 17.5
T. 6 S., R. 6 E., corner secs. 21, 22, 27, and 28	40 29 49.3	84 09 51.5
T. 6 S., R. 6 E., corner secs. 22, 23, 26, and 27	40 29 49.7	84 08 42.6
T. 6 S., R. 6 E., corner secs. 23, 24, 25, and 26	40 29 50.6	84 07 34.2
T. 6 S., Rs. 6 and 7 E., corner secs. 19, 24, 25, and 30....	40 29 51.9	84 06 25.6
T. 6 S., R. 7 E., corner secs. 19, 20, 29, and 30	40 29 51.6	84 05 17.1
T. 6 S., R. 7 E., corner secs. 20, 21, 28, and 29	40 29 51.7	84 04 08.3
T. 6 S., R. 7 E., corner secs. 21, 22, 27, and 28	40 29 51.7	84 02 59.8
T. 6 S., R. 7 E., corner secs. 22, 23, 26, and 27	40 29 51.6	84 01 51.3
T. 6 S., R. 7 E., corner secs. 23, 24, 25, and 26	40 29 51.5	84 00 42.9
Santa Fe, crossroads at	40 29 28.4	83 59 37.7
Santa Fe, T road west 1½ miles north of	40 30 43.8	83 59 37.8
T. 6 S., Rs. 7 and 8 E., corner secs. 7, 12, 13, and 18....	40 31 40.3	83 59 37.9
T. 6 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, and 12.....	40 32 32.7	83 59 37.8
Tps. 5 and 6 S., Rs. 7 and 8 E., corner secs. 1, 6, 31, and 36.	40 33 25.2	83 59 37.7
T. 5 S., Rs. 7 and 8 E., corner secs. 25, 30, 31, and 36	40 34 17.4	83 59 37.8
T. 5 S., Rs. 7 and 8 E., corner secs. 19, 24, 25, and 30	40 35 09.8	83 59 37.9
T. 5 S., Rs. 7 and 8 E., corner secs. 13, 18, 19, and 24	40 36 02.1	83 59 38.0
T. 5 S., Rs. 7 and 8 E., corner secs. 7, 12, 13, and 18.....	40 36 54.3	83 59 38.2
T. 5 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, and 12.....	40 37 46.6	83 59 38.4
Tps. 4 and 5 S., Rs. 7 and 8 E., corner secs. 1, 6, 31, and 36.	40 38 38.7	83 59 38.5
Tps. 4 and 5 S., R. 8 E., corner secs. 5, 6, 31, and 32.....	40 38 39.1	83 58 31.7
T. 4 S., R. 8 E., corner secs. 29, 30, 31, and 32	40 39 31.4	83 58 32.2
T. 4 S., R. 8 E., corner secs. 19, 20, 29, and 30.....	40 40 23.6	83 58 32.6
Westminster, T road east at	40 41 35.9	83 58 47.4
Westminster, T road north 1 mile northwest of	40 42 05.8	83 59 38.6
Westminster station, azimuth of railroad 276° 41'	40 42 57.2	83 59 35.3

Butler, Montgomery, Preble, and Warren counties; Middletown quadrangle.

This line starts from adjusted position in West Dayton and follows public highway south along east border of quadrangle to Red Lion post-office, connecting with adjusted position at that place.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
West Dayton, "Big Four" Railway, east and west crossing, 760 feet north of railroad bridge, azimuth of railroad 12° 02'	39 43 57.4	84 12 40.4
West Dayton, intersection of Springboro pike and road, southwest	39 43 30.0	84 13 01.6
West Dayton, "Big Four" Railway at Springboro pike crossing, north and south	39 42 14.8	84 13 08.5
T. 1, R. 6, corner secs. 10, 11, 16, and 17	39 41 40.3	84 13 11.3
T. 1, R. 6, quarter corner between secs. 9 and 15	39 40 23.9	84 13 17.7
Tps. 1 and 2, R. 6, corner secs. 7, 12, 13, and 18	39 38 36.9	84 13 27.6
T road west	39 37 43.8	84 13 32.3
Corner sections, T road east	39 36 46.9	84 13 37.6
Dunkard Church, crossroads at	39 35 48.9	84 13 42.8
T. 2, R. 4, corner secs. 8, 9, 14, and 15	39 34 30.8	84 13 50.1
Springboro, crossing of pikes in north part of	39 33 24.0	84 13 56.8
Ts. 2 and 3, R. 4, corner secs. 7, 12, 13, and 18	39 32 41.7	84 14 01.1
T. 3, R. 4, corner secs. 11, 12, 17, and 18	39 31 47.0	84 14 05.9
T. 3, R. 4, corner secs. 10, 11, 16, and 17	39 30 52.8	84 14 11.2
Red Lion, T. 3, R. 4, center secs. 15, at	39 29 28.2	84 14 55.4

This line starts from adjusted position 1 mile west of Trenton and follows public highways north along west border of quadrangle to northwest corner of same, thence east along north border, connecting with original position in West Dayton.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Trenton, Tps. 1, 2, 2, and 3, Rs. 3 and 4, 1 mile west of ..	39 28 51.0	84 28 35.8
Tps. 2 and 3, Rs. 3 and 4, E., corner secs. 25, 30, 31, and 36	39 29 43.3	84 28 36.5
Ts. 2 and 3, Rs. 3 and 4 E., corner secs. 19, 24, 25, and 30 ..	39 30 35.9	84 28 37.3
Jacksonburg, T road east 1.5 miles south of	39 31 00.7	84 30 14.5
Jacksonburg, crossroads at	38 32 19.7	84 30 07.1
T road east	39 33 12.2	84 29 49.5
T. 4, R. 3, quarter corner between secs. 35 and 36	39 34 32.1	84 29 49.8
T. 4, R. 3, corner secs. 23, 24, 25, and 26	39 35 46.7	84 29 51.6
Tps. 3 and 4, Rs. 3 and 4, quarter corner between secs. 19 and 24, T road near	39 36 15.6	84 28 43.4

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road east	37 37 16.3	84 28 44.5
Crossing Germantown and Winchester and Farmersville and Middletown pikes.....	39 38 09.8	84 28 45.4
Tps. 3 and 4, corner secs. 1, 6, 7, and 12.....	39 38 30.4	84 28 45.8
Tps. 3 and 4, Rs. 3 and 4, corner secs. 1 and 6 (north corner).....	39 39 26.2	84 28 46.6
T road east	39 40 39.4	84 28 47.9
Cincinnati Northern Railroad, at county line road crossing north and south	39 41 53.1	84 28 49.3
Tps. 4 and 5, Rs. 3 and 4, quarter corner between secs. 13 and 18.....	39 42 30.6	84 28 50.0
Crossing county line road and West Alexandria and Germantown pikes.....	39 43 23.1	84 28 51.2
Tps. 4 and 5, Rs. 3 and 4, corner secs. 1, 6, 7, and 12.....	39 43 51.2	84 28 52.0
Tps. 4, 5, 5, and 6, Rs. 3 and 4.....	39 44 42.1	84 28 53.1
T road south.....	39 44 42.7	84 27 41.7
T road north	39 44 43.2	84 26 44.0
T. 5, R. 4 E., corner secs. 34 and 33 (south corner).....	39 44 43.7	84 25 21.4
T. 5, R. 4 E., corner secs. 34 and 35 (south corner).....	39 44 44.4	84 24 13.7
Tps. 4 and 5, R. 4 E., corner secs. 1, 2, 35, and 36.....	39 44 44.9	84 23 05.8
Tps. 3, 4, 4 and 5, Rs. 4 and 5 E., corner secs. 1, 6, 31, and 36.....	39 44 45.5	84 21 58.4
Tps. 3 and 4, R. 5 E., corner secs. 5, 6, 31, and 32.....	39 44 45.9	84 20 50.3
Tps. 3 and 4, R. 5 E., corner secs. 4 and 5 (north corner).....	34 44 46.6	84 19 42.3
T. 4, R. 5 E., corner secs. 33 and 34 (south corner).....	39 44 47.2	84 18 34.0
T road north.....	39 44 47.4	84 18 00.4
Miller avenue north.....	39 44 48.0	84 16 55.2
Soldiers' Home, crossing of Eaton pike and north and south road at northeast corner of.....	39 44 58.4	84 15 10.4
West Dayton, West Third street crossing Cincinnati, Hamilton and Dayton Railroad	39 45 06.3	84 14 23.1

Darke and Mercer Counties; St. Henry Quadrangle.

This line starts from adjusted position at southwest corner of quadrangle and follows highways north to near northwest corner of quadrangle; thence east along highways to Montgomery; thence south along Cincinnati, Hamilton and Dayton Railroad and highways to adjusted position 0.5 mile east of Frenchtown.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 13 N., R. 1 E., corner secs. 1, 2, 11, and 12.....	40 15 06.9	84 43 40.9
T. 14 N., R. 1 E., corner secs. 27, 28, 33, and 34.....	40 16 54.3	84 44 49.8
Tps. 13 and 14 N., R. 1 E., corner secs. 2, 3, 33, and 34.....	40 16 02.0	84 44 49.0

Geographic positions along highways—Continued.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 14 N., R. 1 E., corner secs. 21, 22, 27, and 28.....	40	17	40.6	84	44	48.9
T. 14 N., R. 1 E., quarter corner between secs. 15 and 22.....	40	18	32.8	84	44	14.5
T. 14 N., R. 1 E., corner secs. 10, 11, 14, and 15.....	40	19	24.3	84	43	39.5
T. 14 N., R. 1 E., corner secs. 2, 3, 10, and 11.....	40	20	16.6	84	43	38.9
Tps. 14 and 15 N., R. 1 E., corner secs. 2, 3, 34, and 35....	40	21	08.9	84	43	38.4
Viola, crossing pike and north and south road at.....	40	22	04.4	84	42	38.8
Road southwest.....	40	22	53.2	84	42	08.0
T. 15 N., R. 1 E., quarter corner between secs. 24 and 25.....	40	22	53.6	84	43	09.4
T. 15 N., R. 1 E., quarter corner between secs. 13 and 24.....	40	23	46.7	84	43	08.6
Schoolhouse, T road south at.....	40	24	15.6	84	43	08.6
T. 7 S., R. 1 E., corner secs. 13, 14, 23, and 24.....	40	25	17.9	84	42	27.5
T. 7 S., R. 1 E., corner secs. 11, 12, 13, and 14.....	40	26	10.5	84	42	27.6
Tps. 6 and 7 S., R. 1 E., corner secs. 1, 2, 35, and 36....	40	27	55.4	84	42	27.8
T. 7 S., R. 1 E., corner secs. 1, 2, 11, and 12.....	40	27	02.9	84	42	27.8
T. 6 S., R. 1 E., corner secs. 25, 26, 35, and 36.....	40	28	47.9	43	42	27.8
T. 6 S., Rs. 1 and 2 E., corner secs. 25, 30, 31, and 36....	40	28	47.9	84	41	19.2
T. 6 S., R. 2 E., corner secs. 29, 30, 31, and 32.....	40	28	47.9	84	40	00.1
T. 6 S., R. 2 E., corner secs. 28, 29, 32, and 33.....	40	28	48.0	84	38	51.4
T. 6 S., R. 2 E., corner secs. 27, 28, 33, and 34.....	40	28	47.9	84	37	43.0
Coldwater, crossing Cincinnati Northern Railroad and Main street.....	40	28	47.9	84	37	38.5
T. 6 S., R. 2 E., corner secs. 26, 27, 34, and 35.....	40	28	48.2	84	36	34.3
Coldwater, crossroads 2 miles east of.....	40	28	52.3	84	35	25.9
Montezuma station, crossroads 1 mile west of.....	40	29	01.7	84	34	16.9
Montezuma station, road crossing Cincinnati, Hamilton and Dayton Railroad north of.....	40	29	18.0	84	33	10.1
Road crossing east and west.....	40	28	49.1	84	32	38.8
Tps. 6 and 7 S., R. 2 E., corner secs. 32, 33, 4, and 5....	40	27	56.4	84	31	53.3
Road crossing north and south.....	40	27	19.7	84	31	01.8
Road crossing north and south.....	40	26	48.1	84	30	27.5
Chickasaw, Main street crossing.....	40	26	13.7	84	29	50.2
Maria Stein station, road crossing.....	40	24	28.2	84	29	35.5
T. 7 S., R. 3 E., corner secs. 26, 27, 34, and 35.....	40	23	35.3	84	29	36.4
Tps. 7 and 8 S., R. 3 E., corner secs. 2, 3, 34, and 35....	40	22	42.7	84	29	36.6
Tps. 7 and 8 S., R. 3 E., corner secs. 2, 3, 11, and 12....	40	21	16.0	84	29	42.5
Osgood station, street crossing 75 feet south of.....	40	20	24.0	84	29	42.0
Tps. 1 and 12 N., Rs. 3 and 4 E., secs. 7, 12, 13, and 18...	40	19	31.8	84	29	42.7
Road crossing east and west near schoolhouse.....	40	18	23.2	84	29	42.1
Road crossing about 500 feet east of quarter corner be- tween secs. 25 and 30, T. 11 N., Rs. 3 and 4 E.....	40	17	30.9	84	29	37.0
T road west at center sec. 36, T. 11 N., R. 3 E.....	40	16	28.5	84	30	15.5
T. 11 N., R. 3 E., center sec. 12.....	40	14	49.5	84	30	14.2

Geographic positions along spur line west from near northwest corner of Greenville quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 13 N., R. 1 E., quarter corner between secs. 10 and 11.	40 14 40.7	84 44 48.1
T. 13 N., R. 1 E., center sec. 9, crossroads near.....	40 14 43.2	84 46 30.6
Ohio-Indiana State line at blacksmith shop	40 14 45.9	84 48 16.2

Geographic positions along spur line west from near northwest corner of St. Henry quadrangle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 6 S., R. 1 E., corner secs. 26, 27, 34, and 35	40 28 47.9	84 43 36.8
T. 6 S., R. 1 E., corner secs. 27, 28, 33, and 34	40 28 47.9	84 44 45.7
T. 6 S., R. 1 E., corner secs. 28, 29, 32, and 33	40 28 48.0	84 45 54.2
T. 6 S., R. 1 E., corner secs. 29, 30, 31, and 32	40 28 48.5	84 42 02.9
Ohio-Indiana State-line near quarter corner between secs. 25 and 30, T. 6 S., Rs. 1 E. and 1 W.....	40 29 06.1	84 48 10.3

Clark, Fayette, Greene, and Madison counties; South Charleston quadrangle.

This line starts from adjusted position at Sedalia, follows public highways as nearly as possible along the south, west, and north borders of the South Charleston quadrangle, connecting with adjusted position at Tradersville.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road north.....	39 44 02.7	83 30 01.9
Y road east	39 43' 41.5	83 31 32.1
Grasse Point church, T road north at	39 43 50.2	83 32 00.2
Paint Creek, center of covered bridge over	39 43 58.2	83 32 31.6
T road south.....	39 44 07.8	83 32 50.1
T road north.....	39 44 11.4	83 34 51.6
Thomas schoolhouse, T road south at.....	39 44 12.4	83 35 13.5
South Solon, Main street crossing Detroit Southern Railroad.....	39 44 14.9	83 36 34.1
South Solon, crossing of Main and Washington streets ...	39 44 15.5	83 36 50.7
South Solon, T road south, 1 mile west of	39 44 19.6	83 38 06.5
Madison and Green counties, stone monument between..	39 44 24.4	83 39 03.7
T road southwest	39 44 36.7	83 39 47.9
Oakland schoolhouse, crossroads at	39 45 05.1	83 40 47.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gladstone, T road west, about 1.75 miles north of.....	39 45 59.1	83 41 47.1
Green and Clark county line, T road east, near.....	39 46 44.3	83 42 00.7
Selma, crossing of pikes at.....	39 47 11.7	83 42 31.7
Selma, Pennsylvania Railroad at street crossing.....	39 47 19.6	83 42 46.4
Selma, crossroads 0.75 mile northwest of.....	39 47 47.6	83 43 15.4
T road northeast.....	39 48 26.8	83 44 06.5
Pitchin, crossroads 2 miles southeast of.....	39 49 12.2	83 44 48.4
Pitchin, crossroads at.....	39 50 34.5	83 45 45.9
Pitchin, road west about 1 mile northwest of.....	39 51 24.7	83 46 26.8
Crossing of Springfield and Selma pikes and east and west roads.....	39 52 15.8	83 46 43.9
Crossroads.....	39 52 38.0	83 45 53.9
Calvary Cemetery, T road west at.....	39 53 02.2	83 45 16.9
T. 5, R. 9, quarter corner between secs. 14, 15.....	39 53 28.4	83 45 14.1
Locust Grove Church, road east at.....	39 53 35.9	83 45 01.4
"Big Four" Railway, overhead road crossing north and south.....	39 54 22.2	83 44 40.0
Reeds schoolhouse, crossroads at.....	39 54 45.4	83 44 33.4
T. 5, R. 9, corner secs. 10, 11, 16, 17.....	39 55 11.6	83 44 24.2
Crossing of old Columbus and Springfield road and Buck Creek lane.....	39 56 17.9	83 43 48.4
Township line crossing north and south road between secs. 7, 12, Ts. 5 and 6, R. 10.....	39 56 55.2	83 43 44.7
"Big Four" Railway at northwest and southeast road crossing, about 1.75 miles southwest of New Moorefield. Azimuth of railroad 220° 40'.....	39 58 25.9	83 43 54.3
New Moorefield station. Azimuth of railroad 220° 41'...	39 59 17.0	83 42 57.4
"Big Four" Railway, at east and west road crossing. Azimuth of railroad 220° 41'.....	39 59 31.1	83 42 41.5
Ts. 5 and 6, R. 10, corner secs. 3, 4, 33, 34.....	39 59 27.6	83 41 41.2
Intersection of east and west road and road northwest...	39 58 58.0	83 40 51.4
T road south.....	39 58 57.2	83 40 35.8
Bridge, west end of.....	39 59 27.1	83 39 18.0
Cemetery, T road east at.....	39 59 43.3	83 38 50.1
T. 6, R. 10, corner secs. 15, 16, 21, and 22.....	39 59 15.4	83 38 18.4
Catawba, T road west about 1 mile south of.....	39 59 12.9	83 37 32.5
Catawba, T road northeast about 1.75 miles south of.....	39 58 38.8	83 37 20.5
Pleasant Township, schoolhouse, road southeast at.....	39 58 54.4	83 36 06.6
T road northwest.....	39 59 07.4	83 35 05.8
T road southeast.....	39 59 18.0	83 34 15.6
Nation Chapel, Y road 0.25 mile northwest of.....	39 59 39.4	83 32 38.6
Clark and Madison counties, stone monument between ..	39 59 14.4	83 31 11.2

Clark and Greene counties; Springfield quadrangle.

This line starts from New Moorefield and follows public highways along the north, west, and south borders of the quadrangle, connecting with line run by Mr. George T. Hawkins near Osborn, and tied to position 1 mile north of Gladstone post-office.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
New Moorefield; road crossing "Big Four" Railway	39 59 31.1	83 42 41.5
New Moorefield, T road south.....	39 59 32.5	83 43 05.5
T. 5, R. 10, corner secs. 9, 10, 15, and 16	39 59 36.3	83 44 01.5
T. 5, R. 10, corner secs. 15, 16, 21, and 22	39 59 39.9	83 45 10.1
T. 5, R. 10, corner secs. 21, 22, 27, 28	39 59 44.0	83 46 20.6
Springfield and Urbana pike, at T road east.....	39 59 50.1	83 48 02.8
T road east.....	39 58 57.7	83 48 26.9
Erie Railroad at east and west crossing, on long curve....	39 58 27.9	83 48 44.1
Mad River, T road north, near	39 58 41.2	83 49 50.3
Blacksmith shop, crossroads at	39 58 38.7	83 50 31.2
T road north	39 58 57.3	83 51 22.1
Lawrenceville, intersection of roads in east part of.....	39 59 08.8	83 52 09.7
T. 4, R. 10, corner secs. 20, 21, 26, and 27	39 59 14.6	83 53 19.2
T. 4, R. 10, corner secs. 26, 27, 32, and 33	39 59 18.8	83 54 28.2
Northampton, road southeast, 1 mile east of.....	39 59 22.0	83 55 21.4
Northampton, crossroads at	39 59 25.5	83 56 23.9
T. 3, R. 10, corner secs. 8, 9, 14, and 15	39 59 30.5	83 57 46.6
T. 3, R. 10, corner secs. 14, 15, 20, and 21	39 59 34.3	83 58 54.7
T. 3, R. 10, quarter corner between secs. 21, 22.....	39 59 36.2	83 59 28.8
T road south	39 59 42.7	83 59 01.8
Liberty schoolhouse, T road east, 400 feet south of.....	39 57 45.4	83 59 05.5
Liberty church, T road south, 0.5 mile west of	39 57 26.7	83 59 42.1
New Carlisle, T road north, 1.5 miles east of.....	39 55 52.9	83 59 50.0
T. 3, R. 10, corner secs. 21, 22, 27, and 28	39 55 17.7	84 00 29.9
T. 3, R. 10, corner secs. 20, 21, 26, and 27	39 54 25.2	84 00 35.6
Midway, crossing of pikes at Tecumseh Hotel	39 52 55.6	84 00 35.0
Mad River, T road east at	39 52 33.3	83 59 42.2
Erie Railroad, at north and south road crossing. Azimuth 241° 18'	39 51 53.1	83 59 38.6
T. 3, R. 8, corner secs. 16, 17, 22, and 23	39 50 49.6	83 59 45.2
T. 3, R. 8, corner secs. 15, 16, 21, and 22	39 49 56.0	83 59 51.2
T. 3, R. 8, corner secs. 14, 15, 20, and 21	39 49 04.6	83 59 57.6
Crossing Xenia pike and north and south road	39 48 42.8	83 58 51.6
T. 3, R. 8, corner secs. 7, 8, 13, and 14	39 48 07.2	83 58 54.7
Byron, road north at	39 47 08.5	83 59 01.0

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Byron, T road north 1.5 miles south and 0.5 mile west of..	39 46 03.4	83 59 36.3
Byron, T road east, 2.5 miles south of, is near T. 3, R. 7, quarter corner between secs. 10 and 16.....	39 45 05.5	83 59 15.2
T. 3, R. 7, quarter corner between secs. 4 and 10.....	39 45 00.9	83 58 04.4
Xenia, intersection of Xenia and Fairfield pikes and road west 4 miles northwest of.....	39 44 55.7	83 56 30.4
Oldtown, Pennsylvania Railroad, at east and west crossing.	39 44 38.3	83 55 49.4
T road southeast.....	39 45 27.2	83 53 52.2
Clifton and Xenia and Yellow Springs and Cedarville pikes, crossing of.....	39 46 30.6	83 52 04.4
Cory schoolhouse, T road northwest, $\frac{1}{2}$ mile southeast of..	39 45 30.1	83 51 36.1
Cedarville, T road southeast, about 2.5 miles northwest of..	39 45 46.6	83 50 45.8
Cedarville, T road northeast, 1 mile northwest of.....	39 45 02.9	83 49 28.2
Cedarville, crossing Pennsylvania Railroad at. Azimuth 235° 24'	39 44 23.7	83 48 20.9
Schoolhouse, crossroads at.....	39 43 05.1	83 46 31.9
Schoolhouse, T road northwest, 1.25 miles northeast of...	39 43 22.4	83 45 11.3
Shiloh Academy, T road north, 0.5 mile east of.....	39 43 45.7	83 43 27.6
T road northwest.....	39 43 55.1	83 42 46.0
Gladstone, intersection pikes $\frac{1}{4}$ mile south of.....	39 44 18.5	83 41 03.3
Gladstone, intersection of roads 1 mile north of.....	39 45 17.7	83 41 15.7

Darke and Preble counties; West Manchester quadrangle.

This line starts from adjusted position at southeast corner of quadrangle and follows highways west along south border to southwest corner of quadrangle. Thence via highways along west border to point near northwest corner of quadrangle, thence east along "Big Four" Railway, connecting with primary traverse line of Mr. George T. Hawkins at Arcanum, and thence east on "Big Four" Railway to Pittsburg, where it connects with adjusted position.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tps. 5 and 6, R. 3 E., corner secs. 1, 2, 35, and 36	39 44 41.7	84 30 01.0
Tps. 5 and 6, R. 3 E., corner secs. 2, 3, 34, and 35	39 44 41.2	84 31 09.4
West Alexandria, crossing of Dayton and Main streets...	39 44 40.9	84 31 54.5
Azimuth of Cincinnati Northern Railroad in West Alexandria is 336° 32'.		
Tps. 5 and 6, R. 3 E., corner secs. 4, 5, 32, and 33	39 44 40.4	84 33 25.3
T. 8, R. 3, corner secs. 31 and 32	39 44 39.9	84 34 32.8
T. 8, Rs. 2 and 3 E., corner secs. 31 and 36	39 44 39.4	84 35 40.1
Tps. 7 and 8, R. 3 E., corner secs. 1, 2, 35, and 36	39 44 38.9	84 36 45.8
Eaton, crossing Pennsylvania Railroad and Main street, azimuth of railroad 168° 28'	39 44 39.0	84 37 47.4
Eaton, intersection of Main street and Richmond pike, in west part of	39 44 38.9	84 38 27.0
Tps. 7 and 8, R. 2 E., corner secs. 4, 5, 32, and 33	39 44 38.2	84 40 08.3
Tps. 7 and 8, Rs. 1 and 2 E., corner secs. 1, 6, 31, and 36..	39 44 37.8	84 42 11.5
T. 8, R. 1 E., corner secs. 35 and 36	39 44 37.8	84 43 18.8
T. 8, R. 1 E., corner secs. 23, 24, 25, and 26	39 46 23.4	84 43 18.6
Azimuth Pennsylvania Railroad, between these two positions, 112° 19'.		
T. 8, R. 1 E., corner secs. 13, 14, 23, and 24	39 47 16.8	84 43 20.1
T. 8, R. 1 E., corner secs. 11, 12, 13, and 14	39 48 08.9	84 43 21.4
T. 8, R. 1 E., corner secs. 1, 2, 11, and 12	39 49 01.1	84 43 21.5
Ebenezer, T. road south at	39 50 26.1	84 43 22.3
T. 9, R. 1 E., corner secs. 23, 24, 25, and 26	39 51 28.6	84 43 22.6
T. 9, R. 1 E., corner secs. 13, 14, 23, and 24	39 52 21.6	84 43 22.6
T. road, west	39 52 52.7	84 44 18.6
T. 9, R. 1 E., corner secs. 1, 2, 11, and 12	39 55 07.5	84 43 24.2
Tps. 9 and 10, R. 1 E., corner secs. 1, 2, 35, and 36	39 55 00.6	84 43 24.3
New Madison, crossroads 2½ miles south of	39 55 50.2	84 43 22.7
T. 10, R. 1 E., corner secs. 25, 26, 35, and 36	39 56 45.9	84 43 21.3

Geographic positions along the Pennsylvania Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
New Madison, road crossing 200 feet southwest of	39 58 08.5	84 42 41.0
Road crossing northwest and southeast	39 58 39.1	84 41 48.0

Geographic positions along the "Big Four" Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10, R. 2 E., corner secs. 4, 5, 8, and 9.....	39 59 23.4	84 40 17.2
Savona, crossing Cincinnati Northern Railroad.....	39 59 12.7	84 39 43.6
Road crossing north and south.....	39 59 13.0	84 39 10.1
Road crossing north and south.....	39 59 13.7	84 37 53.0
Greenville and Lewisburg pike crossing.....	39 59 14.3	84 36 48.0
Private road crossing.....	39 59 15.0	84 35 28.4
Road crossing north and south.....	39 59 15.5	84 34 35.5
Arcanum, crossing Dayton and Union Railroad.....	39 59 16.3	84 33 07.5
Road crossing north and south.....	39 59 16.8	84 32 03.7
Road crossing north and south.....	39 59 17.3	84 30 56.4

Geographic positions along the spur line from Ebenezer west to Ohio-Indiana State line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ebenezer, crossing National road and north and south road 1.5 miles west of.....	39 59 19.7	84 44 47.7
Crossing National road and New Paris and Westerville pike.....	39 50 08.8	84 47 35.5
Crossing National road and Ohio-Indiana State line.....	39 50 01.9	84 48 48.0

Clinton and Warren counties, Wilmington quadrangle.

This line, run by Mr. J. R. Ellis, starts from adjusted position at Blanchester and follows highways to southwest corner of quadrangle; thence to Westboro and via Baltimore and Ohio Southwestern Railroad to southeast corner of quadrangle; thence along highways to blind siding 4 miles northeast of Wilmington, where it connects with primary traverse by Mr. George T. Hawkins; thence along highways to northeast corner of quadrangle, and south along highways to Blanchester, where the line connects with original position.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Blanchester, Main street crossing Baltimore and Ohio Southwestern Railroad	39 17 31.4	83 59 14.2
Road southeast	39 16 54.1	83 59 43.1
Road northwest	39 15 51.4	84 00 09.2
Woodville, intersection of roads 0.25 mile east of	39 15 19.2	84 00 26.3
Pike road southeast	39 15 42.0	83 59 19.3
Blanchester, crossroads 2 miles southeast of	39 16 06.0	83 58 13.9
Road northeast	39 15 36.7	83 57 39.7
T. road southeast	39 15 58.1	83 56 37.8
Road south	39 16 24.6	83 55 16.7

Geographic positions along the Baltimore and Ohio Southwestern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Westboro station, road crossing 300 feet west of	39 16 51.3	83 54 38.6
Private road crossing north and south	39 16 35.5	83 53 48.0
Private road crossing north and south	35 16 17.7	83 52 45.3
Road crossing north and south	39 16 00.6	83 52 02.7
Klocks station, road crossing at	39 15 24.5	83 50 14.3
Private road crossing north and south	39 15 06.7	83 49 21.1
Road crossing north and south	39 14 35.0	83 47 45.6
Lynchburg, Main street crossing at	39 14 30.5	83 47 32.4
Road crossing north and south	39 14 08.4	83 46 28.6

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road south	39 15 12.9	83 45 55.0
Highland and Clinton county line	39 15 49.9	83 46 59.4
Road east	39 16 48.6	83 46 21.8
Bridge, T road north at	39 17 23.2	83 45 55.6
Intersection of roads	39 18 22.9	83 44 45.6

Geographic positions along the Baltimore and Ohio Southwestern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing under trestle	39 19 14.8	83 45 12.8
Farmers station, Main street crossing	39 19 13.9	83 45 48.9

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bridge, crossroads at	39 20 16.3	83 45 34.3
Farmers station, crossroads 3 miles north of	39 21 15.4	83 45 33.9
Church, T road northeast at	39 21 59.0	83 46 11.0
Lane southeast	39 22 46.4	83 45 55.5
T road southwest	39 23 29.5	83 44 55.0
T road northeast	39 24 08.2	83 45 19.4
New Antioch, T road northeast at church in west part of ..	39 24 32.0	83 44 56.0
Union schoolhouse, T road southwest near	39 25 53.4	83 44 11.0
T road southwest	39 26 31.9	83 44 53.0

Geographic positions along Baltimore and Ohio Southwestern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Northwest and southeast road crossing	39 27 41.1	83 46 11.2
Blind siding, road crossing near	39 27 56.2	83 45 05.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T road northwest	39 28 23.3	83 44 21.9
T road southeast	39 29 31.3	83 45 40.9
T road east	39 29 54.9	83 47 06.4
T road north	39 30 03.0	83 48 04.1
Intersection of roads	39 30 05.5	83 48 56.7
Crossroads	39 29 57.8	83 50 27.2
Gurneyville, crossroads 1 mile southeast of	39 30 24.8	83 51 29.9
Gurneyville, crossroads at	39 30 53.2	83 52 37.3
T road north	39 31 13.4	83 53 43.5

Geographic positions along the Detroit Southern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Private road crossing	39 31 14.2	83 54 28.9
Road crossing north and south	39 30 42.9	83 55 14.3
Kingman road crossing	39 29 58.9	83 56 21.7

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
St. Johns Church, T road south near	39 29 46.9	83 58 54.6
T road west.....	39 29 08.7	83 58 56.8
Hickoryville, T road east, just south of	39 27 53.2	83 59 41.0
Road west.....	39 27 10.4	83 59 37.1
Vandivert crossroads	39 26 39.6	83 59 18.7
T road west.....	39 25 46.0	83 58 59.0
Pennsylvania Railroad at private road crossing, azimuth of railroad 60° 01'	39 24 25.2	83 58 37.9
Clarksville, crossing Wilmington and Cincinnati pike and Main street	39 24 03.3	83 58 50.6
Intersection Wilmington and Cincinnati pike and Blan- chester road	39 23 40.6	83 59 15.3
T road northwest.....	39 22 04.5	83 58 17.9
Crossroads.....	39 21 33.8	83 59 04.2
T road southeast	39 21 11.9	83 59 37.3
Blanchester crossroads, 3 miles northeast of.....	39 19 45.5	83 58 08.7
Road north	39 18 55.4	83 59 01.8
T road	39 17 53.1	83 59 32.9

PENNSYLVANIA.

TRIANGULATION STATIONS.

Allegheny, Armstrong, and Westmoreland counties; Freeport and Sharpsburg quadrangles.

In the spring of 1903, Mr. D. H. Baldwin, topographer, triangulated two 15-minute quadrangles northeast of Pittsburg. In the prosecution of this work seven new stations based upon Clearview, Rose, and Steele, were occupied. Positions are given on the United States standard datum.

BAKERSTOWN, ALLEGHENY COUNTY.

(Not occupied.)

A very high watertank tower near northwest corner of Richland Township, west of Bakerstown station of Pittsburg and Western Railway, used in connection with a greenhouse, and believed to be owned by Mr. Crawford.

Station mark: Center of tower.

[Latitude $40^{\circ} 39' 37.60''$. Longitude $79^{\circ} 58' 43.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Christy.....	285 14 59.36	105 21 26.85	4.1611425
Heverline.....	329 52 32.42	149 54 45.02	3.9797018

CHRISTY, ALLEGHENY COUNTY.

On a high, bare hill in East Deer Township, about 4 miles northwest of Tarentum and Hites, on land owned by James S. Christy, whose residence is on east side of hill. There are a few large trees along road near summit south of signal and some timber on west slope.

Station mark: A marble post 36 by 6 by 6 inches, set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $40^{\circ} 37' 33.59''$. Longitude $79^{\circ} 48' 48.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Heverline.....	64 18 52.24	244 14 37.60	4.0090145
Bakerstown.....	105 21 26.85	285 14 59.36	4.1611425
Shrader.....	230 12 41.89	50 18 06.21	4.1818886
McGinnis.....	264 01 09.55	84 06 37.85	4.0759792
Natrona.....	272 18 36.57	92 22 21.92	3.9107096
McKelvey.....	349 21 18.82	169 22 15.55	4.0458322

HEVERLINE, ALLEGHENY COUNTY.

On a high, orchard-topped knob in the east border of Hampton Township, about 2 miles southeast of Talley Cavey and $2\frac{1}{2}$ miles west of Dorseyville, on land owned by Mr. George Heverline, blacksmith, whose residence and shop are on west slope of hill. The orchard extends from the house up the west slope nearly to the summit.

Station mark: A marble post 33 by 6 by 6 inches, set 33 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference marks: A peach tree 1 foot in diameter, standing alone, east of orchard, true azimuth 227° , distant 24 feet from station. A peach tree 1 foot in diameter, in edge of orchard, true azimuth 77° , distant 97 feet from station. A very small peach tree 2 inches in diameter, at corner of new orchard, true azimuth 316° , distant 61.1 feet from station.

[Latitude 40° 35' 09.94". Longitude 79° 55' 19.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bakerstown.....	149 54 45.02	329 52 32.42	3.9797018
Christy.....	244 14 37.60	64 18 52.24	4.0090145
McKelvey.....	299 55 35.48	120 00 46.57	4.1137512

INDIAN, ALLEGHENY COUNTY.

On the middle one of three conspicuous high hills about one-half mile east of Center (Trestle post-office), on land owned by Mr. Abers, whose residence is on the west side of the hill. The hilltop is stony and covered with small bushes and wild vines.

Station mark: A marble post 33 by 6 by 6 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, and around which is placed a pile of stones.

[Latitude 40° 27' 52.27". Longitude 79° 45' 15.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McKelvey.....	157 11 20.53	337 09 59.19	3.8810619
McGinnis.....	199 40 42.18	19 43 51.81	4.3086642
Yeter.....	244 24 29.20	64 29 34.52	4.0890284
Clearview.....	283 39 04.24	103 42 48.02	3.9223930
Rose.....	329 46 13.40	149 48 35.89	4.0126322

M'KELVEY, ALLEGHENY COUNTY.

At the center of high, hogback hill in Plum Township about one-fourth mile from Barking and 2 miles east of Hulton, on land owned by Mrs. John McKelvey. The hill is nearly bare, there being a few large chestnut trees just northwest of summit, and timber on west end of slope of ridge, and wild cherry and locust trees at northeast end.

Station mark: A marble post 33 by 6 by 6 inches, set 32 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference marks: A large chestnut tree 3.1 feet in diameter, large branches cut from north side, on fence line; true azimuth 161°, distant 81 feet from station. A large chestnut tree a few feet from fence line, true azimuth 141° from station. A large chestnut tree 3 feet in diameter, on fence line, distant 179.6 feet from station.

[Latitude $40^{\circ} 31' 39.50''$. Longitude $79^{\circ} 47' 21.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Heverline	120 00 46.57	299 55 35.48	4.1137512
Christy	169 22 15.55	349 21 18.82	4.0458322
McGinnis	218 51 31.21	38 56 02.44	4.1935728
Yeter	276 55 14.39	97 01 41.29	4.1499159
Indian	337 09 59.19	157 11 20.53	3.8810619

NATRONA, ALLEGHENY COUNTY.

(Not occupied.)

A very tall smokestack erected on the hillside overlooking Natrona, Harrison Township. The property of the Pennsylvania (?) Salt Works, chemical manufacturers.

Station mark: Center of smokestack.

[Latitude $40^{\circ} 37' 22.81''$. Longitude $79^{\circ} 43' 02.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Christy	92 22 21.92	272 18 36.57	3.9107096
McGinnis	247 08 44.70	67 10 27.61	3.6053188

SHRADER, ARMSTRONG COUNTY.

(Not occupied.)

On a bare ridge in South Buffalo Township, 3 miles northeast of Freeport, on land owned by Mr. A. C. Shrader, of Freeport.

Station mark: A sandstone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey—Pennsylvania."

[Latitude $40^{\circ} 42' 48.68''$. Longitude $79^{\circ} 40' 30.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Christy	50 18 06.21	230 12 41.89	4.1818886
McGinnis	358 58 12.23	178 58 16.46	3.9288459

CLEARVIEW, WESTMORELAND COUNTY.

In Franklin Township, about 4 miles north of Export, on high, bare, round knob owned by Joseph Cline. .

Station mark: A stone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet marked "U. S. Geological Survey—Pennsylvania."

Reference marks: A stone 8.1 feet north, a stone 7.3 feet south, a stone 8.5 feet west, a stone 74 feet east.

[Latitude 40° 26' 48.14". Longitude 79° 39' 31.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian	103 42 48.02	283 39 04.24	3.9223930
Yeter	202 05 16.35	22 06 37.73	3.8948211
Bush	224 57 11.00	45 00 25.20	3.9994467
Rose	23 06 19.40	203 04 58.30	3.8762981
Steel	249 59 21.50	70 04 30.70	4.0770516
Kepple	323 55 24.70	143 58 12.50	4.0157222

M'GINNIS, WESTMORELAND COUNTY.

On a high, nearly bare knob, about 3 miles southeast of Freeport and about 2 miles west of Leechburg, on land owned by Andrew McGinnis, who lives near Markle. There is a single large locust reference tree near summit, and timber on north slope.

Station mark: A marble post 36 by 6 by 6 inches, set 35 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: A large locust tree 2.2 feet in diameter, true azimuth 292°, distant 60.47 feet from station.

[Latitude 40° 38' 13.52". Longitude 79° 40' 24.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian	19 43 51.81	199 40 42.18	4.3086642
McKelvey	38 56 02.44	218 51 31.21	4.1935728
Natrona	67 10 27.61	247 08 44.70	3.6053188
Christy	84 06 37.85	264 01 09.55	4.0759792
Shrader	178 58 16.46	358 58 12.23	3.9288459
Yeter	343 08 06.60	163 10 02.74	4.1610875

ROSE, WESTMORELAND COUNTY.

About 4 miles north of Irwin, on a cleared ridge owned by the Rose heirs.

Station mark: A stone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey—Pennsylvania."

[Latitude 40° 23' 03.83". Longitude 79° 41' 36.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian	149 48 35.89	329 46 13.40	4. 0126322
Wiley	25 50 13.10	205 47 29.00	4. 1382508
Terrace	76 55 47.10	256 51 00.80	4. 0297096
Clearview	203 04 58.30	23 06 19.40	3. 8762981
Steel	232 08 55.20	52 15 25.40	4. 2538871
Kepple	279 08 53.60	99 13 02.30	3. 9625866
Altman	328 27 25.60	148 30 09.70	4. 0584376

STEEL, WESTMORELAND COUNTY.

About 4 miles west of Saltsburg, on the southern part of summit of high, bare hill in Bell Township, on land owned by John Steel.

Station mark: A stone post 40 by 8 by 8 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze tablet marked "U. S. Geological Survey."

[Latitude 40° 29' 00.34". Longitude 79° 31' 34.73".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian	83 52 48.71	263 43 55.63	4. 2891339
Yeter	111 09 44.60	291 05 56.64	3. 9475188
Bush	125 41 21.60	305 39 26.90	3. 7093968
Kepple	22 23 34.00	202 21 12.90	4. 1295269
Rose	52 15 25.40	232 08 55.20	4. 2538871
Clearview	70 04 30.70	249 59 21.50	4. 0770516
Hilty	172 52 01.30	352 51 45.50	3. 6629986
Hood	227 47 34.00	47 52 51.90	4. 1913671
Marshall	286 33 14.00	106 37 25.00	3. 9778350

YETER, WESTMORELAND COUNTY.

On the cleared northeast end of a timbered saddleback ridge about $1\frac{1}{2}$ miles south of Merwin and $\frac{3}{4}$ miles north of Mamont, on land owned by Mr. Charles Yeter, whose residence is on the northeast side of the hill. It is about 9 feet east of a rail line fence, at a point 123 feet from fence corner.

Station mark: A marble post 36 by 6 by 6 inches, set 35 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: A tall, dead, line tree, 2 feet in diameter, at corner of adjacent farm, true azimuth 54° , distant 121.75 feet from station.

[Latitude $40^{\circ} 30' 43.91''$. Longitude $79^{\circ} 37' 25.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clearview	22 06 37.73	202 05 16.35	3.8948211
Indian	64 29 34.52	244 24 29.20	4.0890284
McKelvey	97 01 41.29	276 55 14.39	4.1499159
McGinnis	163 10 02.74	343 08 06.60	4.1610875
Steele	291 05 56.64	111 09 44.60	3.9475188

PRIMARY TRAVERSE.

Berks, Chester, and Lancaster counties; Suplee quadrangle.

The following geographic positions were determined in the spring of 1904 from primary traverse by Mr. E. L. McNair, topographer. The line starts from an adjusted traverse position at Downingtown and follows highways westward and northward along border of quadrangle to Beartown triangulation station of the United States Coast and Geodetic Survey, thence northward and eastward to traverse position near Monocacy station. Positions are given on the United States standard datum.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Downingtown freight station.....	40 00 10.5	75 42 08.0
Downingtown station, 700 feet east of, stone viaduct over highway; stone arch of, tablet in coping stone of, stamped "Prim. Trav. Sta. No. 255"	40 00 09.8	75 42 28.9
Road north	40 00 38.7	75 43 13.8
Guthrieville, four corners at	40 01 59.1	75 45 50.5
Reeceville, road north (Manor, 2 miles)	40 01 40.5	75 47 46.8
Cedar Knoll station, 0.25 mile east of, four corners at blacksmith shop	40 01 54.5	75 49 39.6
Forks of road (Martins Corners, 2 miles; Rockville, 2 miles)	40 01 59.7	75 50 20.2
Martins Corners, four corners at.....	40 02 32.0	75 51 37.7
Brook crossing	40 02 29.3	75 52 49.8
Gottlieb Wolf's house (Sandy Hill, 2 miles), 800 feet northeast of; forks of road	40 02 22.8	75 53 36.0
Four corners.....	40 01 48.7	75 54 05.5
Sadsbury, road south, four miles north of.....	40 01 21.2	75 55 34.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Compass, four corners at.....	40 01 22.6	75 56 34.0
Compass, Chester County, St. John's Church, aluminum bench mark tablet on door step of, stamped "520 ft."...	40 01 24.1	75 56 39.5
Cains post-office, four corners at.....	40 01 37.8	75 57 15.8
Road northeast.....	40 01 43.6	75 57 54.2
Pequea post-office, stream crossing, 0.25 mile east of.....	40 02 05.3	75 59 36.8
Pequea church, forks of road at corner of churchyard....	40 03 04.9	75 59 33.5
Alert post-office, T corners, 1,800 feet east of, 150 feet north of William Hyman's house.....	40 04 20.2	75 59 08.9
Alert post-office, four corners at George Rancks, about 0.5 mile west of.....	40 03 56.4	75 59 59.6
Top of mountain, four corners near.....	40 04 37.5	76 00 51.8
Beartown triangulation station, U. S. Coast and Geodetic Survey.....	40 04 52.0	76 00 48.5
Cedar Lane, 0.8 mile south of, forks of road southeast....	40 05 38.6	76 01 16.9
Cedar Lane station, crossing Downingtown and Lancaster branch, Pennsylvania Railroad.....	40 06 22.8	76 01 28.5
Goodville, 1.5 miles south of, T corners 130 feet west of Sorrel Horse hotel.....	40 06 35.0	76 00 26.8
Goodville, corner at Sensenig Hardware Co. store.....	40 07 32.8	76 00 12.9
Goodville, four corners 1 mile northwest of.....	40 08 09.0	76 00 51.3
Conestoga Creek, near house of Peter Sander, center of iron bridge over.....	40 08 41.0	76 00 37.8
Frank Martin's house, T road at, to Churchtown, 3 miles; to Bowmansville, 4 miles.....	40 09 29.9	76 00 13.9
Samuel H. Hollinger's house, small pasture on east side of road near, bronze tablet cemented in large boulder, in a rocky mass of boulders, stamped "Prim. Trav. Sta." Azimuth to corner of porch of house, 218°; distance, 162 feet.....	40 09 49.4	76 00 29.7
Schoolhouse, four corners at.....	40 10 25.3	76 00 31.0
Abraham Shirk's house, road west near.....	40 11 36.4	75 59 55.2
Lancaster and Berks counties, opposite county line stone.	40 12 30.0	75 59 02.0
Bowmansville, 3 miles northeast of, Thomas Moore's house, 500 feet west of, forks of road.....	40 12 33.6	75 58 45.7
Alleghenyville, 1 mile southeast of, John Free's new storehouse, in large boulder near fence on east side of road, 200 feet north of, bronze tablet.....	40 13 31.9	75 58 49.8
Alleghenyville, 0.75 mile southeast of, four corners.....	40 13 40.4	75 58 48.1
Albert Kramer's mill, three corners, 400 feet north of....	40 13 49.4	75 57 06.3
Plowville, 2 miles north of, road south.....	40 13 59.1	75 56 08.3
Road corners.....	40 14 18.8	75 55 15.1
Beckersville hotel and post-office, signboard at.....	40 14 02.2	75 54 31.2
Road crossing, Beckersville 0.5 mile, Gibraltar 4.5 miles..	40 14 01.2	75 53 49.4
Four corners, Beckersville 1.5 miles, White Bear 2 miles, Plowville 1 mile, Birdsboro 5 miles.....	40 13 48.9	75 53 01.8

Geographic positions along Wilmington and Northern Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
White Bear station, east end of bridge, about 120 feet north of, aluminum tablet in south abutment of, stamped "345"	40 13 35.0	75 51 04.9
Road crossing	40 13 53.9	75 50 46.9
Water tank, road crossing 580 feet south of	40 14 31.2	75 49 41.9
South Birdsboro flag station, road crossing 200 feet south of	40 15 16.6	75 48 50.2
Birdsboro station, 150 feet east of, copper bolt in top stone of east abutment, north end	40 15 51.6	75 48 21.6
Road crossing 0.25 mile east of milepost 47-48	40 15 40.0	75 47 17.1
Monocacy station, road crossing at	40 15 23.8	75 46 05.9

Chester County; Coatesville quadrangle.

The following geographic positions were determined by primary traverse, run by Mr. C. B. Kendall, field assistant, in the fall of 1903. The line begins at Thorndale, on the main line of the Pennsylvania Railroad, previously located by primary traverse, and runs westward over that railroad to Atglen, thence southward along public highways to Oxford, on the Philadelphia, Baltimore and Washington Railroad, thence eastward along railway to Avondale, thence southward along Pomeroy and Newark branch of Pennsylvania Railroad to boundary post No. 1 on the Delaware-Pennsylvania State line. Positions are given on the United States standard datum.

Geographic positions between Thorndale and Atglen along the Pennsylvania Railroad.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Thorndale, road crossing at	39 59 38.5	75 45 21.0
Thorndale, 2 miles west of; road crossing, center of south track	39 59 17.5	75 47 27.9
Coatesville, Sixth avenue crossing, center of north track ..	39 59 16.3	75 48 49.2
Brandywine Creek, road crossing at east end of bridge over ..	39 59 06.7	75 49 32.4
Overhead road crossing, south rail of south track at	39 58 48.5	75 50 08.9
Pomeroy, 1.25 miles east of; road crossing, center of north track	39 58 15.2	75 52 01.2
Pomeroy, over road crossing at, south rail of south track ..	39 57 56.8	75 53 23.2
Parkesburg, over road crossing at, south rail of south track ..	39 57 34.9	75 55 18.3
Lenover, over road crossing at, north rail of north track ..	39 57 16.8	75 56 49.4
Atglen, street crossing at, north rail of north track (references: 63.9 feet southeast to danger signal post; 50.3 feet west to mile post; 58 feet east to nail in telephone post)	39 57 02.0	75 58 26.6

Geographic positions along public highways between Atglen and Oxford.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Octoraro Creek, three corners at bridge over	39 56 34.4	75 58 18.5
Three corners, at burnt house near bridge over creek....	39 56 15.2	75 59 05.3
Three corners, road south	39 55 46.8	75 59 25.2
Road forks to northwest	39 55 28.6	75 59 49.2
Three corners, road west	39 54 57.7	75 59 47.2
Three corners, road east to Steelville	39 54 17.8	75 59 50.0
Four corners, at milepost 5 to Atglen, near schoolhouse..	39 53 24.2	75 59 49.3
Octoraro, 1 mile northeast of, forks of road	39 52 59.1	75 59 38.8
Octoraro, four corners at	39 52 16.6	76 00 18.4
Octoraro, 1.25 miles south of, north end of covered end of bridge over creek	39 51 09.6	76 00 35.0
Four corners	39 50 54.8	76 00 31.4
Three corners	39 50 36.3	76 00 13.2
Cream post-office, four corners at	39 49 53.4	76 00 09.2
Hayesville, 1 mile west of, four corners	39 49 11.6	75 59 19.0
Union schoolhouse, four corners at	39 48 46.8	75 59 16.4
Oxford, 1.5 miles northeast of, four corners	39 48 16.0	75 58 12.1
Oxford, junction of Market and Third streets, near Ox- ford Hotel (reference marks: 42 feet southeast to north- west corner of store; 44 feet northeast to nail in telephone pole; 26 feet west to northeast corner of horseblock) ...	39 47 05.8	75 58 45.0

Geographic positions along Philadelphia, Baltimore and Washington Railroad between Oxford and Avondale.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Oxford, 1 mile east of, road crossing	39 47 32.1	75 57 47.7
Road crossing, 5 feet south of south rail	39 47 21.3	75 56 58.6
Road crossing, 3 feet south of south rail	39 47 50.1	75 56 06.4
Lincoln University station, center of main track at road crossing just west of	39 47 58.6	75 55 21.8
Elkview station, road crossing just west of, 11 feet south of south rail	39 48 29.4	75 53 43.2
Kelton station, road crossing just east of	39 48 33.0	75 52 35.2
Overhead bridge, south rail at	39 48 50.5	75 51 34.5
West Grove station, road crossing just west, south rail...	39 49 19.8	75 49 38.8
Road crossing, south rail at	39 49 37.6	75 48 53.3
Road crossing, south rail at	39 49 52.5	75 48 07.4
Avondale station, street crossing just east of, 7.8 feet north of rail (reference marks: 37.3 feet to southeast corner of passenger station; 40.6 feet to southwest cor- ner of frame building, on northeast corner of street; 7.5 feet to north rail of main line)	39 49 26.9	75 47 03.8

Geographic positions along Pomeroy and Newark Branch of Pennsylvania Railroad between Avondale and Pennsylvania-Delaware State line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing near water mill.....	39 48 12.0	75 46 56.9
Road crossing 150 feet from north end of trestle, 5 feet west of west rail	39 47 28.2	75 46 21.3
Overhead bridge, center of track under.....	39 47 05.2	75 46 26.7
Landenburg station, 250 feet south of, west rail near center of bridge over street.....	39 46 41.8	75 46 16.2
Road crossing 50 feet south of bridge, center of track.....	39 46 07.9	75 46 00.8
Yeatman station, road crossing just north of, west rail...	39 44 56.2	75 46 07.3
Pennsylvania-Delaware State line, north end of bridge...	39 44 17.8	75 46 03.0
Pennsylvania-Delaware State line, boundary post No. 1..	39 44 08.85	75 06 03.31

Chester County; Phoenixville quadrangle.

The following geographic positions were determined from primary traverse in 1904 by Mr. E. L. McNair, topographer. The line starts from adjusted position at Downingtown and follows the Pennsylvania Railroad to Milford Mills; thence along highways near border of quadrangle via Pottstown, Limerick, and Malvern; thence to starting point along Pennsylvania Railroad.

Geographic positions along the Pennsylvania Railroad between Downingtown and Dorlan flag station.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Downingtown freight station.....	40 00 10.5	75 42 08.0
East Downingtown station.....	40 00 22.3	75 42 03.9
Dowlin flag station, road crossing at.....	40 02 07.6	75 42 29.1
Dorlan flag station, road crossing at	40 02 53.9	75 43 01.2

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milford Mills, four corners at	40 03 54.8	75 43 44.0
Milford Mills, covered bridge, at east end of north wing wall, bronze tablet cemented in	40 03 58.4	75 43 38.1
Milford, 1.5 miles northwest of, four corners	40 04 58.8	75 44 38.5
Fairview Presbyterian Church, four corners at	40 05 42.2	75 45 28.7
Fairview church, 1 mile north of, four corners	40 06 20.9	75 46 03.9
Marsh post-office, 2 miles southeast of, road west and pike, corner of	40 07 10.7	75 45 14.0
Marsh post-office, Hause's store, corner at	40 08 32.9	75 46 34.6
Warwick, 1 mile south of, road corners	40 09 10.4	75 46 35.7
Warwick station, 40 feet east of, crossing branch of Philadelphia and Reading Railway	40 10 02.1	75 47 03.2
Immanuel United Evangelical Church	40 10 55.4	75 47 05.3
Immanuel United Evangelical Church, 1 mile northeast of, forks of road	40 11 19.1	75 46 12.6
Hopewell Furnace, creek crossing	40 12 17.7	75 46 25.8
Hopewell, 1 mile north of, three corners at top of hill ...	40 12 59.4	75 46 35.0
Monocacy station, 1 mile south of, road corners	40 14 37.7	75 46 26.8

Geographic positions along the Pennsylvania Railroad between Monocacy and Pottstown.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Monocacy station, canal at, bridge over, west end, north abutment of, bronze triangulation tablet	40 15 22.6	75 46 04.7
Douglasville, road crossing at, 3 feet south of south rail ..	40 15 17.5	75 43 38.2
Douglasville, 1.37 miles east of, road crossing	40 14 56.4	75 42 16.9
Pottstown, 165 feet west of station, Pennsylvania Railroad tracks, culvert under, south end of, bronze tablet ..	40 14 34.2	75 39 05.8
Pottstown, Pennsylvania Railroad station, doorsill of, copper bolt	40 14 33.8	75 39 03.6

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
East Pottstown, four corners at	40 14 39.1	75 37 41.0
Sanatoga post-office, crossroads at	40 14 41.6	75 35 51.2
Four corners	40 14 37.7	75 34 26.5
St. James South Church, 0.5 mile west of four corners ...	40 14 25.8	75 32 37.4
Limerick post-office, four corners at	40 13 51.5	75 31 20.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Limerick, 1 mile east of, Linderman's brick house, 600 feet east of, culvert under road, bronze tablet	40 13 04.7	75 30 18.8
Four corners	40 12 53.6	75 30 00.5
Four corners	40 12 25.6	75 30 28.3
Limerick station, 3 miles, road to	40 11 46.3	75 31 07.5
Mingo Mills	40 11 07.1	75 31 13.2
Rogers Ford, 2 miles east of, four corners	40 10 35.0	75 30 16.2
Philadelphia and Reading Railway tunnel, in road over ..	40 08 40.4	75 30 50.6
Phoenixville, Pennsylvania Railroad girder bridge over Main street, north abutment of, bench mark (127)	40 08 13.1	75 30 59.2
Phoenixville, Main street, south end of, road forks	40 07 24.9	75 30 48.1
Williams corners, 150 feet north of, four corners	40 06 35.1	75 30 45.0
Road southeast	40 05 40.1	75 30 56.8
Devault post-office, four Corners at	40 04 28.6	75 32 10.3
Road west	40 03 33.2	75 32 04.0

Geographic positions along the Pennsylvania Railroad between Malvern and Woodbine.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Malvern post-office, crossing of Lancaster pike, culvert of Pennsylvania Railroad at, lower course, north wing, bronze triangulation tablet	40 02 36.6	75 31 25.1
Overhead crossing, station is between tracks	40 02 09.9	75 33 33.0
Glen Lock station, center of tracks opposite	40 01 46.3	75 35 06.3
Ship Road station, road crossing at	40 01 23.5	75 36 32.2
Whiteland station, opposite (north of track)	40 01 10.2	75 37 19.8
Whiteferd station, opposite (north of track)	40 00 52.9	75 38 20.8
Bradford Hills station (north of track)	40 00 21.9	75 39 45.8
Woodbine station (north of track)	40 00 19.2	75 41 07.3

Crawford County; Linesville quadrangle.

The following geographic positions were determined by primary traverse run by Mr. C. B. Kendall, field assistant, in the summer of 1903. The line begins at milepost 14 on the Ohio-Pennsylvania State line and runs east over highways to meridian $80^{\circ} 15'$, thence south to parallel $41^{\circ} 30'$, thence east to milepost 33 on Ohio-Pennsylvania State line. Positions are given on United States standard datum.

Geographic positions east from milepost 14 along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 14, Ohio-Pennsylvania State line	41 46 05.0	80 31 10.1
Milepost 14, four corners 1,000 feet south of	41 45 54.8	80 31 10.2
Milepost 14, 1.1 miles east of, four corners at church	41 45 54.3	80 29 51.1
Conneautville, 5 miles west of, four corners (at milepost) ..	41 45 46.9	80 28 10.8
Conneautville, 4 miles west of, four corners	41 45 47.1	80 26 59.1
Palmer, four corners at	41 45 38.8	80 25 45.6
Four corners	41 45 32.5	80 24 38.8
Conneautville, Pennsylvania Railroad crossing west of ...	41 45 37.8	80 24 09.2
Forks of road to south	41 45 34.9	80 23 39.6
Conneautville, junction of Main, Water, and Center streets ..	41 45 28.0	80 22 04.9
Conneautville, three corners just south of bridge over Ashtabula Creek	41 45 26.4	80 22 19.9
Four corners	41 45 16.8	80 20 59.4
Four corners	41 45 18.1	80 19 40.6
Three corners, road to south	41 45 29.9	80 17 51.2
Rundell post-office, forks of road just northwest of creamery	41 45 31.1	80 17 06.6
Rundell, 1 mile east of, three corners (reference marks: 36 feet southwest to nail in root of elm tree; 51 feet southeast to nail in root of elm tree; 28 feet east to nail in root of apple tree)	41 45 21.1	80 16 09.4

Geographic positions southward along meridian 80° 15' between parallels 41° 45' and 41° 30' and westward to milepost 33 on the State line.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Three corners, road to west, 135 feet north of road to east ..	41 44 36.5	80 16 10.4
Norrisville, four corners at	41 42 56.9	80 16 13.0
Four corners	41 41 36.0	80 16 15.0
Four corners	41 40 25.3	80 16 17.2
Four corners	41 39 20.0	80 15 53.6
Three corners	41 38 16.1	80 15 39.6
Three corners	41 37 16.7	80 15 30.6
Birch schoolhouse, three corners at	41 36 52.5	80 15 05.8
Three corners	41 35 57.0	80 15 06.6
Geneva, 3 miles west of, three corners	41 35 27.7	80 14 32.4
Geneva, 1.75 miles north of, three corners	41 35 23.2	80 13 03.2
Geneva, Erie Railroad, crossing just east of station	41 34 18.6	80 13 22.0
Geneva, intersection of Main and Center streets	41 33 40.6	80 13 33.6
Geneva, 1 mile southwest of, four corners	41 32 46.2	80 14 03.2
Four corners	41 31 57.2	80 14 14.5

Geographic positions southward along meridian 80° 15' between parallels 41° 45' and 41° 30' and westward to milepost 33 on the State line—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Geneva, 4 miles south of; Atlantic, 5 miles east of, four corners (reference marks: 33 feet northwest to nail in milepost; 28 feet northeast to nail in gatepost).....	41 30 23.1	80 14 17.8
Posters Corners, three corners.....	41 30 32.9	80 15 12.2
Atlantic, 2.5 miles east of, four corners at schoolhouse ...	41 30 13.1	80 17 17.0
Four corners.....	41 30 13.9	80 18 29.0
Atlantic, four corners at	41 30 16.8	80 20 16.7
Adamsville, 1 mile southeast of, Bessemer and Lake Erie Railroad, road crossing.....	41 30 20.1	80 21 55.5
Adamsville, four corners at	41 30 40.2	80 22 11.0
Adamsville, 1 mile southwest of, four corners	41 30 23.9	80 23 16.5
Adamsville, 1.5 miles west of, four corners.....	41 30 12.6	80 23 51.6
Four corners.....	41 30 23.6	80 25 04.7
Three corners.....	41 30 24.8	80 26 12.8
Turnersville, 2 miles northeast of, junction with State road.....	41 31 45.2	80 26 10.2
Turnersville, 0.75 mile east of four corners, 200 feet east of Pennsylvania Railroad crossing	41 30 55.5	80 27 50.7
Turnersville, four corners at	41 30 35.3	80 28 37.2
Turnersville, 1 mile southwest of, three corners.....	41 30 06.3	80 29 43.4
State line, 0.25 mile east of, three corners at brick church.	41 29 42.6	80 30 54.5
Pennsylvania-Ohio State line, milepost 33.....	41 29 34.0	80 31 09.6

VERMONT—NEW YORK.

TRANGULATION STATIONS.

Chittenden County (Vt.) and Essex County (N. Y.); Burlington and Milton quadrangles.

Two quadrangles in the vicinity of Burlington were controlled by Mr. E. L. McNair, topographer, who occupied four stations and located six points by intersections.

Positions were first computed from United States Coast and Geodetic Survey stations Bigelow and Philo, but in 1904 the position given for Philo was discovered to be erroneous, thus necessitating further field work, which was done in 1904 by Mr. D. H. Baldwin, topographer, who occupied Mount Mansfield, Milton, and Yantz.

Positions are now based upon Bigelow and Mount Mansfield and checked closely upon Camels Hump and two secondary points, Juniper and Colchester Reef light-houses, all stations of the United States Coast and Geodetic Survey, United States standard datum.

BIGELOW, ESSEX COUNTY, N. Y.

A United States Coast and Geodetic Survey station on Bigelow Mountain about 4 miles south of Keeseville.

Station mark: A copper bolt sunk in solid rock with a triangle chiseled around it.

[Latitude $44^{\circ} 26' 54.123''$. Longitude $73^{\circ} 28' 09.618''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Milton	228 09 21	48 23 44	4.56945
Yantz	275 36 22	95 53 42	4.52181
Philo	312 59 12	133 09 55	4.44248

BURLINGTON TOWER, CHITTENDEN COUNTY, VT.

(Not occupied.)

The round brick tower, situated in the city of Burlington, on top of hill, about one-half mile south of University of Vermont.

Station mark: Center of tower.

[Latitude $44^{\circ} 28' 14.6''$. Longitude $73^{\circ} 11' 51.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Philo	4.33138
Milton	4.36247
Yantz	4.10898

BURLINGTON UNIVERSITY, CHITTENDEN COUNTY, VT.

(Not occupied.)

The University of Vermont, situated in the city of Burlington.

Station mark: Center of tower on main building.

[Latitude $44^{\circ} 28' 40.4''$. Longitude $73^{\circ} 11' 57.6''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Philo	4.34701
Milton	4.34847
Yantz	4.12502

ESSEX CENTER CHURCH, CHITTENDEN COUNTY, VT.

(Not occupied.)

The most prominent spire in the village of Essex Center.

Station mark: Center of spire.

[Latitude 44° 30' 43.9". Longitude 73° 03' 27.0%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bigelow			4. 52536
Yantz			4. 01812

ESSEX JUNCTION CHURCH, CHITTENDEN COUNTY, VT.

(Not occupied.)

The tallest and most prominent spire in the village of Essex Junction.

Station mark: Center of spire.

[Latitude 44° 29' 30.8". Longitude 73° 06' 31.3%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Philo			4. 40193
Yantz			3. 96664

FORT ETHAN ALLEN, CHITTENDEN COUNTY, VT.

(Not occupied.)

Station mark: Center of stone water tower.

[Latitude 44° 30' 17.1". Longitude 73° 08' 26.9%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Philo			4. 41290
Milton			4. 26720
Yantz			4. 07307

HOLMES, CHITTENDEN COUNTY, VT.

(Not occupied.)

Situated on a bare hill in town of Westford, about 2 miles northwest of Westford post-office. Land belongs to Fred Holmes.

Station mark: A lone tree on which targets were nailed.

[Latitude $44^{\circ} 37' 04.7''$. Longitude $73^{\circ} 02' 14.6''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yantz			4. 34661
Milton			3. 94590

YANTZ, CHITTENDEN COUNTY, VT.

Situated on a partly cleared hill about $1\frac{1}{2}$ miles southeast of village of Milliston, on land owned by Carl Yantz.

Station mark: A hole 1 inch in diameter drilled 3 inches deep in solid rock.

[Latitude $44^{\circ} 25' 06.27''$. Longitude $73^{\circ} 03' 22.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bigelow	95 53 42	275 36 22	4. 52181
Burlington round brick tower.....			4. 10898
Burlington University of Vermont..			4. 12502
Fort Ethan Allen			4. 07307
Essex Junction Church.....			3. 96664
Milton	169 16 37	349 13 37	4. 45527
Essex Center Church.....			4. 01812
Holmes			4. 34661

MILTON, CHITTENDEN COUNTY, VT.

On summit of rocky, partially timbered mountain, locally known as Snake Hill, about 2 miles north of town of Milton.

Station mark: A bronze tablet cemented in solid rock.

[Latitude 44° 40' 14.26". Longitude 73° 07' 14.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fort Ethan Allen			4. 26720
Philo.....	9 50 18	189 46 40	4. 64601
Burlington round brick tower.....			4. 36247
Burlington, University of Vermont..			4. 34847
Bigelow	48 23 44	228 09 21	4. 56945
Holmes.....			3. 94590
Yantz	349 13 37	169 16 37	4. 45527

PHILO, CHITTENDEN COUNTY, VT.

A United States Coast and Geodetic Survey secondary station located on a well-known and prominent hill $2\frac{1}{2}$ miles east of North Ferrisburg. An observation tower 50 feet in height was erected in 1903 over the geodetic point.

Station mark: A copper bolt cemented in solid rock under center of tower.

[Latitude 44° 16' 41.28". Longitude 73° 12' 55.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bigelow	133 09 55	312 59 12	4. 44248
Burlington, University of Vermont..			4. 34701
Burlington round brick tower.....			4. 33138
Milton	189 46 40	9 50 18	4. 64601
Fort Ethan Allen			4. 41290
Essex Junction Church.....			4. 40193

VIRGINIA.

PRIMARY TRAVERSE.

Gloucester, King, and Queen counties; Williamsburg quadrangle.

The following geographic positions were determined from primary traverse in 1904 by Mr. C. B. Kendall, field assistant. The line starts from approximate location of Yorktown triangulation station, crosses York River, and then follows highways north and west along border of quadrangle, and is tied to position at Dudley's ferry, which was scaled from Coast and Geodetic Survey Chart No. 399.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Yorktown triangulation station of Coast and Geodetic Survey	37 14 09.6	76 30 28.4
Yorktown, old custom house, tablet in northeast corner of, stamped "Prim. Trav. Sta. No. 0"	37 14 05.7	76 30 29.0
Gloucester Point, wharf at, post painted "U S x G S"	37 14 43.6	76 30 15.9
Browns' store, crossroads at; 30 feet west to locust tree; 25 feet east to corner of fence	37 15 50.7	76 29 43.7
Hayes' store, three corners at; 25 feet west to front step of store; 35 feet northeast to southwest corner of porch ..	37 16 34.8	76 30 12.1
Old store, three corners at; 30 feet east to door; 40 feet southeast to northwest corner of store	37 17 28.3	76 30 33.9
Ordinary post-office, 50 feet north of, three corners at ..	37 18 59.3	76 30 49.2
Brick church between Ordinary and Whitmarsh, southwest corner of brick wall around	37 19 58.6	76 30 50.1
Whitmarsh post-office, 175 feet southeast of; telephone post in angle of road forks	37 20 40.8	76 31 21.7
Pine tree in angle of road forks to northeast	37 21 34.4	76 31 27.3
Roanes post-office, 100 feet southwest of, in southeast corner of small brick potato house, opposite three corners, bronze tablet stamped "Prim. Trav. Sta. No. 56A" ..	37 22 15.7	76 30 23.8
Three corners, road to west; 40 feet northwest to cedar tree; 30 feet southwest to corner fence post	37 22 54.0	76 30 37.2
Three corners, road east and west; 50 feet southeast to persimmon tree; 40 feet southwest to cedar tree	37 23 50.8	76 30 09.9
Money post-office, 600 feet south of; road forks at store; 20 feet east to cedar tree	37 24 01.7	76 31 04.0
Gloucester, road junction 0.75 mile southeast of; 30 feet northeast to telephone pole; 40 feet southeast to cedar tree	37 24 44.4	76 31 13.9
Road fork to north (known as Indian road), 30 feet east to hickory tree	37 25 08.7	76 30 53.7
Four corners, 35 feet northwest to double pine; 55 feet south to leaning pine	37 26 07.2	76 30 52.7
Crossroad, east and west, second-class	37 27 13.7	76 30 46.7
Schoolhouse, 300 feet north of, road forks	37 27 35.1	76 30 29.8
Sawmill, second-class road to southwest, near	37 28 22.8	76 31 14.6
Peach Hill Run, stream crossing	37 28 53.9	76 31 36.2
Ebenezer Baptist Church, at forks of road; at southeast corner of foundation of church bronze tablet stamped "Prim. Trav. Sta. No. 173A"	37 29 57.4	76 31 50.6
Second-class crossroads northeast and southwest, 30 feet west to large oak, 35 feet south to gate	37 29 32.2	76 33 33.6
West side of road at forks, 30 feet to small blazed pine ..	37 29 58.7	76 34 19.0
Miller & Rilie's store, road forks at, 40 feet southwest of hickory tree	37 30 07.8	76 35 40.2
Three corners, road to east, 25 feet west to corner of fence, 50 feet northeast to cedar tree	37 29 15.9	76 36 22.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Woods crossroads, four corners at, 75 feet east to large oak tree, 40 feet northwest to cedar tree	37 28 41.4	76 36 59.0
Three corners, 300 feet north of old store, 25 feet west to large rock, 20 feet south to corner of fence	37 29 40.4	76 38 06.1
Adner post-office, 245 feet southwest of, in large chimney at dwelling of S. H. Wolfe, bronze tablet stamped "Prim. Trav. Sta. No. 265 A"	37 29 53.8	76 38 03.3
Gloucester, King, and Queen County line, Potopotank Creek, center of bridge over	37 30 03.9	76 39 10.8
Plain View, post-office, road forks, 200 feet southwest of, 25 feet southeast of, large sycamore tree	37 29 48.5	76 40 16.2
Vacant store, road forks to west, 25 feet west to small oak ..	37 31 32.3	76 41 11.0
Road forks, 50 feet east to pine tree, signboard, Gloucester C. H., 15 miles; Saluda, 10 miles.	37 32 39.6	76 42 17.2
Shacklefords post-office, road forks 325 feet northeast of, 15 feet north to corner of red and white fence	37 33 08.2	76 43 53.2
Center of road at forks to Dudley's and Chain's ferries...	37 32 32.5	76 45 09.2
Three corners, center of road leading to the old Brooks house	37 31 41.2	76 46 45.7
Dudley's ferry, Brooks's residence at, set in west wall of, between two chimneys, bronze tablet stamped "Prim. Trav. Sta. No. 349"	37 31 47.7	76 46 49.4

Isle of Wight and Surrey counties; Jamestown and Yorktown quadrangles.

The following geographic positions were obtained from primary traverse in 1904 by Mr. C. B. Kendall, field assistant.

The line starts from United States Coast and Geodetic Survey triangulation station Allen, and follows highways near west and south borders of quadrangle, and is tied to the position of Rock Wharf, as given on Coast and Geodetic Survey chart No. 401a.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Allen triangulation station	37 13 48.09	76 57 08.74
Claremont, intersection of Moncha avenue and Bailey avenue	37 13 40.2	76 57 52.2
Claremont, 1 mile southeast of Southern Railway crossing.	37 13 08.0	76 58 01.6
Second class crossroad	37 11 48.2	76 58 12.9
Crossroads, 25 feet northwest to pine tree at northwest corner, 40 feet southeast to oak tree at southeast corner.	37 11 18.6	76 58 07.5
East and west road, 25 feet south to oak tree, 25 feet northwest to corner fence post.	37 10 03.9	76 58 04.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing at forks.....	37 09 21.5	76 59 21.6
Savage post-office, junction of roads at, 200 feet south-west of, iron post stamped "Prim. Trav. Sta. No. 54".....	37 07 59.8	77 01 12.0
Road forks.....	37 06 42.9	77 01 28.5
Carsley post-office, four corners at, 20 feet southwest to fence post marked with brass tacks, 20 feet southeast to corner of porch of store.....	37 05 44.9	77 00 21.9
Crossroads, 20 feet north to pine tree, 20 feet south to blazed oak tree marked with brass tacks.....	37 05 26.6	76 59 56.9
Second class crossroads, 15 feet east to pine tree, 15 feet southwest to pine tree blazed and marked with brass tacks.....	37 04 26.8	77 00 06.2
Road east to Dendron.....	37 03 34.5	76 59 35.5
Bridge over Blackwater Creek.....	37 03 01.2	76 59 34.6
Road to south, 5 feet northwest to blazed pine, 30 feet south to pine tree at fence.....	37 02 23.1	77 00 01.9
Dun post-office, forks of road at, 10 feet east to northwest corner of Drewey's mill, 75 feet west to large pine tree.....	37 01 39.0	76 59 55.2
Crossroads, in southeast corner of, iron post stamped "Prim. Trav. Sta. No. 132".....	37 00 47.5	76 59 39.6
Three corners, 800 feet southwest of store, at forks of road, 1,025 feet west of narrow gauge railroad, 3 feet west to cedar tree, 25 feet south to sign post.....	37 01 07.8	76 58 07.2
Milltale Creek, bridge over.....	37 00 55.5	76 56 57.1
Anchor post-office, forks of road 350 feet south of, 26.12 feet west to nail in pine stump, 23.05 feet northeast to nail in root of pine tree.....	36 59 53.8	76 55 29.8
Schoolhouse, forks of road at, 70 feet south to northwest corner of school, 55 feet east to blazed pine tree in fork.....	37 00 12.7	76 54 04.4
Walls Bridge post-office, forks of road 75 feet east of, iron post in southwest corner of front yard of Mr. Mollie Wilkinson, just north of north end of bridge over Blackwater Swamp, stamped "Prim. Trav. Sta. No. 182".....	37 01 32.4	76 52 28.2
Runnymede post-office, forks of road at, 30 feet east to mulberry tree on south edge of woods, 25 feet north to large catalpa tree on left of forks.....	37 02 11.2	76 51 06.8
Berryman post-office, center of road opposite, 16 feet east to old brick signpost, 54 feet northwest to nail in large oak.....	37 01 41.8	76 50 07.5
Stata post-office, three corners 200 feet east of, 30 feet south to fence post, 15 feet north to post.....	37 02 11.2	76 48 37.4
Four corners, 20 feet west to signpost, 20 feet south to telephone pole.....	37 02 45.4	76 47 33.6
Second-class crossroads, 20 feet east to double pine tree, 40 feet south to pine tree.....	37 01 51.3	76 46 18.8
Road to west, 20 feet southwest to corner fence post, 25 feet northwest to signpost "Old Mill, 3 miles" "Survey C. H. 11 mi.".....	37 01 29.4	76 45 57.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bobs post-office, junction of Burwell Bay and Proctor Bridge roads, with Smithfield road at, iron bench-mark post stamped "Prim. Trav. Sta. No. 242"	37 01 08.2	76 45 39.7
Tram road crossing, 500 feet east of church	37 00 53.8	76 45 05.3
Forks of road, 25 feet northwest to signpost, 30 feet south to telephone pole	37 00 37.9	76 40 13.2
Septa post-office, small gum tree in angle of forks of road at, 30 feet east to oak tree, 50 feet southeast to front step of post-office	37 00 32.0	76 41 55.3
Four corners, west corner of fence to front yard of 2-story square dwelling on north side of road	36 59 55.5	76 40 15.0
Pagan Creek, northwest end of bridge over	36 59 19.6	76 38 56.7
Smithfield, spike in center of road at junction of Main street and road to Septa, 28.9 feet southwest to nail in cedar tree, 34.5 feet southeast to nail in elm tree	36 58 46.7	76 38 11.7
Smithfield, bronze bench-mark tablet cemented in northeast corner of feed store, 125 feet southwest of Main and Wharf streets, stamped "Prim. Trav. Sta. 299 A"	36 58 58.0	76 37 49.8
Smithfield, intersection of Main and Commerce streets, 30 feet north to southeast corner of brick store, 28 feet south to northwest corner frame house on southeast side of alley	36 58 58.8	76 37 49.2
Road to northwest, 30 feet southwest to cedar tree, 40 feet north to gatepost	36 59 37.1	76 37 45.1
Forks of road at store, 30 feet south to pine tree, 35 feet northwest to gum tree in front of store	37 00 39.8	76 37 49.2
Four corners, 25 feet northeast to signpost, 12 feet southwest to small pine	37 01 39.2	76 37 57.3
Rocks Wharf, shore end of old foundation of, position, as given on United States Coast and Geodetic Survey chart, No. 401a	37 02 07.3	76 37 26.7

WEST VIRGINIA.

TRIANGULATION STATIONS.

Jackson, Mason, Putnam, Roane, Tyler, Wirt, and Wood counties; Elizabeth, Millwood, New Martinsville, and Winfield quadrangles.

Triangulation control for the New Martinsville quadrangle was obtained by Mr. S. S. Gannett, geographer, and that for the other quadrangles mentioned above by Mr. D. H. Baldwin and Mr. E. L. McNair, topographers, the total number of stations located being twenty-five. Positions are given on the United States standard datum.

BALIS, JACKSON COUNTY.

At the highest point, near the north end of a very high, bare hog-back about 2 miles northeast of Odaville and about 1 mile southwest of Lockhart, on land owned by Mr. S. Balis, who lives in valley of the Turkey Fork, about one-half mile south of station.

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

Reference mark: A very tall dead tree trunk 2 feet in diameter; true azimuth from station, $36^{\circ} 48'$; distance, 220.9 feet:

[Latitude $38^{\circ} 57' 11.95''$. Longitude $81^{\circ} 36' 07.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reynolds	22 33 28.14	202 29 59.03	4.3215672
Sayre	44 57 53.77	224 49 37.54	4.4315279
Pleasant	53 21 31.55	233 16 33.80	4.1534997
Finlay	66 40 59.89	246 28 00.29	4.5133279
Windy	218 11 58.59	38 14 44.90	4.0120772
Ruble	255 54 05.29	76 05 30.89	4.4319366
Weed	295 12 30.91	115 16 15.75	3.9789552
Staats	317 12 31.56	137 16 22.34	4.1152546

FOSTER CHAPEL, JACKSON COUNTY.

(Unoccupied.)

Station mark: Center of belfry of Methodist Episcopal Church.

[Latitude $38^{\circ} 45' 19.92''$. Longitude $81^{\circ} 46' 43.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jividen	33 41 30	213 38 29	4.09988
Sayre	127 02 15	307 00 38	3.67090

GARNES, JACKSON COUNTY.

A high knob about 1 mile west of Kenna post-office. Timber mostly cleared from summit. Land owned by Doctor Simmons estate.

Station mark: A triangular stone monument 30 inches long, base area about 48 square inches, and top area about 24 square inches, in top of which is cemented a bronze triangulation tablet.

[Latitude 38° 40' 15.33". Longitude 81° 40' 51.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McKee	35 51 01.00	215 48 03.00	4.06956
Honaker	53 19 57.28	233 13 44.04	4.2563876
Jividen	86 03 20.03	265 56 39.93	4.1908908
Sayre	134 59 19.65	314 54 02.71	4.2378132
Reynolds	174 21 03.59	354 20 32.88	4.0805751

PLEASANT HILL CHURCH, JACKSON COUNTY.

The church is situated near the Ripley and Ravenswood road, about midway between those points, east of the pike, and on north side of the ridge road. It is a frame building painted white, with an 8-foot square pyramidal tower, 4 feet from the south face of the building.

Station mark: Center of square tower.

[Latitude 38° 52' 36.10". Longitude 81° 44' 01.65".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sayre	35 44 40.56	215 41 21.94	4.1169124
Finlay	76 31 38.26	256 23 36.68	4.2795972
Balis	233 16 33.80	53 21 31.55	4.1534997
Reynolds	342 37 45.47	162 39 13.72	4.0561462

REYNOLDS, JACKSON COUNTY.

On highest point of a cultivated knob in a young peach orchard on the south side of Millbrook Valley, 3 miles south of Ripley and 0.5 mile west of the Charleston pike. It is on land owned by Mr. A. T. Reynolds, whose house is situated on ridge in a saddle west of station and east of McCoys Knob.

Station mark: A sandstone post 36 by 9 by 9 inches set 28 inches in the ground, surrounded by a small cairn of rocks; in the center of top of post is cemented a bronze triangulation tablet.

[Latitude $38^{\circ} 46' 43.85''$. Longitude $81^{\circ} 41' 40.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sayre	91 15 23.79	271 10 37.22	4.0432231
Finlay	106 22 10.14	286 12 40.85	4.3585715
Pleasant	162 39 13.72	342 37 45.47	4.0561462
Balis	202 29 59.03	22 33 28.14	4.3215672
Staats	239 50 50.09	59 58 09.35	4.2908180
Garnes	354 20 32.88	174 21 03.59	4.0805751

SAYRE, JACKSON COUNTY.

At highest point of a very high, broad hill about 4 miles southwest of Evans, on the Point Pleasant ridge road, on land owned by Squire F. B. Sayre, who lives three-fourths mile west of Evans. Heavy timber covers portions of the west, south, and east slopes, and a peach orchard is on the north slope in adjacent field. The station is in a pasture field about 10 feet south of a rail fence, and is reached by a log road running east from Mr. King's house on ridge road.

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

Reference marks: A tall isolated spruce pine tree, with branches bunched near the top, is true azimuth $13^{\circ} 16'$ from station. The chimney of Mr. King's house is true azimuth $70^{\circ} 42'$ from station.

[Latitude $38^{\circ} 46' 51.46''$. Longitude $81^{\circ} 49' 18.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Honaker	5 29 25.09	185 28 28.01	4.3638018
Jividen	13 40 12.39	193 38 48.72	4.1362197
Kennard	69 44 05.15	249 34 03.69	4.3936764
Finlay	119 36 18.09	299 31 35.57	4.0970912
Pleasant	215 41 21.94	35 44 40.56	4.1169124
Balis	224 49 37.54	44 57 53.77	4.4315279
Reynolds	271 10 37.22	91 15 23.79	4.0432231
Foster	307 00 38.00	127 02 15.00	3.6709000
Garnes	314 54 02.71	134 59 19.65	4.2378132
Clarks	354 15 20.00	174 15 38.00	3.8312700

CLARKS KNOB, JACKSON-MASON COUNTY LINE.

(Unoccupied.)

A pointed knob with orchard on the top.

Station mark: A lone, low, bushy tree.

[Latitude $38^{\circ} 43' 12.66''$. Longitude $81^{\circ} 48' 50.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jividen.....	30 51 25	210 49 44	3. 88251
Sayre	174 15 38	354 15 20	3. 83127

FINLAY, MASON COUNTY.

A high cleared ridge in Cooper district, 13 miles by road east of Point Pleasant, $1\frac{1}{2}$ miles west of Chestnut post-office, on land owned by David Hart. A fine view can be had in all directions, although there are a few trees 150 yards eastward.

Station mark: A sandstone post 38 by 18 by 18 inches, set 36 inches in the ground, top dressed 8 inches square, and has a bronze triangulation tablet cemented in its center.

Reference mark: Chestnut signal tree; azimuth from station mark, $25^{\circ} 53'$; distance, 29 feet.

[Latitude $38^{\circ} 50' 11.56''$. Longitude $81^{\circ} 56' 49.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kennard	39 51 27.72	219 46 08.18	4. 2842014
Houck	62 53 22.49	242 38 56.49	4. 5747505
Graham	105 26 39.74	285 15 10.50	4. 4386594
Leonard	128 32 29.47	308 21 37.63	4. 5039347
Greenler	157 19 00.37	337 13 28.07	4. 5174129
Melhorn.....	213 23 06.74	33 30 24.62	4. 4833310
Balis	246 28 00.29	66 40 59.89	4. 5133279
Pleasant.....	256 23 36.68	76 31 38.26	4. 2795972
Reynolds.....	286 12 40.85	106 22 10.14	4. 3585715
Sayre	299 31 35.57	119 36 18.09	4. 0970912
Jividen.....	338 30 15.75	158 33 34.19	4. 3205388

KENNARD, MASON COUNTY.

On a cultivated hill owned by Charles Kennard, in Clendenning district, 2 miles south of Arlee post-office, 12 miles by road southeast of Gallipolis, Ohio. An unobstructed view can be had in all directions.

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

Reference marks: Spike driven in top of oak stump, 7.9 feet northward. Spike driven in top of oak stump, 6.2 feet eastward.

[Latitude $38^{\circ} 42' 12.28''$. Longitude $82^{\circ} 05' 19.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gebhardt.....	36 34 35.94	216 28 26.76	4.3810159
Houck.....	83 33 45.05	263 24 39.30	4.3270505
Finlay.....	219 46 08.18	39 51 27.72	4.2842014
Sayre.....	249 34 03.69	69 44 05.15	4.3936764
Jividen.....	283 07 26.69	103 16 03.77	4.3125898
Henderson.....	317 19 20.04	137 24 30.78	4.2495934

BLAKE KNOB, PUTNAM COUNTY.

(Not occupied.)

Station mark: Center of lone tree.

[Latitude $38^{\circ} 36' 02.83''$. Longitude $81^{\circ} 48' 47.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Honaker.....	44 35 16	224 34 00	3.62495
Henderson.....	82 03 38	261 58 30	4.08217

HENDERSON, PUTNAM COUNTY.

Situated about $3\frac{1}{2}$ miles southeast of Buffalo. On a high knob, though having about same height as surrounding hills to east and southeast. Timbered on west side with second growth of timber; clear on east side. Land belongs to Mrs. Emma Henderson, of Buffalo, West Virginia.

Station mark: A sandstone block 30 by 8 by 10 inches set flush with surface of ground, in top of which is cemented a bronze triangulation tablet.

[Latitude $38^{\circ} 35' 08.40''$. Longitude $81^{\circ} 57' 01.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kennard.....	137 24 30.78	317 19 20.04	4.2495934
Jividen.....	223 33 12.06	43 36 37.88	4.0633532
Honaker.....	278 20 20.38	98 24 12.46	3.9592901
Blake Knob.....	261 58 30.00	82 03 38.00	4.0821700

HONAKER, PUTNAM COUNTY.

On a bare, pointed knob about 1 mile west of Confidence post-office. Land belongs to John Honaker.

Station mark: A sandstone post, 12 by 12 by 28 inches, set 26 inches in the ground, in top of which is cemented a bronze triangulation tablet.

[Latitude $38^{\circ} 34' 25.41''$. Longitude $81^{\circ} 50' 49.77''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Henderson	98 24 12.46	278 20 20.38	3.9592901
Jividen.....	173 58 08.41	353 57 41.93	3.9895057
Sayre	185 28 28.01	5 29 25.09	4.3638018
Garnes	233 13 44.04	53 19 57.28	4.2563876
Blake Knob	224 34 00.00	44 35 16.00	3.6249500
McKee	260 27 28.00	80 30 43.00	3.8868000

JIVIDEN, PUTNAM COUNTY.

Situated in the northern part of Putnam County, close to the Mason County line, on divide between waters of Thirteenmile Creek and Eighteenmile Creek. Land belongs to Granville Jividen, Bee post-office, whose house stands on highest part of hill, and who keeps a store on opposite side of road. The station is on north side of house.

Signal: A quadripod of poles 30 feet long.

Station mark: A sandstone block, 13 by 17 by 21 inches, set flush with surface of ground, in top of which is cemented a bronze triangulation tablet.

Reference mark: Center of sandstone post under northwest corner of house, distant 26.25 feet, azimuth $40^{\circ} 24'$. Center of sandstone block under northeast corner of house (L part), distant 40 feet, azimuth $307^{\circ} 56'$.

[Latitude $38^{\circ} 39' 40.22''$. Longitude $81^{\circ} 51' 32.19''$.]

To station.	Azimuth.	Back azimuth.	Log. distance
	° ' "	° ' "	Meters.
Henderson	43 36 37.88	223 33 12.06	4.0633532
Kennard	103 16 03.77	283 07 26.69	4.3125898
Finley	158 33 34.19	338 30 15.75	4.3205388
Sayre	193 38 48.72	13 40 12.39	4.1362197
Clarks Knob.....	210 49 44.00	30 51 25.00	3.8825100
Foster Chapel.....	213 38 29.00	33 41 30.00	4.0998800
Garnes	265 56 39.93	86 03 20.03	4.1908908
McKee	314 20 28.00	134 24 10.00	4.0813400
Honaker	353 57 41.93	173 58 08.41	3.9895057

M'KEE, PUTNAM COUNTY.

(Unoccupied.)

Situated on a high knob about one-half mile west of Center Point, or Sigman post-office, on land owned by Mr. McKee.

Station mark: A pine pole with bushy top, spiked fast to stump of tree.

[Latitude $38^{\circ} 35' 06.72''$. Longitude $81^{\circ} 45' 35.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Honaker	80 30 43	260 27 28	3.88680
Jividen	134 24 10	314 20 28	4.08134
Garnes	215 48 03	35 51 01	4.06956

STAATS, ROANE COUNTY.

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

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

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reynolds	59 58 09.35	239 50 50.09	4.2908180
Balis	137 16 22.34	317 12 31.56	4.1152546
Weed	177 35 16.45	357 35 10.40	3.7416364
Ruble	227 07 48.19	47 15 22.24	4.3750402

POLLOCK, TYLER COUNTY.

On a prominent river bluff, about 3 miles (air line) northeast of Sistersville and 2 miles south of Paden Valley, on land owned by Mrs. E. A. Pollock.

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

[Latitude 39° 35' 27.78". Longitude 80° 56' 40.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Smith	33 32 15.6	213 30 35.1	3. 83402
Glass			4. 20425
High Knob	99 44 56.3	279 41 54.3	3. 83962
Flag N	189 41 26.8	9 42 02.4	3. 89744
Tree E	318 08 46.7	138 12 31.9	4. 10252
Owls Head			4. 22808

SMITH, TYLER COUNTY.

On a prominent bald knob, owned by C. E. Smith, 3 miles by road southeast of Sistersville.

Station mark: A sandstone post 36 by 6 by 6 inches, set 30 inches in the ground, in the center of top of which is cemented a bronze tablet "West Va."

[Latitude 39° 32' 23.32". Longitude 80° 59' 18.75".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Glass	96 56 45.4	276 51 34.5	4. 06987
High Knob	165 02 57.6	336 01 36.3	3. 87521
Flag N			4. 15850
Pollock	213 30 35.1	33 32 15.6	3. 83402
Owls Head			4. 06107

TREE E, TYLER COUNTY.

(Not occupied.)

A big lone tree on bald summit of ridge, about 3 miles south of Iuka post-office.

Station mark: Center of tree.

[Latitude 39° 30' 21.82". Longitude 80° 50' 47.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Smith	107 05 53.5	287 00 28.0	4. 10650
High Knob			4. 26907
Pollock	138 12 31.9	318 08 46.7	4. 10252

ELIZABETH, WIRT COUNTY.

The south meridian mark monument about 18 feet east of east corner of Wirt County Bank, part of the New Raleigh Hotel Building.

Station mark: A sandstone post 42 by 8 by 8 inches, sunk 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 03' 46.28''$. Longitude $81^{\circ} 23' 39.51''$.]

To station.—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jephany.....	3. 36882

JEPHANY, WIRT COUNTY.

On a high, bare summit about 1 mile southwest of Elizabeth, on land owned formerly by Jephany Wiseman, who lives at north base of hill.

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

[Latitude $39^{\circ} 02' 50.94''$. Longitude $81^{\circ} 24' 45.97''$.]

To station.—	Azimuth	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Weed	28 16 02.67	208 12 38.91	4. 2168738
Windy	76 43 14.56	256 38 51.71	4. 0134702
Freed	179 13 13.31	359 13 08.85	4. 0934350
Swearingen	203 08 10.39	23 11 12.48	4. 2461645
Ruble	291 41 08.73	111 45 25.77	4. 0240129

RUBLE, WIRT COUNTY.

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

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

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

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

WEED, IN WIRT, JACKSON, AND ROANE COUNTIES.

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

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

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Balis	115 16 15.75	295 12 30.91	3.9789552
Windy	169 30 34.12	349 29 35.35	4.0915521
Jephany	208 12 38.91	28 16 02.67	4.2168738
Ruble	238 54 07.75	59 01 48.11	4.3132201
Staats	357 35 10.40	177 35 16.45	3.7416364

WILLIAMS, WIRT COUNTY.

(Not occupied.)

A small wild cherry tree on highest part of broad, bare ridge having timber on south slope. It is east of West Point schoolhouse, on land belonging to Ellis Williams.

Station mark: Center of cherry tree.

[Latitude 39° 05' 09.44". Longitude 81° 24' 41.76".]

WINDY, WIRT COUNTY.

A high, bare conical peak about 300 feet south of Windy post-office, on land owned by G. W. Boice, who lives on west side of hill.

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

[Latitude $39^{\circ} 01' 33.90''$. Longitude $81^{\circ} 31' 43.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Balis	38 14 44.90	218 11 58.59	4. 0120772
Goff	174 13 15.63	354 12 17.75	4. 3395345
Freed	213 31 36.92	33 35 55.63	4. 2512547
Jephany	256 38 51.71	76 43 14.56	4. 0134702
Ruble	274 20 57.36	94 29 37.09	4. 2992679
Weed	349 29 35.35	169 30 34.12	4. 0915521

FREED, WOOD COUNTY.

On a high, practically bare ridge 2 miles northeast of Leachtown and 4 miles northwest of Greencastle, on land owned by A. R. Freed, whose residence is on adjacent summit southwest on sand ridge about same elevation.

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

[Latitude $39^{\circ} 09' 35.81''$. Longitude $81^{\circ} 24' 53.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Windy	33 35 55.63	213 31 36.92	4. 2512547
Goff	119 46 48.89	299 41 31.67	4. 1422190
Pinnacle	199 10 46.34	19 12 37.23	4. 1071426
Swearingen	242 18 33.58	62 21 40.36	3. 9038136
Ruble	328 38 06.99	148 42 28.80	4. 2831913
Jephany	359 13 08.85	179 13 13.31	4. 0964350

GOFF, WOOD COUNTY.

Situated on a high, cleared hill about 4 miles south of Parkersburg and one-half mile west of the Elizabeth pike, on land owned by Nathan Goff.

Station mark: A stone post 42 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 13' 18.75''$; $a 39^{\circ} 13' 18.97''$. Longitude $81^{\circ} 33' 14.81''$; $a 81^{\circ} 33' 15.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wigal	69 50 00.78	249 45 17.54	4.0590737
Nolan	135 04 44.31	314 58 46.74	4.2822068
Nolan ^b	135 04 36.68	314 58 39.12	4.2822061
Seffens ^b	173 29 48.59	353 29 10.61	4.1032735
Pinkerton ^b	184 54 59.34	4 55 52.16	4.3666186
Pinnacle ^b	252 10 36.52	72 17 45.09	4.2319366
Pinnacle	252 10 30.08	72 17 38.58	4.2319171
Freed	299 41 31.67	119 46 48.89	4.1422190
Windy	354 12 17.75	175 13 15.63	4.3395345

^a From Kennard-Finlay through West Virginia; triangulation of 1903.

^b Culland az.

MOUNT CARMEL CHURCH, WOOD COUNTY.

(Not occupied.)

Station mark: Center of spire on Mount Carmel frame church, on road from Greencastle to Walker station.

[Latitude $39^{\circ} 09' 27.33''$. Longitude $81^{\circ} 23' 21.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goff			4.20250
Jephany			4.09316

PINNACLE, WOOD COUNTY.

Situated on the summit of a high, sharp hill, locally known as "The Pinnacle," about 2 miles northwest of Deerwalk post-office, on land owned by W. E. Whitlatch.

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

Reference mark: The tall black-walnut signal tree standing a little below summit, on north side of hill. Distance to center of signal tree, 40.85 feet; true azimuth, $250^{\circ} 00'$.

[Latitude $39^{\circ} 16' 07.50''$; $39^{\circ} 16' 07.74''$. Longitude $81^{\circ} 21' 57.37''$; $81^{\circ} 21' 57.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goff.....	72 17 45.09	252 10 36.52	4. 2319366
Seffens.....	112 47 04.89	292 39 17.80	4. 2822967
Pinkerton.....	141 41 14.67	321 34 57.99	4. 3601976
Moore.....	204 43 50.23	24 47 56.51	4. 3462483
Griffith.....	230 06 12.40	50 10 45.31	4. 1286309
Freed.....	19 12 37.23	199 10 46.34	4. 1071426
Goff ^a	72 17 38.58	252 10 30.08	4. 2319171
Swearingen.....	340 57 45.36	160 59 01.43	3. 9469149

^a From Kennard-Finlay through West Virginia; triangulation of 1903.

SWEARINGEN, WOOD COUNTY.

On a bare hogback about 4 miles east of Walker railroad station and about 1 mile south of Eatons railroad station, on land owned by A. Swearingen, who lives on the southeast side of the hill.

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

Reference mark: The small pine signal tree. True azimuth from station mark, $103^{\circ} 31'$; distance, 11.6 feet.

[Latitude $39^{\circ} 11' 36.46''$. Longitude $81^{\circ} 19' 57.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jephany.....	23 11 12.48	203 08 10.39	4. 2461645
Freed.....	62 21 40.36	242 18 33.58	3. 9038136
Pinnacle.....	160 59 01.43	340 57 45.36	3. 9469149

WISCONSIN.

PRIMARY TRAVERSE.

Columbia and Dodge counties; Beaverdam and Doylestown quadrangles.

The following geographic positions were obtained from primary traverse by Mr. George T. Hawkins in 1903: The line starts from United States Lake Survey triangulation station Minnesota Junction, follows highways west to Chicago, Milwaukee and St. Paul Railway; thence along that railway to Randolph; thence south along highways to Columbus; thence along Chicago, Milwaukee and St. Paul Railway to Reesville; thence along highways east to Chicago and Northwestern Railway; thence along that railway to 2 miles north of Minnesota Junction; thence west along highways to Minnesota Junction triangulation station. Positions are given on United States standard datum.

DODGE COUNTY; BEAVERDAM QUADRANGLE.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Minnesota Junction triangulation station, U. S. Lake Survey	43 28 28.5	88 43 46.8
T. 12 N., R. 15 E., corner secs. 29, 30, 31, and 32.....	43 28 24.4	88 44 36.6
T road west.....	43 27 58.4	88 45 31.0

Geographic positions along the Chicago, Milwaukee and St. Paul Railway between milepost 62 and Randolph.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Milepost 62, road crossing 300 feet east of	43 27 58.2	88 47 48.4
Beaverdam Junction, road crossing at	43 28 07.7	88 49 44.2
Road crossing north and south	43 28 32.5	88 50 04.4
Road crossing (private)	43 31 27.2	88 53 21.7
T. 12 N., R. 13 E., corner secs. 1, 2, 11, and 12	43 31 54.0	88 54 20.9
Road crossing northeast and southwest	43 32 14.4	88 57 18.0
Road crossing north and south	43 32 14.6	88 59 08.4
Randolph, road crossing north and south in east part of..	43 32 15.0	89 00 02.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Creamery, crossroads at.....	43 31 00.3	89 00 00.1
T road east	43 29 28.7	88 59 59.2
T. 12 N., R. 13 E., quarter corner between secs. 30 and 31 ..	43 28 23.5	88 59 41.6
Lost Lake, crossroads at	43 27 30.9	88 59 23.9
T road west.....	43 26 38.6	88 59 29.6
Creamery, crossroads at.....	43 25 46.3	88 59 40.1
Crossroads.....	43 24 10.7	88 59 59.2
Creamery, road east at	43 23 09.6	89 00 16.0
T road east	43 22 11.4	89 00 23.5

Geographic positions along the Chicago, Milwaukee and St. Paul Railway between Columbus and Reesville.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Columbus, railway crossing east of station	43 20 25.6	89 00 41.4
Road crossing north and south	43 20 04.2	88 59 09.3
Road crossing north and south over railway.....	43 20 02.3	88 57 57.4
Ella, road crossing 500 feet east of station	43 19 58.4	88 56 11.5
Milepost 58, north-and-south road crossing 1,000 feet west of ..	43 19 18.1	88 54 39.9
Milepost 57, north-and-south road crossing 250 feet west of ..	43 18 44.5	88 53 31.7
Road crossing north and south over railway	43 18 29.0	88 52 59.1
Reesville, road crossing at	43 18 13.8	88 50 43.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10 N., R. 14 E., corner secs. 22, 23, 26, and 27	43 18 51.4	88 48 47.1
T. 10 N., R. 14 E., corner secs. 23, 24, 25, and 26.....	43 18 50.6	88 47 35.3
T. 10 N., Rs. 14 and 15 E., corner secs. 19, 30, 25, and 24 ..	43 18 50.3	88 46 24.1
Graveyard, T road north at	43 18 49.9	88 45 19.7
T. 10 N., R. 15 E., corner secs. 20, 21, 28, and 29.....	43 18 50.3	88 44 03.7

Geographic positions along the Chicago and Northwestern Railway between Clyman and Minnesota Junction.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Clyman, east-and-west road crossing, 0.25 mile north of..	43 18 50.4	88 43 07.7
T. 10 N., R. 15 E., corner secs. 9, 10, 15, and 16.....	43 20 33.8	88 42 49.7
Milepost 143, crossing 200 feet south of.....	43 22 04.9	88 42 26.8
T. 11 N., R. 15 E., corner secs. 27, 28, 33, and 34.....	43 23 09.8	88 42 08.9
Juneau, east-and-west road crossing north of station.....	43 24 24.9	88 41 52.8
Juneau, Insane Asylum, road crossing at.....	43 24 55.4	88 41 46.1
Milepost 147, east-and-west road crossing 0.25 mile north of	43 25 47.0	88 41 39.3
Milepost 148, east-and-west road crossing 0.25 mile north of	43 26 41.3	88 41 43.1
Minnesota Junction, crossing Chicago, Milwaukee and St. Paul Railway.....	43 27 13.7	88 41 48.4
T. 12 N., R. 15 E., corner secs. 23, 24, 27, and 28.....	43 28 24.2	88 42 11.8

COLUMBIA COUNTY; DOYLESTOWN QUADRANGLE.

The following line starts from adjusted position at Columbus and follows highways southwest to Keyser, thence north and east to Chicago, Milwaukee and St. Paul Railway at Cambria, thence along railway to Randolph.

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 10 N., R. 12 E., corner secs. 21, 22, 27, and 28.....	43 18 43.3	89 04 07.4
T. 10 N., R. 12 E., quarter corner between secs. 20 and 29.	43 18 42.6	89 05 54.7
T. 10 N., Rs. 11 and 12 E., range line crossing east-and- west road.....	43 18 47.6	89 07 35.0
T road north.....	43 18 48.6	89 10 05.4
T road south.....	43 19 03.3	89 11 13.5
Intersection road west with road northeast and southwest.	43 18 41.8	89 13 15.0
Keyser, crossroads at.....	43 17 47.2	89 15 18.6
Crossroads.....	43 18 40.4	89 14 47.0
T. 10 N., Rs. 10 and 11 E., corner secs. 13, 18, 19, and 24.	43 19 32.4	89 14 41.1
T. 10 N., Rs. 10 and 11 E., corner secs. 7, 18, 13, and 12..	43 20 24.3	89 14 40.6
Tps. 10 and 11 N., T road south on line.....	43 22 08.6	89 14 35.6
Tps. 10 and 11 N., T road north on line.....	43 22 08.6	89 14 38.9
T. 11 N., Rs. 10 and 11 E., corner secs. 30, 31, 36, and 25.	43 23 01.5	89 14 37.1
T. 11 N., Rs. 10 and 11 E., corner secs. 19, 30, 24, and 25.	43 23 54.0	89 14 37.7
T. 11 N., Rs. 10 and 11 E., corner secs. 13, 18, 19, and 24.	43 24 46.7	89 14 38.8
T. 11 N., Rs. 10 and 11 E., corner secs. 7, 18, 13, and 12..	43 25 39.1	89 14 39.6
T. 11 N., Rs. 10 and 11 E., corner secs. 1, 6, 7, and 12....	43 26 31.4	89 14 39.9

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rio, railway crossing at.....	43 26 57.7	89 14 18.2
T. 11 N., R. 11 E., quarter corner between secs. 5 and 6..	43 26 58.0	89 13 32.0
T. 12 N., R. 11 E., corner secs. 29, 30, 31, and 32	43 28 16.0	89 13 33.0
T. 12 N., R. 11 E., corner secs. 7, 8, 18, and 19	43 29 59.0	89 13 35.0
Crossroads	43 30 00.9	89 12 22.0
T. 12 N., R. 11 E., sec. 15, center of	43 30 26.4	89 10 35.4
T. 12 N., R. 11 E., corner secs. 10, 11, 14, and 15	43 30 52.8	89 10 00.6
T. 12 N., R. 11 E., corner secs. 11, 12, 13, and 14.....	43 30 53.1	89 08 47.9
T. 12 N., Rs. 11 and 12 E., corner secs. 7, 18, 13, and 12..	43 30 53.1	89 07 36.2
Schoolhouse, T road west at	43 31 08.1	89 06 05.7

Geographic positions along the Chicago, Milwaukee and St. Paul Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south	43 32 16.8	89 03 42.1
Road crossing north and south	43 32 16.0	89 02 15.8

WESTERN DIVISION OF TOPOGRAPHY.

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

ARIZONA.

TRIANGULATION STATIONS.

Cochise, Pima, Pinal, and Santa Cruz counties; Nogales, Patagonia, Tombstone, and Tucson quadrangles.

In the spring of 1903, Mr. T. M. Bannon, topographer, extended triangulation southward from stations Grayback and Walker to the vicinity of Tombstone and Nogales. Twenty primary stations were occupied and numerous points were located by intersection for the control of six 30-minute quadrangles. Connection was made with monuments No. 120 and No. 121 of the United States and Mexico boundary line near Nogales. To reduce to mean position of latter, add 4.9" to latitude and 2.2" to longitude.

Connection was also made with San Francisco Mountain, which has also been located from the Fort Wingate, N. Mex., base and astro-nomic position, the latter agreeing closely with U. S. standard datum of the Coast and Geodetic Survey. To reduce Maricopa datum to Fort Wingate datum (approximate U. S. standard datum) add 4.4" to latitude, and subtract 4.8" from longitude.

AJAX, COCHISE COUNTY.

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

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

[Latitude 31° 42' 29.06". Longitude 110° 07' 46.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mustang.....	86 58 58.34	266 48 00.67	4.5186134
Stonewhet.....	114 13 06.71	294 03 37.16	4.4941312
Rincon.....	140 46 53.91	320 34 24.21	4.7693886

COMSTOCK, COCHISE COUNTY.

A secondary station on a low hill on west edge of Tombstone. The hill is called Comstock by some of the old settlers.

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

[Latitude $31^{\circ} 43' 05.04''$. Longitude $110^{\circ} 04' 28.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Schieffelin.....	114 03 11	294 02 15	3. 48187
Mineral monument No. 6.....	352 52 25	352 52 35	3. 60712

MINERAL MONUMENT NO. 6, COCHISE COUNTY.

On Bunker Hill, about 1 mile south of Tombstone, being the established mineral monument No. 6.

Station mark: A 6 by 6 inch redwood post centered in a very large rock monument.

[Latitude $31^{\circ} 40' 54.66''$. Longitude $110^{\circ} 04' 09.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ajax.....	116 59 02	296 57 08	3. 80695
Schieffelin.....	148 04 52	328 03 46	3. 79152
Comstock.....	172 52 25	352 52 35	3. 60712

SCHIEFFELIN, COCHISE COUNTY.

The large tombstone erected to the memory of Ed. Schieffelin, the discoverer of Tombstone, about 3 miles west of Tombstone, on the main wagon road to Fairbanks.

Station mark: Center of the large masonry monument.

[Latitude $31^{\circ} 43' 45.16''$. Longitude $110^{\circ} 06' 14.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ajax.....	46 10 00	226 09 12	3. 52944
Stonewhet.....	108 42 31	288 32 12	4. 51342
Comstock.....	294 02 15	114 03 11	3. 48187
Mineral monument No. 6.....	328 03 46	148 04 52	3. 79152

STONEWHET, COCHISE COUNTY.

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

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

[Latitude $31^{\circ} 49' 23.31''$. Longitude $110^{\circ} 25' 48.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mustang.....	17 04 38.58	197 03 09.26	4. 1823800
Baldy	76 20 22.14	250 07 09.15	4. 6246192
Faggan	105 27 10.46	285 17 46.21	4. 4645904
Rincon	164 55 28.62	344 52 30.54	4. 5302026
Ajax	294 03 37.16	114 13 06.71	4. 4941312

EMPIRE, PIMA COUNTY.

(Not occupied.)

On the highest point at the north end of the Empire Mountains, about 6 miles southwest of Pantano station on the Southern Pacific Railroad, 2 miles northeast of the old "Total Wreck mine."

Station mark: A rock monument.

[Latitude $31^{\circ} 54' 56.1''$. Longitude $110^{\circ} 36' 48.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stonewhet.....	4. 30422
Faggan.....	4. 04306

FAGGAN, PIMA COUNTY.

On the round hill at the extreme north end of the Santa Rita Mountains, about 8 miles south of Vails station, and 30 miles southwest of Tucson.

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

[Latitude $31^{\circ} 53' 34.21''$. Longitude $110^{\circ} 43' 37.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Baldy	27 40 27.13	207 36 36.59	4. 3946483
Samaniego.....	92 33 28.15	272 18 26.76	4. 6518608
Wasson	136 44 15.11	316 30 50.94	4. 7620535
Pusch	159 19 12.91	339 12 25.93	4. 7531701
Kellogg	181 37 56.64	1 38 30.09	4. 7608738
Rincon	217 30 45.62	37 37 13.95	4. 4988971
Stonewhet.....	285 17 46.21	105 27 10.46	4. 4645904
Mustang.....	313 12 35.34	133 20 29.14	4. 5118308

HOPKINS, PIMA COUNTY.

(Not occupied.)

The high sharp peak 2 miles west of Baldy Mountain, the highest peak of the Santa Rita Mountains.

Station mark: Center of peak.

[Latitude $31^{\circ} 41' 15.0''$. Longitude $110^{\circ} 53' 09.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wasson			4. 84109
Warner			4. 76861
Samaniego.....			4. 58784

KELLOGG, PIMA COUNTY.

On a high timbered summit of the Santa Catalina Mountains, about 4 miles east of Mount Lemon, and 3 miles south of the Inter-Ocean (Kellogg) ranch. Most easily reached from the north via the old saw-mill road.

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

[Latitude $32^{\circ} 24' 45.42''$. Longitude $110^{\circ} 42' 34.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Faggan	1 38 30.09	181 37 56.64	4. 7608738
Warner	49 48 11.97	229 39 07.03	4. 5435066
Wasson	69 23 00.45	249 08 56.84	4. 6443677
Black	149 32 09.78	329 23 56.65	4. 6719930
Rincon	331 42 19.13	151 48 16.72	4. 5687310

PANTANO RAILROAD STATION, PIMA COUNTY.

(Not occupied.)

Station mark: Center of the building of Pantano station, Southern Pacific Railroad.

[Latitude $31^{\circ} 59' 54.9''$. Longitude $110^{\circ} 34' 58.0''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stonewhet.....			4. 38424
Rincon			4. 15838

PUSCH, PIMA COUNTY.

On a sharp, white peak at the southwest end of the Santa Catalina Mountains, 2 miles southwest of steam pump on Pusch's ranch on the Tucson, Oracie and Mammoth road, 10 miles north of Tucson.

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

[Latitude 32° 22' 14.14". Longitude 110° 56' 22.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warner	15 37 08.17	195 35 25.90	4. 2700335
Samaniego	25 49 58.20	205 41 37.85	4. 7536563
Wasson	60 50 54.56	240 44 14.27	4. 3510366
Picacho	124 03 51.42	303 48 58.79	4. 7182656
Tortolitas	152 21 13.23	332 18 40.41	4. 2049267
Black	177 07 00.07	357 06 13.04	4. 6550474
Rincon	305 23 35.33	125 36 54.50	4. 6827630
Faggan	339 12 25.93	159 19 12.91	4. 7531701

RINCON, PIMA COUNTY.

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

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

[Latitude 32° 07' 05.94".. Longitude 110° 31' 25.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Faggan	37 37 13.95	217 30 45.62	4. 4988971
Warner	83 35 18.22	282 39 11.20	4. 6569384
Wasson	106 18 02.24	285 58 05.16	4. 7871876
Pusch	125 36 54.50	305 23 35.33	4. 6827630
Kellogg	151 48 16.72	331 42 19.13	4. 5687310
Ajax	320 34 24.21	140 46 53.91	4. 7693886
Stonewhet	344 52 30.54	164 55 28.62	4. 5302026

SAMANIEGO, PIMA COUNTY.

On Samaniego Peak in the Sierrita Mountains, about 2 miles north of McGee's cattle ranch and 30 miles southwest of Tucson.

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

[Latitude $31^{\circ} 54' 36.03''$. Longitude $111^{\circ} 12' 03.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wasson	187 07 29.71	7 09 11.52	4.6067648
Pusch	205 41 37.85	25 49 58.20	4.7536563
Warner	210 36 40.03	30 43 17.63	4.5857330
Faggan	272 18 26.76	92 33 28.15	4.6518608
Baldy	305 30 32.37	125 41 40.65	4.6130612
Cayetano	331 38 15.31	151 45 45.76	4.6773982

SÁN XAVIER MISSION, PIMA COUNTY.

(Not occupied.)

Station mark: The highest dome of the old San Xavier Mission, 11 miles south of Tucson.

[Latitude $32^{\circ} 06' 20.1''$. Longitude $111^{\circ} 00' 31.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Samaniego.....			4.45166
Wasson			4.35458

SONOITA SECTION HOUSE, PIMA COUNTY.

(Not occupied.)

The two-story section-house building at Sonoita station on the Nogales Branch of the Southern Pacific Railroad.

[Latitude $31^{\circ} 40' 24.1''$. Longitude $110^{\circ} 39' 18.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Baldy			4.26729
Stonewhet.....			4.43165

TORTOLLITAS, PIMA COUNTY.

On a high peak at the southeast end of the Tortollitas Mountains, 8 miles northeast of Pusch's ranch (steam pump), on the Tucson, Oracle and Mammoth road.

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

[Latitude $32^{\circ} 29' 55.04''$. Longitude $111^{\circ} 01' 07.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wasson	25 46 43.96	205 42 35.48	4.4458903
Picacho	112 45 42.20	292 33 21.38	4.5900081
Black	189 26 10.71	9 27 57.27	4.4964023
Pusch	332 18 40.41	152 21 13.23	4.2049267

TUCSON COURT-HOUSE, PIMA COUNTY.

(Not occupied.)

Station mark: Center of cupola.

[Latitude $32^{\circ} 13' 17.3''$. Longitude $110^{\circ} 58' 25.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pusch			4.22640
Warner			3.35984

TUCSON, SOUTH MERIDIAN STATION, PIMA COUNTY.

A secondary triangulation station in the southwest corner of the grounds of the University of Arizona, 108.5 feet from the west fence, and 157.4 feet from the south fence.

Station mark: A dark stone post, 60 by 7 by 7 inches, set 57 inches in the ground, in the center of top of which is cemented a copper bolt.

[Latitude $32^{\circ} 13' 44.82''$. Longitude $110^{\circ} 57' 24.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warner	56 26 51	236 25 42	3.60912
Wasson	104 48 54	284 42 47	4.26932
North Meridian	180 00 39	0 00 39	2.45133

TUCSON STANDPIPE, PIMA COUNTY.

(Not occupied.)

Station mark: Center of standpipe.

[Latitude $32^{\circ} 12' 39.0''$. Longitude $110^{\circ} 58' 00.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pusch	4. 25281
Wasson	4. 26372
Warner	3. 39424

VAILS, PIMA COUNTY.

(Not occupied.)

The railroad station building at Vails, Southern Pacific Railroad.

[Latitude $32^{\circ} 02' 47.6''$. Longitude $110^{\circ} 42' 46.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Faggan	4. 23297
Kellogg	4. 60780
Rincon	4. 29122

WARNER, PIMA COUNTY.

On a round black malpais hill known as Warner Hill, about one-half mile west of Tucson.

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

[Latitude $32^{\circ} 12' 31.86''$. Longitude $110^{\circ} 59' 34.33''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Samaniego	30 43 17.63	210 36 40.03	4. 5857330
Wasson	115 37 17.13	295 32 19.77	4. 2089442
Pusch	195 35 25.90	15 37 08.17	4. 2700335
Kellogg	229 39 07.03	49 48 11.97	4. 5435066
Rincon	282 39 11.20	83 35 18.22	4. 6569384

WASSON, PIMA COUNTY.

On the highest peak, known as Mount Wasson, of the Tucson Range, about 12 miles west of Tucson.

Station mark: A bronze tablet buried about 1 foot under ground, over which is centered a 6 by 6 inch redwood mineral monument post, around which is built a large rock monument.

[Latitude 32° 16' 18.64". Longitude 111° 08' 51.74".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Samaniego	7 09 11.52	187 07 29.71	4. 6067648
Picacho	149 22 06.89	329 13 57.31	4. 6690990
Black	197 03 38.12	17 09 33.79	4. 7684935
Tortollitas	205 42 35.48	25 46 43.96	4. 4458903
Pusch	240 44 14.27	60 50 54.66	4. 3510366
Kellogg	249 08 56.84	69 23 00.25	4. 6443677
Rincon	285 58 05.16	106 18 02.24	4. 7871876
Warner	295 32 19.77	115 37 17.13	4. 2089442
Faggan	316 30 50.94	136 44 15.11	4. 7620535

RICE, PIMA AND PINAL COUNTIES.

(Not occupied.)

High round peak on the Crocle ridge of the Santa Catalina Mountains, about 12 miles south of Oracle health resort. A county-line monument between Pima and Pinal counties is a few feet from the station.

Station mark: A rock monument.

[Latitude 32° 30' 38.5". Longitude 110° 45' 02.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tortollitas	4. 40215
Black Mountain	4. 55306
Kellogg	4. 06209

BLACK, PINAL COUNTY.

On the highest peak of the low mountain, known both as the Cottonwood Mountains and as Black Mountains, about 35 miles south of east from Florence and 9 miles south of Burns's Cottonwood ranch. The Florence and Mammoth road passes several miles to the north.

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

[Latitude $32^{\circ} 46' 39.32''$. Longitude $110^{\circ} 57' 50.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tortollitas	9 27 57.27	189 26 10.71	4.4964023
Wasson	17 09 33.79	197 03 38.12	4.7684935
Picacho	68 51 35.00	248 37 24.60	4.6433106
Walker	121 44 11.48	301 26 12.80	4.7820429
Grayback	159 06 33.58	339 02 09.38	4.5484595
Pusch	357 06 13.04	177 07 00.07	4.6550474
Kellogg	329 23 56.65	149 32 09.78	4.6119930

PICACHO, PINAL COUNTY.

On the high prominent peak named Picacho, 1 mile south of Wynola siding on the Southern Pacific Railroad, 8 miles west of Red Rock station.

Station mark: A bronze bench-mark tablet centered under a large rock monument.

[Latitude $32^{\circ} 38' 01.60''$. Longitude $110^{\circ} 24' 04.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walker	167 23 37.17	347 19 54.28	4.6887917
Grayback	209 55 43.08	30 05 33.23	4.7524589
Black	248 37 24.60	68 51 35.00	4.6433106
Tortollitas	292 33 21.38	112 45 42.20	4.5900081
Pusch	303 48 58.79	124 03 51.42	4.7182656
Wasson	329 13 57.31	149 22 06.89	4.6690990

BALDY, SANTA CRUZ COUNTY.

On the high prominent peak known as Baldy, in the Santa Rita Mountains, about 35 miles southeast of Tucson, visible from all directions.

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

[Latitude 31° 41' 40.59". Longitude 110° 50' 55.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Santa	3 54 56.06	183 54 05.82	4.5704004
Benedict	12 04 19.21	192 01 58.42	4.5314281
Cayetano	31 05 08.40	211 01 32.75	4.3226362
Samaniego	125 41 40.65	305 30 32.37	4.6130612
Faggan	207 36 36.59	27 40 27.13	4.3946483
Stonewhet	250 07 09.15	70 20 22.14	4.6246192
Mustang	270 23 08.91	90 34 51.29	4.5466564

BENEDICT, SANTA CRUZ COUNTY.

On the highest round hill, about 5 miles south of Calabasas and 4 miles north of Nogales, between the Santa Cruz River and Nogales Creek.

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

[Latitude 31° 23' 41.10". Longitude 110° 55' 24.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cayetano	166 09 49.22	346 08 34.95	4.1957829
Baldy	192 01 58.42	12 04 19.21	4.5314281
Santa	310 07 05.57	130 08 35.66	3.7767067

CAYETANO, SANTA CRUZ COUNTY.

On the highest peak of the Cayetano Mountains, 4 miles north of Calabasas and about 15 miles north of Nogales.

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

[Latitude 31° 31' 55.92". Longitude 110° 57' 46.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Samaniego	151 45 45.76	331 38 15.31	4.6773982
Baldy	211 01 32.75	31 05 08.40	4.3226362
Mustang	248 51 00.95	69 06 17.36	4.6934490
Benedict	346 08 34.95	166 09 49.22	4.1957829

MONUMENT NO. 121, SANTA CRUZ COUNTY.

International boundary line monument No. 121.

Station mark: Center of the large iron boundary monument.

[Latitude $31^{\circ} 19' 52.23''$; $\alpha 31^{\circ} 19' 57.13''$. Longitude $110^{\circ} 56' 22.58''$; $\alpha 110^{\circ} 56' 24.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Benedict	192 18 25	12 18 56	3. 8582241
Santa	242 23 24	62 25 25	3. 8386500

a Mean position by United States and Mexico Boundary Survey Report, p. 54.

MUSTANG, SANTA CRUZ COUNTY.

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

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

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cayetano	69 06 17.36	248 51 00.95	4. 6934490
Baldy	90 34 51.29	270 23 08.91	4. 5466564
Faggan	133 20 29.14	313 12 35.34	4. 5118308
Stonewhet	197 03 09.26	17 04 38.58	4. 1823800
Ajax	266 48 00.67	86 58 58.34	4. 5186134

RED, SANTA CRUZ COUNTY.

(Not occupied.)

On the high mountain 3 miles southeast of Patagonia station, on the Nogales Branch of the Southern Pacific Railroad.

Station mark: A bronze tablet set in solid rock under a small monument.

[Latitude $31^{\circ} 30' 18.1''$. Longitude $110^{\circ} 43' 35.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Benedict	56 53 03	236 46 53	4. 349256
Baldy	151 10 26	331 06 36	4. 380230

SANTA, SANTA CRUZ COUNTY.

On a white grassy ridge on the west side of Santa Cruz River and about 4 miles northeast of Nogales.

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

[Latitude $31^{\circ} 21' 35.96''$. Longitude $110^{\circ} 52' 31.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Monument 121	62 25 24.00	242 23 27.00	3.8386500
Benedict	130 08 35.66	310 07 05.57	3.7767067
Baldy	183 54 05.82	3 54 56.06	4.5704004

WASHINGTON, SANTA CRUZ COUNTY.

(Not occupied.)

On a high timbered hill about $1\frac{1}{2}$ miles north of the Mexican boundary line and 13 miles east of Nogales.

Station mark: A rock monument.

[Latitude $31^{\circ} 21' 07.1''$. Longitude $110^{\circ} 43' 33.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Benedict	104 13 34	284 07 24	4.287074
Baldy	162 59 11	342 55 20	4.599195

Coconino and Mohave counties; Grand Canyon Forest Reserve.

During the summer of 1903 Mr. J. T. Stewart controlled, by triangulation, seven 15-minute quadrangles lying within this reserve, the work being based upon stations Floyd and Kendrick developed from the Maricopa base. In the prosecution of this work Mr. Stewart occupied twenty-seven primary and five 3-point stations.

APACHE, COCONINO COUNTY.

On the northernmost point of the Apache headland; as it was covered with cedar and pinyon timber, a great deal of cutting was necessary. Station was cleared for all points north. Sight lanes were cut to Chapin and Oliver signals. Station can be reached with saddle horses from Bass-Supai wagon road.

Signal: A pole tripod 12 feet high centered over tablet.

Station mark: A bronze triangulation tablet cemented in a limestone rock.

178 . PRIMARY TRIANGULATION AND PRIMARY TRAVERSE. [BULL. 245.

[Latitude $36^{\circ} 12' 45.02''$. Longitude $112^{\circ} 30' 03.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chapin	10 43 50.26	190 43 12.83	3.9301718
Oliver	63 11 33.20	243 08 22.71	3.9557725
Elliott	109 23 25.03	288 18 45.94	4.0968329
Fossil	155 08 24.32	335 06 12.81	4.1202820
Millett	193 17 58.36	13 20 15.65	4.3996208
Sublime	274 14 43.60	94 23 35.22	4.3531054
Bass	290 22 28.95	110 27 33.65	4.1385497

BASS, COCONINO COUNTY.

On high point of plateau, 1 mile east of Bass camp. The point was covered with small timber, but was cleared so that sights can be had in all directions. Station is 300 feet south of the wagon road which runs from Bass camp to Havasupai Point.

Signal: A pole tripod 13 feet high and 9 feet at the base.

Station mark: A bronze triangulation tablet cemented in a flat limestone ledge.

[Latitude $36^{\circ} 10' 09.31''$. Longitude $112^{\circ} 21' 27.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd	21 08 51.88	200 55 59.30	4.9658682
Cataract	53 20 19.10	233 13 27.96	4.3378082
Chapin	76 12 53.16	256 07 11.32	4.1736931
Apache	110 27 33.65	290 22 28.95	4.1385497
Sublime	252 03 26.26	72 07 12.97	4.0036308
Royal	278 59 58.91	99 14 26.13	4.5709072
Rowe	300 22 03.79	120 29 15.05	4.3266836
Red Butte	328 04 46.78	148 14 12.70	4.6600887

CANE, COCONINO COUNTY.

On east bank of North Canyon Wash, 4 miles southeast of Cane Springs. This station can be reached from Cane Springs by wagon road and is near the north line of the Grand Canyon Forest Reserve.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn $6\frac{1}{2}$ feet high and 6 feet in diameter at base.

[Latitude 36° 31' 43.92". Longitude 111° 56' 36.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle	1 29 03.94	181 28 49.02	4.3838093
North Canyon	48 57 37.79	228 54 00.26	4.0819001
Shinumo	297 42 07.86	117 50 14.73	4.3624460

CARDENAS, COCONINO COUNTY.

On a knoll one-half mile east of the mouth of the Little Colorado River and one-fourth mile north of the Canyon rim. Country is cleared of timber, and station can be reached by wagon from Willow Springs.

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

[Latitude 36° 13' 04.15". Longitude 111° 46' 39.66".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Comanche	9 44 19.47	189 43 22.94	4.1514199
Final	54 09 04.56	234 04 26.74	4.1618480
Saddle	123 40 39.04	303 34 31.21	4.2704914
Shinumo	193 05 56.64	13 08 08.24	4.3877147
Desert	236 19 07.87	56 23 51.71	4.1581709

CATARACT, COCONINO COUNTY.

On the north rim of Cataract Canyon, about 10 miles south of the Bass and Supai road. Station can be reached with saddle horses from Bass and Supai or Bass and Ash Fork road.

Station mark: A bronze tablet cemented in a limestone rock under center of a cairn built of rock and earth 6 feet high and 8 feet in diameter at bottom and 6 feet at top.

[Latitude 36° 03' 07.06". Longitude 112° 33' 05.48".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd	12 07 48.67	192 01 44.45	4.8746164
Supai	128 46 52.24	308 41 56.74	4.2064305
Oliver	165 36 58.18	345 35 35.08	4.1517421
Chapin	197 21 59.31	17 23 08.94	3.9956194
Bass	233 13 27.96	53 20 19.10	4.3378082
Red Butte	301 40 46.75	121 57 01.30	4.6900568

CHAPIN, COCONINO COUNTY.

On a prominent ridge about 3 miles south of the Bass and Supai road, and 5 miles east of Cataract Creek. Ridge had been timbered and burnt over and some cutting was necessary to clear it. It can be reached with saddle horses from Bass and Supai road.

Signal: A pole tripod 12 feet high centered over tablet.

Station mark: A bronze tablet cemented in limestone rock.

[Latitude $36^{\circ} 08' 13.59''$. Longitude $112^{\circ} 31' 07.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cataract.....	17 23 08.94	197 21 59.31	3.9956194
Supai.....	92 20 07.68	272 14 02.19	4.1905212
Oliver.....	123 31 44.28	303 29 11.33	3.8903789
Elliott.....	140 47 57.81	320 43 56.42	4.2081040
Apache.....	190 43 12.83	10 43 50.26	3.9301718
Bass.....	256 07 11.32	76 12 53.16	4.1736931

COCONINO, COCONINO COUNTY.

On Coconino Point, a rocky conical point on the north side of Coconino Ridge, near the point where the Little Colorado River leaves the foot of the Coconino Ridge and runs northerly. The point was covered with scrub piñon and cedar timber, but was cleared sufficiently for sights to all signal points. Station can be reached by pack train from Red Horse or Halls tank; also from the east.

Station mark: A bronze triangulation tablet cemented in a limestone boulder under center of cairn 6 feet high and 6 feet in diameter.

[Latitude $35^{\circ} 55' 37.93''$. Longitude $111^{\circ} 40' 37.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kendrick.....	15 21 26.53	195 15 20.27	4.7770728
Hollenbeck.....	121 29 09.93	301 22 08.30	4.3237168
Royal.....	130 34 04.88	310 24 28.37	4.5088644
Comanche.....	147 54 39.85	327 50 10.39	4.3341223
Desert.....	184 10 07.44	4 11 16.69	4.6056022

COMANCHE, COCONINO COUNTY.

On Comanche Point, the most prominent peak on the east rim of the Great Canyon, 7 miles south of the mouth of the Little Colorado River. The peak is covered with scattering piñon timber, and some

cutting was done near the station. A wagon road runs within 2 miles and saddle horses can be taken nearly to station.

Station mark: A bronze triangulation tablet cemented in limestone rock and stamped "7074 A," under the center of a cairn 6 feet at base and 5½ feet high.

[Latitude 36° 05' 30.98". Longitude 111° 40' 15.48%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hollenbeck	41 42 10.42	221 39 37.74	3.9895506
Royal	101 37 48.09	281 32 40.50	4.1247756
Final	120 14 41.09	300 11 00.17	4.0353079
Cardenas	189 43 22.94	9 44 19.47	4.1514199
Desert	213 12 17.39	33 17 57.39	4.4189270
Coconino	327 50 10.39	147 54 39.85	4.3341223

DESERT, COCONINO COUNTY.

On the east end of the second mesa from the west, in a group of mesa buttes which lie about 10 miles northeast of the mouth of the Little Colorado River. The mesa was covered with scattering cedar timber and some cutting was done around the station. Foot of butte can be reached by wagon from Willow Springs.

Station mark: A bronze triangulation tablet cemented in rock, under center of a cairn 6 feet high and 6 feet in diameter.

[Latitude 36° 17' 22.86". Longitude 111° 38' 39.69%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coconino	4 11 16.69	184 10 07.44	4.6056022
Comanche	33 17 57.39	213 12 17.39	4.4189270
Cardenas	56 23 51.71	236 19 07.87	4.1581709
Shinumo	157 53 36.43	337 51 03.59	4.2320781

ELLIOTT, COCONINO COUNTY.

On a prominent round-topped butte about 6 miles southeast of the mouth of Cataract Canyon. Top of butte was cleared of timber, so signal can be seen in all directions. Station can be reached with saddle horses from head of Topocobya trail.

Station mark: A bronze triangulation tablet cemented in limestone rock under a cairn 6 feet in diameter and 6 feet high.

[Latitude $36^{\circ} 14' 59.38''$ Longitude $112^{\circ} 37' 56.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Supai	23 55 32.28	203 53 27.71	4.1141108
Philips	165 13 48.93	245 11 35.17	4.3433722
Fossil	218 31 38.04	38 34 05.92	4.0002696
Apache	289 18 45.94	109 23 25.03	4.0968329
Chapin	320 43 56.42	140 47 57.81	4.2081040
Oliver	335 32 04.94	155 33 33.33	3.9555966

FINAL, COCONINO COUNTY.

On the southeastern extremity of the Greenland headland known as Cape Final. It is a prominent point and no cutting was done. The point can be reached with saddle horses from Greenland Spring.

Signal: A pole tripod 14-feet high centered over station mark.

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

[Latitude $36^{\circ} 08' 28.08''$ Longitude $111^{\circ} 54' 30.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Royal	52 56 03.74	232 54 36.96	3.6640197
Saddle	168 40 23.19	348 38 53.83	4.2834731
Cardenas	234 04 26.74	54 09 04.56	4.1618480
Comanche	300 11 00.17	120 14 41.09	4.0353079

FLOYD, COCONINO COUNTY.

On highest point of Floyd Peak, 10 miles northeast of Seligman. North foot of mountain can be reached by wagon road from either Seligman or Ash Fork. Saddle horses can be taken within 300 feet of summit.

Station mark: A cairn, 8 feet base and 10 feet high, built by the Powell Survey in 1872.

Reference mark: A bronze tablet set in a large boulder; true azimuth from cairn, $290^{\circ} 23'$; distance, 12 feet.

[Latitude 35° 23' 29.88". Longitude 112° 43' 29.30'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cataract.....	192 01 44.45	12 07 48.67	4.8746164
Bass.....	200 55 59.30	21 08 51.88	4.9658682
Sublime.....	205 27 45.63	25 44 23.07	4.9961160
Red Butte.....	230 17 26.15	50 39 36.07	4.8724083
Kendrick.....	268 31 27.33	89 01 48.55	4.8995706
Picacho.....	4 45 03.24	184 44 28.91	4.2584423
Rowe.....	214 10 05.72	34 30 04.66	4.9612843
Middle.....	217 54 56.04	38 17 22.48	4.9727543
Williams.....	294 12 18.34	114 30 18.21	4.7146324

FOSSIL, COCONINO COUNTY.

On a prominent ridge on the west rim of the Grand Canyon near where the rim turns east. Station can be reached with saddle horses from the Bass and Supai road.

Signal: A pole tripod 12 feet high centered over tablet.

Station mark: A bronze tablet cemented in limestone rock.

[Latitude 36° 19' 13.28". Longitude 112° 33' 46.21'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elliott.....	38 34 05.92	218 31 38.04	4.0002696
Phillips.....	138 44 20.70	318 39 38.62	4.2542865
Millett.....	222 13 38.44	42 18 07.76	4.2260816
Apache.....	335 06 12.81	155 08 24.32	4.1202820

HOLLENBECK, COCONINO COUNTY.

On Hollenbeck Point, 6 miles northeast of Hall Tank, on canyon rim; can be reached on saddle horses from the latter place. Point is covered with scrub cedar, which was cut off around the station.

Signal: A pole tripod 13 feet high centered over station mark.

Station mark: A bronze triangulation tablet, stamped "7370 V," cemented in limestone rock.

[Latitude 36° 01' 34.43". Longitude 111° 52' 34.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Royal	146 37 38.29	326 35 03.67	4. 0769757
Comanche	221 39 37.74	41 42 10.42	3. 9895506
Coconino	301 22 08.30	121 29 09.93	4. 3231168
Kendrick	358 07 01.91	178 07 54.18	4. 8372895

KENDRICK, COCONINO COUNTY.

On highest point of Kendrick Mountain, the west foot of which can be reached by a wagon road from Spring Valley and Motts Lake. Saddle horses can be taken within 300 feet of summit.

Station mark: A bronze triangulation tablet cemented in malpais rock under a loose pile of rock 5 feet high.

[Latitude 35° 24' 24.83". Longitude 111° 51' 05.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd	89 01 48.55	268 31 27.33	4. 8995706
Red Butte	154 45 38.82	334 37 18.29	4. 7041872
Royal	173 36 50.89	353 33 25.08	4. 8986132
Hollenbeck	178 07 54.18	358 07 01.91	4. 8372895
Coconino	195 15 20.27	15 21 26.53	4. 7770728
Picacho	76 31 55.77	256 01 03.88	4. 9206164
Williams	54 29 31.81	234 17 15.00	4. 5979301

MILLETT, COCONINO COUNTY.

On a prominent point on the north rim, about halfway between Powells Plateau and the mouth of Kanab Canyon. Station can be reached with saddle horses from Bee Spring. A lone pine tree stands east of station. No other large timber near.

Signal: A pole tripod 16 feet high centered over tablet.

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

[Latitude 36° 25' 57.35". Longitude 112° 26' 12.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Apache	13 20 15.65	193 17 58.36	4. 3996208
Fossil	42 18 07.76	222 13 38.44	4. 2260816
Phillips	92 38 29.19	272 29 17.03	4. 3650771
Sublime	327 23 53.96	147 30 29.71	4. 4911712

NORTH CANYON, COCONINO COUNTY.

On easternmost of two buttes which stand east of main mountain on north side of North Canyon, 6 miles southwest of Cane Springs, and can be reached by saddle horses from foot of mountain.

Signal: A tripod made of poles centered over station mark.

Station mark: A bronze triangulation tablet cemented in a limestone boulder.

[Latitude $36^{\circ} 27' 26.55''$. Longitude $112^{\circ} 02' 42.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cane	228 54 00.26	48 57 37.79	4.0819001
Shinumo	275 19 29.70	95 31 13.44	4.4718207
Saddle	332 23 53.29	152 27 15.36	4.2634384

OLIVER, COCONINO COUNTY.

On a prominent knoll about 3 miles southwest of Topocobya Spring. Knoll was covered with scattering cedar and piñon, and a small amount of cutting was necessary to clear it. Station can be reached with saddle horses from head of Topocobya trail.

Station mark: A bronze tablet cemented in limestone rock under center of a cairn 4 feet base and 4 feet high.

[Latitude $36^{\circ} 10' 32.74''$. Longitude $112^{\circ} 35' 26.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Supai	67 52 08.09	247 48 35.35	3.9881870
Elliott.....	155 33 33.33	335 32 04.94	3.9555966
Apache.....	243 08 22.71	63 11 33.20	3.9557725
Chapin.....	303 29 11.33	123 31 44.23	3.8903789
Cataract.....	345 35 35.08	165 36 58.18	4.1517421

RED BUTTE, COCONINO COUNTY.

On Red Butte, a prominent flat-topped mountain about 15 miles southeast of Bright Angel Hotel. Summit cleared except on the south, east, and southwest part, where some timber still stands. A wagon road runs from Rain Tank around the foot of mountain on east side.

Station mark: A bronze triangulation tablet cemented in malpais rock near the center of the butte and under a cairn 6 feet high and 6 feet in diameter.

[Latitude $35^{\circ} 49' 09.20''$. Longitude $112^{\circ} 05' 24.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd	50 39 36.07	230 17 26.08	4.8724083
Cataract	121 57 01.30	301 40 46.75	4.6900588
Bass	148 14 12.70	328 04 46.78	4.6600887
Sublime	160 58 34.77	340 52 54.41	4.6471363
Rowe	168 21 18.49	348 19 02.67	4.4576552
Royal	201 03 58.48	21 08 56.49	4.5478419
Kendrick	334 37 18.29	154 45 38.75	4.7041872

ROWE, COCONINO COUNTY.

On Rowe Point, 2 miles northwest of Bright Angel Hotel, near wagon road.

Signal: A pole tripod 12 feet high and 6 feet at base.

Station mark: A bronze triangulation tablet set in rock 24 inches under the surface. Centered over this is an iron bench-mark post marked "7075 CANYON."

[Latitude $36^{\circ} 04' 20.68''$. Longitude $112^{\circ} 09' 16.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bass	120 29 15.05	300 22 03.79	4.3266836
Royal	255 15 11.99	75 22 27.24	4.2811802
Red Butte	348 19 02.67	168 21 18.49	4.4576552

ROYAL, COCONINO COUNTY.

On the southernmost point of the Greenland headland and the first point east of the mouth of the main drainage canyon of the headland. It is also the land end of the Newberry Terrace and can be reached with saddle horses from Greenland Spring. The point is rocky, and had previously been cleared, and only a little new cutting was done.

Signal: A pole tripod 10 feet high centered over station mark.

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

[Latitude $36^{\circ} 06' 57.84''$. Longitude $111^{\circ} 56' 57.48''$.]

To station—	Azimuth.	Back azimuth,	Log. distance.
	° ' "	° ' "	Meters.
Red Butte	21 08 56.49	201 03 58.48	4.5478419
Rowe	75 22 27.24	255 15 11.99	4.2811802
Bass	99 14 26.13	278 59 58.91	4.5709072
Final	232 54 36.96	52 56 03.74	3.6640197
Comanche	281 32 40.50	101 37 48.09	4.1247756
Coconino	310 24 28.37	130 34 04.88	4.5088644
Hollenbeck	326 35 03.67	146 37 38.29	4.0769757
Kendrick	353 33 25.08	173 36 50.89	4.8986132

SADDLE, COCONINO COUNTY.

On highest point of mountain, cut off from Kaibab Plateau by deep saddle. This mountain lies about 10 miles northwest of mouth of Little Colorado River and can be best reached with saddle horses from Cane Springs. A great deal of cutting was necessary to clear lines of sight to all stations sighted.

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

Reference mark: An 18-inch dead pine tree 28 feet north of station mark.

[Latitude $36^{\circ} 18' 39.08''$. Longitude $111^{\circ} 57' 01.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
North Canyon	152 27 15.36	332 23 53.29	4.2634384
Cane	181 28 49.02	1 29 03.94	4.3838093
Shinumo	237 19 34.20	57 27 54.71	4.3975134
Cardenas	303 34 31.21	123 40 39.04	4.2704914
Final	348 38 53.83	168 40 23.19	4.2834731

SHINUMO, COCONINO COUNTY.

On the highest point of the south end of Shinumo Altar, a prominent bald mesa butte about 15 miles north of the mouth of the Little Colorado River and 7 miles east of the Colorado River. Foot of butte can be reached by wagon from Willow Springs.

Station mark: A bronze triangulation tablet cemented in limestone rock under center of cairn 6 feet high and 6 feet in diameter.

[Latitude $36^{\circ} 25' 55.69''$. Longitude $111^{\circ} 42' 57.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cardenas	13 08 08.24	193 05 56.64	4.3877147
Saddle	57 27 54.71	237 19 34.20	4.3975134
North Canyon	95 31 13.44	275 19 29.70	4.4718207
Cane	117 50 14.73	297 42 07.86	4.3624460
Desert.....	337 51 03.59	157 53 36.43	4.2320781

SUBLIME, COCONINO COUNTY.

Near the south end of the headland known as Point Sublime. There is a blazed trail to the point, and the station can be reached by pack train. There is scattering timber on the point and a little clearing had to be done around the station.

Signal: A pole tripod 11 feet high centered over the station mark.

Station mark: A bronze triangulation tablet cemented in the rock, about 12 inches under the surface of the ground.

[Latitude $36^{\circ} 11' 49.93''$. Longitude $112^{\circ} 15' 03.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd	25 44 23.07	205 27 45.63	4.9961160
Bass	72 07 12.97	252 03 26.26	4.0036308
Apache.....	94 23 35.22	274 14 43.60	4.3531054
Millett	147 30 29.71	327 23 53.96	4.4911712
Red Buttè	340 52 54.41	160 58 34.77	4.6471363

SUPAI, COCONINO COUNTY.

On a small round-topped butte three-fourths mile southeast of the Hilltop storehouse, at the head of the Walapai trail. Station can be reached with saddle horses from Hilltop.

Station mark: A bronze triangulation tablet cemented in limestone rock under a cairn 5 feet at base and 6 feet high.

[Latitude $36^{\circ} 08' 33.65''$. Longitude $112^{\circ} 41' 27.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elliott.....	203 53 27.71	23 55 32.28	4.1141108
Oliver	247 48 35.35	67 52 08.09	3.9881870
Chapin	272 14 02.19	92 20 07.68	4.1905212
Cataract.....	308 41 56.74	128 46 52.24	4.2064305

PHILLIPS, MOHAVE COUNTY.

On the west rim of Kanab Canyon, near the northwest corner of the last bay before the rim of Kanab Canyon joins the north rim of Grand Canyon. Station can be reached by wagon from Finley reservoir and Black Knolls. Cedar and piñon timber is on the north and west of station.

Signal: A sawed timber tripod 12 feet high centered over station mark.

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

[Latitude 36° 26' 31.00". Longitude 112° 41' 41.76".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Millett	272 29 17.03	92 38 29.19	4.3650771
Fossil	318 39 38.62	138 44 20.70	4.2542865
Elliott.....	245 11 35.17	165 13 48.93	4.3433722

Maricopa and Yavapai counties.

In the fall of 1900, Mr. H. L. Baldwin, jr., topographer, extended triangulation northwestward from Camels Back and Black Mesa stations, which were established the preceding year by Prof. A. H. Thompson, geographer; eight new stations, controlling two 30-minute quadrangles in Maricopa and Yavapai counties, were occupied.

PYRAMID, MARICOPA COUNTY.

On the highest part of the conical hill known on the public-land survey maps as Pyramid Mountains, and about 3 miles a little south of east of New River station on the Frog Tanks road.

Station mark: A bronze bench-mark tablet cemented in a granite boulder.

Reference mark: A rock cairn, 5 feet high and 4 feet in diameter at base; true azimuth from station, 351° 10'; distance, 5 feet.

[Latitude 33° 44' 45.17". Longitude 112° 10' 53.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Camels Back	321 38 10.48	141 45 28.04	4.5165837
Black Mesa	223 29 48.27	43 36 32.51	4.4328558
New River.....	206 45 46.67	26 51 39.70	4.5570802
Syenite.....	120 32 16.33	300 25 19.78	4.3493361
Silver	153 52 44.98	333 45 11.39	4.6747504

SYENITE, MARICOPA COUNTY.

On the summit of a prominent rounded peak about 8 miles west of the Agua Fria dam at Camp Dyer.

Station mark: A bronze bench-mark tablet set in solid rock.

Reference mark: A rock cairn, $4\frac{1}{2}$ feet base and 7 feet high; true azimuth from station, $223^{\circ} 53'$; distance, 7.85 feet.

[Latitude $33^{\circ} 50' 53.17''$. Longitude $112^{\circ} 23' 22.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Silver	177 00 00.07	356 59 24.52	4.4933180
New River	239 27 35.04	59 40 26.66	4.6144764
Black Mesa	257 32 16.00	77 45 58.28	4.5888110
Pyramid	300 25 19.78	120 32 16.23	4.3493361
Camels Back	313 00 00.38	133 14 13.81	4.7348605

BOULDER PASS, YAVAPAI COUNTY.

On the highest hill about 1 mile northeast of Boulder Pass, on the wagon road from Hot Springs to Minnehaha.

Station mark: A bronze bench-mark tablet set in sandstone rock.

[Latitude $34^{\circ} 06' 53.32''$. Longitude $112^{\circ} 30' 05.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Union	194 59 39.81	15 02 55.72	4.5358861
Del Pasco	223 07 36.48	43 12 05.85	4.2541341
Silver	260 06 30.29	80 09 40.92	3.9463803

DEL PASCO, YAVAPAI COUNTY.

On the highest part of mountain of that name, about 3 miles northwest of the Crowned King mining camp.

Station mark: A bronze bench-mark tablet set in solid rock.

[Latitude $34^{\circ} 13' 58.31''$. Longitude $112^{\circ} 22' 06.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Silver	17 10 59.75	197 09 41.25	4.0835313
Boulder Pass	43 12 05.85	223 07 36.48	4.2541341
Mount Union	170 29 58.37	350 28 44.18	4.3087386
Squaw Peak	239 55 11.00	60 11 52.00	4.7187145
New River	303 01 09.15	123 13 21.93	4.6015068
Black Mesa	313 40 55.00	133 53 58.75	4.6961884

MOUNT UNION, YAVAPAI COUNTY.

On the highest part of Mount Union, $1\frac{1}{2}$ miles east of the Senator mine.

Station mark: A bronze bench-mark tablet set in granite boulder.

Reference marks: A rock cairn with small tree placed in center; true azimuth from station, 176° ; distance, 3.83 feet. A cross (+) cut on granite rock; true azimuth from station, $294^{\circ} 13'$; distance, 2.75 feet.

[Latitude, $34^{\circ} 24' 49.94''$. Longitude, $112^{\circ} 24' 17.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boulder Pass.....	15 02 55.72	194 59 39.81	4.5358861
Squaw Peak	83 04 30.00	262 46 32.00	4.6904200
Del Pasco.....	350 28 44.18	170 29 58.37	4.3087386

NEW RIVER, YAVAPAI COUNTY.

On summit of the highest peak of the ridge between Black Canyon and New River.

Station mark: A bronze bench-mark tablet set in small rock about 2 inches below surface of ground and at the southwest edge of a rock cairn. It is close to and north of a sharp rock which projects slightly above surface of ground.

[Latitude, $34^{\circ} 02' 09.86''$. Longitude, $112^{\circ} 00' 20.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pyramid.....	26 51 39.70	206 45 46.67	4.5570802
Syenite.....	59 40 26.66	239 27 35.04	4.6144764
Silver	105 34 10.27	285 20 40.19	4.5849214
Del Pasco.....	123 13 21.93	303 01 09.15	4.6015068
Mount Union	138 49 55.87	318 36 27.39	4.7463591
Black Mesa.....	349 13 55.85	169 14 47.79	4.1064174

SILVER, YAVAPAI COUNTY.

On highest peak of the Silver Mountains, about 4 miles south of Minnehaha.

Station mark: A bronze bench-mark tablet cemented in solid rock.

Reference mark: A rock cairn 4 feet high, $3\frac{1}{2}$ feet base; true azimuth from station, $217^{\circ} 11'$; distance, 4 feet.

[Latitude $34^{\circ} 07' 42.47''$. Longitude $112^{\circ} 24' 26.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boulder Pass.....	80 09 40.92	260 06 30.29	3.9463803
Del Pasco.....	197 09 41.25	17 10 59.75	4.0835313
New River.....	285 20 40.19	105 34 10.27	4.5849214
Black Mesa.....	299 53 36.04	120 07 56.92	4.6587958
Pyramid.....	333 45 11.39	153 52 44.98	4.6747504
Syenite.....	356 59 24.52	177 00 00.07	4.4933180

SQUAW PEAK, YAVAPAI COUNTY.

On highest part of Squaw Peak, 4 miles southwest of Camp Verde.

Station mark: A bronze bench-mark tablet set in a flat basalt rock.

Reference mark: A rock cairn $4\frac{1}{2}$ feet base and 6 feet high; true azimuth from station, $107^{\circ} 22'$; distance, $5\frac{1}{2}$ feet.

[Latitude $34^{\circ} 28' 05.9''$. Longitude $111^{\circ} 52' 32.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Del Pasco.....	60 11 52	239 55 11	4.7187145
Mount Union.....	83 04 30	262 46 32	4.6904235

Maricopa County; secondary positions.

Secondary positions located by lines from two stations.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rock cairn	33 59 09.0	112 01 47.2
Highest point 8 miles east of Phoenix mine.....	33 54 44.6	111 47 04.8
High point (sharp).....	33 52 43.8	111 53 32.9
Bald Mountain ^a	34 27 12.8	111 56 36.5

^a Yavapai County.

Yavapai County; secondary positions.

Secondary positions located by lines from three or more stations.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Rock Bluff	34 14 06.1	112 24 42.1
Conical rock	34 07 03.2	112 14 11.5
Round Hill	34 29 13.3	112 12 15.2
Do	34 31 09.3	112 11 18.1
Pinnacle	34 06 56.5	112 28 45.5
Peak	34 06 37.8	112 24 05.1
Southeast Twinpoint	34 11 30.2	112 15 49.0
Square Rock	33 57 40.7	112 30 55.3
West End (Double Butte) ^b	33 52 41.8	112 03 39.0

^b Maricopa County.

SECONDARY TRIANGULATION STATIONS.

Cochise County; Bisbee quadrangle.

Control for the Bisbee quadrangle is based upon the positions of boundary monuments No. 91 and No. 93, as given by the report of the United States and Mexico Boundary Commission. The field work was by Mr. T. M. Bannon in February, 1902, twelve stations being located.

BISBEE WEST, COCHISE COUNTY.

On a lone hill near the Bisbee West mine.

Station mark: A rock monument.

[Latitude 31° 24' 59.32". Longitude 109° 56' 17.42".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lime Hill	3. 35974
Johnson	3. 69065

BOUNDARY MONUMENT NO. 91, COCHISE COUNTY.

Station mark: Center of monument.

Bull. 245—04—13

[Latitude $31^{\circ} 20' 01.95''$. Longitude $109^{\circ} 52' 24.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boundary monument No. 93	90 02 23	269 59 03	4. 00680
Naco Junction			4. 08826
Irryng flag			4. 15600
Johnson No. 3	170 53 19	350 52 53	3. 92142

BOUNDARY MONUMENT NO. 93, COCHISE COUNTY.

Station mark: Center of monument.

[Latitude $31^{\circ} 20' 02.02''$. Longitude $109^{\circ} 58' 49.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Naco Junction			3. 83644
Bisbee West			3. 99980
Don Louis	219 31 23	39 33 39	4. 03586
Johnson No. 3	226 58 13	47 01 07	4. 08196
Boundary monument 91	269 59 03	90 02 23	4. 00680

CALUMET AND ARIZONA FLAG, COCHISE COUNTY.

On the end of a limestone ridge one-fourth mile west of the Calumet and Arizona mine.

Station mark: A rock monument.

[Latitude $31^{\circ} 25' 43.87''$. Longitude $109^{\circ} 54' 44.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lime Hill	21 52 48	201 52 42	2. 88670
Red Hill	185 30 11	5 30 14	3. 24666
Mineral monument No. 2	222 41 08	42 41 19	2. 92520
North-end flag	303 06 50	123 07 04	2. 92139

CENTER FLAG, COCHISE COUNTY.

On the highest point of a limestone hill 0.5 mile south of the Lowell mine.

Station mark: A bench-mark tablet marked 5604 feet.

[Latitude 31° 25' 19.02". Longitude 109° 54' 10.32".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Don Luis	18 07 50	198 07 41	3.16412
Lime Hill	92 28 27	272 28 04	3.07165
North-end flag	148 09 21	328 09 17	2.56184
Johnson No. 3	316 14 22	136 14 51	3.32487

DON LUIS, COCHISE COUNTY.

On a limestone hill at the south end of a limestone ridge three-fourths mile northeast of Don Luis railroad station.

Station mark: A bench-mark tablet marked 5525 feet.

[Latitude 31° 24' 33.98". Longitude 109° 54' 27.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boundary monument No. 93	39 33 39	219 31 23	4.03586
Mineral monument No. 3			2.94204
Lime Hill	153 15 41	333 15 27	3.20678
Center flag	198 07 41	18 07 50	3.16412
Johnson No. 3	274 09 15	94 09 53	3.28339

JOHNSON NO. 3, COCHISE COUNTY.

On the highest point of Limestone Hill and one-half mile northeast of Don Luis railroad station.

Station mark: A bench-mark tablet marked 5,493 feet.

[Latitude 31° 24' 29.48". Longitude 109° 53' 14.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boundary monument No. 93	47 01 07	226 58 13	4.08196
Don Luis	94 09 53	274 09 15	3.28339
Lime Hill			3.48780
Calumet and Arizona flag			3.51642
Center flag	136 14 51	316 14 22	3.32487
Mineral monument No. 2			3.53304
Red Hill			3.66264
Boundary monument No. 91	350 52 53	170 53 19	3.92142

LIME, COCHISE COUNTY.

A summit on limestone ridge, $1\frac{1}{2}$ miles due north of Don Luis railroad station and three-fourths mile southwest of the Lowell mine.

Station mark: A bench-mark tablet marked 6,320 feet.

[Latitude $31^{\circ} 25' 20.66''$. Longitude $109^{\circ} 54' 54.94''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mineral monument No. 3 .....	.....	.....	3.13942
Red Hill .....	.....	.....	3.40009
Calumet and Arizona flag	201 52 42	21 52 48	2.88670
Mineral monument No. 2 .....	.....	.....	3.20014
North-end flag	255 16 58	75 17 17	3.00835
Center flag	272 28 04	92 28 27	3.07165
Johnson No. 3 .....	.....	.....	3.48780
Don Luis	333 15 27	153 15 41	3.20678

MINERAL MONUMENT NO. 2, COCHISE COUNTY.

On a lone, black mineral hill about 1 mile south of Bisbee and one-half mile east of the Spray mine.

Station mark: A bench-mark tablet marked 5656 feet, under a small monument 5.1 feet south of iron post, mineral monument No. 2.

[Latitude $31^{\circ} 26' 03.96''$. Longitude $109^{\circ} 54' 22.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Calumet and Arizona flag	42 41 19	222 41 08	2.92520
Red Hill	160 33 46	340 33 38	3.08142
Johnson No. 3 .....	.....	.....	3.53304
Center flag .....	.....	.....	3.15252
North-end flag	353 11 33	173 11 36	3.03433

MINERAL MONUMENT NO. 3, COCHISE COUNTY.

The large rock mineral monument three-fourths mile north of Don Luis station.

Station mark: Center of monument.

[Latitude $31^{\circ} 24' 36.16''$. Longitude $109^{\circ} 55' 00.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lime Hill.....	3. 13942
Don Luis.....	2. 94204

NACO JUNCTION, COCHISE COUNTY.

On a hill three-fourths mile northeast of Naco Junction, on the El Paso and Southwestern Railroad.

[Latitude $31^{\circ} 23' 44.83''$. Longitude $109^{\circ} 58' 49.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Boundary monument No. 91.....	4. 08826
Boundary monument No. 93.....	3. 83644
Lime Hill.....	3. 83630

RED HILL, COCHISE COUNTY.

On a red hill at the west end of ridge on the south side of Brewery Gulch and about 0.5 mile east of Bisbee.

Station mark: A bench-mark tablet marked 5,895 feet, cemented under a rock monument.

[Latitude $31^{\circ} 26' 40.90''$. Longitude $109^{\circ} 54' 37.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Calumet and Arizona flag.....	5 30 14	185 30 11	3. 24666
Mineral monument No. 2.....	340 33 38	160 33 46	3. 08142

CALIFORNIA.

TRIANGULATION STATIONS.

Kern County.

Three 15-minute quadrangles were controlled by Mr. C. F. Urquhart, topographer, who extended triangulation westward from Oldtown and Breckinridge. Besides reoccupying these, eight new stations were built and occupied. Positions are given on the United States standard datum.

BAKERSFIELD, KERN COUNTY.

Station mark: Center of cupola on court-house at Bakersfield.

[Latitude $35^{\circ} 22' 23.40''$. Longitude $119^{\circ} 01' 07.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jewetta	142 54 59.35	322 52 30.33	4.0316615
Oil	184 19 36.84	4 20 01.68	4.1556536
Round	223 18 15.28	43 22 46.34	4.2351484
Lakeview	290 15 18.51	110 22 21.64	4.2943877

BEALE, KERN COUNTY.

On a bald hill in Mr. Truxton Beale's pasture, on north of road from Bakersfield to Caliente, and about 5 miles from latter.

Station mark: A bronze triangulation tablet under center of cairn.

[Latitude $35^{\circ} 15' 12.17''$. Longitude $118^{\circ} 41' 16.99''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lakeview	119 08 15.22	299 03 50.29	4.1227132
Pampa	170 08 28.22	350 07 38.79	4.1006651
Rankin	219 43 02.42	39 46 33.04	4.1583974

BRECKINRIDGE, KERN COUNTY.

The station is at the eastern end of Breckinridge Mountain, a heavily timbered plateau south of the Kern River, 6 miles west of Havilah. It was ascended from Rankin's ranch in Walker basin in three and one-fourth hours by following the main ridge.

Station mark: A bronze triangulation tablet cemented in the top of a ledge which projects 10 or 12 feet above surface of ground, surmounted by a cairn 5 feet high.

[Latitude $35^{\circ} 27' 03.86''$. Longitude $118^{\circ} 34' 58.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Oldtown	351 04 52.21	171 06 46.54	4.5091169
Rankin	1 48 57.45	181 48 49.55	4.0360517
Pampa	50 55 30.33	230 51 01.71	4.1782951

JEWETTA, KERN COUNTY.

Station is in the valley northwest from Jewetta, a siding on the Southern Pacific Railroad above Bakersfield.

Signal: A lumber tripod.

Station mark: A bronze triangulation tablet cemented in rock under center of tripod.

[Latitude $35^{\circ} 27' 01.76''$. Longitude $119^{\circ} 05' 24.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Oil	233 01 02.75	53 03 56.87	3.9761508
Bakersfield	322 52 30.33	142 54 59.35	4.0316615

LAKEVIEW, KERN COUNTY.

On Lakeview schoolhouse, about 14 miles by road ESE. from Bakersfield.

Station mark: Flag pole on cupola.

[Latitude $35^{\circ} 18' 41.52''$. Longitude $118^{\circ} 48' 55.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bakersfield	110 22 21.64	290 15 18.51	4.2943877
Round	161 01 04.18	340 58 31.32	4.3107062
Pampa	237 36 40.24	57 40 16.07	4.0474858
Beale	299 03 50.29	119 08 15.22	4.1227132

OIL, KERN COUNTY.

About 10 miles almost due north from Bakersfield, on a sand hill about 200 yards east of the most northwestern group of oil wells.

Signal: A lumber tripod.

Station mark: A bronze triangulation tablet cemented in rock under center.

[Latitude $35^{\circ} 30' 06.42''$. Longitude $119^{\circ} 00' 24.29''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bakersfield	4 20 01.68	184 19 36.84	4.1556536
Jewetta	53 03 56.87	233 01 02.75	3.9761508
Round	279 21 40.81	90 25 47.42	4.0354821

OLDTOWN, KERN COUNTY.

A low peak at the northern edge of Tehachapi Pass, about 2 miles north of the old settlement of Tehachapi.

Station mark: A bronze triangulation tablet cemented in solid rock surmounted by a cairn 6 feet high.

[Latitude $35^{\circ} 09' 48.59''$. Longitude $118^{\circ} 31' 41.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Breckinridge	171 06 45.54	351 04 52.21	4.5091169
Pah Ute	201 18 06.13	21 22 51.50	4.5350191
Cache	255 32 11.59	75 41 49.28	4.4179828
Pajuela	282 23 32.31	102 31 37.32	4.3393768
Double	344 44 02.36	164 45 32.38	4.1782222

PAMPA, KERN COUNTY.

On a high foothill about 3 miles northeast from Pampa, a station on the Southern Pacific Railroad.

Station mark: A bronze triangulation tablet under center of cairn with tree in center (there are three or four other trees on hill, but cairn can be easily seen).

[Latitude $35^{\circ} 21' 55.25''$. Longitude $118^{\circ} 42' 42.51''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lakeview	57 40 16.07	237 36 40.24	4.0474858
Round	129 48 05.81	309 41 56.56	4.3201804
Breckinridge	230 51 01.71	50 55 30.33	4.1782951
Rankin	276 44 14.06	96 48 34.46	4.0584457
Oldtown	323 12 07.72	143 18 29.61	4.4463278
Beale	350 07 38.79	170 08 28.22	4.1006651

RANKIN, KERN COUNTY.

On a high foothill about 4 miles from Mr. Rankin's ranch in Walker basin. Road from Rankin's to Bakersfield passes very near and to the west of signal.

Station mark: A bronze triangulation tablet in rock to south of signal tree.

Reference mark: The dead pine signal tree trimmed up.

[Latitude $35^{\circ} 21' 11.47''$. Longitude $118^{\circ} 35' 12.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beale.....	39 46 33.04	219 43 02.42	4.1583974
Pampa.....	96 48 34.46	276 44 14.06	4.0584457
Breckinridge.....	181 48 49.55	1 48 57.45	4.0360517

ROUND, KERN COUNTY.

On a sand ridge about 15 miles from Bakersfield by road and ridge. Go from Bakersfield to east side of oil field, thence over Kern River about 3 miles, thence up ridge north of river to station.

Signal: A lumber tripod.

Station mark: A bronze triangulation tablet under center.

[Latitude $35^{\circ} 29' 08.94''$. Longitude $118^{\circ} 53' 19.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bakersfield.....	43 22 46.34	223 18 15.28	4.2351484
Oil.....	99 25 47.42	279 21 40.81	4.0354821
Pampa.....	309 41 56.56	129 48 05.81	4.3201804
Lakeview.....	340 58 31.32	161 01 04.18	4.3107062

PRIMARY TRAVERSE.

Colusa, Tehama, and Yolo counties; Arbuckle, Norman, Tehama, Vina, and Willow quadrangles.

Five 15-minute quadrangles in the Sacramento Valley between Arbuckle and Red Bluff were controlled by 255 miles of primary traverse run by Mr. C. F. Urquhart, topographer, in the spring of 1903. The line starts at Northwest Yolo base triangulation station United States Coast and Geodetic Survey, follows county roads until it strikes the Southern Pacific Railroad north of Woodland, thence along this railroad to Red Bluff. It also follows the railroad from Tehama to Chico, thence along county roads to Orland. A line was run approximately on the 122d meridian between latitude $39^{\circ} 00'$ and $39^{\circ} 43'$, with several cross lines between $122^{\circ} 00'$ and $122^{\circ} 15'$. Positions are given on the United States standard datum.

Since this work was done the alignment of the railroad track has in places been changed, and the descriptions of a few of the positions given may thus need correction.

Geographic positions between Northwest Yolo base triangulation station, United States Coast and Geodetic Survey, and Liberty schoolhouse.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Northwest Yolo base triangulation station, U. S. Coast and Geodetic Survey.....	38 40 44.8	121 51 28.6
Station 10, road turns north.....	38 42 24.9	121 51 21.8

Geographic positions along the Southern Pacific Railroad from Liberty schoolhouse to Red Bluff.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Liberty schoolhouse, road crossing near	38 45 36.4	121 50 23.2
Blacks or Zamora, road crossing.....	38 47 58.6	121 52 53.1
Road crossing.....	38 50 45.0	121 55 48.7
Dunnigan station.....	38 53 07.4	121 58 07.4
Road crossing.....	38 54 57.5	121 59 19.6
Road crossing, 60 feet north of	38 57 45.1	122 01 09.7
Arbuckle station	39 01 03.9	122 03 20.6
Genevra, signboard.....	39 04 11.3	122 05 24.0
Road crossing, joint in rail.....	39 06 04.9	122 06 38.9
Road crossing, 20 feet north.....	39 08 00.1	122 07 54.7
Williams station	39 09 19.8	122 08 47.3
Milepost 127	39 10 44.3	122 09 43.0
Colusa Junction, narrow-gage railroad crossing	39 13 07.7	122 11 07.4
Colusa Junction station	39 13 11.0	122 11 09.2
Road crossing.....	39 14 50.8	122 11 23.9
Maxwell station.....	39 16 35.0	122 11 24.7
Bunks Slough, road crossing north of.....	39 20 04.9	122 11 26.4
Milepost 141	39 22 38.1	122 11 27.6
Norman station	39 24 26.0	122 11 28.5
Lyondale platform	39 26 18.5	122 11 29.3
Milepost 148	39 28 43.1	122 11 30.4
Willows station	39 31 14.0	122 11 31.6
Milepost 153, 820 feet northwest of	39 33 13.8	122 11 32.5
Milepost 155	39 34 49.4	122 11 33.2
Gormantown station.....	39 37 14.5	122 11 34.3
Road crossing.....	39 39 12.5	122 11 35.2
Road crossing at gravel pit, rail joint north of road	39 40 56.9	122 11 36.0
Road crossing	39 43 33.1	122 11 42.4
Orland railroad station	39 44 44.7	122 11 44.7

Geographic positions along the Southern Pacific Railroad from Liberty schoolhouse to Red Bluff—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Stony Creek station, first road crossing north, joint north of road	39 46 09.1	122 11 28.7
Malton, signboard	39 47 44.7	122 10 42.5
Road crossing	39 50 10.7	122 09 31.9
Kirkwood station	39 51 19.3	122 09 48.4
Milepost 176	39 52 40.1	122 10 28.2
Road crossing	39 54 22.9	122 10 40.2
Corning station	39 55 41.5	122 10 40.4
Milepost 182	39 57 50.5	122 10 38.0
Milepost 184	39 59 31.1	122 10 11.9
Tehama, joint in rails at junction of track with Marysville Branch, 14.3 feet south of switch lever and 67 feet south of and opposite water tank	40 01 49.1	122 08 03.6
Milepost 215	40 03 12.7	122 09 00.8
Proberta	40 04 52.7	122 10 09.2
Ransom	40 07 10.9	122 11 43.9
Milepost 222	40 08 36.1	122 12 42.4
Red Bluff, Main street crossing	40 10 35.9	122 14 18.6

Geographic positions along highways from Red Bluff eastward 4 miles, thence southward to Tehama.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Red Bluff, west end of bridge 0.5 mile east of	40 10 39.2	122 13 53.8
Antelope school	40 11 09.1	122 11 38.0
Junction of roads	40 11 04.1	122 10 31.4
Opposite Coné ranch house	40 10 20.1	122 09 49.6
Adobe ranch	40 07 33.3	122 06 53.9

Geographic positions along Marysville Branch Southern Pacific Railroad, between Tehama and Chico.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Tehama, 55 feet east of east end of trestle leading to bridge over Sacramento River.....	40 01 45.9	122 06 39.6
Milepost 210	40 00 29.7	122 05 34.2
Milepost 208	39 58 53.0	122 04 44.4
Vina railroad station, 75 feet north road crossing	39 55 58.3	122 03 14.5
Milepost 202	39 54 03.3	122 02 07.4
Lota signboard.....	39 52 31.3	122 01 08.4
Cana station, signboard.....	39 50 25.4	121 59 47.6
Road crossing.....	39 49 07.6	121 58 57.7
Nord station, road crossing	39 46 47.1	121 57 21.6
Milepost 191, elevation 148 feet.....	39 45 55.2	121 55 53.3
Chico, crossing Third street.....	39 43 28.8	121 50 48.0

Geographic positions along county roads from Chico to Orland.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Chico, at turn of road 20 feet northwest of water tank....	39 42 43.7	121 51 53.3
At turn of road, 45 feet east of large gate into private field.....	39 41 46.3	121 55 22.0
Sacramento River, 10 feet east of bridge over.....	39 42 44.7	121 56 42.9
Junction of roads to Orland and Jacinto	39 42 32.9	122 00 08.6
Junction road from north, 35 feet south fence corner....	39 42 33.5	122 02 37.5
Road crossing.....	39 42 39.2	122 05 04.3
Junction of roads north and south.....	39 42 39.1	122 08 23.9
Road crossing.....	39 44 13.9	122 10 10.6
Orland	39 44 44.7	122 11 44.7

Geographic positions along county roads from Willows (on S. P. R. R.) to Jacinto, thence north to station 508 on line between Chico and Orland.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of road at junction of road turning north, jog in road east and west	39 31 27.3	122 08 09.3
Center of junction of road running east	39 33 12.2	122 08 09.2
Center of roads, road to Jacinto turns east	39 34 56.4	122 08 09.8
Turn in road to north	39 34 55.4	122 05 56.4
Fifty feet southwest of southwest corner of fence around ranch house on north side of road. The only house for long distance. Point at south edge of road opposite telephone pole	39 34 57.2	122 02 47.9
Jacinto, at junction of road north and south point 50 feet north of signboard at fence corner	39 34 57.1	122 00 22.9
At angle in road opposite high telephone pole marked "613," center of road	39 36 10.8	122 00 24.5
Telephone pole marked "618"	39 38 38.4	122 00 23.6
Road turns north	39 40 27.8	122 00 17.3
Station 508, on line Chico-Orland	39 42 32.9	122 00 08.6

Geographic positions along county roads from station 556 on line from Willows to Jacinto to "Four Corners," 1½ miles west from Butte City.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Junction of road from Williams to Butte City	39 29 41.1	122 08 09.5
At turn of Butte road to east, road also continues south, iron bench mark post is 34 feet northeast, elevation 97 feet	39 27 53.3	122 08 08.5
At turn of road east, 575 cut in telephone pole southeast of station	39 27 29.6	122 05 48.8
Butte City, "Four Corners," 1½ miles west from	39 27 26.6	122 00 59.0

Geographic positions along county roads from Jacinto south to "Four Corners."

Station.	Latitude.	Longitude.
	° ' "	° ' "
Center of road, opposite old gate in fence to east	39 32 46.2	122 00 16.6
Center of road going west to Willows, west post on property line	39 31 18.6	122 00 47.0
Center of road, opposite schoolhouse to west	39 30 39.0	122 00 58.1
Opposite driveway to cottage, 656 cut on post at gate	39 28 20.6	122 01 05.6

Geographic positions along county roads from "Four Corners" south via Colusa to Arbuckle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Opposite southwest corner of sheet-iron warehouse, large oak tree between road and warehouse.....	39 25 41.7	122 00 36.6
Princeton, east side of road, 92 feet north from "Odd Fellows" hall and 25 feet east from center of road.....	39 24 15.8	122 00 30.6
Road crossing, gate on either side of road, road to east leads to residence of late John Boggs.....	39 22 37.4	122 01 10.5
Opposite schoolhouse, iron gate.....	39 20 29.2	122 02 04.4
North end of bridge over ditch, 1,060 feet south from Mr. F. A. Wohlfoom's residence.....	39 18 12.6	122 01 56.4
Road to west, signboard as follows: Maxwell, 8.5 miles, Princeton, 8.75 miles, Colusa, 5 miles.....	39 16 40.5	122 02 04.4
Road intersects from the west, house on southwest corner.....	39 14 36.0	122 01 49.4
Colusa, road crossing narrow-gage railroad (north rail)...	39 13 02.1	122 00 58.6

Geographic positions along railroad through Colusa to end of track and on county road south to Arbuckle.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Junction of road to Arbuckle, point 91 feet from gate in fence between roads.....	39 12 12.8	122 00 14.1
Station 744, 8 feet east of center of road on top of levee...	39 09 33.4	122 00 51.1
In center of road, east of and opposite fence corner, (only fence in several miles), corner of levee just inside of fence.....	39 06 55.3	122 01 17.1
At center of junction of road from north.....	39 05 22.8	122 01 17.9
At center of junction of east and west roads, bridge over ditch just to north of station, line turns east.....	39 03 24.3	122 01 19.9
Junction of road turning west to Arbuckle (road continues south).....	39 01 39.8	122 00 54.6
At T road junction, west and south, line turns south....	39 01 39.9	122 03 02.0
Arbuckle station.....	39 01 03.9	122 03 20.6

Geographic positions along narrow-gage railway from Colusa to Colusa Junction.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Station 7, center of road crossing, along top of embankment north and south.....	39 13 04.1	122 04 35.9
Station 11, road crossing.....	39 13 05.3	122 06 55.9
Colusa Junction, crossing of railroads.....	39 13 07.7	122 11 07.4

COLORADO.

TRIANGULATION STATIONS.

Boulder, Clear Creek, Gilpin, and Jefferson counties; Central and Georgetown quadrangles.

During the early part of the season of 1903, Mr. H. L. Baldwin, jr., controlled two 15-minute quadrangles by reoccupying three old triangulation stations, occupying nine new stations, and locating ten points by intersections. Positions are given on the United States standard datum as derived from Mount Morrison and Table Mound, stations of the United States Coast and Geodetic Survey.

SOUTH BOULDER, BOULDER COUNTY.

On mountain of same name, 4.5 miles west of Marshall (Gorham post-office) and 5 feet east of highest point of eastern summit of mountain.

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

[Latitude $39^{\circ} 57' 37.50''$. Longitude $105^{\circ} 17' 40.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Morgan	265 33 17.12	85 43 41.84	4.3645097
Westminster	291 25 51.83	111 36 03.95	4.3865108
North Table Mountain	336 39 17.06	156 42 54.86	4.3095850
Mount Morrison	348 40 34.18	168 43 28.06	4.5178904

CHIEF, CLEAR CREEK COUNTY.

On mountain of same name, 8 miles south of Idaho Springs.

Point is best reached by following wagon road from Idaho Springs up Soda Creek to bars, and thence up east fork of creek to summit within 0.75 mile of its head. Here leave road and pass through burnt timber to point.

Station mark: A bronze triangulation tablet cemented in solid rock, over which is erected a rock cairn, 4 feet base and 5 feet high.

[Latitude $39^{\circ} 40' 33.28''$. Longitude $105^{\circ} 31' 20.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grindal	78 43 19.32	258 36 51.74	4. 1691625
Democrat.....	103 18 06.18	283 09 57.48	4. 2724927
Kingston	150 10 40.31	330 05 45.85	4. 3425825
Central.....	169 12 35.68	348 11 22.98	4. 1219695
Sheepshead.....	200 31 44.57	20 35 47.52	4. 4102949
Douglas	218 06 25.13	38 11 14.11	4. 2412059
Bergen	275 32 07.38	95 37 01.06	4. 0420656
Legault.....	305 25 28.07	125 35 19.64	4. 4345086

DEMOCRAT, CLEAR CREEK COUNTY.

On Republican Mountain, 2 miles west of Georgetown. Point is best reached by following trail up first prominent gulch north of Georgetown, just at city limits. Follow this to summit of mountain, thence south along ridge to highest point. Elevation, 12,393 feet.

Station mark: Rock monument, 4 feet at base and 4 feet high.

Reference mark: Bronze triangulation tablet cemented in solid rock nearly at highest point of mountain; true azimuth from station, $32^{\circ} 52'$; distance, 6 feet.

[Latitude $39^{\circ} 42' 52.29''$. Longitude $105^{\circ} 44' 05.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kingston	206 04 56.09	26 08 11.11	4. 2169623
Chief.....	283 09 57.48	103 18 06.18	4. 2724927

GRINDAL, CLEAR CREEK COUNTY.

On the first high point above timber line on Sugarloaf Mountain, and about 5 miles south of Georgetown.

Station mark: A rock monument, 4 feet diameter at base and 4 feet high.

Reference mark: A bronze triangulation tablet cemented in solid rock; true azimuth, $281^{\circ} 17'$; distance, 7.6 feet from station mark.

[Latitude $39^{\circ} 38' 59.23''$. Longitude $105^{\circ} 41' 27.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kingston	189 01 21.28	9 02 55.18	4. 3475797
Chief.....	258 36 51.74	78 43 19.32	4. 1691625

DOUGLAS, GILPIN COUNTY.

On mountain of that name $1\frac{1}{2}$ miles south of Golden and Black Hawk road, and 4 miles east of Central City.

Station mark: A bronze triangulation tablet cemented in solid rock nearly at highest point of mountain.

[Latitude $39^{\circ} 47' 57.64''$. Longitude $105^{\circ} 23' 48.61''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chief.....	38 11 14.11	218 06 25.13	4.2412059
Central.....	86 53 43.59	266 47 41.46	4.1297204
Kingston.....	104 00 33.00	283 50 48.67	4.3494042
Sheepshead.....	170 35 28.61	350 34 42.24	4.0220084
North Table Mountain.....	272 49 15.28	92 56 48.25	4.2268302
Mount Morrison.....	313 24 12.51	133 31 01.26	4.3217667
Legault.....	338 55 23.94	159 00 27.74	4.4997715
Bergen.....	359 15 38.56	179 15 43.68	4.1695654

CENTRAL, ON GILPIN-CLEAR CREEK COUNTY LINE.

On mountain locally known as Bald Mountain, $1\frac{1}{2}$ miles west of Nevada.

Station mark: A bronze triangulation tablet cemented in solid sandstone on summit. Elevation 9,993 feet above sea.

[Latitude $39^{\circ} 47' 33.58''$. Longitude $105^{\circ} 33' 14.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kingston.....	126 37 55.99	306 34 14.01	4.0115544
Douglas.....	266 47 41.46	86 53 43.59	4.1297204
Chief.....	348 11 22.98	168 12 35.68	4.1219695

KINGSTON, ON GILPIN-CLEAR CREEK COUNTY LINE.

On mountain of same name, 12,137 feet above sea and 2 miles east of James Peak. Station is best reached by going via wagon road to Yankee post-office from Central City or Idaho, thence as locally directed.

Station mark: A bronze triangulation tablet, over which was erected a rock cairn 5 feet in diameter at base and 6 feet high.

[Latitude 39° 50' 52.123". Longitude 105° 39' 01.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grindal	9 02 55.18	189 01 21.28	4.3475797
Democrat.....	26 08 11.11	206 04 56.09	4.2169623
Sheepshhead.....	255 52 24.18	76 01 22.68	4.3134460
Douglas	283 50 48.67	104 00 33.00	4.3494042
Central.....	306 34 14.01	126 37 55.99	4.0115544
Chief.....	330 05 45.85	150 10 40.31	4.3425825

BERGEN, JEFFERSON COUNTY.

On mountain of same name, about 5 miles northwest of Evergreen post-office. Elevation about 9,000 feet.

Station mark: A pine tree 15 feet high and 6 inches in diameter.

Reference mark: A bronze bench-mark tablet set in a sloping sandstone rock on north edge of hill at highest point; true azimuth from station, 181° 23'; distance, 8.67 feet.

[Latitude 39° 39' 58.57". Longitude 105° 23' 40.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chief.....	95 37 01.06	275 32 07.38	4.0420656
Douglas	179 15 43.68	359 15 38.56	4.1695654
North Table Mountain.....	230 02 58.89	50 10 26.11	4.3367978
Morrison	268 37 48.10	88 44 31.17	4.1776792
Legault.....	322 47 21.27	142 52 19.92	4.2666761

LEGAULT, JEFFERSON COUNTY.

On mountain of same name 3 miles east of Conifer post-office.

Station mark: A pine tree 6 inches in diameter, 12 feet high, on highest point of mountain, 9,000 feet above sea.

Reference mark: A bronze triangulation tablet set in solid sandstone rock at highest point; true azimuth from station, 193° 05'; distance, 3 feet 2½ inches.

[Latitude 39° 32' 01.11". Longitude 105° 15' 52.68".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chief.....	125 35 19.64	305 25 28.07	4.4345086
Bergen	142 52 19.92	322 47 21.27	4.2666761
Douglas	159 00 27.74	338 55 23.94	4.4997715

MORRISON, JEFFERSON COUNTY.

A secondary station of the United States Coast and Geodetic Survey, on mountain of the same name about 3 miles northwest of the town of Morrison.

Station mark: A drill hole, $\frac{3}{4}$ -inch in diameter and 4 inches deep, in the rock at the summit.

Reference mark: The point occupied by the theodolite, which is marked by a copper bolt stamped U. S. G. S. with arrow pointing to station mark; true azimuth from station, $311^{\circ} 41'$; distance, 10.27 feet.

[Latitude $39^{\circ} 40' 09.76''$. Longitude $105^{\circ} 13' 09.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
South Boulder Peak.....	168 43 28.06	348 40 34.18	4.5178904
Table Mountain.....	186 49 08.91	6 49 52.54	4.1360412
Westminster.....	214 43 19.52	34 50 36.11	4.4543863
Capitol.....	248 49 46.59	68 58 46.78	4.3342863
Observatory.....	268 01 26.49	88 11 39.60	4.3598734
Indian Mound.....	271 26 55.18	91 51 12.57	4.7360113
Schweiger.....	298 50 33.23	119 03 56.80	4.5363141
Round Hill.....	298 43 03.78	119 04 29.83	4.7410023
Riley Hill.....	309 09 15.78	129 20 32.67	4.5151358
Table Mound.....	310 54 28.00	131 18 59.6	4.8662580
Raspberry.....	331 07 06.42	151 19 15.07	4.7555794
Douglas.....	133 31 01.26	313 24 12.51	4.3217667
Bergen.....	88 44 31.17	268 37 48.10	4.1776792

SHEEPSHEAD, JEFFERSON COUNTY.

On eastern one of the group known as Ralston Buttes, 450 feet south-east of highest point of mountain and 50 feet east of bare rocky point.

Station mark: A bronze triangulation tablet set in a solid flat rock between two very large boulders.

[Latitude $39^{\circ} 53' 34.14''$. Longitude $105^{\circ} 25' 01.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chief.....	20 35 47.52	200 31 44.57	4.4102949
Kingston.....	76 01 22.68	255 52 24.18	4.3134460
Douglas.....	350 34 42.24	170 35 28.61	4.0220084

TABLE MOUNTAIN, JEFFERSON COUNTY.

On the northeast part of North Table Mountain, 3 miles northeast of Golden.

Station mark: A copper bolt set in the flat basalt rock and stamped
G. S.
U. Δ S.

[Latitude 39° 47' 30.14". Longitude 105° 12' 00.90'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Morrison	6 49 52.54	186 49 08.97	4.1360412
South Boulder Peak	156 42 54.86	336 39 17.06	4.3095850
Morgan	216 12 55.82	36 19 41.60	4.4051184
Westminster	236 04 39.29	56 11 12.72	4.2452124
Capitol	287 21 54.45	107 30 11.67	4.2876445
Douglas	92 56 48.25	272 49 15.28	4.2268302
Bergen	50 10 26.11	230 02 58.89	4.3367978

Gunnison, Hinsdale, and Ouray counties; Lake City quadrangle.

Mr. J. F. McBeth, assistant topographer, occupied four stations and located four points by intersections in June and July, 1903. Positions are given on the United States standard datum, and based upon Uncompahgre-Sneffels as located by the United States Coast and Geodetic Survey.

ALPINE, GUNNISON COUNTY

(Not occupied.)

On west end of summit of small bare ridge at highest point of Alpine Plateau, sometimes locally called "Big Blue Ridge," $4\frac{1}{2}$ miles in an air line northwest of Youman station on the Denver and Rio Grande Railroad, 12 miles north of Lake City.

Station mark: An aluminum bench-mark tablet cemented in solid rock.

[Latitude 38° 13' 11.90". Longitude 107° 20' 52.02'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre	31 16 34.7	211 12 21.6	4.2841915
Lake	36 16 05.4	156 19 56.2	4.3544223

LAKE, HINSDALE COUNTY.

On a flat-topped slide rock summit 3 miles east of the town of Lake City, 2 miles north of the Lake City and Creede wagon road, where this road reaches the divide at the head of Slum Gullion Creek, from which point it is reached on horseback.

Station mark: A bronze tablet cemented into solid rock.

[Latitude $38^{\circ} 02' 00.29''$. Longitude $107^{\circ} 14' 38.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre.....	102 38 39.2	282 30 36.9	4. 2913527
Sneffels.....			4. 6831490
Sherman.....	52 24 44.1	232 18 03.2	4. 3027316

NO. 5, HINSDALE COUNTY.

(Not occupied.)

On summit at northeast edge of large mesa, about 12 miles southeast of Lake City.

Station mark: A rock monument.

[Latitude $37^{\circ} 57' 20.35''$. Longitude $107^{\circ} 06' 09.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lake.....			4. 1800108
Sherman.....			4. 4560829
Uncompahgre.....			4. 5323664

RIO GRANDE PYRAMID, HINSDALE COUNTY.

(Not occupied.)

A tall, sharp peak standing prominently higher than any other in its locality (Hayden Survey triangulation station), about 20 miles south of Uncompahgre Peak.

Station mark: A rock monument.

[U. S. standard: Latitude $37^{\circ} 40' 47.55''$. Longitude $107^{\circ} 23' 31.10''$. Hayden:
Latitude $37^{\circ} 40' 52.2''$. Longitude $107^{\circ} 23' 19.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sneffels	4. 7017823
Uncompahgre	4. 6426623
Lake	4. 6163674
Sherman	4. 4335574

SHERMAN, HINSDALE COUNTY.

On summit of dark quartzite peak about $1\frac{1}{2}$ miles north of the abandoned town of Sherman, 1 mile southwest of Redcloud Peak, and at the head of the south fork of Silver Creek.

Station mark: A bronze tablet cemented in large fragment of rock, over which was erected a rock cairn $4\frac{1}{2}$ feet high.

[Latitude $37^{\circ} 55' 22.54''$. Longitude $107^{\circ} 25' 30.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Uncompahgre	169 01 03.2	348 59 42.2	4. 2261074
Sneffels	105 42 19.2	285 28 47.5	4. 5245571
Lake	232 18 03.2	52 24 44.1	4. 3027316

TABASCO, HINSDALE COUNTY.

(Not occupied.)

On highest summit about 5 miles northwest of the town of Sherman and about 2 miles south of the Tabasco mine.

Station mark: A rock monument.

[Latitude $37^{\circ} 54' 47.25''$. Longitude $107^{\circ} 30' 14.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sneffels	4. 4351511
Uncompahgre	4. 2552210
Sherman	3. 8463457

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 half-inch copper bolt, leaded into the solid rock under masonry pier for theodolite support. The circular stone ring wall, inner diameter 11 feet, was left standing.

[Latitude 38° 04' 18.42". Longitude 107° 27' 41.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sneffels.....	75 32 46.6	255 20 34.1	4.4764217
Treasury Mountain.....	196 43 01.82	16 56 36.24	5.0387020
Mount Ouray	249 49 54.38	70 35 52.02	5.0611148
Lake	282 30 36.9	102 38 39.2	4.2913527
Sherman	348 59 42.2	169 01 03.2	4.2261074

SNEFFELS, OURAY COUNTY.

About 1 mile west of the town of Ouray.

Station mark: A rock monument about 4 feet high on summit of peak.

[Latitude 38° 00' 14.28". Longitude 107° 47' 30.59".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesa	161 21 47.8	341 07 21.2	5.0215579
Uncompahgre	255 20 34.1	75 32 46.6	4.4764215
Sherman	285 28 47.5	105 42 19.2	4.5245510

MONTANA.

TRIANGULATION STATIONS.

Choteau and Valley counties; Assiniboine, Bowdoin, Chinook, Dodson, Glasgow, Harlem, Havre, Hinsdale, Saco, Wayne Creek, Yantic, and other quadrangles.

During the season of 1902 an area of about 2,000 square miles in Choteau County was controlled by triangulation by Mr. J. T. Stewart under the supervision of Mr. H. L. Baldwin, jr. A base line 5.6 miles in length was measured along the railroad track near Burnham. From this base triangulation was extended northeastward to the Canadian boundary line and connected therewith. Azimuth observations were taken at one end of the base and also at Snake Butte. Twenty-five stations were occupied, controlling portions of four 30-minute quadrangles. This work was further extended eastward during the season

of 1903 by Messrs. Pearson Chapman and Fred McLaughlin, under the supervision of Mr. Baldwin. These observers, besides reoccupying five old stations, built and occupied thirty-five new stations and located twenty-two points by intersections. The latitude adopted is that of international boundary monument No. 318, corrected graphically for station error to the mean parallel or $49^{\circ} 00' 04.90''$, being about $1.94''$ greater than the latitude computed from Bear Paw station.

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.

BELKNAP, CHOTEAU COUNTY.

On the Fort Belknap Indian Reservation, on divide between Peoples and White Bear creeks, 300 feet south of ridge road to Fort Belknap Agency. This ridge is the first high ground south of Milk River, running about east and west, and the station is on the west end, overlooking White Bear bottom.

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

[Latitude $48^{\circ} 21' 55.62''$. Longitude $108^{\circ} 28' 25.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° / "	° / "	Meters.
Snake Butte	96 35 18.99	276 19 38.58	4.4158428
Wayne	159 26 29.62	339 21 06.87	4.4007927
Mesa	176 05 16.01	356 03 59.60	4.4858407
Eureka	185 17 39.52	5 18 54.67	4.3484067
Dodson	242 54 54.17	63 09 12.35	4.4227012
East Belknap	291 54 25.39	112 02 47.44	4.1738547

BIG SANDY, CHOTEAU COUNTY.

(Not occupied.)

A prominent point on ridge 3 miles east of Big Sandy railroad station, 239 feet west of section corner, one-fourth mile northwest of wagon road.

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

[Latitude $48^{\circ} 09' 46.49''$. Longitude $110^{\circ} 01' 49.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° / "	° / "	Meters.
Sage	153 36 02	333 29 29	4.38702
Square	202 55 39	23 00 25	4.30656
Box Elder schoolhouse .....	.....	.....	4.23651

BOUNDARY POST NO. 318, CHOTEAU COUNTY.

Situated 9.8 feet south of monument No. 318 on line between United States and Canada. It is about 7 miles west of North Fork River. The boundary monument is composed of earth and rock and is about 10 feet in diameter and 3 feet high.

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

[Latitude 49° 00' 04.90". Longitude 109° 16' 39.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Forks	16 15 57.66	196 12 21.11	4. 3207174
West Cherry.....	300 37 56.27	120 52 12.43	4. 4295770
Fifteenmile.....	339 10 25.93	159 17 05.01	4. 4835387

BOX ELDER, CHOTEAU COUNTY.

On highest point of divide northeast of Little Box Elder Creek, about 3 miles southeast of Toledo, one-fourth mile west of wagon trail to Milk River, 2,592 feet northwest of quarter corner common to sections 14 and 23, T. 32 N., R. 17 E.

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

[Latitude 48° 31' 45.99". Longitude 109° 29' 42.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Squaw	81 04 44.04	260 54 18.97	4. 2389816
Saddle	84 25 53.22	264 19 38.45	4. 0133845
Pepin	140 58 16.42	320 52 56.78	4. 1418483
Walker.....	183 01 54.62	3 02 34.38	4. 3113019
Yantic	215 56 24.57	36 03 08.34	4. 2733973
Chinook.....	290 05 16.98	110 16 01.32	4. 2745474

BOX ELDER SCHOOLHOUSE, CHOTEAU COUNTY.

(Not occupied.)

[Latitude 48° 19' 03.58". Longitude 110° 00' 58.36".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Big Sandy			4. 23651
Sage			4. 10570

BURNHAM, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of water tank at Burnham.

[Latitude $48^{\circ} 33' 44.24''$. Longitude $109^{\circ} 53' 20.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Red Rock	4. 09517
East Base	3. 02447

CHAIN, CHOTEAU COUNTY.

On a prominent hill 1 mile east of east end of Chain Lake, about 1 mile northeast of the wagon road which runs from Havre via Burnham on the high land up and along the west side of Milk River, about 8 miles northwest of Burnham and 6 miles north of Great Northern Railroad.

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

[Latitude $48^{\circ} 38' 47.39''$. Longitude $110^{\circ} 00' 49.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
West Base	5 52 09.70	185 51 37.91	3. 9291630
Mileboard 984	58 06 05.27	237 59 05.28	4. 1307931
Red Rock	258 18 23.15	78 26 06.87	4. 1107852
East Base	318 54 47.70	138 59 46.41	4. 0942557

CHINOOK, CHOTEAU COUNTY.

On a grassy hill, about 8 miles south of Chinook, on divide east of telephone road, one-half mile west of Chinook road.

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

[Latitude $48^{\circ} 28' 15.86''$. Longitude $109^{\circ} 15' 22.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Box Elder	110 16 01.32	290 05 16.98	4. 2745474
Yantic	163 05 34.06	343 01 32.64	4. 3552089
North Fork	195 50 46.31	15 54 13.56	4. 3164741
Zurich	228 16 41.26	48 29 15.23	4. 4407869
Snake Butte	285 12 54.68	105 32 21.21	4. 5216736

CHINOOK SCHOOLHOUSE, CHOTEAU COUNTY.

(Not occupied.)

[Latitude 48° 35' 29.36". Longitude 109° 13' 42.43".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chinook.....	4. 13183
Box Elder.....	4. 31939

COBURG WATER TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 26' 23.97". Longitude 108° 21' 14.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
East Belknap.....	4. 168285
Belknap.....	4. 084094

CONE, CHOTEAU COUNTY.

(Not occupied.)

[Latitude 48° 22' 29.80". Longitude 108° 51' 19.44".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snake.....	3. 48288
Chinook.....	4. 49876

DODSON, CHOTEAU COUNTY.

On a rolling prairie hill 6 miles north of Dodson post-office.

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

[Latitude 48° 28' 24.17". Longitude 108° 09' 17.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
East Belknap.....	29 07 15.03	209 01 19.69	4. 3036544
Belknap.....	63 09 12.35	242 54 54.17	4. 4227012
Eureka.....	115 31 28.34	295 18 24.04	4. 3763025
Mesa.....	126 01 01.09	305 45 24.62	4. 4999560
Three Buttes.....	284 35 13.43	104 41 57.55	4. 0597848
Malta.....	317 16 41.69	137 28 31.93	4. 4604733

EAST BASE, CHOTEAU COUNTY.

At east end of Burnham base line, one-half mile west of Burnham section house on Great Northern Railroad right of way, 80 feet south of track, on small knoll near west end of curve.

Station mark: An iron bench-mark post set in a cubic yard of cement; top of post projecting 3 inches above ground.

Reference marks: Bench-mark posts set 3 feet in ground at right angles to and on prolongation of base line, 20 feet distant from station mark.

[Latitude 48° 33' 44.05". Longitude 109° 54' 11.63".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Square Butte.....	3 24 17.53	183 23 21.86	4. 4116023
West Base.....	95 51 27.58	275 45 57.27	3. 9580732
Chain.....	138 59 46.41	318 54 47.70	4. 0942557
Red Rock.....	200 33 27.52	20 36 12.18	4. 1067880
Squaw.....	295 58 40.57	116 06 36.03	4. 1610340

EAST BELKNAP, CHOTEAU COUNTY.

On highest point of land about 4 miles south of Milk River and one-fourth mile east of east boundary of the Fort Belknap Indian Reservation.

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

[Latitude 48° 18' 54.83". Longitude 108° 17' 13.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Belknap.....	112 02 47.44	291 54 25.39	4. 1738547
Eureka.....	157 08 46.25	337 01 38.53	4. 4796513
Dodson.....	209 01 19.69	29 07 15.03	4. 3036544
Three Buttes.....	234 48 03.29	55 00 42.61	4. 4072741
Malta.....	276 57 02.92	97 14 47.12	4. 4713432

EAST CHERRY, CHOTEAU COUNTY.

On the south ridge of the Cherry Patch Hills, known as East Cherry Patch, on highest part of southwest point near break-off, about 4 miles east of Thirtymile Creek, three-fourths of a mile west of Harlem wagon road.

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

[Latitude 48° 43' 56.42". Longitude 108° 49' 47.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Zurich	45 18 03.65	225 11 26.32	4. 1829020
Fifteenmile	93 51 47.45	273 38 13.95	4. 3455558
Snake Butte	359 14 39.37	179 14 57.57	4. 5783100

EUREKA, CHOTEAU COUNTY.

On western side of divide between Eureka and Dodson creeks, overlooking the valley of Savoy Creek, and about 1 mile northeast of the head of Eureka Creek or Coulee. A rather dim road runs to Coburg, about 2 miles southwest of triangulation point.

Station mark: An iron bench-mark post set 32 inches in ground.

[Latitude 48° 33' 54.65". Longitude 108° 26' 44.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Belknap	5 18 54.67	185 17 39.52	4. 3484067
Snake Butte	55 29 38.24	235 12 41.20	4. 5303454
Wayne	97 05 42.24	276 59 03.73	4. 0405474
Mesa	153 32 58.70	333 30 26.88	3. 9685886
Dodson	295 18 24.04	115 31 28.34	4. 3763025
East Belknap	337 01 38.53	157 08 46.25	4. 4796513

FIFTEENMILE, CHOTEAU COUNTY.

On highest point of divide between heads of Fifteenmile and Coal creeks, 752.9 feet northeast of corner common to sections, 1 mile northwest of wagon road to Chinook via Gibbs ranch.

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

[Latitude 48° 44' 43.34". Longitude 109° 07' 49.65".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
North Fork	18 50 38.60	198 48 26.23	4. 0479153
Yantic	60 56 47.36	240 47 05.33	4. 2584864
Forks	116 44 32.75	296 34 18.06	4. 2710728
Boundary 318	159 17 05.01	339 10 25.93	4. 4835387
West Cherry	219 57 02.98	40 04 38.77	4. 2837150
East Cherry	273 38 13.95	93 51 47.45	4. 3455558
Zurich	317 02 48.73	137 09 44.28	4. 2206852

FOGERTY, CHOTEAU COUNTY.

On divide between Fogerty and Thirtymile Creek, 6 miles north-northwest of Harlem, about one-half mile west of wagon road.

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

[Latitude $48^{\circ} 36' 43.37''$. Longitude $108^{\circ} 49' 03.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snake Butte	0 55 35.90	180 55 21.48	4.3890661
Zurich	102 47 40.58	282 40 31.01	4.0798706
East Cherry	176 12 11.30	356 11 29.66	4.1273234
Prairie	231 30 21.08	51 37 19.99	4.1637621
Wayne	283 03 56.47	103 14 02.23	4.2303029

FORKS, CHOTEAU COUNTY.

On divide between West Fork and North Fork, about 1 mile north-west of junction of East Fork with North Fork, 2 miles northwest of Link's ranch, 1 mile west of North Fork wagon road.

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

[Latitude $48^{\circ} 49' 14.46''$. Longitude $109^{\circ} 21' 26.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walker.....	37 11 33.72	217 06 00.70	4.1753922
Boundary 318.....	196 12 21.11	16 15 57.66	4.3207174
West Cherry.....	257 30 53.87	77 48 45.24	4.4726699
Fifteenmile.....	296 34 18.06	116 44 32.75	4.2710728
North Fork.....	325 16 22.90	145 24 24.70	4.3623141
Yantic	357 06 22.02	177 06 53.97	4.2361690

FORT ASSINNIBOINE, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of water tank at Fort Assinniboine.

[Latitude $48^{\circ} 29' 58.61''$. Longitude $109^{\circ} 47' 36.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
West base	4.27575
Red Rock	4.28498

FORT BELKNAP WATER TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of tank.

[Latitude 48° 29' 08.24". Longitude 108° 46' 02.92".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte			4. 049709
Prairie			4. 387029
Wayne			4. 215074

HARLEM CHURCH, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of Methodist Church spire.

[Latitude 48° 31' 59.04". Longitude 108° 46' 57.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte			4. 203903
Belknap			4. 469670
Savoy			4. 278939

HAVRE, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of roundhouse chimney at Havre.

[Latitude 48° 33' 15.12". Longitude 109° 39' 52.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Saddle			3. 64170
Squaw			3. 85449

LITTLE ROCKIES (SULLIVAN PEAK), CHOTEAU COUNTY.

(Not occupied.)

[Latitude $47^{\circ} 59' 39.07''$. Longitude $108^{\circ} 35' 44.7''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Belknap.....			4. 672573
Dodson.....			4. 796155
West Fork.....			4. 891750
Malta			4. 788578

MILE BOARD 984, CHOTEAU COUNTY.

On top of ridge 2 miles east of Xenia siding, 400 feet northwest of mile board 984, on Great Northern Railroad, on small knoll 300 feet north of railroad track. Wagon road runs south of railroad.

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

[Latitude $48^{\circ} 34' 55.83''$. Longitude $110^{\circ} 10' 09.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chain.....	237 59 05.28	58 06 05.27	4. 1307931
Red Rock	247 51 07.90	68 05 51.47	4. 4151518
West Base.....	276 55 17.82	97 01 45.79	4. 0287844
Square	326 55 15.82	147 06 17.17	4. 5230478

MESA, CHOTEAU COUNTY.

On edge of a rise in Cherry Patch Ridge, about 2 miles north of East Fork of Savoy Creek and 3 miles north of Black Butte.

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

[Latitude $48^{\circ} 38' 24.22''$. Longitude $108^{\circ} 30' 07.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wayne.....	44 02 01.45	223 57 54.55	3. 9870088
Dodson.....	305 45 24.62	126 01 01.09	4. 4999560
Eureka.....	333 30 26.88	153 32 58.70	3. 9685886
Belknap.....	356 03 59.60	176 05 16.01	4. 4858407

MILK RIVER BRIDGE, CHOTEAU COUNTY.

(Not occupied.)

East of Zurich, a station on the Great Northern Railroad.

Station mark: Center of bridge.

[Latitude 48° 33' 20.21". Longitude 108° 57' 06.27".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook.....	4. 387024
Snake Butte	4. 312804

NORTH FORK, CHOTEAU COUNTY.

On highest point of bench 2½ miles east of North Fork River, about 6 miles northeast of Chinook, about 3 miles southeast of Gibbs's ranch, and 2,459 feet south of township corner.

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

[Latitude 48° 39' 01.19". Longitude 109° 10' 45.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook.....	15 54 13.56	195 50 46.31	4. 3164741
Yantic	98 09 01.00	278 01 31.68	4. 0924138
Forks	145 24 24.70	325 16 22.90	4. 3623141
Fifteenmile	198 48 26.23	18 50 38.60	4. 0479153
West Cherry.....	212 11 13.47	32 21 01.45	4. 4757747
Zurich	276 04 16.10	96 13 23.61	4. 1766183

PEPIN, CHOTEAU COUNTY.

About 6 miles northeast of Havre, on divide between Red Rock Coulee and Milk River. In Pepin's pasture, near east fence, 4 miles east of Havre and Lake Thibideau wagon road.

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

Bull. 245—04—15

[Latitude $48^{\circ} 37' 34.40''$. Longitude $109^{\circ} 36' 48.99''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle	7 20 27.45	187 19 32.01	4.0744270
Squaw	31 52 37.91	211 47 31.96	4.2003833
Red Rock	106 09 48.02	285 59 30.12	4.2439166
Thibideau	186 19 06.28	6 20 13.52	4.2202759
Walker	225 17 52.23	45 23 52.10	4.1393886
Box Elder	320 52 56.78	140 58 16.42	4.1418483

PIKES PEAK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of summit.

[Latitude $47^{\circ} 56' 23.6''$. Longitude $108^{\circ} 31' 38.7''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dodson	4.81600
Malta	4.78384

PRAIRIE, CHOTEAU COUNTY.

Near center sec. 24, T. 34 N., R. 23 E., about 12 miles north of Harlem, Montana.

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

[Latitude $48^{\circ} 41' 36.79''$. Longitude $108^{\circ} 39' 45.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fogerty	51 37 19.99	231 30 21.08	4.1637621
East Cherry	109 23 39.89	289 15 59.13	4.1149395
Wayne	338 24 23.71	158 27 31.06	4.1431148

RED ROCK, CHOTEAU COUNTY.

About 12 miles northwest of Havre, on a prominent knoll on divide between Milk River and Red Rock Coulee, about 5 miles north of Milk River and 0.6 mile south of Havre road, 273 feet east of corner, to secs. 25 and 36, T. 34 N., R. 14 E.

Station mark: An iron bench-mark post set 36 inches in the ground and marked "2945 Havre."

[Latitude 48° 40' 11.61". Longitude 109° 50' 32.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
East Base.....	20 36 12.18	200 33 27.52	4. 1067880
West Base.....	50 48 02.12	230 39 46.87	4. 2420716
Mile board 984.....	68 05 51.47	247 51 07.90	4. 4151518
Chain.....	78 26 06.87	258 18 23.15	4. 1107852
Thibideau.....	237 55 17.03	58 06 42.90	4. 3422807
Pepin.....	285 59 30.12	106 09 48.02	4. 2439166
Squaw.....	335 03 58.81	155 09 10.08	4. 3055702

SADDLE, CHOTEAU COUNTY.

A prominent rocky butte 3 miles southeast of Havre. Foot of butte is 1 mile northwest of wagon road from Havre to Little Box Elder Creek.

Station mark: A bronze triangulation tablet set in solid rock on highest part of butte.

[Latitude 48° 31' 13.28". Longitude 109° 38' 02.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Squaw.....	76 04 47.02	256 00 36.68	3. 8492805
Pepin.....	187 19 32.04	7 20 27.45	4. 0744270
Box Elder.....	264 19 38.45	84 25 53.22	4. 0133845

SAGE, CHOTEAU COUNTY.

(Not occupied.)

About 9 miles west of Box Elder railroad station, on small ridge on divide south of Sage Creek; 3 miles west of wagon road, 1½ 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.
	° ' "	° ' "	Meters.
Mile board.....	181 14 01	1 14 21	4. 39446
Square.....	279 31 43	99 43 03	4. 27873
Big Sandy.....	333 29 29	153 36 02	4. 38702

SAVOY, CHOTEAU COUNTY.

On divide between White Bear Creek and Milk River, about 1,000 feet west of the road to Landusky. This divide is the eastern continuation of the divide of which Snake Butte is the summit.

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

[Latitude $48^{\circ} 24' 06.05''$. Longitude $108^{\circ} 37' 05.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Snake Butte			4. 182442
Eureka	214 57 22.3	35 05 07.3	4. 346351
Belknap	290 34 47.4	110 41 16.1	4. 058080

SAVOY WATER TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude $48^{\circ} 28' 31.36''$. Longitude $108^{\circ} 32' 43.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Belknap			4. 124710
Snake Butte			4. 353254

SNAKE BUTTE, CHOTEAU COUNTY.

A prominent butte 10 miles south of Harlem on the Fort Belknap Indian Reservation. Wagon road runs from Harlem to spring at west end of butte.

Station mark: A bronze triangulation tablet cemented in a flat rock 20 feet long and 10 feet wide, on highest point of butte.

[Latitude $48^{\circ} 23' 30.49''$. Longitude $108^{\circ} 49' 23.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chinook	105 32 21.21	285 12 54.68	4. 5216736
Zurich	157 21 13.10	337 14 18.62	4. 4686389
East Cherry	179 14 57.57	359 14 39.37	4. 5783100

SQUARE BUTTE, CHOTEAU COUNTY.

On a high point near northwest rim of Square Butte, a prominent butte 4 miles northeast of Box Elder railroad station. A wagon road passes one-half mile northwest of foot of butte.

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

[Latitude 48° 19' 50.29". Longitude 109° 55' 26.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mile board 984.....	147 06 17.17	326 55 15.82	4.5230478
West Base.....	164 16 59.51	344 12 25.44	4.4427027
East Base.....	183 23 21.86	3 24 17.53	4.4116023
Squaw.....	216 51 29.68	37 00 19.96	4.3848879

SQUAW, CHOTEAU COUNTY.

A prominent rocky butte about 5 miles south of Havre and 3 miles east of Fort Assiniboine. Ryan's sheep ranch at the north foot of the butte is reached by wagon road from Havre.

Station mark: A bronze triangulation tablet cemented in solid rock on highest part of butte.

[Latitude 48° 30' 18.10". Longitude, 109° 43' 37.10".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Square Butte.....	37 00 19.96	216 51 29.68	4.3848879
East Base.....	116 06 36.03	295 58 40.57	4.1610340
Red Rock.....	155 09 10.08	335 03 58.81	4.3055702
Pepin.....	211 47 31.96	31 52 37.91	4.2003833
Saddle.....	256 00 36.68	76 04 47.02	3.8492805
Box Elder.....	260 54 18.97	81 04 44.04	4.2389816

THIBIDEAU, CHOTEAU COUNTY.

On a prominent hill 1 mile northeast of Thibideau Lake, one-half mile east of Havre and Thibideau Lake wagon road.

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

[Latitude 48° 46' 28.72". Longitude 109° 35' 19.48".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pepin.....	6 20 13.52	186 19 06.28	4.2202759
Red Rock.....	58 06 42.90	237 55 17.03	4.3422807
Walker.....	310 31 40.91	130 36 33.91	4.0204727

THREE BUTTES, CHOTEAU COUNTY.

On highest northwest end of group of buttes, 10 miles northwest of Malta.

Station mark: An iron bench-mark post set 3 feet in the ground and surrounded by a rock cairn $3\frac{1}{2}$ feet in diameter at base and 6 feet high.

Reference mark: Cross on granite rock 2 feet square and projecting 1 foot above ground; true azimuth to mark, $201^{\circ} 49'$; distance, 6.30 feet.

[Latitude $48^{\circ} 26' 50.25''$. Longitude $108^{\circ} 00' 17.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
East Belknap	55 00 42.61	234 48 03.29	4.4072741
Dodson.....	104 41 57.55	284 35 13.43	4.0597848
West Fork.....	261 47 16.33	81 55 38.46	4.1437880
Remove	303 19 37.21	123 31 54.21	4.3856389
Hicks	327 11 28.88	147 19 36.16	4.3948424
Malta	335 16 11.57	155 21 17.70	4.3051098

WALKER, CHOTEAU COUNTY.

A prominent swell on the divide between Red Rock Coulee and West Fork, about 6 miles southeast of Thibideau Lake, $1\frac{1}{2}$ miles south of a grassy lake, one-fourth mile southwest of Chinook and Thibideau Lake wagon road.

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

[Latitude $48^{\circ} 42' 48.02''$. Longitude $109^{\circ} 28' 49.71''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Box Elder	3 02 34.38	183 01 54.62	4.3113019
Pepin	45 23 52.10	225 17 52.23	4.1393886
Thibideau	130 36 33.91	310 31 40.91	4.0204727
Forks	217 06 00.70	37 11 33.72	4.1753922
Yantic	297 53 48.89	117 59 53.44	4.0506437

WAYNE, CHOTEAU COUNTY.

Near center sec. 33, T. 33 N., R. 24 E., on divide between Wayne and Savoy creeks and 7 miles north of Savoy.

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

[Latitude 48° 34' 38.21". Longitude 108° 35' 36.29'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snake Butte	39 32 59.15	219 22 40.00	4.4267609
Fogerty	103 14 02.23	283 03 56.47	4.2303029
Prairie	158 27 31.06	338 24 23.71	4.1431148
Mesa	223 57 54.55	44 02 01.45	3.9870088
Eureka	276 59 03.73	97 05 42.24	4.0405474
Belknap	339 21 06.87	159 26 29.62	4.4007927

WEST BASE, CHOTEAU COUNTY.

On a prominent knoll 6 miles west of Burnham section house, 600 feet south of Great Northern Railroad track.

Station mark: An iron bench-mark post set in cubic yard of concrete, top of post projecting 3 inches above the ground.

Reference marks: Bench-mark posts set 3 feet in the ground at right angles to and on prolongation of the base line 20 feet distant from station mark.

[Latitude 48° 34' 13.82". Longitude 110° 01' 32.22'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mile board 984	97 01 45.79	276 55 17.82	4.0287844
Chain	185 51 37.91	5 52 09.70	3.9291630
Red Rock	230 39 46.87	50 48 02.12	4.2420716
East Base	275 45 57.27	95 51 27.58	3.9580732
Square Butte	344 12 25.44	164 16 59.51	4.4427027

WEST CHERRY, CHOTEAU COUNTY.

On the northwest butte of the Cherry Patch Ridge, about 250 feet east of the break-off at west end of ridge; can be reached from the south side by wagon.

Station mark: An iron post with bronze triangulation top set 36 inches in the ground.

[Latitude 48° 52' 39.83". Longitude 108° 57' 44.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
North Fork.....	32 21 01.45	212 11 13.47	4.4757747
Fifteenmile.....	40 04 38.77	219 57 02.98	4.2837150
Forks.....	77 48 45.24	257 30 53.87	4.4726699
Boundary 318.....	120 52 12.43	300 37 56.27	4.4295770

YANTIC, CHOTEAU COUNTY.

A grassy swell on divide between Red Rock Coulee and West Fork, about 8 miles northwest of Chinook and one-half mile southwest of wagon road which runs from Chinook northwestward near West Fork.

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

[Latitude 48° 39' 57.53". Longitude 109° 20' 44.36".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Box Elder.....	36 03 08.34	215 56 24.57	4.2733973
Walker.....	117 59 53.44	297 53 48.89	4.0506437
Forks.....	177 06 53.97	357 06 22.02	4.2361690
Fifteenmile.....	240 47 05.33	60 56 47.36	4.2584864
North Fork.....	278 01 31.68	98 09 01.00	4.0924138
Chinook.....	343 01 32.64	163 05 34.06	4.3552089

YANTIC TANK, CHOTEAU COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank at Yantic.

[Latitude 48° 35' 29.08". Longitude 109° 24' 16.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Box Elder.....	3.98274
Saddle.....	4.27199

ZURICH, CHOTEAU COUNTY.

On divide between Thirtymile and Fifteenmile creeks, about 6 miles north of Zurich railroad station; about one-half mile west of Zurich wagon road and 1 mile southwest of Harlem wagon road.

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

[Latitude 48° 38' 09.12". Longitude 108° 58' 36.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chinook.....	48 29 15.23	228 16 41.26	4.4407869
North Fork.....	96 13 23.61	276 04 16.10	4.1766183
Fifteenmile.....	137 09 44.28	317 02 48.73	4.2206852
East Cherry.....	225 11 26.32	45 18 03.65	4.1829020
Snake Butte.....	337 14 18.62	157 21 13.10	4.4686389

ASH, VALLEY COUNTY.

On prairie hill 3 miles south of Vandalia railroad station.

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

[Latitude 48° 20' 36.15". Longitude 106° 59' 16.59".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peak.....	103 56 44.98	283 49 13.45	4.1076542
Rock Creek.....	162 31 24.79	342 26 28.90	4.4311067
Buggy.....	201 43 16.20	21 47 18.41	4.2544042
Vandalia.....	249 50 50.06	70 03 35.75	4.3509663
Tampico.....	283 59 31.08	104 05 42.83	4.0239072

ASHFIELD WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 25' 37.53". Longitude 107° 31' 19.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Remove.....			4.280582
Moraine.....			3.979367
Saco.....			4.115548

BEAVER, VALLEY COUNTY.

On prairie hill 12 miles south of Lake Bowdoin.

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

[Latitude $48^{\circ} 14' 18.63''$. Longitude $107^{\circ} 40' 29.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky.....	86 36 12.70	266 32 15.65	3.8176223
Hicks	101 59 34.59	281 52 54.75	4.0531163
Remove	157 01 48.44	336 59 17.46	4.0284139

BRAZIL, VALLEY COUNTY.

On flat prairie ridge 8 miles southwest of Glasgow.

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

[Latitude $48^{\circ} 12' 16.96''$. Longitude $106^{\circ} 52' 48.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Vandalia	209 29 40.84	29 37 35.83	4.4243592
Chester	233 05 52.01	53 18 15.25	4.4089996
Glasgow	265 43 15.66	85 55 09.74	4.2972128

BUGGY, VALLEY COUNTY.

On gently sloping prairie hill 10 miles northeast of Hinsdale post-office and station, on Great Northern Railroad.

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

[Latitude $48^{\circ} 29' 36.31''$. Longitude $106^{\circ} 53' 52.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ash	21 47 18.41	201 43 16.20	4.2544042
Peak	54 35 26.67	234 23 52.34	4.3698512
Rock Creek.....	121 35 43.93	301 26 45.05	4.2382127
Vandalia	301 55 35.17	122 04 19.41	4.2297322
Tampico.....	349 27 32.62	169 29 42.64	4.2917641

CHESTER, VALLEY COUNTY.

On small prairie knob on south end of ridge, 11 miles northeast of Glasgow.

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

[Latitude 48° 20' 34.30". Longitude 106° 36' 12.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Glasgow	3 14 20.88	183 13 52.39	4. 1442242
Brazil	53 18 15.25	233 05 52.01	4. 4089996
Tampico	82 16 26.96	262 05 24.81	4. 2654875
Vandalia	136 20 23.76	316 15 54.80	4. 0300669
Porcupine	303 05 13.45	123 13 08.60	4. 1948931

GLASGOW, VALLEY COUNTY.

On flat prairie 2 miles north of Glasgow.

Station mark: An iron bench-mark post set 3½ feet in the ground.

[Latitude 48° 13' 03.74". Longitude 106° 36' 50.68".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willow	6 40 55.53	186 40 01.96	4. 1066538
Brazil	85 55 09.74	265 43 15.66	4. 2972128
Tampico	123 12 10.45	303 01 37.41	4. 3198313
Vandalia	163 01 32.99	342 57 32.79	4. 3551759
Vandalia (observed)	163 01 26.90	.....	.....
Chester	183 13 52.39	3 14 20.88	4. 1442242
Porcupine	248 54 02.83	69 02 25.99	4. 1734807

HICKS, VALLEY COUNTY.

On prominent hill 5 miles south of Malta.

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

[Latitude 48° 15' 34.31". Longitude 107° 49' 25.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Three Buttes	147 19 36.16	327 11 28.88	4. 3948424
West Fork	180 58 07.48	0 58 21.52	4. 3589656
Remove	222 31 27.14	42 35 36.26	4. 0072925
Beaver	281 52 54.75	101 59 34.59	4. 0531163
Rocky	301 13 51.93	121 16 34.63	3. 7212330

HINSDALE, VALLEY COUNTY.

On northwest summit of range of hills known as Larb Hills, and 4 miles southwest of Hinsdale post-office and station of the Great Northern Railroad.

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

[Latitude $48^{\circ} 23' 35.95''$. Longitude $107^{\circ} 12' 44.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Short	74 33 00.28	254 21 46.14	4. 2848144
Larb	91 01 07.73	270 48 47.51	4. 3089235
Saco	132 55 55.47	312 46 13.86	4. 3379786
Rock Creek	202 43 40.44	22 48 49.30	4. 3401399
Peak	300 35 52.33	120 38 24.52	3. 6873169
Square	358 42 41.48	178 42 49.94	4. 0164066

HINSDALE WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude $48^{\circ} 23' 38.08''$. Longitude $107^{\circ} 05' 12.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hinsdale	3. 968121
Rock Creek	4. 303822
Buggy	4. 250994

LARB, VALLEY COUNTY.

Near southeast corner SE. $\frac{1}{4}$ sec. 31, T. 31 N., R. 33 E., on north end of high prairie ridge 3 miles southeast of Ashfield station of the Great Northern Railroad.

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

[Latitude 48° 23' 46.48". Longitude 107° 29' 14.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nemo	24 03 39.16	204 00 53.29	4.0500023
Remove	66 58 08.46	246 47 12.74	4.2931029
West Fork	107 27 19.29	287 12 27.30	4.4095080
Moraine	153 38 43.72	333 35 01.71	4.1372472
Hinsdale	270 48 47.51	91 01 07.73	4.3089235
Saco	196 46 48.03	16 49 27.38	4.1798441
Short	341 43 24.90	161 44 30.70	3.7619111

MALTA, VALLEY COUNTY.

Situated 4 miles south of Malta, on low mound west of road.

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

[Latitude 48° 16' 56.38". Longitude 107° 53' 27.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
East Belknap	97 14 47.12	276 57 02.92	4.4713432
Dodson	137 28 31.93	317 16 41.69	4.4604733
Three Buttes	155 21 17.70	335 16 11.57	4.3051098
West Fork	194 47 40.98	14 50 56.25	4.3225286
Remove	247 17 04.78	67 24 14.92	4.1094006

MISSOURI, VALLEY COUNTY.

On west end of ridge and 9 miles south of Glasgow.

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

[Latitude 48° 00' 43.32". Longitude 106° 34' 44.71".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Willow	158 04 56.93	338 02 29.75	4.0400666
Porcupine	201 50 13.59	21 57 02.13	4.4830632
Nashua	213 28 02.48	33 31 32.57	4.0252679

MORaine, VALLEY COUNTY.

On prairie hill 6 miles northwest of Ashfield station of the Great Northern Railroad, and in NE. $\frac{1}{4}$ sec. 33, T. 32 N., R. 32 E.

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

[Latitude 48° 30' 24.29". Longitude 107° 34' 10.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Remove	30 54 03.31	210 46 48.93	4.3672291
West Fork	75 56 07.98	255 44 57.35	4.2779994
Saco	258 05 02.38	78 11 24.10	4.0287770
Larb	333 35 01.71	153 38 43.73	4.1372472
Nemo	356 05 36.79	176 06 32.64	4.3538616

NASHUA, VALLEY COUNTY.

On prairie ridge 6 miles east of Glasgow.

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

[Latitude 48° 05' 29.49". Longitude 106° 30' 02.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Missouri	33 31 32.57	213 28 02.48	4.0252679
Willow	97 41 32.75	277 35 35.26	4.0011852
Porcupine	195 48 25.16	15 51 43.45	4.3041769

NEMO, VALLEY COUNTY.

In NE. $\frac{1}{4}$ sec. 3, T. 29 N., R. 32 E., on low ridge 2 miles east of Beaver Creek and 7 miles south of Bowdoin station on the Great Northern Railroad.

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

[Latitude 48° 18' 14.73". Longitude 107° 32' 56.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Remove	100 42 07.19	280 33 57.72	4.1379682
West Fork	131 58 25.83	311 46 20.38	4.4283085
Moraine	176 06 32.64	356 05 36.79	4.3538616
Larb	204 00 53.29	24 03 39.16	4.0500023
Short	233 16 30.62	53 20 22.18	3.9011360

PEAK, VALLEY COUNTY.

In sec. 10, T. 30 N., R. 35 E., on northern summit of range known as Larb Hills, and 3 miles southwest of Hinsdale.

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

[Latitude 48° 22' 15.68". Longitude 107° 09' 20.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Square	26 37 49.45	206 35 25.83	3.9464286
Hinsdale	120 38 24.52	300 35 52.33	3.6873169
Rock Creek.....	190 42 04.11	10 44 40.50	4.3628765
Buggy.....	234 23 52.34	54 35 26.67	4.3698512
Ash.....	283 49 13.45	103 56 44.98	4.1076542

PORCUPINE, VALLEY COUNTY.

On ridge one-half mile west of Porcupine Creek and 11 miles east of Glasgow.

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

[Latitude 48° 15' 56.97". Longitude 106° 25' 36.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nashua.....	15 51 43.45	195 48 25.16	4.3041769
Missouri.....	21 57 02.13	201 50 13.59	4.4830632
Willow.....	40 35 03.05	220 25 46.76	4.3754135
Glasgow.....	69 02 25.99	248 54 02.83	4.1734807
Chester.....	123 13 08.60	303 05 13.45	4.1948931

REMOVE, VALLEY COUNTY.

On high prairie ridge about 6 miles east of Malta.

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

[Latitude 48° 19' 36.82". Longitude 107° 43' 51.72".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky	13 08 15.74	193 06 49.45	4.0209973
Hicks	42 35 36.26	222 31 27.14	4.0072925
Malta	67 24 14.92	247 17 04.78	4.1094006
Three Buttes	123 31 54.21	303 19 37.21	4.3856389
West Fork.....	157 10 05.28	337 06 09.80	4.2219402
Moraine.....	210 46 48.93	30 54 03.32	4.3672291
Larb	246 47 12.74	66 58 08.46	4.2931029
Nemo	280 33 57.72	100 42 07.19	4.1379682
Beaver	336 59 17.46	157 01 48.44	4.0284139

ROCK CREEK, VALLEY COUNTY.

In SE. $\frac{1}{4}$ sec. 35, T. 33 N., R. 35 E., on ridge running north and south and 12 miles north of Hinsdale.

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

[Latitude $48^{\circ} 34' 29.22''$. Longitude $107^{\circ} 05' 51.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peak	10 44 40.50	190 42 04.11	4.3628765
Hinsdale	22 48 49.30	202 43 40.44	4.3401399
Buggy	301 26 45.05	121 35 43.93	4.2382127
Ash	342 26 28.90	162 31 24.79	4.4311067

ROCK MONUMENT, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of monument.

[Latitude $48^{\circ} 20' 34.31''$. Longitude $107^{\circ} 08' 58.05''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Square			3.813634
Hinsdale			3.862882
Peak			3.500498

ROCK MONUMENT NO. 2, VALLEY COUNTY.

(Not occupied.)

On high point.

Station mark: Center of monument.

[Latitude $48^{\circ} 30' 17.28''$. Longitude $107^{\circ} 53' 54.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
West Fork			3.868521
Three Buttes			4.005730
Remove			4.368258

ROCKY, VALLEY COUNTY.

On rocky butte 5 miles west of Beaver Creek and 7 miles southeast of Malta.

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

[Latitude $48^{\circ} 14' 05.90''$. Longitude $107^{\circ} 45' 47.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hicks	121 16 34.63	301 13 51.93	3.7212330
Remove	193 06 49.50	13 08 15.74	4.0209973
Beaver	266 32 15.65	86 36 12.70	3.8176223

SACO, VALLEY COUNTY.

Near southwest corner of sec. 15, T. 32 N., R. 33 E., on flat prairie 6 miles northwest of Saco post-office, and 1 mile east of Hedger's ranch on Milk River.

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

[Latitude $48^{\circ} 31' 35.40''$. Longitude $107^{\circ} 25' 41.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Larb	16 49 27.38	196 46 48.03	4.1798441
Moraine	78 11 24.10	258 05 02.38	4.0287770
Rock Creek	257 27 50.00	77 42 41.60	4.3975770
Hinsdale	312 46 13.86	132 55 55.47	4.3379786

SACO WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude $48^{\circ} 27' 26.71''$. Longitude $107^{\circ} 20' 36.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rock Creek			4.349536
Hinsdale			4.080889

SHORT, VALLEY COUNTY.

On ridge 6 miles southeast of Ashfield station on the Great Northern Railroad.

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

[Latitude $48^{\circ} 20' 48.80''$. Longitude $107^{\circ} 27' 46.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nemo	53 20 22.18	233 16 30.62	3.9011360
Larb	161 44 30.70	341 43 24.90	3.7619111
Hinsdale	254 21 46.14	74 33 00.28	4.2848144
Square	285 24 40.61	105 36 02.72	4.2905541

SQUARE, VALLEY COUNTY.

On ridge running west from Larb Hills and 8 miles southwest of Hinsdale.

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

[Latitude $48^{\circ} 17' 59.82''$. Longitude $107^{\circ} 12' 33.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Short	105 36 02.72	285 24 40.61	4.2905541
Hinsdale	178 42 49.94	358 12 41.48	4.0164066
Peak	206 35 25.83	26 37 49.45	3.9464286

T. 31 N., R. 33 E., $\frac{1}{4}$ SECTION CORNER, VALLEY COUNTY.

South side section 36.

[Latitude $48^{\circ} 23' 44.6''$. Longitude $107^{\circ} 29' 11.8''$.]

TAMPICO, VALLEY COUNTY.

On prairie 1 mile west of Tampico station on the Great Northern Railroad.

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

[Latitude 48° 19' 13.14". Longitude 106° 50' 58.93".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ash	104 05 42.83	283 59 31.08	4. 0239072
Buggy	169 29 42.64	349 27 32.62	4. 2917641
Vandalia	226 31 55.80	46 38 29.40	4. 1738161
Chester	262 05 24.81	82 16 26.96	4. 2654875
Glasgow	303 01 37.41	123 12 10.45	4. 3198313
Willow	326 18 03.85	146 27 42.71	4. 4616288

TAMPICO WATER TANK, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of railroad water tank.

[Latitude 48° 18' 24.60". Longitude 106° 49' 24.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' " •	° ' "	<i>Meters.</i>
Vandalia			4. 168685
Chester			4. 225476

TIGER BUTTE, VALLEY COUNTY.

(Not occupied.)

Station mark: Center of rocky peak.

[Latitude 48° 07' 36.13". Longitude 106° 31' 53.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Missouri			4. 121771
Willow			3. 906356
Chester			4. 39137

VANDALIA, VALLEY COUNTY.

On ridge running east and west 6 miles north of Tampico station on the Great Northern Railroad.

Station mark: An iron bench-mark post set 3½ feet in the ground.

[Latitude $48^{\circ} 24' 45.14''$. Longitude $106^{\circ} 42' 12.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brazil	29 37 35.83	209 29 40.84	4.4243592
Tampico	46 38 29.40	226 31 55.80	4.1738161
Ash	70 03 35.75	249 50 50.06	4.3509663
Buggy	122 04 19.41	301 55 35.17	4.2297322
Chester	316 15 54.80	136 20 23.76	4.0300669
Glasgow	342 57 32.79	163 01 32.99	4.3551759

WEST FORK, VALLEY COUNTY.

On high bluff west of Milk River, 8 miles north of Malta.

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

[Latitude $48^{\circ} 27' 54.10''$. Longitude $107^{\circ} 49' 06.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hicks	0 58 21.52	180 58 07.48	4.3589656
Malta	14 50 56.25	194 47 40.98	4.3225286
Three Buttes	81 55 38.46	261 47 16.33	4.1437880
Moraine	255 44 57.35	75 56 07.98	4.2779994
Larb	287 12 27.30	107 27 19.29	4.4095080
Nemo	311 46 20.38	131 58 25.83	4.4283085
Remove	337 06 09.80	157 10 05.28	4.2219402

WILLOW, VALLEY COUNTY.

On ridge running northwest and southeast and 4 miles south of Glasgow.

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

[Latitude $48^{\circ} 06' 12.66''$. Longitude $106^{\circ} 38' 02.58''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tampico	146 27 42.71	326 18 03.85	4.4616288
Glasgow	186 40 01.96	6 40 55.53	4.1066538
Porcupine	220 25 46.76	40 35 03.05	4.3754135
Nashua	277 35 35.26	97 41 32.75	4.0011852
Missouri	338 02 29.75	158 04 56.93	4.0400666

OREGON.

TRIANGULATION STATIONS.

Grant, Harney, and Malheur counties.

During the latter part of the season of 1903 Mr. C. F. Urquhart, topographer, extended triangulation south and east from stations Fields and Strawberry, previously developed from the Baker City base. In the progress of this work Mr. Urquhart occupied eighteen stations, which furnish control for eight 30-minute quadrangles.

FIELDS, GRANT COUNTY.

On the highest bald summit at the head of Fields Creek, 10 miles southwest of Mount Vernon post-office and 7 miles south of John Day River. Follow trail up Fields Creek 8 miles, thence up steep ridge to left, leading to station. Best approached from the southwest side, as the ridges on the north side are very steep and rocky.

Station mark: Copper bolt cemented in solid rock; above it a rock cairn 5 feet in height.

[Latitude 44° 20' 20.60". Longitude 119° 15' 35.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snow.....	25 01 34.28	204 51 37.89	4. 6542932
Strawberry.....	273 43 31.37	94 06 15.10	4. 6369569
Soda.....	318 13 49.6	138 26 36.9	4. 5651789
Baldy.....	322 34 36.70	142 52 42.36	4. 7576209
Silvies.....	336 10 56.3	156 20 14.4	4. 6456061
Long.....	204 59 59.38	25 08 58.54	4. 6030953
Greenhorn.....	232 46 42.57	53 16 01.50	4. 8409415
Dixie.....	241 24 35.94	61 51 09.39	4. 7570659
Strawberry.....	273 43 31.37	94 06 15.10	4. 6360569

SILVIES, GRANT COUNTY.

(Not occupied.)

On the highest point on the timbered ridge, about 8 or 9 miles a little north of west from Silvies post-office. Station is probably in Grant County, but very near the Harney County line. It can be plainly seen from Silvies Valley and is easily reached on horseback.

Station mark: The lone signal tree, trimmed up.

[Latitude 43° 58' 29.18". Longitude 119° 02' 14.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fields	156 20 14.4	336 10 56.3	4.6456061
Strawberry	214 10 06.9	34 23 28.2	4.6570964
Soda			4.1653220
Baldy			4.2465954
Trout			4.3534978
Burns			4.6557042

SNOW, GRANT COUNTY.

Snow Mountain is in Grant County, very near the Harney County line. Station is on highest point of bald ridge and is well known locally as Snow Mountain, as there is generally a small bank of snow on the north side. It is at the source of Emigrant Creek, south fork of John Day River, or Silver Creek, and the waters of Crooked River. It is the highest point for a long distance south of the Strawberry Range. Can be easily ascended from almost any direction on horseback.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet in diameter at base and 9 feet high.

[Latitude 43° 58' 15.34". Longitude 119° 29' 51.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fields	204 51 37.89	25 01 34.28	4.6542932
Strawberry	238 25 45.71	58 58 21.19	4.8635558
Baldy	274 41 18.41	95 09 14.64	4.7328401
Trout	289 10 17.11	109 36 22.18	4.7276892
Burns	326 15 04.53	146 30 13.06	4.7246653

SODA, GRANT COUNTY.

(Not adjusted.)

A secondary station on a low ridge about 1½ miles south from Soda Springs, an old deserted ranch, 4 miles from Seneca, on the Canyon City and Snow road, on the east side of Silvies River and not more than 1 mile from it. There are a number of fir and pine trees on the east side of ridge, but nothing in the way in other directions. Can ride on it from any direction.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 6 feet in diameter at base and 7 feet high.

[Latitude 44° 05' 31.27". Longitude 118° 57' 14.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Silvies			4. 1653220
Fields	138 26 36.9	318 13 49.6	4. 5651789
Strawberry	217 35 05.0	37 44 58.4	4. 4904901
Baldy			4. 3176197
Trout			4. 5038298

STRAWBERRY, GRANT COUNTY.

The highest mountain in the southeastern portion of the county, 10 miles south of Prairie City, at the head of Strawberry Creek, easily ascended by a direct but steep trail on the north side. From Prairie City follow wagon road up Strawberry Creek to Street's ranch, thence follow wood road up the hollow $1\frac{1}{2}$ miles to a "burn" leading up to the main ridge, thence up the main ridge to the summit. Station is at the southern end of the summit, which is covered with shaly rock.

Station mark: Copper bolt cemented in solid rock, above which is a rock cairn 6 feet in diameter and 6 feet high.

[Latitude 44° 18' 44.72". Longitude 118° 43' 03.48".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Baldy	11 37 24.87	191 32 51.54	4. 6381680
Silvies	34 23 28.20	214 10 06.90	4. 6570964
Soda	37 44 58.40	217 35 05.00	4. 4904901
Snow	58 58 21.19	238 25 45.71	4. 8635558
Fields	94 06 15.10	273 43 31.37	4. 6369569
Ironside	279 12 09.23	99 36 26.77	4. 6714342
Castle Rock	306 55 21.49	127 17 39.55	4. 7283623
Malheur	328 09 30.46	148 22 02.92	4. 6595361
Long	146 28 49.47	326 15 00.78	4. 6737986
Dixie	193 19 13.09	13 22 59.47	4. 4907164
Greenhorn	195 20 07.05	15 26 37.25	4. 6658137
Elkhorn	222 25 36.41	42 52 37.29	4. 8764545
Black	237 44 10.12	58 14 08.19	4. 8254494

BALDY, HARNEY COUNTY.

On a high, bald ridge on the east side of Silvies Valley and about 9 miles east from Silvies post-office. The point is known locally as Baldy and is the highest point on divide between Silvies River and Malheur

River. It can be reached easily on horseback from any direction, the best route being probably from the north side.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude $43^{\circ} 55' 45.09''$. Longitude $118^{\circ} 49' 36.09''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Trout	15 04 02.42	195 02 13.11	4.1323179
Burns	32 03 03.28	211 50 21.29	4.6683085
Snow	95 09 14.64	274 41 18.41	4.7328401
Silvies			4.2465954
Fields	142 52 42.36	322 34 36.70	4.7576209
Soda			4.3176197
Strawberry	191 32 51.54	11 37 24.87	4.6381680
Castle Rock	258 28 31.63	78 55 17.68	4.7207802
Malheur	263 20 47.57	83 37 49.89	4.5193596
Crow	330 04 44.01	150 17 59.73	4.7145725

BURNS, HARNEY COUNTY.

On a rather flat ridge covered with sagebrush and scattering juniper trees, about 5 miles west from the town of Burns. Can ride or drive up wood road from Burns.

Station mark: Center of the trimmed juniper signal tree.

Reference mark: A bronze triangulation tablet cemented in solid rock; azimuth from station mark, $172^{\circ} 33'$; distance, 4.8 feet.

[Latitude $43^{\circ} 34' 24.07''$. Longitude $119^{\circ} 07' 57.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snow	146 30 13.06	326 15 04.53	4.7246653
Silvies			4.6557042
Baldy	211 50 21.29	32 03 03.28	4.6683085
Trout	218 33 32.65	38 44 24.84	4.5296086
Crow	275 55 04.13	96 20 56.42	4.7064442

CROW, HARNEY COUNTY.

On the highest point of the "Crow Camp" Mountains; a round, bald hill at the head of Crane Creek and near the head of Stinkingwater Creek. It is about $3\frac{1}{2}$ miles east from Joseph Rector's ranch, which is 28 or 30 miles east from Burns and 15 or 16 miles ESE. from Harney. It can be reached from any direction on horseback.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude 43° 31' 27.96". Longitude 118° 30' 24.91".]

To station—	Azimuth,	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burns	96 20 56.42	275 55 04.13	4. 7064442
Trout	137 30 38.28	317 15 34.51	4. 6366070
Baldy	150 17 59.73	330 04 44.01	4. 7145725
Malheur.....	188 22 46.97	8 26 29.57	4. 6924064
Castle Rock.....	205 04 00.57	25 17 24.36	4. 7858781
Westfall.....	223 03 02.02	43 25 18.23	4. 8003972
Hunter.....	252 20 17.40	72 45 41.32	4. 7157176

MALHEUR, HARNEY COUNTY.

On a high, bald mesa, except for a few small trees on south end, in northeast corner of Harney County, about 15 miles a little west of north from Drewsey, and about 17 miles a little north of west from Beulah. It is on the divide between the north fork and middle fork of Malheur River and near the head of the two west forks of Otis Creek. It is about 7 miles from Frederick's ranch on Otis Creek. The mesa is easy to ride on from any direction, though the country around is very rocky.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 11 feet high.

[Latitude 43° 57' 46.57". Longitude 118° 25' 02.97".]

To station—	Azimuth,	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow	8 26 59.57	188 22 46.97	4. 6924064
Trout	65 19 29.70	245 00 39.13	4. 6032876
Baldy	83 37 49.89	263 20 47.57	4 5193596
Strawberry	148 22 02.92	328 09 30.46	4. 6595361
Ironside.....	215 36 48.44	35 48 29.41	4. 5841093
Castle Rock.....	250 37 11.87	70 46 55.24	4. 2973222
Westfall.....	274 09 33.44	94 28 11.56	4. 5566126
Hunter.....	307 57 33.11	128 19 20.26	4 7296034

TROUT, HARNEY COUNTY.

On a high, bald mountain, with timber almost to the top, on the east side and near the head of Trout Creek. Road from Silvies Valley to the head of Trout Creek passes about 3 miles a little south of west from station to a ranch, thence up a dry creek bed to signal.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude $43^{\circ} 48' 40.75''$. Longitude $118^{\circ} 52' 13.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Burns	38 44 24.84	218 33 32.65	4.5296086
Snow	109 36 22.18	289 10 17.11	4.7276892
Silvies			4.3534978
Soda			4.5038298
Baldy	195 02 13.11	15 04 02.42	4.1323179
Malheur	245 00 39.13	65 19 29.70	4.6032876
Crow	317 15 34.51	137 30 38.28	4.6366070

CASTLE ROCK, MALHEUR COUNTY.

Station is on a very prominent and well-known mountain, about 10 miles north from Beulah post-office and about 4 miles northeast from Harkness's ranch, on the north fork of Malheur River, 8 miles above Beulah. Mountain is easily ascended on horseback to within about 200 feet of top; thence is a rather steep ascent on foot.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 9 feet high.

[Latitude $44^{\circ} 01' 18.92''$. Longitude $118^{\circ} 11' 03.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow	25 17 24.36	205 04 00.57	4.7858781
Malheur	70 46 55.24	250 37 11.87	4.2973222
Baldy	78 55 17.68	258 28 31.63	4.7207802
Strawberry	127 17 39.55	306 55 21.49	4.7283623
Ironside	188 34 43.63	8 36 40.14	4.3960190
Dry Creek	248 21 59.52	68 43 43.74	4.6512299
Westfall	298 15 06.99	118 24 02.47	4.2905738
Hunter	329 21 37.82	149 33 43.89	4.6635390

DRY CREEK, MALHEUR COUNTY.

Station is on highest point of high bald ridge on divide between Willow Creek and Clover Creek. It is at the head of east fork of Dry Creek, a tributary of Bully Creek, and about 15 miles north from Westfall. Juniper Mountain, a well-known point, is about 5 miles WNW. from station. Ridge can be easily ascended on horseback from almost any direction, though it is rather steep from the Willow Creek side.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude $44^{\circ} 10' 09.71''$. Longitude $117^{\circ} 39' 48.80''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hunter.....	18 16 27.97	198 06 55.00	4.7710334
Westfall.....	43 51 41.90	223 38 54.85	4.5503162
Castle Rock.....	68 43 43.74	248 21 59.95	4.6512299
Ironside.....	102 24 47.63	282 04 57.48	4.5886244
Weiser.....	259 42 07.91	80 14 00.95	4.7912617
Vale.....	300 40 45.38	120 59 58.66	4.6332245
Grass.....	353 35 54.59	173 39 24.59	4.7846403

GRASS, MALHEUR COUNTY.

On a high, bald ridge about midway between Malheur and Owyhee rivers. The Vale and Skull Spring road passes 3 or 4 miles west from station at a point a little more than halfway from Vale. There is a spring about 3 miles east from station, the only water found, the country being very dry. The spring is sometimes known as "Freezeout" Spring, and the ridge is sometimes spoken of as "Freezeout" Hills.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet in diameter at base and 10 feet high.

[Latitude $43^{\circ} 37' 28.60''$. Longitude $117^{\circ} 34' 45.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hunter.....	100 05 25.86	279 52 26.70	4.4097843
Westfall.....	138 06 12.34	317 49 59.51	4.6717166
Dry Creek.....	173 39 24.59	353 35 54.59	4.7846403
Vale.....	218 04 25.19	38 20 03.18	4.6900926
Mitchell.....	242 58 45.11	63 15 15.55	4.5562198
Owyhee.....	289 19 22.27	109 32 53.73	4.4472156

HUNTER, MALHEUR COUNTY.

On the highest of several bald buttes near the head of Hunters Creek. To reach it, go from William Jones's ranch on the Malheur River, 12 miles below Juntura, to ranch on Hunters Creek (good trail) known as the "horse pasture;" thence about 2 miles up creek to its head, and signal can be seen one-half mile farther up.

Station mark: A bronze triangulation tablet cemented in rock, over which a cairn 7 feet in diameter and 11 feet high was erected.

[Latitude $43^{\circ} 39' 52.90''$. Longitude $117^{\circ} 53' 34.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow.....	72 45 41.32	252 20 17.40	4.7157176
Malheur.....	128 19 20.26	307 57 33.11	4.7296034
Castle Rock.....	149 33 43.89	329 21 37.82	4.6635390
Westfall.....	168 31 11.86	348 28 00.07	4.4920334
Vale.....	238 14 42.47	58 43 22.42	4.8137318
Grass.....	279 52 26.70	100 05 25.86	4.4097843
Dry Creek.....	198 06 55.00	18 16 27.97	4.7710334

IRONSIDE, MALHEUR COUNTY.

On the highest point of Ironside Mountain, a well-known mountain on the divide between Willow Creek and the Malheur River. It is near the head of Bridge Creek, a tributary of the Malheur. It can be reached from the head of Willow Creek or Bridge Creek. It is possible to take animals up from Willow Creek, but better to walk. There is a road up Willow Creek and a trail up Bridge Creek.

Station mark: A bronze triangulation tablet cemented in solid rock under a cairn 7 feet in diameter and 10 feet high.

[Latitude $44^{\circ} 14' 36.27''$. Longitude $118^{\circ} 08' 15.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Rock.....	8 36 40.14	188 34 43.63	4.3960190
Malheur.....	35 48 29.41	215 36 48.44	4.5841093
Strawberry.....	99 36 26.77	279 12 09.23	4.6714342
Dry Creek.....	282 04 57.48	102 24 47.63	4.5886244
Westfall.....	338 18 42.94	158 25 43.07	4.5615800

MITCHELL, MALHEUR COUNTY.

On Mitchell Butte just north of Owyhee River.

Station mark: A large cairn.

[Latitude $43^{\circ} 46' 15.95''$; $43^{\circ} 46' 12.59''$.^a Longitude $117^{\circ} 10' 52.29''$; $117^{\circ} 10' 52.19''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Owyhee	12 41 11.19	192 38 14.06	4.4188203
Grass	63 15 15.55	242 58 45.11	4.5562198
Westfall	106 37 19.02	286 04 31.58	4.8201630
Vale	175 30 12.32	355 29 17.99	4.3481002
Weiser	202 04 21.40	22 16 00.86	4.7739090

^a Bull 122, p. 320. From Boise, Idaho, base and astronomic position.

OWYHEE, MALHEUR COUNTY.

On east side of the Owyhee River, on highest point of ridge known as the Owyhee Ridge. It is about 3 or 4 miles, air line, a little south of east from Hot Springs, at the mouth of Dry Creek. From Hot Springs go about $1\frac{1}{2}$ miles down the river; thence up trail to ridge; thence to highest point in sight. There is good traveling from Wilson's ranch at Mitchell up ridge on east side of river.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet in diameter at base and 10 feet high. There is another cairn on high point about 1 mile southeast from station.

[Latitude $43^{\circ} 32' 26.67''$. Longitude $117^{\circ} 15' 08.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Grass	109 32 53.73	289 19 22.27	4.4472156
Vale	184 44 56.03	4 46 59.23	4.6810602
Mitchell	192 38 14.06	12 41 11.19	4.4188208

VALE, MALHEUR COUNTY.

Station is on a rocky hill about 2 miles a little south of east from Vale, and is on the east side of Malheur River. The hill is the highest point near Vale, but low when compared with other mountains 10 to 20 miles distant, and rather steep, but can be ascended from almost any direction on horseback.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 8 feet in diameter at base and 10 feet high.

[Latitude $43^{\circ} 58' 15.92''$. Longitude $117^{\circ} 12' 10.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mitchell	355 29 17.99	175 30 12.32	4.3481002
Owyhee	4 46 59.23	184 44 56.03	4.6810602
Grass	38 20 03.18	218 04 25.19	4.6905926
Hunter	58 43 22.42	238 14 42.43	4.8137318
Westfall	86 54 18.18	266 22 21.58	4.7901006
Dry Creek	120 59 58.66	300 40 45.38	4.6332245
Weiser	216 13 44.33	36 26 19.67	4.6098122

WESTFALL, MALHEUR COUNTY.

Station is on highest of three prominent buttes known as "the Westfall Buttes." Point used is the most western of the three buttes, and is 10 or 12 miles from the town of Westfall and about the same distance from Beulah post-office. It is on the main divide between Bully Creek and Malheur River and at the head of Cottonwood Creek; also near the head of Warm Creek. It can be easily reached on horse-back from any direction.

Station mark: A bronze triangulation tablet cemented in rock under center of a cairn 8 feet in diameter at base and 10 feet high.

[Latitude $43^{\circ} 56' 18.76''$. Longitude $117^{\circ} 58' 11.95''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow	43 25 18.23	223 03 02.02	4.8003972
Malheur	94 28 11.56	274 09 33.44	4.5566126
Castle Rock	118 24 02.47	298 15 06.99	4.2905738
Ironside	158 25 43.07	338 18 42.94	4.5615800
Dry Creek	223 38 54.85	43 51 41.90	4.5503162
Vale	266 22 21.58	86 54 18.18	4.7901006
Mitchell	286 04 31.58	106 37 19.02	4.8201630
Grass	317 49 59.51	138 06 12.34	4.6717166
Hunter	348 28 00.07	168 31 11.86	4.4920698

IDAHO.

TRIANGULATION STATION.

Washington County.

WEISER, WASHINGTON COUNTY.

(Not occupied.)

On Sage Brush Hill, 6 miles northeast of the city of Weiser.

[Latitude $44^{\circ} 15' 58.73''$. Longitude $116^{\circ} 54' 05.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mitchell.....	22 16 00.86	202 04 21.40	4. 7739090
Vale	36 26 19.67	216 13 44.33	4. 6098122
Dry Creek	80 14 00.95	259 42 07.91	4. 7912617

TEXAS.

TRIANGULATION STATIONS.

Brewster and Presidio counties; Chisos, San Jacinto, Santiago, and Terlingua quadrangles.

Mr. Arthur Stiles, topographer, controlled portions of four 30-minute quadrangles in western Texas in July, August, and September, 1902, and in June, 1903.

This work is based upon stations Chisos and Santiago, previously developed from the Sierra Blanca base and astronomic station. Eight stations were occupied and numerous points located by intersections.

BIG CHRISTMAS, BREWSTER COUNTY.

(Not occupied.)

The highest peak in the Christmas Mountains, about 20 miles northeast of Terlingua.

Station mark: A large pile of loose stones and brush on the highest part of the peak.

[Latitude $29^{\circ} 25' 38.73''$. Longitude $103^{\circ} 26' 33.31''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sue Peak			4. 6518188
Chisos.....			4. 3786355

BOQUILLAS, BREWSTER COUNTY.

(Not occupied.)

A windmill belonging to Mr. M. A. Ernst, about 500 feet west of the post-office, on the north side of the Neville Springs road.

Station mark: Center of tower.

[Latitude $29^{\circ} 14' 56.80''$. Longitude $103^{\circ} 01' 53.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sue Peak	4. 2920238
Chisos.....	4. 4256435

CANYON FLAG, BREWSTER COUNTY.

About 8 miles south of Terlingua post-office, and 7 miles east of the United States custom-house at Lajitas. On the highest point of the Mesa de Anguila, overlooking the Grand Canyon of the Rio Grande. A trail from Lajitas leads up a big arroya to the Tinaja Lujan, which is about 1 mile north of the station. From this tinaja pack animals can be taken to station. Nearest semipermanent water is in Tinaja Lujan. There is a large ironwood bush on the mesa about 500 feet south of the station.

Station mark: A bronze triangulation tablet cemented in the solid rock, over which is a small conical pile of stones.

[Latitude $29^{\circ} 12' 37.50''$. Longitude $103^{\circ} 41' 19.25''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fresno	4. 4469426
Three caves.....	4. 0768005
Hen Egg	4. 4859880
Chisos.....	4. 5733764

CHISOS, BREWSTER COUNTY.

The highest peak in the Chisos Mountains, about 90 miles south of Marathon and 30 miles east of Terlingua. It is most easily reached from the west side of the range by following a log road and trail leading up Blue Creek into the "basin," thence north and west over a very dim trail that leads up the long sloping ridge which runs out to the northeast from the peak. Nearest water is in the "basin," about 1,000 feet below the station on the southeast side. Pack animals can be taken to within 100 feet of station.

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

Reference mark: A cross mark and the letters U. S. cut deep in the rock. True azimuth, $145^{\circ} 30'$; distance, 8.6 feet from station mark to center of cross.

[Latitude $29^{\circ} 14' 43.36''$. Longitude $103^{\circ} 18' 20.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon flag.....	4. 5733764
Fresno	4. 7438314
Hen Egg	4. 5744834
San Jacinto	4. 9268718
Santiago.....	4. 8207929
Sue Peak	4. 5687809

CROTON PEAK, BREWSTER COUNTY.

(Not occupied.)

About 25 miles northwest of Boquillas post-office, north of the Terlingua and Boquillas wagon road, and about 3 miles west of Paint Gap.

Station mark: A bronze triangulation tablet cemented in the top of the highest boulder on the mountain.

[Latitude $29^{\circ} 22' 18.24''$. Longitude $103^{\circ} 20' 54.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sue Peak	4. 5577963
Chisos.....	4. 1646320

HEN EGG MOUNTAIN, BREWSTER COUNTY.

About 75 miles south of Alpine, 20 miles northeast of Terlingua, and about 4 miles west of Adobe Walls. Nearest permanent water is in Terlingua Creek, 3 miles west. The mountain is a high, bare, lone peak. There are no trails, and pack animals can not be taken up at any point. A dim wagon road leads up the first big arroya on the east side, and about 2 miles distant from the peak. This mountain is sometimes called the "G 4 Mountain."

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

[Latitude $29^{\circ} 28' 23.72''$. Longitude $103^{\circ} 35' 29.87''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Canyon flag.....			4. 4859880
Three caves.....			4. 3295298
Fresno.....			4. 3878944
San Jacinto.....			4. 6717707
Santiago.....			4. 6384671
Chisos.....			4. 5733764

MAIL BOX TANK, BREWSTER COUNTY.

(Not occupied.)

About 20 miles north of Boquillas post-office and on the east side of the Marathon and Boquillas road.

Station mark: Center of water tank.

This is a mud tank made by damming up a small draw. The lake formed above this dam is usually of a uniform shape and size, and it is the center of the lake that was sighted. Lake is about 100 by 150 feet.

[Latitude $29^{\circ} 28' 49.03''$. Longitude $103^{\circ} 08' 02.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sue Peak.....			4. 2128530
Chisos.....			4. 4901508

MARISCAL MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 18 miles south of Boquillas post-office, and in the extreme south point of the "big bend" of the Rio Grande. The river cuts through the mountain. Station is on highest part of the ridge.

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

[Latitude $29^{\circ} 00' 54.71''$. Longitude $103^{\circ} 08' 51.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chisos.....			4. 4740387
Sue Peak.....			4. 6787910

MAVERICK MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 12 miles east of Terlingua post-office and about 1 mile southwest of Maverick Spring. Highest point of mountain, Terlingua and Boquillas road passes near on north side. A trail leads up from the Study mines on the west side.

Station mark: Center of a cairn 6 feet high.

[Latitude $29^{\circ} 19' 03.75''$. Longitude $103^{\circ} 30' 44.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Three caves.....	4. 2991046
Hen Egg	4. 2759721

NORTH CHRISTMAS, BREWSTER COUNTY.

(Not occupied.)

A big, high peak in the north edge of the Christmas Mountains.

Station mark: A bronze triangulation tablet cemented in the highest point of the peak.

[Latitude $29^{\circ} 27' 12.51''$. Longitude $103^{\circ} 37' 35.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sue Peak	4. 6689303
Chisos	4. 4392551

ROSILLOS MOUNTAINS, BREWSTER COUNTY.

(Not occupied.)

About 70 miles south of Marathon and 20 miles north of Boquillas post-office. About 4 miles west of the Marathon and Boquillas road, on highest peak in the range.

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

[Latitude $29^{\circ} 31' 50.17''$. Longitude $103^{\circ} 14' 33.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chisos.....	4. 5078397
Sue Peak	4. 4507407

SANTIAGO, BREWSTER COUNTY.

On highest point of Santiago Mountain, about 18 miles a little north of east from Collins's ranch.

Station mark: A cross mark on a small stone post set in the earth under center of a cairn 10 feet high.

Reference marks: A bronze triangulation tablet cemented in the solid rock under the cairn and bearing from station mark N. 30° W.; distance, 1.6 feet. A cross mark and the letters U. S. cut deep in the rock and bearing from station mark S. $22^{\circ} 59'$ W.; distance, 15.3 feet.

[Latitude $29^{\circ} 50' 04.66''$. Longitude $103^{\circ} 24' 59.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hen Egg			4. 6384671
Fresno			4. 7847269
San Jacinto	80 20 25.89	260 04 22.01	4. 7232080
Sue Peak			4. 7952361
Chisos			4. 8207929

SAWMILL MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 12 miles northeast of Terlingua post-office and 2 miles southwest of Doc Gourley's ranch. The Terlingua and Alpine road leads around the mountain on the east side. There is no trail to the summit, but the mountain is easily climbed from the northwest side.

Station mark: Center of a cairn 6 feet high.

Reference mark: A bronze triangulation tablet cemented in solid rock. True azimuth, $58^{\circ} 30'$; distance, 18 feet.

[Latitude $29^{\circ} 22' 00.05''$. Longitude $103^{\circ} 37' 19.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hen Egg			4. 0854364
Three caves			4. 0367221

SIERRA CASTELLAN, BREWSTER COUNTY.

(Not occupied.)

A high red peak overlooking the valley of the Rio Grande, about 20 miles southeast of Terlingua, and about 7 miles east of the mouth

of the Grand Canyon of the Rio Grande. A plain wagon road from Terlingua de Abaja leads around the north side of the peak. Peak can be climbed from the east side only.

Station mark: Center of a cairn 7 feet high.

[Latitude $29^{\circ} 08' 37.89''$. Longitude $103^{\circ} 29' 51.89''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hen Egg			4. 5755520
Canyon flag.....			4. 3006878
Fresno			4. 6583082

STUARTS PEAK, BREWSTER COUNTY.

(Not occupied.)

A sharp peak on the highest part of long ridge, about 20 miles north of Boquillas post-office and about 8 miles due east of the "Mail Box tank."

Station mark: A cairn about 6 feet high.

[Latitude $29^{\circ} 29' 39.19''$. Longitude $103^{\circ} 01' 12.63''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sue Peak			3. 5579811
Chisos.....			4. 5921700

SUE PEAK, BREWSTER COUNTY.

About 75 miles south of Marathon and 15 miles northeast of Boquillas post-office. About 10 miles from the Marathon and Boquillas wagon road, southeast from the "Mail Box tank." A very dim wagon road leads from the tank eastward to within about 3 miles of the peaks. The station is on the easternmost and highest of the two peaks. Nearest permanent water is in the Mail Box water tank.

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

Reference mark: A cross mark and the letters U. S. cut deep in the rock. Azimuth from station mark is $103^{\circ} 42'$; distance, 15.6 feet to center of cross.

[Latitude $29^{\circ} 25' 12.29''$. Longitude $102^{\circ} 58' 49.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Chisos.....	4. 5687809
Hen Egg.....	4. 7752113
Santiago.....	4. 7952361

THREE CAVES, BREWSTER COUNTY.

One mile west of Terlingua post-office, on the highest part of limestone ridge, immediately above the three caves. A good trail leads from the post-office to the station, and saddle animals can be taken to station.

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

[Latitude $29^{\circ} 18' 54.42''$. Longitude $103^{\circ} 43' 02.41''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fresno.....	4. 2304563
Hen Egg.....	4. 3295288

WEST CORAZONES, BREWSTER COUNTY.

(Not occupied.)

The highest and sharpest of the Corazones peaks, about 25 miles northeast of Terlingua post-office.

Station mark: A bronze triangulation tablet cemented in the rock on the highest part of the peak.

[Latitude $29^{\circ} 29' 28.09''$. Longitude $103^{\circ} 25' 44.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sue Peak.....	4. 6457200
Chisos.....	4. 4735843

WILLOW MOUNTAIN, BREWSTER COUNTY.

(Not occupied.)

About 15 miles east of Terlingua post-office, just above Willow Spring and George Cartwright's ranch.

Station mark: Center of highest boulder on mountain.

[Latitude 29° 21' 52.02". Longitude 103° 30' 58.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hen Egg			4. 1494596
Three caves			4. 3071437
Fresno			4. 5045176

BASSETT BUTTE, PRESIDIO COUNTY.

(Not occupied.)

A lone, smooth knob about 10 miles east of Pulvo, 7 miles west of George Howard's ranch, and $3\frac{1}{2}$ miles southwest of Sancita Spring. An old trail leads from Sancita Spring around the east foot of the knob. Peak commands good view of country around.

Station mark: Small pile of stones on highest part of peak.

[Latitude 29° 26' 56.05". Longitude 104° 01' 02.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fresno			4. 2455097
San Jacinto			4. 5351691
Hen Egg			4. 6167310

FRESNO, PRESIDIO COUNTY.

About 70 miles south of Marfa, about 20 miles northeast of Terlingua, about $1\frac{1}{2}$ miles east of the main Marfa and Terlingua road, and about 1,500 feet above it. It overlooks the canyon of Fresno Creek. It is the highest peak on the western rim of a region known as the "Solitario." Most easily reached from McGuirk's tanks in the "Solitario," from which a trail leads to the east bottom of the peak. Pack animals can be led up to the station from the east side only. Nearest permanent water is in the tanks, or at Rawl's ranch. A dim wagon road leads from the tanks to the ranch.

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

[Latitude $29^{\circ} 25' 35.41''$. Longitude $103^{\circ} 50' 15.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
San Jacinto			4. 5797046
Santiago			4. 7847269
Hen Egg			4. 3878944
Chisos			4. 7438314
Three caves			4. 2304563
Canyon flag			4. 4469426

UTAH.

SECONDARY TRIANGULATION STATIONS.

Salt Lake, Summit, and Wasatch counties; Cottonwood special quadrangle.

Secondary triangulation for the control of the Cottonwood special quadrangle was extended from stations Bald, Clayton, and Saddle in June, 1903, by Mr. R. H. Sargent, topographer. Eight stations were occupied and numerous points were cut in. Positions are given on the United States standard datum.

BRIGHTON, SALT LAKE COUNTY.

A secondary station on limestone bluff on divide 1,500 feet north of Brighton and Alta trail.

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

[Latitude $40^{\circ} 35' 55.43''$. Longitude $111^{\circ} 36' 34.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugarloaf	18 55 10	198 54 36	3. 58188
Silver	193 00 16	13 00 54	3. 78710
Clayton	281 27 09	101 29 07	3. 63744

SUGARLOAF, SALT LAKE COUNTY.

A secondary station on first point east of trail from Alta to American Fork.

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

Reference mark: A rock monument 5 feet high and 4 feet in diameter at base; distance from station mark, 8.33 feet; true azimuth, $66^{\circ} 40'$.

[Latitude 40° 33' 58.33". Longitude 111° 37' 26.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Silver	195 15 59	15 17 12	3.99698
Brighton	198 54 36	18 55 10	3.58188
Clayton	243 22 57	63 25 29	3.78830
Bonanza	267 35 54	87 41 40	4.09696

ANCHOR, SUMMIT COUNTY.

A secondary station on ridge just west of Anchor mine and about three-fourths mile northwest of Chapman's Sawtooth triangulation station.

Station mark: A bronze triangulation tablet cemented in a rock 12 by 10 by 8 inches, set in ground.

[Latitude 40° 36' 44.48". Longitude 111° 31' 38.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clayton	48 39 50	228 38 35	3.55585
Saddle	232 28 35	52 30 47	3.77897
Bald	274 57 38	94 59 29	3.60493
Bonanza	317 01 05	137 03 04	3.79949

BALD, SUMMIT COUNTY.

A secondary station on a high rocky summit about one-half mile south of the Ontario mine.

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

[Latitude 40° 36' 33.16". Longitude 111° 28' 48.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clayton	73 13 37	253 10 31	3.84581
Anchor	94 59 29	274 57 38	3.60493
Wanship	180 03 00	00 03 01	4.43717
Saddle	190 43 02	10 43 23	3.61070
Highway			3.50672
Silver	116 40 04	296 35 39	4.03002
Bonanza	356 12 20	176 12 28	3.63062

SADDLE, SUMMIT COUNTY.

A secondary station on a high, bare hill 1 mile due east of Park City and one-eighth mile north of Heber and Park City wagon road where it crosses divide.

Station mark: A bronze triangulation tablet cemented in shattered rock in place.

[Latitude $40^{\circ} 38' 43.14''$. Longitude $111^{\circ} 28' 15.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bald	10 43 23	190 43 02	3. 61070
Treasury Hill	69 04 11	249 02 43	3. 53084
Bluff	72 30 55	252 29 07	3. 61255

SAWTOOTH, SUMMIT COUNTY.

A secondary station on a rocky hill one-fourth mile south of the Daly West mine and one-fourth mile west of road crossing divide.

Station mark: A bronze tablet set in concrete, about 6 inches below surface of ground.

[Latitude $40^{\circ} 36' 31.98''$. Longitude $111^{\circ} 31' 01.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clayton	3. 61210
Wanship	4. 44060

SILVER, ON LINE BETWEEN SUMMIT AND SALT LAKE COUNTIES.

A secondary station, located on the divide between the Big Cottonwood Creek and Iron Hollow drainages, $2\frac{1}{2}$ miles north of the stage road from Park City to Silverlake.

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

[Latitude 40° 39' 08.88". Longitude 111° 35' 35.64%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brighton	13 00 54	193 00 16	3. 78710
Sugarloaf	15 17 12	195 15 59	3. 99698
Saddle			4. 01562
Clayton	337 10 45	157 12 05	3. 86981
Bald	295 35 39	116 40 04	4. 03002

BONANZA, WASATCH COUNTY.

On the north end of the last knob of the spur running south from Bald Mount, 2 miles southeast of Bonanza Flat.

Station mark: A bronze triangulation tablet cemented in solid rock on north end of hill.

[Latitude 40° 34' 14.97". Longitude 111° 28' 35.98%.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clayton	107 45 07	287 41 54	3. 86602
Anchor	137 03 04	317 01 05	3. 79949
Bald	176 12 28	356 12 20	3. 63062
Sugarloaf	87 41 40	267 35 54	4. 09696

WASHINGTON.

TRIANGULATION STATIONS.

Adams, Douglas, Franklin, Kittitas, Okanogan, and Yakima counties.

During the field season of 1903 Mr. R. B. Robertson extended triangulation from stations Moses, Salt Lake, and Kellar, previously located from the Spokane base and astronomic station, southward and westward, connecting with stations Cooper, Chelan, Atanum, and Wenas, established from the Ellensburg base and astronomic station; the net results of this work being the locating and monumenting of sixty-two stations for the control of an area of 6,500 square miles in the central portion of the State. Positions are given on Spokane datum.

CRAB, ADAMS COUNTY.

The highest point of the Saddle Mountain range east of the Ephrata and White Bluff road. Station is about 8 miles south of Sam Hutchinson's ranch on Crab Creek. Take road from Sam Hutchinson's

place to White Bluff, follow this road until summit of Saddle Mountain is reached, then go east along summit to highest point, which is about 10 miles north of White Bluff ferry. Water can be found in Crab Creek, 4 miles north.

Signal: A lumber tripod 10 feet high.

Station mark: A bronze triangulation tablet cemented in a stone placed in ground, level with surface.

[Latitude $46^{\circ} 46' 27.99''$. Longitude $119^{\circ} 19' 18.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle (2).....	99 17 12.86	279 01 52.50	4.4333970
Frenchman.....	132 33 44.15	312 20 36.00	4.4913920
McManamon.....	173 35 13.29	353 33 57.80	4.2920014
Jackson.....	218 11 56.36	38 20 59.03	4.4053183

SADDLE, ADAMS COUNTY.

Station is on the highest point of Saddle Mountain and is about 4 miles southwest of Ben Hutchinson's ranch on Crab Creek. Trails from Hutchinson's ranch to top of mountain. The nearest water is Crab Creek. Grass and hay at Ben Hutchinson's place.

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

[Latitude $46^{\circ} 48' 22.45''$. Longitude $119^{\circ} 33' 33.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coal.....	48 46 15	228 31 59	4.52292
Saddle (2).....	95 13 15	275 08 14	3.93823
Frenchman.....	164 43 06	344 40 24	4.25600
McManamon.....	224 54 23	45 03 32	4.35260
Crab.....	280 56 24	101 06 47	4.26676
Kuntz.....	306 22 22	126 37 38	4.52155
Gable.....	342 45 28	162 49 32	4.38094

BADGER, DOUGLAS COUNTY.

On the summit of the highest part of the Badger Mountain that is bare of timber. The highest part lies some miles northwest and has some timber on the top. Badger Mountain forms a divide between Douglas Creek on the north and Rock Island Creek and Moses Coulee on the south. Station is about 6 miles a little north of west from Smith's ranch, where Douglas Creek joins Moses Coulee. Take wagon

road up Douglas Creek about 1 mile, then trail to left, and keep going up until station is reached. This station can probably be reached from any side.

Signal: A small pine tree set in ground and braced with four poles.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground, with top a few inches above surface.

[Latitude 47° 28' 24.48". Longitude 119° 58' 51.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chelan	173 44 09.91	353 41 45.54	4.5713228
Guske	233 22 53.35	53 34 21.36	4.3850879
Three Springs	274 20 42.34	94 39 29.94	4.5071933
Baird	321 35 25.76	141 43 19.37	4.3374576
Hill	358 21 55.52	178 22 27.88	4.5115055

BAIRD, DOUGLAS COUNTY.

On the summit of the highest peak of range of mountains lying north of Quincy and Winchester, and about 6 miles north-northeast of the former and the same distance northwest of the latter. There is a road from Quincy to Baird Springs, which crosses the mountains to the west of station, and not over 2 miles from it. There is a road from Winchester to a spring well, in a ravine, about 1 mile southwest of station. From this well a wagon can be taken to summit of peak by following spur on east side of ravine. Station is easily reached from any side.

Station mark: A bronze triangulation tablet set in a stone and placed in ground, level with surface, under center of a cairn 7 feet high.

[Latitude 47° 19' 12.13". Longitude 119° 48' 08.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Columbia	12 38 06.10	192 33 22.53	4.5724445
Hill	39 21 44.55	219 14 24.38	4.2988781
Badger	141 43 19.36	321 35 25.76	4.3374576
Guske	190 51 09.80	10 54 42.86	4.5062376
Three Springs	231 54 24.77	52 05 17.45	4.3730495
Two Springs	279 33 25.97	99 40 05.38	4.0635487
Blythe	292 12 12.60	112 23 46.96	4.3317557
Frenchman	340 54 07.46	161 02 04.21	4.6235149
McMain	0 52 22.23	180 52 12.45	4.2653792

BLACK BUTTE, DOUGLAS COUNTY.

(Not occupied.)

A prominent butte about 5 miles west of Leahy post-office. Always looks blacker than the rest of the country.

Station mark: The sharp summit of the butte.

[Latitude $47^{\circ} 55' 00.6''$ Longitude $119^{\circ} 31' 20.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dewey	45 08 12.8	224 56 20	4. 45125
Chelan	72 29 42.0	252 06 52	4. 60556

BLUFF, DOUGLAS COUNTY.

About 6 miles southeast of Ephrata and 2 miles about northeast of Blythe's upper ranch on Crab Creek. The country is very flat around station and there is very little difference in elevations. The best road to take is from T. S. Blythe's ranch on Crab Creek, 8 miles from Ephrata. Take road from ranch across Crab Creek; after road crosses creek it goes up the bluff to a rocky flat. Just on top of bluff leave road and go east-northeast a short distance, when a black rocky bluff will appear in view. This bluff is steep in the middle and slopes off gradually at north and south ends. Climb bluff at north end and go east about 400 yards to a slight but decided rise on the flat, where the ground is sandy and nearly free from rock. Station is on this rise.

Signal: A lumber tripod 8 feet high, with flag pole.

Station mark: A stone marked with a shallow drill hole with a triangle around it and a poorly carved U. S.—thus: U Δ S.

[Latitude $47^{\circ} 16' 28.6''$ Longitude $119^{\circ} 25' 10.7''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blythe	71 14 52	251 09 35	3. 98273
Three Springs.....	152 18 23	332 12 22	4. 34494

BLYTHE, DOUGLAS COUNTY.

About 5 miles south of Ephrata and on the highest point in the vicinity, take road from Ephrata to Blythe's ranch, on Crab Creek, and follow it one-half mile, then take right-hand road on top of hill overlooking town; follow this right-hand road about $2\frac{1}{2}$ miles, then go across country 2 miles to a gradually sloping low, round hill, on which station is located.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground with top 6 inches above surface.

[Latitude 47° 14' 48.37". Longitude 119° 32' 23.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Frenchman	11 09 38.62	191 06 02.73	4.5077012
Columbia	44 53 19.08	224 37 03.15	4.6007210
Hill	77 34 28.41	257 15 34.91	4.5224508
Baird	112 23 46.93	292 12 12.60	4.3317557
Two Springs	126 23 14.56	306 18 19.50	4.0204556
Three Springs	176 55 26.91	356 54 44.15	4.3562817
Severson	226 08 06.12	46 23 19.04	4.5568617
Lewis	292 50 15.48	112 58 11.70	4.1708355

COLUMBIA, DOUGLAS COUNTY.

On the highest point on the west end of Frenchman Mountain, where it breaks off to the Columbia River. It is about 18 miles from Quincy and is nearly due south of that place; there is a road to base of hill on which station is located, and there will be a road crossing the hill soon. This will be the road from Quincy to Cregg's ferry, at the mouth of Crab Creek, and it will cross Frenchman Mountain about one-half mile east of station. Water is in Columbia River 3 miles west, and there is said to be water in breaks northwest of station.

Signal: A lumber tripod 14 feet high.

Station mark: A bronze triangulation tablet buried 2 feet underground, over which is placed a stone, resting on tablet, with the top level with surface of ground; this stone, a very hard one, marked with a $\frac{1}{4}$ -inch drill hole, one-half inch deep, centered over tablet, which is centered under signal.

[Latitude 46° 59' 31.35". Longitude 119° 54' 35.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Johnson	55 09 26.83	234 57 20.01	4.4096007
Hill	167 59 57.52	347 57 21.76	4.3331720
Baird	192 33 22.53	12 38 06.10	4.5724445
McMann	203 33 12.69	23 37 46.14	4.2941981
Blythe	224 37 03.15	44 53 19.08	4.6007210
Frenchman	278 21 53.23	98 34 31.47	4.3456293
Saddle (2)	317 36 34.61	137 36 34.61	4.4292627
Sentinel	349 35 54.22	169 37 56.52	4.2936977

COULEE, DOUGLAS COUNTY.

On a round hill on top of the east bluff of Moses Coulee, about 9 miles northwest of Quincy and 3 miles northwest of Willow Springs. Take road from Quincy to Moses Coulee by Willow Springs; 2 miles northwest of Springs take right-hand road about 1 mile to top of ridge. Station is 0.25 mile west of here and is in sight from road.

Station mark: A bronze triangulation tablet in solid rock 8 inches underground, over which is placed a stone marked U. S., with a drill hole one-half inch deep under center of a cairn 7 feet high.

[Latitude $47^{\circ} 19' 30.31''$. Longitude $119^{\circ} 59' 54.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger	184 33 51	4 34 37	4. 21880
Baird	272 05 41	92 14 20	4. 17153
Hill	351 58 22	171 59 41	4. 20733

COULEE CITY, DOUGLAS COUNTY.

(Not occupied.)

Two-story yellow schoolhouse.

Station mark: Center of cupola.

[Latitude $47^{\circ} 19' 30.30''$. Longitude $119^{\circ} 59' 54.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger	184 33 51	4 34 37	4. 21880
Baird	272 05 41	92 14 20	4. 17153

DEWEY, DOUGLAS COUNTY.

On a little sharp peak about 3 miles northeast of Dewey schoolhouse and 2 miles east of Carl Schmidt's farm. Station is about 10 miles southwest of Buckingham post-office. Take road from Schmidt's northeast about a mile, to top of hill, then go east along ridge to station. This is the Buckingham and Waterville road and it passes about 1 mile west of station.

Station mark: A bronze triangulation tablet cemented in a stone, which was placed in ground level with surface under center of a cairn 7 feet high.

[Latitude 47° 44' 13.84". Longitude 119° 47' 21.73".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chelan	112 49 00.15	292 38 04.30	4.3008639
Cooper	144 00 48.68	323 47 37.27	4.5756229
Dyer	182 23 34.86	2 24 16.13	4.4415349
Ragged	225 55 34.82	46 13 25.91	4.6198824
St. Andrews	268 25 52.73	88 37 07.45	4.2787582
Guske	341 12 03.86	161 15 03.04	4.1961927

DYER, DOUGLAS COUNTY.

On the highest point of a rocky butte lying one-half mile north-northwest from Dyer post-office. Land belongs to Mrs. Priest, Dyer postmaster.

Station mark: A bronze triangulation tablet cemented in solid rock under center of a cairn 7 feet high.

[Latitude 47° 59' 07.97". Longitude 119° 46' 26.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dewey	2 24 16.13	182 23 34.86	4.4415349
Chelan	44 36 12.71	224 24 34.33	4.4454873
Cooper	96 58 04.26	276 44 09.94	4.3699991
Salt Lake	210 41 56.32	30 51 27.60	4.4917360
Ragged	267 16 48.54	87 34 00.36	4.4596984
St. Andrew	326 39 05.15	146 49 39.93	4.5110898

FLYNN, DOUGLAS COUNTY.

In a plowed field controlled by Andy Flynn, about 1 mile east and 4 miles north of Hartline. From Hartline take lane north one-half mile, east 1 mile, north about 3 or 3½ miles until top of hill is reached; from here station is 75 yards east.

Signal: A lumber tripod 14 feet high over station mark.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground, level with surface.

Reference mark: A bronze triangulation tablet cemented in rock and placed in ground, under east fence of lane, 298.5 feet from station mark, on line to Pilot Rock. Station mark and reference mark are alike. The latter is below top of hill and view to east is cut off.

[Latitude 47° 45' 07.15". Longitude 119° 05' 02.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Severson	15 01 03.78	194 56 08.15	4. 5098451
McDonald	57 00 25.27	236 44 02.78	4. 5199072
Pilot	70 05 34.67	249 54 34.04	4. 2967367
Stevenson	171 56 27.46	351 53 57.42	4. 4755802

FRENCHMAN, DOUGLAS COUNTY.

Frenchman Mountain is a long ridge running east and west from Crab Creek at McManamon's ranch to the Columbia River, forming a divide between Crab Creek and the flats and sand hills lying south of Quincy and Ephrata. There are several points along this ridge which are higher than the rest of it, on three of which are triangulation stations, viz: McManamon, at extreme east end; Columbia, near the west end; and Frenchman, about halfway between the two. There is a wagon road from McManamon's to the Columbia River, which leaves station about 1 mile to the west or north according to where the road is left. It is best to leave the road where it starts down on south edge of ridge. From this place station is on highest point a mile east. There is a road part of the way from Winchester, but the rest of the way is in sand hills, which make slow traveling, although there is nothing to stop a vehicle anywhere; nearest water, Crab Creek.

Signal: A tripod 14 feet high with targets.

Station mark: A bronze triangulation tablet centered under signal, cemented in stone.

[Latitude 46° 57' 45.64". Longitude 119° 37' 18.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle (2)	13 07 43.69	193 05 30.31	4. 2317882
Sentinel	48 57 26.19	228 46 51.30	4. 3881650
Columbia	98 34 31.47	278 21 53.23	4. 3456293
Hill	132 49 17.03	312 34 01.90	4. 5548277
McMain	146 44 50.81	326 36 44.96	4. 4065124
Baird	161 02 04.21	340 54 07.46	4. 6235149
Blythe	191 06 02.73	11 09 38.62	4. 5077012
Lewis	217 32 14.88	37 43 45.81	4. 5131908
McManamon	273 56 46.92	94 08 40.62	4. 3159944
Crab	312 20 36.00	132 33 44.15	4. 4913920

GREEN, DOUGLAS COUNTY.

Station is about 10 miles southwest of Ephrata, on one of the highest points, where country breaks toward Moses Lake. It is a small hill composed of very fine black gravel and is difficult to describe. It will best be found by taking a course from other stations.

Signal: A lumber tripod 12 feet high.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground, level with surface, under center of signal.

[Latitude $47^{\circ} 11' 09.87''$. Longitude $119^{\circ} 29' 29.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Frenchman	21 46 16	201 40 32	4.42705
Lewis	264 20 56	84 26 01	4.00163
McManamon	337 47 08	157 53 19	4.45321

GUSKE, DOUGLAS COUNTY.

On nearly the highest point of a ridge running above the north or west side of Moses Coulee. It is the highest point in the vicinity. Station is about 25 miles from Coulee City on the Waterville road and 5 miles east of Farmer post-office on the same road, and one-half mile south of where the road crosses the ridge. Land is owned or leased by August Guske, who lives 300 yards west of station.

Signal: A lumber tripod 14 feet high, with two black and white targets in top, centered over mark.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground, level with surface.

[Latitude $47^{\circ} 36' 12.21''$. Longitude $119^{\circ} 43' 19.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Baird	10 54 42.86	190 51 09.80	4.5062376
Badger	53 34 21.36	233 22 53.35	4.3850879
Chelan	133 58 28.50	313 44 34.10	4.5134122
Dewey	161 15 03.04	341 12 03.86	4.1961927
St. Andrew	222 11 42.06	42 19 56.88	4.3172329
McDonald	274 20 41.93	94 32 36.88	4.3072474
Three Springs	323 33 12.08	143 40 32.95	4.3238180

HILL, DOUGLAS COUNT

Station is said to be in southeast quarter of sec. 32, T. 19, R. 23, homesteaded by John Hill, and lying 3 miles south and 4 miles west of Quincy. It is about the highest point of ridge and is 8 feet south of fence dividing lands of John Hill and Mr. Coburn. The ground in Coburn's plowed field may be a little higher.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A granite boulder marked U. Δ S., with a drill hole one-half inch deep marking center, placed in ground, level with surface. Signal centered over mark.

[Latitude $47^{\circ} 10' 53.45''$. Longitude $119^{\circ} 58' 07.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger	178 22 27.88	358 21 55.52	4.5115055
Baird	219 14 24.38	39 21 44.56	4.2988781
Blythe	257 15 34.91	77 34 28.41	4.5224508
Frenchman	312 34 01.90	132 49 17.03	4.5548277
Columbia	347 57 21.76	167 59 57.52	4.3331720

HILL HOUSE, DOUGLAS COUNTY.

(Not occupied.)

A small unpainted house on top of hill about 4 miles northeast of Adrian and $1\frac{1}{2}$ miles east of where the Coulee City "cut-off" railroad joins the Great Northern main line. This is on the west or lower end of ridge which runs from near Adrian to Wilson Creek. Lamp triangulation station is on the east end of this ridge.

Station mark: Center of house.

[Latitude $42^{\circ} 24' 26.20''$. Longitude $119^{\circ} 20' 33.02''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bluff	21 35 54	201 32 30	4.20027
Three Springs	106 47 18	286 37 52	4.22582

JACKSON, DOUGLAS COUNTY.

On the highest part of a flat ridge about 8 miles south of Wheeler post-office and 6 miles west of Petersburg post-office. Station is on S. C. Hanson's land and is 0.5 mile west of Oliver Jackson's house.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface, under center of signal.

[Latitude $46^{\circ} 57' 14.45''$. Longitude $119^{\circ} 06' 54.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crab	38 20 59.03	218 11 56.39	4.4053183
McManamon	88 29 46.89	268 19 27.84	4.2533409
Lewis	145 20 58.57	325 10 14.06	4.5130523
Wheeler.....	187 48 17.09	7 50 22.96	4.4256706

KEANE, DOUGLAS COUNTY.

(Not occupied.)

On a sharp, bare peak, being the most prominent point between Rock Island Creek and Columbia River, and about 4 miles from the mouth of Rock Island Creek. Rock Island post-office is about 4 miles south of station, and J. E. Keane's house is about 3 miles southwest. There is a good trail from Keane's to station. It is in sec. 7, T. 22, R. 22.

Signal: A small fir tree set in ground and braced with three poles.

Station mark: A bronze triangulation tablet set in stone and placed in ground, level with surface.

[Latitude $47^{\circ} 24' 16.16''$. Longitude $120^{\circ} 06' 43.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger.....	232 06 34	52 12 21	4.09692
Baird	291 45 35	111 59 15	4.40146

LEWIS, DOUGLAS COUNTY.

On seemingly the highest point of a sand flat about 15 miles southeast of Ephrata. The road from Ephrata to White Bluff ferry passes to the north and east of station, and this road is about 150 yards east at the nearest point. Station is in sight from Mr. Lewis's house and bears about $N. 18^{\circ} W.$ from there. Water is in Moses Lake, one-half mile south. Lewis ranch is about 5 miles from station.

Signal: A lumber tripod 14 feet high, with targets on top.

Station mark: A bronze triangulation tablet cemented in a lava stone and placed in ground, with top 3 inches above surface.

[Latitude $47^{\circ} 11' 41.61''$. Longitude $119^{\circ} 21' 34.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Frenchman	37 43 45.81	217 32 14.88	4. 5131908
Blythe	112 58 11.70	292 50 15.48	4. 1708355
Three Springs	152 30 45.60	332 22 05.83	4. 5063587
Severson	201 59 44.73	22 07 00.20	4. 5199865
Wheeler	270 52 17.91	91 05 09.77	4. 3453875
Jackson	325 10 14.06	145 20 58.57	4. 5130523
McManamon	358 31 51.65	178 32 15.87	4. 4359217

M'DONALD, DOUGLAS COUNTY.

On summit of ridge between Grand Coulee and Moses Coulee, on the highest point in this vicinity. It is in a field belonging to Mr. McDonald, of Coulee City, and is about 1 mile north-northeast of his ranch house. This ranch, at which there is a good place to camp, is 12 miles northwest of Coulee City and lies about $1\frac{1}{2}$ miles south of Coulee City and Waterville road.

Signal: A tripod built of lumber 14 feet high, with two black and white targets on top.

Station mark: A bronze triangulation tablet cemented in lava rock and placed in ground, level with surface, under center of signal.

[Latitude $47^{\circ} 35' 21.30''$. Longitude $119^{\circ} 27' 11.13''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Three Springs	26 45 44.23	206 41 10.97	4. 2364733
Guske	94 32 36.88	274 20 41.93	4. 3072474
St. Andrew	159 48 51.97	339 45 11.00	4. 2564234
Pilot Rock	218 45 20.08	38 50 42.29	4. 1621557
Flynn	236 44 02.78	57 00 25.27	4. 5199072
Stevenson	304 00 38.58	124 12 03.62	4. 3703550

M'MANAMON, DOUGLAS COUNTY.

On the east end of Frenchman Mountain, a long ridge extending east and west from the Columbia River to McManamon's ranch on Crab Creek. Road from Ephrata to White Bluff passes 1 mile east of station. Station is about 5 miles east and a little south of Thomas McManamon's ranch. To go from Crab Creek take road from McMana-

mon's east until old crossroad (Winchester road) is reached, then take left-hand crossroad through two gates until top of ridge is reached, thence up ridge to station.

Signal: A lumber tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet set in stone and placed in ground, level with surface, under center of signal.

[Latitude 46° 56' 58.35". Longitude 119° 21' 01.57".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle (2)	58 26 20.98	238 14 14.82	4.4600587
Frenchman	94 08 40.62	273 56 46.92	4.3159944
Lewis	178 32 15.87	358 31 51.65	4.4389217
Wheeler	218 32 00.89	38 44 26.99	4.5369960
Jackson	268 19 27.84	88 29 46.89	4.2533409
Crab	353 33 57.80	173 35 13.29	4.2920014

M'CUNE, DOUGLAS COUNTY.

(Not occupied.)

A prominent butte about 2 miles west and 5 miles south of Buckingham post-office. Seemingly bowlders on top.

Station mark: The highest part of summit.

[Latitude 47° 48' 58". Longitude 119° 44' 13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dewey	24 07 55.8	204 05 36	3.98303
St. Andrew	298 46 02.0	118 54 57	4.23510

M'MANN, DOUGLAS COUNTY.

In the northwest corner of John McMann's field, about 75 yards west and a little north of his house. McMann's ranch is 6 miles south and 1 mile east of Quincy. A good well is at his place.

Signal: A lumber tripod 14 feet high with two white targets on top.

Station mark: A bronze triangulation tablet cemented in a block of gray granite and placed in ground, with top 2 inches above surface, under center of signal.

[Latitude 47° 09' 15.60". Longitude 119° 48' 21.85".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Columbia.....	23 37 46.14	203 33 12.69	4. 2941981
Baird	180 52 12.45	0 52 22.23	4. 2653792
Frenchman	326 36 44.96	146 44 50.81	4. 4065124

PILOT, DOUGLAS COUNTY.

On the highest part of a solid rock 40 feet high, a well-known point one-half mile east of the road from Coulee City to Bridgeport and about 10 miles from Coulee City. A section line runs over the rock, and station is on Mr. Horning's side of the fence.

Signal: A lumber tripod 10 feet high, braced with rocks piled around each leg and centered over mark.

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

[Latitude 47° 41' 27.87". Longitude 119° 19' 55.07".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McDonald	38 50 42.29	218 45 20.08	4. 1621557
St. Andrew.....	110 12 17.04	290 03 13.28	4. 2126215
Ragged.....	172 58 24.75	352 55 54.73	4. 5352471
Stevenson	201 28 16.95	21 36 49.02	4. 5921888
Flynn.....	249 54 34.04	70 05 34.67	4. 2967367
Severson	337 08 15.94	157 14 19.61	4. 4241162

QUINCY, DOUGLAS COUNTY.

(Not occupied.)

Station mark: Center of cupola on two-story white schoolhouse.

[Latitude 47° 13' 59.86". Longitude 119° 51' 18.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hill.....	56 16 00	236 11 00	4. 01692
Frenchman	329 24 02	149 34 18	4. 54310

RAGGED, DOUGLAS COUNTY.

Station is on the top of a large bowlder on the summit of Ragged Butte, 6 miles north of Leahy post-office. The butte is covered with

large boulders and looks ragged from a distance. There is a road from Leahy nearly all the way.

Station mark: A bronze triangulation tablet cemented in top of a boulder 15 feet high and under center of a cairn 5 feet high.

[Latitude $47^{\circ} 59' 49.92''$. Longitude $119^{\circ} 23' 17.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
St. Andrews	21 20 00.25	201 13 25.25	4.4843208
Dewey	46 13 25.91	225 55 34.82	4.6198824
Dyer	87 34 00.36	267 16 48.54	4.4596984
Salt Lake	153 11 41.97	333 03 59.54	4.4537844
Moses	210 03 48.55	30 18 21.95	4.6825417
Pilot	352 55 54.73	172 58 24.75	4.5352471

ROUND, DOUGLAS COUNTY.

(Not occupied.)

On a gradually sloping, round, low hill about 15 miles east of Ephrata. Creston Hochstatter's homestead cabin is about 150 yards south of signal, and is reached by a road from Wilson Creek.

Signal: A lumber tripod 12 feet high centered over mark.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface.

[Latitude $47^{\circ} 15' 51.52''$. Longitude $119^{\circ} 12' 15.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wheeler	307 56 50	128 02 52	4.11895
Lewis	56 48 06	236 41 15	4.14839

ST. ANDREWS, DOUGLAS COUNTY.

On the highest point of a long rocky butte lying about 6 miles northwest of St. Andrews post-office and 8 miles west of Mold post-office. There are roads from both of these places to foot of butte, which is known locally as "Moses Coulee Butte." Station is about 500 yards south of F. A. Wood's house, which is a good place to camp, provided the animals in camp are few.

Station mark: A bronze triangulation tablet cemented in a stone which was placed in ground, level with surface, and under center of a cairn 7 feet high.

[Latitude $47^{\circ} 44' 29.67''$. Longitude $119^{\circ} 32' 10.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Guske	42 19 56.88	222 11 42.06	4.3172329
Dewey	88 37 07.45	268 25 52.73	4.2787582
Dyer	146 49 39.93	326 39 05.15	4.5110898
Ragged	201 13 25.25	21 20 00.25	4.4843208
Stevenson	223 46 43.61	44 04 21.07	4.6304312
Pilot	290 03 13.28	110 12 17.04	4.2126215
McDonald	339 45 11.00	159 48 51.97	4.2564234

SADDLE (2), DOUGLAS COUNTY.

Station is on a high prominent part of the Saddle Mountains, about 5 miles west of the highest point, and is the most prominent point on the range between Saddle Peak and Columbia River. There are two points close together, and station is on the one farthest north, overlooking Crab Creek. To go to station from Crab Creek, take horse trails leading up mountain from point on Crab Creek about 7 miles below Ben Hutchinson's ranch. These trails are range-horse trails, and spread in all directions, but the plainest ones lead to the summit to the right or west of station. Signal is in view from most places on summit. There is a good horse trail from Saddle Peak to Saddle (2) along the summit, so that Saddle (2) can be easily reached by ascending the mountain at Ben Hutchinson's ranch and keeping west along the summit.

Station mark: A bronze triangulation tablet cemented in a rock placed in ground, level with surface, and under center of a cairn 7 feet high.

[Latitude $46^{\circ} 48' 47.81''$. Longitude $119^{\circ} 40' 20.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coal	35 43 30.11	215 34 10.37	4.4475609
Sentinel	92 09 06.03	272 00 45.13	4.1635532
Columbia	137 46 58.52	317 36 34.61	4.4292627
Frenchman	193 05 30.31	13 07 43.69	4.2317882
McManamon	238 12 14.82	58 26 20.98	4.4600587
Crab	279 01 52.50	99 17 12.86	4.4333970

SAND, DOUGLAS COUNTY.

On a ridge of low sand hills 13 miles southeast of Quincy and 6 miles N. 76° W. from John McMann's house. No other description can be given of this station, and it can best be found by taking true bearing from Quincy schoolhouse ($329^{\circ} 54'$) or McMann's triangulation station ($286^{\circ} 39'$).

Signal: A lumber tripod 14 feet high.

Station mark: A bronze triangulation tablet cemented in granite block and placed in ground, level with surface, under center of signal.

[Latitude $47^{\circ} 07' 35.38''$. Longitude $119^{\circ} 40' 09.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Columbia.....	50 48 51	230 38 17	4.37314
Frenchman.....	348 46 16	168 48 21	4.26871

SAND HILL, DOUGLAS COUNTY.

(Not occupied.)

The sand hill farthest east of a chain of sand hills, extending from Moses Lake to about 10 miles southeast of John Lewis's house and 400 yards west of Ephrata and White Bluff road.

Signal: A tripod 10 feet high.

Station mark: A bronze triangulation tablet cemented in a block of lava and placed in ground, with top 8 inches above surface.

[Latitude $47^{\circ} 04' 04.23''$. Longitude $119^{\circ} 14' 13.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jackson.....	323 41 52	143 47 13	4.19569
McManamon.....	33 15 49	213 10 51	4.19647

SCHLAGEL, DOUGLAS COUNTY.

On the highest point of a ridge forming the divide between Grand Coulee and Crab Creek, and the highest ridge between Stafford and Coulee City. It is about 6 miles northwest of Stafford, and there is a road all the way to it from that place. Station is on the land of Antonio Schlagel, said to be in sec. 17, T. 23, R. 28, and is 17 steps slightly west of north of Dent Pugh's northeast corner and Bob Love's northwest corner, being in the middle of Antonio Schlagel's south line. There is a road along the south line.

Signal: A lumber tripod 9 feet high.

Station mark: A bronze triangulation tablet cemented in a block of lava and placed in ground, level with surface, centered under signal.

[Latitude $47^{\circ} 28' 58.90''$. Longitude $119^{\circ} 19' 54.87''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lewis	3 45 05	183 43 51	4.50653
Three Springs	78 05 58	257 56 05	4.23735
Severson	277 22 38	97 28 41	4.01695

SENTINEL, DOUGLAS COUNTY.

On a prominent point of Sentinel Bluffs on the south side of Crab Creek and about 4 miles from the mouth of that creek. Station is on the highest point of the bluffs, and right on the north edge, overlooking Crab Creek. From here the country slopes down to Columbia River and east to a saddle between this range and the Saddle Mountains. Sentinel Bluffs is a continuation of the Saddle Mountains. Station is about 5 miles up Crab Creek from Cregg's ferry and 15 miles down the creek from Ben Hutchinson's ranch. The best way to go is by trail from Crab Creek, about 7 miles below Hutchinson's ranch—the same trail leads to Saddle (2)—and when well up the mountain take a right-hand trail leading along close to the bluff edge nearly all the way. There seems to be another trail from Crab Creek about 5 miles farther down the creek. There is good but steep foot traveling straight to signal from Crab Creek, at a point directly under signal, distant 1 mile. A pack animal could go this way, but footing is bad in places and very steep.

Station mark: A bronze triangulation tablet cemented in a rock placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude $46^{\circ} 49' 04.96''$. Longitude $119^{\circ} 51' 47.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coal	4 16 55.34	184 15 55.66	4.3686394
Moxee	52 39 03.81	232 22 36.58	4.5598550
Johnson	100 46 18.35	280 32 10.40	4.3990825
Columbia	169 37 56.52	349 35 54.22	4.2936977
Frenchman	228 46 51.30	48 57 26.19	4.3881650
Saddle (2)	272 00 45.13	92 09 06.03	4.1635532

SEVERSON, DOUGLAS COUNTY.

On the summit of a high, prominent ridge about 7 miles northeast of Stratford, about 16 miles south and west from Hartline, and 3 miles west of main road from Hartline to Wilson Creek. Station is in Severson pasture, 50 yards west of a seldom-used lane which goes up the north side of hill and stops at the summit. There is a road from Stratford. Take Wilson Creek road to Richardson's ranch at east end of lake, cross ditch and railway, leaving Richardson's to left, and take road up big draw, then ranch roads to Severson's.

Signal: A lumber tripod 14 feet high, with two targets on top, center over mark.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface.

[Latitude $47^{\circ} 28' 15.33''$. Longitude $119^{\circ} 11' 42.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lewis	22 07 00.20	201 59 44.73	4.5199865
Blythe	46 23 19.04	226 08 06.12	4.5568617
Three Springs.....	85 25 32.28	265 09 35.00	4.4362287
McDonald.....	124 12 03.62	304 00 38.58	4.3703550
Pilot Rock.....	157 14 19.61	337 08 15.93	4.4241162
Flynn.....	194 56 08.15	15 01 03.78	4.5098451
Wheeler.....	342 41 17.33	162 46 55.46	4.5123249

STEVENSON, DOUGLAS COUNTY.

On the highest part of a round-topped ridge, about 10 miles southwest of Barry post-office. It is the highest point in the vicinity, although not very prominent. Stevenson's ranch and lake lie about 1 mile south of station. Going from Barry to Leahy on what is known as the Chelan road, station is about 2 miles to right of road. The hill on which it is located is between the Columbia River and the Grand Coulee, and from here the country breaks off to the point of junction of the two.

Signal: A lumber tripod 14 feet high, with two white-and-black targets on top.

Station mark: A bronze tablet cemented in rock and placed in ground, level with surface.

[Latitude 48° 01' 05.45". Longitude 119° 08' 24.41".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pilot	21 36 49.03	201 28 16.95	4. 5921888
St. Andrews	44 04 21.07	223 46 43.61	4. 6304312
Ragged	82 54 35.31	262 43 31.58	4. 2708217
Salt Lake	126 29 10.20	306 10 22.77	4. 5896290
Moses	188 18 39.02	8 22 06.87	4. 5988281
Flynn	351 53 57.43	171 56 27.46	4. 4755802

ST. ANDREWS SCHOOLHOUSE, DOUGLAS COUNTY.

Station mark: A small projection on end of roof.

[Latitude 47° 39' 19.40". Longitude 119° 26' 08.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McDonald	10 07 52	190 07 06	3. 87328
St. Andrews	141 49 37	321 45 10	4. 08622

TIMBER PEAK, DOUGLAS COUNTY.

(Not occupied.)

A small, prominent timbered peak about 5 miles north of Dyer and several miles southwest of Bridgeport, on top of the high country overlooking Columbia River. Highest tree sighted.

[Latitude 48° 03' 19.0". Longitude 119° 45' 04.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dewey	4 38 19	184 36 37	4. 55015
St. Andrews	335 10 34	155 20 08	4. 58440

THREE SPRINGS, DOUGLAS COUNTY.

On the highest point of ridge, overlooking Soap Lake, or Alkali Lake as it is marked on some maps. Station is about three-fourths of a mile south of the Three Springs ranch and about 5 miles, by road, to the north of the south end of Soap Lake. A good road leads from Soap Lake to the Three Springs ranch, and this road passes within

about 50 or 75 yards of signal. Take road from Soap Lake leading into the hills until a crossroad is reached, then take the right-hand end of crossroad to summit. The left end of crossroad goes to Ephrata; the middle road to Sage Brush flat.

Station mark: A bronze triangulation tablet set in a stone and placed in ground, level with surface, under center of a cairn 7 feet high.

[Latitude $47^{\circ} 27' 02.78''$. Longitude $119^{\circ} 33' 21.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Two Springs	23 40 07.56	203 35 54.80	4.2546860
Baird	52 05 17.45	231 54 24.77	4.3730495
Badger	94 39 29.95	274 20 42.34	4.5071933
Guske	143 40 32.95	323 33 12.08	4.3238180
McDonald	206 41 10.97	26 45 44.23	4.2364733
Severson	265 09 35.00	85 25 32.28	4.4362287
Lewis	332 22 05.83	152 30 45.60	4.5063587
Blythe	356 54 44.17	176 55 26.91	4.3562817

TWO SPRINGS, DOUGLAS COUNTY.

Station is on one of the highest hills lying northwest of Ephrata and northeast of Winchester. It is about 5 miles from Winchester and can be reached best from that place. Take road running north-northwest from Winchester, which goes up a ravine to summit of ridge. On reaching summit go east along divide about 2 miles until station is reached. A wagon can go this way.

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

[Latitude $47^{\circ} 18' 09.54''$. Longitude $119^{\circ} 39' 05.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Baird	99 40 05.38	279 33 25.97	4.0635489
Three Springs	203 35 54.80	23 40 07.56	4.2546860
Blythe	306 18 19.50	126 23 14.55	4.0204556

WEBBER'S WINDMILL, DOUGLAS COUNTY.

(Not occupied.)

Four miles south and west from Quincy.

Station mark: Center of tower of windmill.

[Latitude $47^{\circ} 11' 45.99''$. Longitude $119^{\circ} 51' 57.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Columbia.....	8 22 05	188 20 09	4.36040
Hill.....	78 17 10	258 12 38	3.90140

WHEELER, DOUGLAS COUNTY.

On a sagebrush ridge, about 6 miles north of Wheeler post-office and 1 mile southeast of Rickard's ranch, on the old Wilson Creek and White Bluff road. This road passes through Rickard's field, and station is 1 mile east of where it leaves the field on the south side. This is not a very prominent point, as the country rises to the east of it. Water at Rickard's ranch.

Signal: A lumber tripod 14 feet high, with targets on top.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface.

[Latitude $47^{\circ} 11' 29.36''$. Longitude $119^{\circ} 04' 02.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jackson.....	7 50 22.96	187 48 17.09	4.4256706
McManamon.....	38 44 26.99	218 32 00.89	4.5369961
Lewis.....	91 05 09.77	270 52 17.91	4.3453875
Severson.....	162 46 55.46	342 41 17.33	4.5123249

WINCHESTER, DOUGLAS COUNTY.

Station mark: The highest chimney on the section house at Winchester.

[Latitude $47^{\circ} 14' 58.61''$. Longitude $119^{\circ} 43' 27.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blythe.....	271 13 37	91 21 45	4.14484
Frenchman.....	346 15 28	166 19 58	4.51634

KUNTZ, FRANKLIN COUNTY.

(Not occupied.)

On a sagebrush flat about 10 miles southwest of Scooten Springs, on about as high point as any near there. It shows most prominently from Gable Mountain at White Bluff and is about 10 miles in direct

line from White Bluff ferry. Take bearing from Gable and cross the Columbia at White Bluff and go east until a small coulee is crossed. Station is on the east bank of this coulee, on one of several small sandhills.

Signal: A tripod 14 feet high with targets on top.

Station mark: A bronze triangulation tablet cemented in stone and placed in ground, level with surface.

[Latitude $46^{\circ} 37' 42.32''$. Longitude $119^{\circ} 12' 35.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Saddle	126 37 38	306 22 22	4.52160
Crab	152 12 43	332 10 50	4.26365

SCOOTEN, FRANKLIN COUNTY.

(Not occupied.)

On a prominent butte about $2\frac{1}{2}$ miles east of Scooten Springs. Take road from Scooten Springs by the corral to top of hill, then left-hand road, which passes to left of signal.

Signal: A tripod made of lumber.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface.

[Latitude $46^{\circ} 42' 44.10''$. Longitude $119^{\circ} 04' 43.66''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crab	110 30 56	290 20 19	4.29685
Jackson	174 07 31	354 05 55	4.43167

JOHNSON, KITTITAS COUNTY.

On the highest point of the ridge between Honson and Johnson creeks, and at the head of these creeks, being about 20 miles south-east of Ellensburg. Taking the road from Ellensburg to Cregg's ferry, station is about 2 miles north of the highest point of said road, and by leaving the road at this point a wagon can be taken all the way. Water in "Mud Springs," one-half mile south of station. Plenty of grass when the sheep are gone.

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

[Latitude 46° 51' 35.03". Longitude 120° 11' 10.29".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Moxee	8 45 51.23	188 43 30.23	4.4319569
Atanum	39 23 01.66	219 05 13.83	4.6928859
Wenas	85 18 41.83	265 03 40.72	4.4193073
Columbia	234 57 20.01	55 09 26.83	4.4096007
Séntinel	280 32 10.40	100 46 18.35	4.3990825
Coal	320 30 00.76	140 43 07.55	4.5581070

SQUAW, KITTITAS COUNTY.

On a round hill on the dividing ridge between Squaw and Selah creeks, about 3 miles north of Selah Springs. Road from North Yakima, via Selah Springs to Ellensburg, passes about 500 yards west of station. From Yakima keep this road about 16 miles to the summit of above-mentioned divide, then take the ridge to right to the top of a round hill which is in sight. Station is on the same ridge as "Hog Ranch" triangulation station. Water 3 miles south at Selah Springs and 3 miles north on Squaw Creek, both on Ellensburg and North Yakima road.

Signal: A lumber tripod 14 feet high with targets.

Station mark: A bronze triangulation tablet set in a block of soft sandstone and placed in ground, top of stone projecting 3 inches above surface. This stone is the only one of the kind on the hill.

[Latitude 46° 44' 20.9". Longitude 120° 20' 30.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wenas	128 06 05	307 57 53	4.25962
Johnson	221 28 41	41 35 29	4.23505
Moxee	329 39 14	149 43 41	4.18823
Atanum	38 00 50	217 49 48	4.49717

WENATCHEE, KITTITAS AND CHELAN COUNTIES.

(Not occupied.)

On one of the prominent summits of Wenatchee Mountain; the summit farthest east. Station is at the head of Squillchuckchee Creek. Take road from Wenatchee to Squillchuckchee schoolhouse and saw-mill road up divide between said creek and another creek with a name as difficult to pronounce, sounding something like "Steamout."

Leave sawmill road where it leaves divide and keep up divide to station. The Ellensburg and Wenatchee trail crosses the summit about 5 miles east. Station is about 20 miles from Wenatchee.

Signal: A pine tree trimmed to a bush on top, 25 feet high; tree leans to east.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, with top 6 inches above surface.

[Latitude $47^{\circ} 16' 25.64''$. Longitude $120^{\circ} 24' 26.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Badger	235 15 13	55 33 59	4.59219
Baird	263 22 03	83 48 43	4.66316

WHISKEYDICK, KITTITAS COUNTY.

(Not occupied.)

On the highest point of Whiskeydick Mountain, about 17 miles east of Ellensburg. This mountain lies at the foot of Wenatchee Mountain to the south, and is bare of timber.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude $47^{\circ} 01' 16.38''$. Longitude $120^{\circ} 13' 31.77''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wenas	49 02 58	228 49 39	4.48692
Johnson	350 31 20	170 33 03	4.26006

BUNCH GRASS, OKANOGAN COUNTY.

(Not occupied.)

A bunch-grass hill, several miles northwest of Brewster, having some timber on north side and summit.

Station mark: Top of highest tree.

[Latitude $48^{\circ} 09' 09.8''$. Longitude $119^{\circ} 51' 22.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Salt Lake	249 43 42	69 56 55	4.36930
Dyer	341 42 40	161 46 20	4.29167

CHELAN, OKANOGAN COUNTY.

On the highest butte south of Lake Chelan, on north side of Columbia River, about 2 miles west of Chelan River. A good trail from the post-office at Lakeside leads almost to summit.

Station mark: A rock cairn 8 feet high, under center of which a copper bolt is cemented in solid rock.

[Latitude $47^{\circ} 48' 18.96''^a$; $47^{\circ} 48' 23.91''^b$. Longitude $120^{\circ} 01' 54.86''^a$; $120^{\circ} 02' 07.39''^b$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stuart <i>a</i>	60 50 48.86	240 12 19.28	4. 8747277
Stormy <i>a</i>	113 09 53.71	292 55 45.05	4. 4126532
Pyramid <i>a</i>	127 27 18.57	307 03 32.08	4. 6998075
North Navarre <i>a</i>	148 58 35.20	328 45 34.49	4. 6250057
Cooper <i>a</i>	170 36 32.45	350 34 18.09	4. 3617212
Baldy <i>a</i>	106 03 07.68	285 50 00.62	4. 3610958
Cooper <i>b</i>	170 35 27.68	350 33 13.05	4. 3617197
Dyer <i>b</i>	224 24 34.33	44 36 12.71	4. 4454873
Dewey <i>b</i>	292 38 04.30	112 49 00.15	4. 3008639
Guske <i>b</i>	313 44 34.10	133 58 28.50	4. 5134122
Badger <i>b</i>	353 41 45.54	173 44 09.91	4. 5713228

a Ellensburg base.*b* Spokane base.

COOPER, NEAR OKANOGAN-CHELAN COUNTY LINE.

On a large, pyramidal rock on a timbered mountain, about 5 miles northeast of the shore of Lake Chelan.

Station mark: A copper bolt cemented in solid rock.

Reference mark: A bronze triangulation tablet, stamped "R. P.," cemented in solid rock, 1.6 feet northwest of station mark.

[Latitude $48^{\circ} 00' 33.61''^a$; $48^{\circ} 00' 38.52''^b$. Longitude $120^{\circ} 04' 55.93''^a$; $120^{\circ} 05' 08.80''^b$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Indian <i>a</i>	20 29 53.08	200 26 30.71	4. 2088432
Stormy <i>a</i>	57 57 02.27	237 45 06.71	4. 3731776
Chelan <i>a</i>	350 34 18.09	170 36 32.45	4. 3617212
Dyer <i>b</i>	276 44 09.94	96 58 04.26	4. 3699991
Dewey <i>b</i>	323 47 37.27	144 00 48.68	4. 5756229
Chelan <i>b</i>	350 33 13.05	170 35 27.68	4. 3617197

a Ellensburg base.*b* Spokane base.

MOSES, OKANOGAN COUNTY.

On a high, timbered mountain, 12 or 15 miles northwest from Indian agency on Nespilem River, locally known as Moses Mountain. Trail up the Nespilem River passes about 4 miles east from station. The mountain is covered with dead timber.

Station mark: A pine tree about 20 feet high.

Reference mark: An aluminum bolt marked \triangle set in a large rock
U. S.
G. S.

25.8 feet distant N. $22^{\circ} 20'$ E. (true) from tree.

[Latitude $48^{\circ} 22' 17.30''$. Longitude $119^{\circ} 03' 45.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bonaparte	174 26 46.28	354 24 02.01	4.6647018
Fir.....	195 53 38.76	15 59 18.90	4.5304707
Summit	241 08 20.14	61 34 19.69	4.6879590
Paint Rock	261 21 47.56	81 46 57.74	4.6231881
Whitestone.....	313 16 09.35	133 40 50.25	4.7523117
Ragged.....	30 18 21.95	210 03 48.55	4.6825417

SALT LAKE, OKANOGAN COUNTY.

On a low timbered hill 5 or 6 miles east of Malott, on west side of Okanogan River and 13 miles southeast from Alma post-office and ferry. The hill is highest point in immediate vicinity and has salt lakes on every side of it.

Station mark: A pine tree trimmed up for signal. (Now dead, 1903.)

Reference mark: A copper bolt marked U. S. G. S. set in solid rock 21 feet west from tree.

[Latitude $48^{\circ} 13' 31.03''$. Longitude $119^{\circ} 33' 38.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Buck	140 12 24.31	320 00 28.29	4.4854816
Omach	216 38 22.64	36 49 35.99	4.4918667
Moses	246 04 17.57	66 26 36.30	4.6060805
Keller.....	287 31 18.60	108 05 26.64	4.7760002
Stevenson	306 10 22.77	126 29 10.20	4.5896290
Ragged.....	333 03 59.51	153 11 41.97	4.4537844
Dyer	30 51 27.60	210 41 56.32	4.4917360

ATANUM, YAKIMA COUNTY.

On the highest point of Atanum Ridge, a low, flat, bare ridge extending east and west between the Atanum and Toppenish valleys. The station is about 8 miles southwest of North Yakima.

Station mark: A copper bolt marked U. S. G. S. set in drill hole in solid rock and having erected over it a rock cairn 7 feet high.

[Latitude $46^{\circ} 30' 54.33''^a$; $46^{\circ} 30' 58.30''^b$ Longitude $120^{\circ} 35' 26.31''^a$; $120^{\circ} 35' 37.84''^b$]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Satas ^a	23 17 27.66	203 10 28.93	4.4959478
Signal Peak ^a	52 41 02.97	232 17 24.47	4.7226954
Cowiche ^a	108 03 32.20	287 50 02.40	4.3975856
Burge ^a	153 21 46.74	333 13 04.85	4.5308826
Umptanum ^a	172 06 07.81	352 03 02.59	4.5936962
Wenas ^a	187 48 13.22	7 51 02.49	4.5600570
Yakima ^a	211 54 03.56	31 57 25.79	4.0499121
Hembree ^a	316 39 09.72	136 52 01.43	4.5214335
Lone Pine ^a	357 28 26.78	177 29 53.40	4.7675891
Lone Grave ^a	335 21 06.69	155 27 33.08	4.4374943
Wenas ^b	187 47 33.61	7 50 22.69	4.5601806
Johnson ^b	219 05 13.83	39 23 01.66	4.6928859
Moxee ^b	246 57 40.00	67 13 05.11	4.4691535

^a Ellensburg base.

^b Spokane base.

COAL, YAKIMA COUNTY.

On a round hill on the divide between Coal Creek and Columbia River, and almost opposite the lower end of Priest Rapids. Station is almost 4 miles (straight) a little south of west from Juniper Springs and 6 miles east of Tom Smith's ranch. Take road down Coal Creek from Smith's until the road passes between a sheep corral on the left and a small house on the right. Go up spur to left at this house, thence east across a ravine, then north up ridge to station. Water is in Coal Creek 1 mile south of station. From Juniper Springs take road up said divide between Coal Creek and Columbia River, and, where road goes down toward Coal Creek, keep west along summit to station.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface, under center of a cairn 7 feet high.

[Latitude 46° 36' 30.28". Longitude 119° 53' 09.80".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Moxee	92 41 44.18	272 26 18.24	4.4335927
Johnson	140 43 07.55	320 30 00.76	4.5581070
Sentinel	184 15 55.66	4 16 55.34	4.3686394
Saddle (2)	215 34 10.37	35 43 30.11	4.4475609

HOG RANCH, YAKIMA COUNTY.

(Not occupied.)

Station is on the highest point of divide between the head of Selah and Squaw creeks. From here the country drops off to Coal Creek and Columbia River. There are two high points on the range, known as the Hog Ranch Buttes. Station is on the one farthest east, being about 4 miles northeast of "Hog Ranch" and 20 miles from North Yakima.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude 46° 39' 52.03". Longitude 120° 06' 53.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wenas	121 46 58	301 28 51	4.57046
Johnson	165 56 10	345 53 03	4.34992

MOXEE, YAKIMA COUNTY.

On a very prominent point of the divide between the Moxee Valley and Selah Creek, the highest point of the divide being a few miles farther east, about the head of Selah and Coal creeks. Station is about 4 miles southwest of "Hog Ranch" and about 15 miles east of North Yakima. The road from North Yakima to Ellensburg on the east side of the Yakima River crosses sand divide about 3 miles east of station. There is also a road from North Yakima to "Hog Ranch" which passes within 2 miles of station on the north side. From this road the ascent is easy, and the best way up can be seen.

Station mark: A bronze triangulation tablet cemented in a stone and placed in ground, level with surface, under center of a cairn 6 feet high.

[Latitude $46^{\circ} 37' 09.64''$. Longitude $120^{\circ} 14' 23.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Atanum	67 13 05.11	246 57 40.00	4.4691535
Wenas	138 03 21.11	317 50 42.75	4.5187656
Johnson	188 43 30.23	8 45 51.23	4.4319569
Sentinel	232 22 36.58	52 39 03.81	4.5598550
Coal	272 26 18.24	92 41 44.18	4.4435927

GABLE, YAKIMA COUNTY.

(Not occupied.)

Station is on the east end of Gable Mountain, being about 5 miles S. 5° W. from White Bluff ferry. Hill is easiest to climb on the south side. Station is on the farthest west of two points at the east end of the range, and is not over 2 miles from Columbia River. The point 300 yards east of station is free from stones and probably a little higher than that on which station is situated.

Station mark: A bronze triangulation tablet, cemented in solid rock under center of a cairn 7 feet high.

[Latitude $46^{\circ} 38' 58.78''$. Longitude $119^{\circ} 27' 58.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crab	209 36 05	29 42 24	4.34944
Saddle	162 49 32	342 45 28	4.38096

WENAS, YAKIMA COUNTY.

On the high, east end of Umptanum Ridge, overlooking the Yakima River, about 12 miles south of Ellensburg.

Station mark: A copper bolt marked U. S. G. S. cemented in drill hole in a small boulder set in the ground, over which is a rock cairn 6 feet high.

[Latitude $46^{\circ} 50' 23.67''$; a $46^{\circ} 50' 19.34''$. b Longitude $120^{\circ} 31' 45.43''$; a $120^{\circ} 31' 33.65''$. b]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Atanum a	7 50 22.69	187 47 33.61	4. 5601806
Johnson a	265 03 40.72	85 18 41.83	4. 4193073
Moxee a	317 50 42.75	138 03 21.11	4. 5187656
Atanum b	7 51 02.49	187 48 13.22	4. 5600570
Cowiche b	45 29 49.62	225 13 28.29	4. 6047034
Burge b	74 26 52.79	254 15 19.85	4. 3206371
Umptanum b	105 40 53.38	285 34 57.91	4. 0301322
Normal School b	176 33 39.13	356 33 02.19	4. 2506572
Manastash a	139 11 08.66	319 05 07.71	4. 2040216

a Spokane base.

b Ellensburg base.

WYOMING.

TRIANGULATION STATIONS.

Albany, Carbon, Johnson, and Natrona counties; Alcova, Broken Horn, Casper, Fort McKinney, Fort Steele, Griggs, Laramie, and Medicine Bow quadrangles.

During the field season of 1903, Mr. Sledge Tatum, topographer, extended triangulation from County Road and Gale stations in Albany County, northwestward, connecting with stations dependent upon the Wheeler astronomic station at Fort Steele, and upon the base line measured by Mr. Frank Tweedy, in 1901, west of that place. The work was then extended due north to the vicinity of Buffalo and connected with stations McKinney and Buffalo, located from the Ranchester base and Sheridan astronomic station.

Positions were computed on the United States standard datum as derived from stations Morrison and Table Mound of the United States Coast and Geodetic Survey transcontinental system, through the Colorado triangulation.

An azimuth and distance check was obtained on the line Mount Steele-St. Mary, the Fort Steele observed azimuth being adopted for the computation of positions northward as far as Buffalo. The connection at the latter point furnished an approximate correction by which to reduce all published positions in Johnson, Sheridan, and Big Horn counties and in the Teton Forest Reserve to the United States standard datum.

JELM, ALBANY COUNTY.

Situated about 3 miles east-southeast of Woods post-office, on highest part of mountain of that name. A tripod of poles is erected over center.

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

[Latitude $41^{\circ} 05' 49.71''$. Longitude $105^{\circ} 58' 35.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pelham	83 25 25.09	262 57 32.98	4.7770893
Medicine Bow	135 47 48.15	315 34 20.44	4.6112707
County road	218 46 30.98	38 57 11.68	4.5573836
Gale	279 58 02.71	100 13 17.46	4.5187373

CHALK HILL, CARBON COUNTY.

Situated about 18 miles north of Shirley post-office and 20 miles south of Winthrop, on highest ground between the two. About 3 miles east of road leading from Shirley to Winthrop.

Signal: A quadripod made of pine poles.

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

[Latitude $42^{\circ} 20' 33.67''$. Longitude $106^{\circ} 28' 20.16''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shirley	19 26 37.32	199 23 15.15	4.3166558
Pedro	82 45 30.10	262 30 52.22	4.4785807
Alcova	144 02 37.01	323 50 30.75	4.6202515
Casper	191 32 26.58	11 36 54.80	4.6542006

ELK, CARBON COUNTY.

A high, dome-shaped mountain about 15 miles south of Hanna and about 10 miles west of Elk Mountain post-office. The mountain is precipitous, with much down timber, making ascent difficult. The most practicable route is from Rattlesnake Pass, on northwest side. At one time there was a trail along this route, but at present only traces are found at intervals. Time required to ascend peak, six hours. Summit is above timber line and consequently bald.

Station mark: A cairn about 5 feet in diameter at base and about 6 feet high.

Reference mark: A bronze triangulation tablet cemented in solid rock; true azimuth from station mark, $198^{\circ} 19' 22''$; distance, 13.1 feet.

[Latitude $41^{\circ} 37' 59.46''$. Longitude $106^{\circ} 31' 31.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Needle	24 15 36.10	204 07 21.85	4.6261196
Mount Steele	120 15 18.52	299 56 28.90	4.6563544
St. Mary	124 33 32.78	304 20 57.98	4.5024440
Shirley	177 34 44.44	357 33 41.62	4.7731041
Rock	288 55 34.17	109 07 25.44	4.4190983
Medicine Bow	330 02 02.98	150 10 20.59	4.5434415

MEDICINE BOW, CARBON COUNTY.

A high, rocky peak about 12 miles west of Centennial and 12 miles north of Rambler mines, the highest point on what is locally known as the Snowy Range. It can be reached by trail from Rambler with pack mules. The last 1,500 feet is very rocky and steep, but ascent can be made on foot.

Signal: A tripod of poles erected over center.

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

[Latitude $41^{\circ} 21' 37.35''$. Longitude $106^{\circ} 19' 00.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pelham	40 22 16.27	220 07 46.93	4.6776056
Needle	76 47 03.61	256 30 34.79	4.5538303
Elk	150 10 20.59	330 02 02.98	4.5434415
Rock Mountain	198 51 06.06	18 54 38.19	4.3613261
County road	271 04 07.40	91 28 19.51	4.7084269
John	315 34 20.44	135 47 48.15	4.6112707

MOUNT STEELE, CARBON COUNTY.

Situated about 6 miles northwest of Fort Steele, on a high, sharp point on ridge northeast of Platte River.

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

Reference mark: A cairn 7 feet high; true azimuth from station mark, $79^{\circ} 00' 35''$; distance, 6.6 feet.

[Latitude $41^{\circ} 50' 16.24''$. Longitude $106^{\circ} 59' 48.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sage	13 33 05.47	193 30 37.00	4. 3429382
Sage (observed)	13 33 15.49	193 30 47.02	-----
Pedro	194 22 54.94	14 29 26.26	4. 7317413
Shirley	224 52 11.10	45 09 53.63	4. 7131835
St. Mary	289 59 56.42	110 06 11.52	4. 1405947
St. Mary (observed)	290 00 06.44	110 06 21.54	-----
Elk	299 56 28.90	120 15 18.52	4. 6563544
Needle	340 08 59.43	160 19 29.97	4. 8139785

NEEDLE, CARBON COUNTY.

A rocky peak 1 mile west of confluence of Grand Encampment Creek and Platte River and 1 mile east of stage road from Encampment to Walcott.

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

Reference mark: A cairn 6 feet high. True azimuth from station mark, $137^{\circ} 35' 45''$; distance, 21.9 feet.

[Latitude $41^{\circ} 17' 09.37''$. Longitude $106^{\circ} 43' 58.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sage	145 46 58.35	325 34 01.34	4. 6838707
Mount Steele	160 19 29.97	340 08 59.43	4. 8137985
St. Mary	171 00 15.64	350 55 58.45	4. 7579061
Elk	204 07 21.85	24 15 36.10	4. 6261196
Medicine Bow	256 30 34.79	76 47 03.61	4. 5538303
Pelham	351 35 16.66	171 37 13.58	4. 4528007

PEDRO, CARBON COUNTY.

A high, rocky peak on Pedro Mountain, locally known as Monument Peak, situated about 10 miles west of Leo post-office and 4 miles west of Indian Grove ranch.

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

Reference mark: A cairn 7 feet high; true azimuth from station mark, $49^{\circ} 38' 18''$; distance, 7.8 feet.

[Latitude 42° 18' 28.64". Longitude 106° 50' 03.94".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
St. Mary	0 30 52.30	180 30 37.46	4. 7555596
Mount Steele	14 29 26.26	194 22 54.44	4. 7317413
Alcova	187 53 30.24	7 56 04.65	4. 5790943
Reef	195 36 57.05	15 45 59.12	4. 8293235
Casper	218 46 29.84	39 05 39.20	4. 7907208
Chalk	262 30 52.22	82 45 30.10	4. 4785807
Shirley	304 12 58.55	124 24 12.85	4. 4447572

PELHAM, CARBON COUNTY.

Situated on a peak $2\frac{1}{2}$ miles north of divide between Grand Encampment Creek and waters of Big Creek where crossed by Columbine road. It is $2\frac{1}{2}$ miles north of Colorado-Wyoming State line, is locally known as "Rocky," and is the point called "Pelham" by the King Survey.

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

Reference mark: A cairn 5 feet high; true azimuth from station mark, 102° 42' 17"; distance, 10 feet.

[Latitude 41° 01' 59.69". Longitude 106° 41' 00.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Needle	171 37 13.58	351 35 16.66	4. 4528007
Medicine Bow	220 07 46.93	40 22 16.27	4. 6776056
John	262 57 32.98	83 25 25.09	4. 7770893

ROCK, CARBON COUNTY.

Situated about 3 miles south of Arlington post-office and 1.5 miles east of Rock Creek. The point locally known as Rock Mountain was cleared of timber, and a quadripod signal erected on highest point. Can be reached with pack outfit by blind trail from Arlington. On account of windfalls this point is difficult of approach except by trail.

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

[Latitude $41^{\circ} 33' 22.12''$. Longitude $106^{\circ} 13' 40.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Medicine Bow	18 54 38.19	198 51 06.06	4.3613261
Elk	109 07 25.44	288 55 34.17	4.4190983
County road	297 31 30.06	117 52 12.93	4.6920909

SAGE, CARBON COUNTY.

Situated about 9 miles southwest of Fort Steele, on south edge of mesa overlooking Sage Creek drainage.

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

Reference mark: A cairn 7 feet high; true azimuth from station mark, $58^{\circ} 16' 14''$; distance, 6 feet.

[Latitude $41^{\circ} 38' 42.12''$. Longitude $107^{\circ} 03' 31.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Steele (observed)	193 30 47.02	13 33 15.49	-----
Mount Steele	193 30 37.00	13 33 05.47	4.3429382
St. Mary	227 22 00.52	47 30 43.33	4.3918949
Needle	325 34 01.34	145 46 58.35	4.6838707

SHIRLEY, CARBON COUNTY.

Situated about 5 miles south of Shirley post-office, on highest part of Shirley Mountain. The summit is flat and timbered. A quadripod signal was erected on rocky peak 75 feet high, affording a good view in all directions. The point is difficult of approach on account of windfalls, but it can best be reached from Bear Park, which lies to the southwest about 2 miles.

Station mark: A bronze tablet cemented in solid rock under center of signal.

[Latitude $42^{\circ} 09' 59.94''$. Longitude $106^{\circ} 33' 20.83''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
St. Mary	29 52 02.34	209 40 36.55	4.6770115
Mount Steele	45 09 53.63	224 52 11.10	4.7131835
Pedro	124 24 12.85	304 12 58.55	4.4447572
Casper	193 58 16.66	14 06 07.38	4.8175664
Chalk	199 23 15.15	19 26 37.32	4.3166558
Elk	357 33 41.62	177 34 54.46	4.7731041

ST. MARY, CARBON COUNTY.

Situated on a high, bare point $2\frac{1}{2}$ miles north of Walcott station on the Union Pacific Railroad.

Station mark: A bronze triangulation tablet set in a rock 10 by 5 by 2 feet, over which a cairn 6 feet high was erected.

[Latitude $41^{\circ} 47' 42.61''$. Longitude $106^{\circ} 50' 26.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sage	47 30 43.33	227 22 00.52	4.3918949
Mount Steele (observed) (U. S. C. and G. S.)	110 06 21.54 110 06 11.52	290 00 06.44 289 59 56.42	4.1405947
Pedro	180 30 37.46	0 30 52.30	4.7555596
Shirley	209 40 36.55	29 52 02.34	4.6770115
Elk	304 20 57.98	124 33 32.78	4.5024440
Needle	350 35 58.45	171 00 15.64	4.7579061

ACCIDENT, JOHNSON COUNTY.

Situated about 8 miles east of Buffalo, on high red butte, three-fourths of a mile south of county road; on the divide between the waters of Clear and Crazy Woman creeks.

Signal: A cairn 7 feet high in John Jones's pasture.

Station mark: Center of cairn.

[Latitude $44^{\circ} 18' 59.70''$. Longitude $106^{\circ} 36' 00.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
The Horn	23 16 16.05	203 06 21.37	4.6834349
Cross H	47 02 58.73	226 59 56.83	3.8972595
McKinney	91°17 08.30	271 09 22.03	4.1700658
Buffalo	145 58 31.65	325 54 38.70	4.1196789
Pyrite	358 27 18.70	178 27 54.87	4.6333317

BUFFALO, JOHNSON COUNTY.

Situated on a grassy point on ridge running east and west, about 3 miles north of Buffalo and 3 miles south of Lake De Smet. It is $2\frac{1}{2}$ miles east of Sheridan and Buffalo stage road.

Station mark: A standard iron bench-mark post.

[Latitude $44^{\circ} 24' 56.31''$. Longitude $106^{\circ} 41' 30.26''$, mean of Yellowstone Lake-Sheridan astronomic stations. Latitude $44^{\circ} 24' 53.28''$. Longitude $106^{\circ} 41' 33.16''$, U. S. standard datum.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Azimuth station, Sheridan azimuth.	5 04 27.74	185 04 05.30	3.9049104
McKinney, Fort Steele azimuth....	34 57 34.36	214 53 40.64	4.1114789
McKinney, Sheridan azimuth.....	34 58 02.87	214 54 09.10	4.1114584
Ten Sleep, Sheridan azimuth.....	61 46 22.30	241 29 00.70	4.5743590
Cloud Peak, Sheridan azimuth	84 45 13.80	264 25 02.95	4.5851407
Shell, Sheridan azimuth	123 47 10.45	303 41 39.91	4.0987021
Banner, Sheridan azimuth.....	137 58 13.68	317 48 15.32	4.4489394
Prairie Dog, Sheridan azimuth	166 21 40.71	346 18 59.87	4.3315864
Cross H, Sheridan azimuth	354 21 26.45	174.22 17.18	4.2141446
Cross H, Fort Steele azimuth.....	354 21 03.57	174 21 52.97	4.2141414
Accident, Fort Steele azimuth.....	325 54 38.70	145 58 31.05	4.1196709

CROSS H, JOHNSON COUNTY.

Situated 1 mile south of Cross H ranch and three-fourths of a mile east of Buffalo and Casper stage road, on the northwest corner of mesa.

Station mark: An iron bench-mark post.

Reference mark: A cairn 6 feet high; true azimuth from station mark, $213^{\circ} 28' 17''$; distance, 5.2 feet.

[Latitude $44^{\circ} 16' 05.37''$. Longitude $106^{\circ} 40' 20.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
The Horn	18 47 02.98	198 40 09.80	4.6142975
McKinney.....	122 18 29.64	302 13 45.48	4.0281222
Buffalo.....	174 21 52.97	354 21 02.82	4.2141414
Accident	226 59 56.83	47 02 58.73	3.8972595
Pyrite.....	349 29 43.30	169 33 20.72	4.5823721

"E. K.," JOHNSON COUNTY.

Situated on highest bald knob of long timbered mountain, about 8 miles south of Mayoworth post-office and 5 miles west of "E. K." Mountain. Can be easily approached from the south.

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

Reference mark: A cairn 6 feet high on the highest point of mountain; true azimuth from station mark, $0^{\circ} 15' 49''$; distance, 9.9 feet.

[Latitude $43^{\circ} 47' 01.14''$. Longitude $106^{\circ} 53' 12.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goodwater	0 15 48.53	180 15 43.17	4.5797219
The Horn	194 56 57.59	14 59 00.87	4.1872692
Pyrite	236 02 24.22	56 14 55.40	4.4647547
Sussex	269 30 49.91	89 44 22.50	4.4192950
Tisdale	322 30 01.39	142 45 01.06	4.6829112

GOODWATER, JOHNSON COUNTY.

Situated at head of Spring Creek, about 3 miles west of MacDonald's ranch, on northwest end of high mesa overlooking Buffalo Creek drainage.

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

Reference mark: A cairn 6 feet high; true azimuth from station mark, $70^{\circ} 30' 03''$; distance, 4.5 feet.

[Latitude $43^{\circ} 26' 30.05''$. Longitude $106^{\circ} 53' 20.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
"E. K."	180 15 43.17	0 15 48.53	4.5797219
Sussex	214 40 10.34	34 53 45.77	4.6671543
Tisdale	270 27 09.97	90 42 12.16	4.4699451
Broken Horn	335 43 19.87	155 46 09.07	4.1302162

PYRITE, JOHNSON COUNTY.

A high, red, dome-shaped prairie hill, situated at the head of Dry Creek on the divide between the waters of Powder River and Crazy Woman Creek, about 14 miles east of Ono post-office and 6 miles east of Casper and Buffalo stage road.

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

Reference mark: A cairn 5 feet high, erected on solid pyrite rock 5 feet in diameter and projecting 2 feet above surface; true azimuth from station mark, $72^{\circ} 04' 35''$; distance, 5.6 feet.

[Latitude 43° 55' 47.47". Longitude 106° 35' 08.05".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
"E. K."	56 14 55.40	236 02 24.22	4.464757
The Horn	86 11 48.00	266 01 19.35	4.3067164
Cross H	169 33 20.72	349 29 43.30	4.5823721
Accident	178 27 54.87	358 27 18.70	4.6333317
Sussex	352 50 58.69	172 52 01.17	4.2094748

SUSSEX, JOHNSON COUNTY.

Situated about 7 miles north of Kaycee, and 12 miles northwest of Sussex, on highest point of ridge running north and south; about 2 miles east of north fork of Powder River and 6 miles north of mouth of middle fork of Powder River. It can be reached from Kaycee by following Buffalo road to crossing of north fork and at intersection of Buffalo road with Powder River road take dim road east to foot of ridge one-half mile west of station.

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

Reference mark: A cairn 7 feet high; true azimuth from station mark, 318° 31' 40"; distance, 5.7 feet.

[Latitude 43° 47' 06.70". Longitude 106° 33' 37.87".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goodwater	34 53 45.77	214 40 10.34	4.6671543
"E. K."	89 44 22.50	269 30 49.91	4.4192950
The Horn	123 32 14.31	303 20 44.01	4.4260360
Pyrite	172 52 01.17	352 50 58.69	4.2094748
Tisdale	355 39 16.77	175 40 46.41	4.5862861

THE HORN, JOHNSON COUNTY.

Situated on a high rocky limestone ridge near southern end of mountain range locally known as The Horn, about 3 miles west of Edgar Simmon's house. It can be best reached by following trail from Mr. Simmons's house 2 miles west to summit of The Horn, thence west over rolling and broken country to station.

Station mark: A bronze triangulation tablet cemented in a limestone rock, 24 by 12 by 12 inches, set flush with surface of ground, under center of the quadripod signal.

[Latitude 43° 55' 02.92". Longitude 106° 50' 14.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
"E. K."	14 59 00.87	194 56 57.59	4.1872692
Cross H	198 40 09.80	18 47 02.98	4.6142975
Accident	203 06 21.37	23 16 16.05	4.6834349
Pyrite	266 01 19.35	86 11 48.00	4.3067164
Sussex	303 20 44.01	123 32 14.31	4.4260360

TISDALE, JOHNSON COUNTY.

Situated on a good natural point about 6 miles southeast of Robert Tisdale's house and 1 mile east of southeast corner of Tisdale's pasture. It can be reached from Buffalo and Casper stage road by following south boundary (a wire fence) of the above-mentioned ranch 10 miles, thence 1 mile east to signal.

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

Reference mark: A cairn 7 feet high; true azimuth from station mark, 274° 24' 30"; distance, 5.2 feet.

[Latitude 43° 26' 20.41". Longitude 106° 31' 27.92".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shepherd	20 27 09.14	200 21 36.11	4.4966656
Broken Horn	63 30 45.66	243 18 33.58	4.4285670
Goodwater	90 42 12.16	270 27 09.97	4.4699451
"E. K."	142 45 01.06	322 30 01.39	4.6829112
Sussex	175 40 46.41	355 39 16.77	4.5862861
Rattlesnake	328 50 27.52	148 56 47.40	4.3825343

ALCOVA, NATRONA COUNTY.

A high, flat-topped hill situated about 6 miles (air line) north of Alcova post-office and 3 miles southwest of Gregg's ranch. A quadri-pod signal was erected on highest ground on eastern extremity. Country to south and east broken and without trail. Can best be reached by going to Gregg's ranch and following small creek to summit.

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

[Latitude $42^{\circ} 38' 46.51''$. Longitude $106^{\circ} 46' 15.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pedro	7 56 04.65	187 53 30.24	4.5790943
Reef	205 20 03.63	25 26 32.15	4.4820033
Casper	252 30 57.49	72 47 35.48	4.5452971
Chalk	323 50 30.75	144 02 37.01	4.6202515

BASIN, NATRONA COUNTY.

Situated on a slight elevation 4 miles (air line) north of Casper and 1,000 feet east of wagon road.

Signal: A sawed lumber quadripod.

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

[Latitude $42^{\circ} 54' 18.38''$. Longitude $106^{\circ} 23' 02.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mesa	259 27 48	79 32 15	3.95629
Casper	354 22 56	174 23 50	4.26432

BROKEN HORN, NATRONA COUNTY.

Situated about 7 miles west of crossing of Buffalo and Casper road over south fork of Powder River, on a high point of a ridge bearing north and south, with other points north and south of it having about the same altitude. This ridge is many miles in length and is locally known as the Broken Horn.

Signal: A wooden quadripod 14 feet high erected over center.

Station mark: A rectangular stone 18 by 12 by 12 inches set flush with the ground and covered with cement on which was inscribed "U. S. G. S."

[Latitude $43^{\circ} 19' 51.32''$. Longitude $106^{\circ} 49' 13.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goodwater	155 46 09.07	335 43 19.87	4.1302162
Tisdale	243 18 33.58	63 30 45.66	4.4285670
Rattlesnake	283 10 48.11	103 29 18.43	4.5741938
Piney	307 02 19.00	127 19 48.27	4.6376603
Shepherd	322 59 48.81	143 06 26.44	4.3380093

BROOKS, NATRONA COUNTY.

Situated between 8 and 9 miles southeast of Casper, and 4 miles north of Brook's ranch, and 1,000 feet east of road leading from Casper to this ranch.

Signal: A sawed lumber quadripod.

Station mark: A bronze triangulation tablet cemented in large boulder which is set flush with ground.

[Latitude $42^{\circ} 48' 10.62''$. Longitude $106^{\circ} 08' 38.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sandy	184 01 59	4 02 26	4.10676
Mesa	140 33 13	320 27 52	4.22634

CASPER, NATRONA COUNTY.

Situated on highest point of Casper Mountain, about 8 miles (air line) south of Casper, at the head of "C Y" canyon. Can be approached from Casper by following trail up "C Y" canyon to summit, thence one-half mile east. The rocky knob was cleared of timber and a quadripod signal erected on highest point over center of station.

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

[Latitude $42^{\circ} 44' 25.64''$. Longitude $106^{\circ} 21' 43.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Chalk	11 36 54.80	191 32 26.58	4.6542006
Shirley	14 06 07.38	193 58 16.66	4.8175664
Pedro	39 05 39.20	218 46 29.84	4.7907208
Alcova	72 47 35.48	252 30 57.49	4.5452971
Reef	129 44 44.36	309 34 32.90	4.4240529
Shepherd	153 23 16.75	333 11 07.64	4.7319880
Piney	176 07 34.85	356 06 14.62	4.5960007
Mesa	199 35 14.05	19 38 46.75	4.3256552

CASPER CITY HOSE TOWER, NATRONA COUNTY.

(Not occupied.)

Station mark: Center of tower.

[Latitude $42^{\circ} 50' 57.5''$. Longitude $106^{\circ} 19' 29.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Casper Mountain.....	14 10 11	194 08 40	4. 09595
Reef	101 46 39	291 34 56	4. 37956

MESA, NATRONA COUNTY.

On the northwest end of the prominent mesa bearing northwest to southeast and situated 5 miles northeast of Casper and $2\frac{1}{2}$ miles east of Buffalo and Salt Creek road.

Signal: A sawed lumber quadripod.

Station mark: A bronze triangulation tablet cemented in large granite rock, which was set under center of signal, flush with ground.

[Latitude $42^{\circ} 55' 11.77''$. Longitude $106^{\circ} 16' 30.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Casper Mountain.....	19 38 46.75	199 35 14.05	4. 3256552
Reef	83 54 14.02	263 40 28.51	4. 4419929
Piney	153 22 01.31	333 17 07.52	4. 3370474

PINEY, NATRONA COUNTY.

On a mesa-like ridge in T. 36 N., R. 80 W., 20 miles north of Casper and 2 miles west of road from Casper to Salt Creek oil wells; it is one-half mile east of a rocky hill covered with pine timber and 5 miles south of spring locally known as "C Y horse ranch."

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

Reference mark: A cairn 5.5 feet high; true azimuth from station mark, $144^{\circ} 17' 30''$; distance, 3.7 feet.

[Latitude $43^{\circ} 05' 41.00''$. Longitude $106^{\circ} 23' 41.29''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reef	38 23 37.29	218 14 44.14	4. 4558186
Shepherd.....	112 24 53.93	292 14 02.96	4. 3666570
Broken Horn	127 19 48.27	307 02 19.00	4. 6376603
Rattlesnake.....	186 21 14.30	6 22 13.71	4. 2479154
Mesa	333 17 07.52	153 22 01.31	4. 3370474
Casper	356 06 14.62	176 07 34.85	4. 5960007

RATTLESNAKE, NATRONA COUNTY.

Situated on highest point or ridge between Teapot and Castle Creek, 4 miles west of Casper and Oilcity wagon road and 4 miles west of "Teapot Rock." It is 8 miles north of spring known as "CY horse ranch" on wagon road referred to.

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

Reference mark: A cairn 6 feet high; true azimuth from station mark, $47^{\circ} 46' 14''$; distance, 4.8-feet.

[Latitude $43^{\circ} 15' 10.96''$. Longitude $106^{\circ} 22' 14.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Piney	6 22 13.71	186 21 14.30	4.2749154
Shepherd.....	69 37 56.74	249 26 05.36	4.3984782
Broken Horn	103 29 18.43	283 10 48.11	4.5741938
Tisdale	148 56 47.40	328 50 27.52	4.3825343

REEF, NATRONA COUNTY.

On highest point of a ridge bearing northwest and southeast, locally known as "The Reefs," about 14 miles west-northwest of Casper and 3 miles south of Casper and Lander stage road.

Signal: A sawed lumber quadripod.

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

[Latitude $42^{\circ} 53' 34.77''$. Longitude $106^{\circ} 36' 43.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pedro	15 45 59.12	195 36 57.05	4.8293235
Alcova	25 26 32.15	205 20 03.63	4.4820033
Shepherd.....	172 59 00.62	352 57 04.44	4.4980832
Piney	218 14 44.14	38 23 37.29	4.4558186
Mesa	263 40 28.51	83 54 14.02	4.4419929
Casper	309 34 32.90	129 44 44.36	4.4240529

SANDY, NATRONA COUNTY.

A secondary station on the highest sand hill about 10 miles east-northeast of Casper and 4 miles north of Platte River.

Station mark: A hole drilled 1 inch deep in a quartzite rock set flush with surface of ground.

[Latitude $42^{\circ} 55' 03.98''$. Longitude $106^{\circ} 07' 59.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brooks	4 02 26	184 01 59	4. 10676
Casper	43 37 23	223 28 03	4. 43418
Mesa	91 14 16	271 08 28	4. 06451

SHEPHERD, NATRONA COUNTY.

Situated on a high knob on a divide between the waters of Casper Creek and the south fork of Powder River; 4 miles west of road from Casper to Buffalo and 5 miles northwest of Hemingway's road ranch.

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

Reference mark: A cairn 6 feet high; true azimuth from station mark, $85^{\circ} 55' 56''$; distance, 4.4 feet.

[Latitude $43^{\circ} 10' 27.34''$. Longitude $106^{\circ} 39' 33.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Broken Horn	143 06 26.44	322 59 48.81	4. 3380093
Tisdale	200 21 36.11	20 27 09.14	4. 4966656
Rattlesnake	249 26 05.36	69 37 56.74	4. 3984782
Piney	292 14 02.96	112 24 53.93	4. 3666570
Casper Mountain	333 11 07.64	153 23 16.75	4. 7319880
Reef	352 57 04.44	172 59 00.62	4. 4980832

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