

Bulletin No. 216

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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

RESULTS

OF

PRIMARY TRIANGULATION AND PRIMARY TRAVERSE

FISCAL YEAR 1902-03

BY

SAMUEL S. GANNETT



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GOVERNMENT PRINTING OFFICE
1903

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C., June 1, 1903.

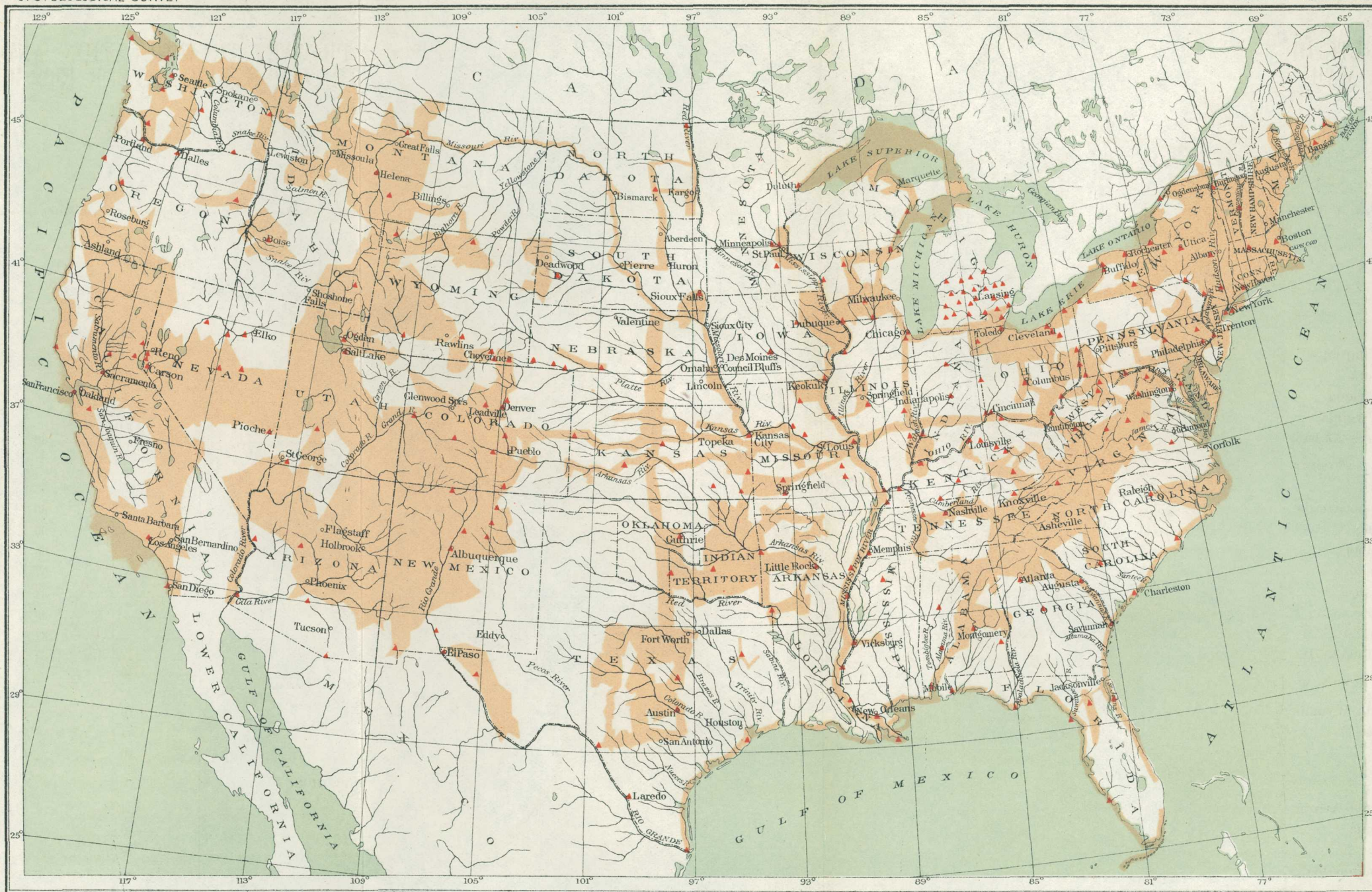
SIR: I have the honor to transmit herewith; in form for publication, the results of the primary triangulation and primary traverse executed by the United States Geological Survey during the fiscal year 1902-3.

The results were computed by Messrs. A. H. Thompson, George T. Hawkins, C. F. Urquhart, H. L. Baldwin, jr., R. H. Chapman, Sledge Tatum, E. L. McNair, J. R. Ellis, L. Scott Smith, and Gilbert Young, under the direction of Mr. S. S. Gannett, who likewise compiled them for publication.

Very respectfully,

R. U. GOODE,
Chairman Topographic Committee.

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



MAP SHOWING CONDITION OF ASTRONOMIC LOCATION AND PRIMARY CONTROL

JULIUS BIEN & CO. LITH. N.Y.

Areas tinted are controlled by triangulation or traverse

▲ Astronomic station

to April 30, 1903

100 0 100 200 300 400 500 600 MILES

RESULTS OF PRIMARY TRIANGULATION AND PRIMARY TRAVERSE, FISCAL YEAR 1902-3.

By SAMUEL S. GANNETT.

SUMMARY.

Summary of published results, 1902-3: Triangulation, primary traverse, and meridian marks.

Locality.	Triangulation stations.	Traverse stations.	Meridian marks.
ATLANTIC SECTION.			
Maine	23		
New Hampshire	9		
New York	39	112	3
Pennsylvania	5		
West Virginia	69		
Tennessee-Alabama		66	
CENTRAL SECTION.			
Ohio	96	53	
Alabama-Georgia		85	
Kentucky		95	
Mississippi		65	
Illinois		57	
Michigan		34	
Missouri		56	
Kansas		137	
North Dakota-Minnesota		34	
ROCKY MOUNTAIN SECTION.			
Colorado-Wyoming	19		
Arizona	34		
Utah	10		
PACIFIC SECTION.			
California-Arizona	64		
California	10		
Oregon	12		
Washington-Idaho	20		
Total	410	794	3

ATLANTIC SECTION OF TOPOGRAPHY.

H. M. WILSON, *Geographer in charge*

MAINE.

TRIANGULATION STATIONS.

Mr. E. L. McNair, topographer, extended triangulation northward from Sabattus-Blue, United States Coast and Geodetic Survey stations, occupying 19 and locating 6 stations for the control of 11 fifteen-minute quadrangles in the Kennebec Valley. Positions are given on the U. S. standard datum.

SABATTUS, ANDROSCOGGIN COUNTY.

A station of the United States Coast and Geodetic Survey on Sabattus Hill in town of Wales, $4\frac{1}{2}$ miles south of Leeds Junction.

Station mark: A copper bolt sunk in solid rock.

[Latitude $44^{\circ} 08' 37.83''$. Longitude $70^{\circ} 04' 43.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue	162 10 18.59	341 59 13.88	4.8340499
Moose Hill	173 26 06.70	353 23 49.26	4.5801167
York	189 22 31.33	9 26 54.88	4.7077893
Quaker	216 39 30.16	36 52 13.48	4.6073824

BANNOCK, FRANKLIN COUNTY.

In town of Industry, on well-known hill of that name.

Station mark: A bronze tablet cemented in solid rock about 20 feet south of highest point of rock and 2 or 3 feet lower.

Reference marks: (1) Anchor bolt 8.10 feet distant; true azimuth $34\frac{1}{2}^{\circ}$. (2) Anchor bolt 8.25 feet distant; true azimuth 129° . (3) Anchor bolt 5.25 feet distant; true azimuth 206° .

[Latitude $44^{\circ} 44' 02.70''$. Longitude $70^{\circ} 02' 24.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Moose Hill	14 58 01.34	194 54 05.13	4.4591095
Blue	88 32 15.06	268 19 28.61	4.3797228
New Portland	179 55 44.92	359 55 44.28	4.2057468
Jewett	227 00 01.05	47 10 16.74	4.4184434
Bigelow	275 12 31.98	95 25 43.35	4.3953903
York	341 03 26.83	161 06 13.61	4.2073497

BLUE, FRANKLIN COUNTY.

A station of the United States Coast and Geodetic Survey on well-known mountain in town of Avon.

Station mark: An iron bolt originally standing 4 or 5 inches out of rock, but now broken off to surface of rock. Chisel mark around bolt.

[Latitude 44° 43' 41.44". Longitude 70° 20' 33.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
New Portland	234 56 22.30	55 09 09.08	4.4650491
Bannock	268 19 28.61	88 32 15.06	4.3799228
York	296 24 29.69	116 40 01.98	4.5140188
Quaker	305 35 39.96	125 59 33.68	4.7447113
Moose Hill	328 29 22.86	148 38 11.41	4.5027541
Sabattus	341 59 13.88	162 10 18.59	4.6073824

MOOSE HILL, FRANKLIN COUNTY.

A prominent bare hill in town of East Livermore, about 3 miles east of Livermore Falls. Land owned by F. H. Record & Bro.

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

Reference marks: (1) A hole drilled 1 inch deep in large boulder 38.5 feet distant; true azimuth 292° 43'. (2) A hole drilled 8 inches deep in solid ledge 51.8 feet distant; true azimuth 305° 16'.

[Latitude 44° 29' 01.78". Longitude 70° 08' 00.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue	148 38 11.41	328 29 22.86	4.5027541
Bannock	194 54 05.13	14 58 01.34	4.4591095
York	225 10 42.76	45 17 25.10	4.2513055
Quaker	280 28 45.10	100 43 48.54	4.4625629
Sabattus	353 23 49.26	173 26 06.70	4.5801167

YORK, FRANKLIN COUNTY.

On a bare hill, about 3 miles south of New Sharon, in New Sharon Township, on land owned by Harry B. York.

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

Reference marks: (1) A hole $\frac{1}{2}$ inch in diameter drilled $1\frac{1}{2}$ inches deep in solid ledge distant 23.65 feet; true azimuth 176° 46'. (2) A hole $\frac{1}{2}$ inch in diameter drilled 2 inches deep in solid ledge distant 27.90 feet; true azimuth 284° 37'.

[Latitude $44^{\circ} 35' 48.70''$. Longitude $69^{\circ} 58' 26.87''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sabattus	9 26 54.88	189 22 31.33	4.7077893
Moose Hill	45 17 25.10	225 10 42.76	4.2513055
Blue	116 40 01.98	296 24 29.69	4.5140188
Bannock	161 06 13.61	341 03 26.83	4.2073497
Bigelow	236 24 05.13	56 34 28.79	4.3700654
Quaker	318 27 37.50	138 35 59.68	4.3781818

QUAKER, KENNEBEC COUNTY.

On Quaker Hill, in town of Sidney, about 6 miles east by road from Belgrade station.

Station mark: An iron ring bolt in solid rock. (Ring above surface.)

[Latitude $44^{\circ} 26' 08.81''$. Longitude $69^{\circ} 46' 30.61''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sabattus	36 52 13.48	216 39 30.16	4.6073824
Moose Hill	100 43 48.54	280 28 45.10	4.4625629
Blue	125 59 33.68	305 35 39.96	4.7447113
York	138 35 59.68	318 27 37.50	4.3781818
Bigelow	186 57 19.39	6 59 19.47	4.4923970

BAKER, PISCATAQUIS COUNTY.

A high, timbered mountain east of Lily Bay, Moosehead Lake. Reached by log roads from Lily Bay House, a 10-mile walk.

Station mark: A bronze triangulation tablet cemented in irregular-shaped boulder.

[Latitude $45^{\circ} 34' 16.28''$. Longitude $69^{\circ} 23' 39.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Squaw	68 50 52.90	248 37 17.0	4.42531
Kineo	118 27 30.00	298 12 58.1	4.47728
Big Spencer			4.34061
Barren	353 55 42.75	173 56 43.0	4.23972

BALD, PISCATAQUIS COUNTY.

(Not occupied.)

A high, bald mountain, about 10 miles west of Blanchard. Can be best reached by going from Forks of Kennebec River over log road (6 miles) to Moxie Pond, thence by boat to Merrills Camp, at Mosquito Narrows. A walk of two and one-fourth hours from Moxie Pond. No trail. Merrills Camp can also be reached by walk of 7 miles over old road from Pleasant Pond.

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

[Latitude $45^{\circ} 15' 50.46''$. Longitude $69^{\circ} 46' 20.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Moxie			4. 06021
Squaw			4. 39678
Russell			4. 10953

BARREN, PISCATAQUIS COUNTY.

A rough mountain, having a bare, rocky summit, about 4 miles north of Onawa station. Take rowboat to foot of mountain. No trail.

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

[Latitude $45^{\circ} 24' 56.89''$. Longitude $69^{\circ} 22' 15.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Russell	43 15 11.58	223 04 47.89	4. 4459388
Squaw	106 02 42.19	285 48 07.13	4. 4432271
Baker	173 56 43.00	353 55 42.75	4. 2397200
Guilford	357 34 12.67	177 34 41.57	4. 3204474

BIG SPENCER, PISCATAQUIS COUNTY.

(Not occupied.)

Situated on the west end of Big Spencer Mountain, east of Moosehead Lake. Summit timbered. Good view.

Station mark: A hole $1\frac{1}{2}$ inches deep drilled in solid rock.

[Latitude $45^{\circ} 45' 41.80''$. Longitude $69^{\circ} 28' 01.58''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Squaw			4. 55944
Baker			4. 34061

BOARSTONE, PISCATAQUIS COUNTY.

(Not occupied.)

On highest point of a steep, bare, rocky peak, just north of the Canadian Pacific Railway, and about 2 miles from Onawa station.

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

[Latitude $45^{\circ} 22' 38.60''$ Longitude $69^{\circ} 24' 15.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Russell	4.36273
Guilford	4.23016

GUILFORD, PISCATAQUIS COUNTY.

On rocky point of timbered mountain, about 4 miles north of Guilford. Reached by driving to farm of Charles Howard, then walking from his house.

Station mark: A bronze triangulation tablet cemented in solid rock on highest part of hill.

[Latitude $45^{\circ} 13' 40.03''$ Longitude $69^{\circ} 21' 34.85''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stickney	39 00 49.07	218 48 20.34	4.5658139
Russell	91 36 31.97	271 25 40.43	4.3016147
Barren	177 34 41.57	357 34 12.67	4.3204474

KINEO, PISCATAQUIS COUNTY.

(Not occupied.)

Situated on the well-known mountain of that name on Moosehead Lake. Highest part of hill is timbered and view is cut off to the north.

Station mark: A bronze tablet cemented in solid rock.

[Latitude $45^{\circ} 41' 57.69''$ Longitude $69^{\circ} 43' 59.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Baker	298 12 58	118 27 30	4.47728
Squaw	356 02 48	176 03 42	4.37946

RUSSELL, PISCATAQUIS COUNTY.

A well-known mountain in town of Blanchard, about 4 miles southwest of Blanchard station. Road to Tyler's farm within forty-five minutes' walk of top of mountain.

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

[Latitude 45° 13' 57.22". Longitude 69° 36' 52.58'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Stickney	5 58 34.54	185 56 55.86	4.4672024
Foss			4.2631400
Fletcher	50 15 46.48	230 01 53.98	4.5241413
Moxie	82 41 08.14	262 29 13.63	4.3453459
Bald			4.1095300
Squaw	164 46 07.49	344 41 57.87	4.4624148
Barren	223 04 47.89	43 15 11.58	4.4459388
Guilford	271 25 40.43	91 36 31.97	4.3016147

SQUAW, PISCATAQUIS COUNTY.

A well-known mountain about 4 miles west of Greenville Junction. Take boat to Squaw Brook (5 miles) and stop at Hatchery or Shaw's lumber camp, thence by log roads to near top of mountain.

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

[Latitude 45° 29' 03.48". Longitude 69° 42' 43.41'.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bald			4.3967800
Moxie	24 54 34.00	204 46 47.49	4.5312302
Kineo	176 03 42.00	356 02 47.70	4.3794600
Big Spencer			4.5594400
Baker	248 37 17.00	68 50 52.90	4.4253100
Barren	285 48 07.13	106 02 42.19	4.4432271
Russell	344 41 57.87	164 46 07.49	4.4624148

BIGELOW, SOMERSET COUNTY.

Situated on a prominent and well-known cleared hill 3½ miles south of Skowhegan.

Station mark: An iron bolt in solid ledge of rock.

Reference marks: (1) A hole drilled 2 inches deep in solid rock distant 81½ feet; true azimuth 307° 28'. (2) A hole drilled 2 inches deep in solid rock distant 51½ feet; true azimuth 17° 18'.

[Latitude 44° 42' 48.06". Longitude 69° 43' 39.65".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quaker	6 59 19.47	186 57 19.39	4.4923970
York	56 34 28.79	236 24 05.13	4.3700654
Bannock	95 25 43.35	275 12 31.98	4.3953903
New Portland	126 42 01.50	306 28 48.48	4.4886529
Jewett	164 43 07.16	344 40 10.34	4.3199458
Stickney	191 37 06.09	11 40 14.80	4.4644220
Fogg	210 14 54.43	30 18 53.15	4.1698850

FLETCHER, SOMERSET COUNTY.

A timbered mountain in town of Concord, about 4 miles west of Bingham.

Station mark: A bronze tablet cemented in boulder.

Reference marks: (1) A hole drilled 2 inches deep in highest boulder on mountain, distant 41.18 feet; true azimuth 156° 38'. (2) Stump of spruce tree 22½ feet high, distant 44.6 feet; true azimuth 232° 20'.

[Latitude 45° 02' 23.26". Longitude 69° 56' 27.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
New Portland	23 41 03.81	203 36 52.91	4.2912680
Moxie	191 09 52.28	11 11 51.26	4.2770157
Russell	230 01 53.98	50 15 46.48	4.5241413
Foss	258 32 58.00	78 43 44.00	4.3088370
Stickney	288 45 01.11	108 57 13.18	4.3794348
Jewett	324 53 02.64	144 59 07.68	4.2945517

FOGG, SOMERSET COUNTY.

Situated in town of Cornville, on a bare hill about 6 miles northeast on Skowhegan, on land owned by C. M. Fogg.

Station mark: A bronze tablet cemented in solid rock.

[Latitude 44° 49' 41.74". Longitude 69° 31' 00.57".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bigelow	30 18 53.15	210 14 54.43	4.1698850
Jewett	119 43 41.16	299 36 44.97	4.1734321
Stickney	174 20 16.93	354 19 26.58	4.1998577

FOSS, SOMERSET COUNTY.

On a bare rocky mountain, about 2 miles east of Brighton, on land owned by Mr. Foss.

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

[Latitude $45^{\circ} 04' 33.20''$. Longitude $69^{\circ} 41' 14.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fletcher	78 43 44	258 32 58	4.808837
Moxie			4.339000
Russell			4.263140
Stickney	347 06 01	167 07 28	4.081205

JEWETT, SOMERSET COUNTY.

On a bare hill with lone birch tree, about 10 miles north of Skowhegan, in Madison Township.

Station mark: A bronze tablet cemented in solid rock.

[Latitude $44^{\circ} 53' 40.81''$. Longitude $69^{\circ} 47' 50.57''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bannock	47 10 16.74	227 00 01.05	4.4184434
New Portland	84 46 12.70	264 35 55.59	4.2849545
Fletcher	144 59 07.68	324 53 02.64	4.2945517
Stickney	233 32 44.76	53 38 51.08	4.1501819
Fogg	299 36 44.97	119 43 41.16	4.1734321
Bigelow	344 40 10.34	164 43 07.16	4.3199458

MOXIE, SOMERSET COUNTY.

A well-known mountain, about 15 miles north of Bingham. Can be reached from Pleasant Pond via log roads by walking 8 or 9 miles. Can be reached also by leaving road up Kennebec River at Berrys, about 8 miles above Bingham, and going over Kate Hill.

Station mark: A bronze tablet cemented in solid rock.

Reference mark: A hole drilled 2 inches deep in solid ledge 63.7 feet distant; true azimuth $121^{\circ} 06'$.

[Latitude 45° 12' 24.64". Longitude 69° 53' 39.21".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fletcher	11 11 51.26	191 09 52.28	4.2770157
Squaw	204 46 47.49	24 54 34.00	4.5312302
Bald			4.0602100
Russell	262 29 13.63	82 41 08.14	4.3453459
Foss			4.3390000
Stickney	324 07 20.15	144 17 34.38	4.5109590

NEW PORTLAND, SOMERSET COUNTY.

In town of New Portland, about 2 miles east of New Portland post-office, on a high, bare hill owned by C. A. McKenny.

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

[Latitude 44° 52' 42.97". Longitude 70° 02' 25.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Blue	55 09 09.08	234 56 22.30	4.4650491
Fletcher	203 36 52.91	23 41 05.81	4.2912680
Jewett	264 35 55.59	84 46 12.70	4.2849545
Bigelow	306 28 48.48	126 42 01.50	4.4886529
Bannock	359 55 44.28	179 55 44.92	4.2057468

STICKNEY, SOMERSET COUNTY.

Situated in town of Athens, about 3½ miles north of Athens village.

Station mark: A bronze tablet cemented in solid rock.

[Latitude 44° 58' 12.49". Longitude 69° 39' 11.90".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bigelow	11 40 14.80	191 37 06.09	4.4644220
Jewett	53 38 51.08	233 32 44.76	4.1501819
Fletcher	108 57 13.18	288 45 01.11	4.3794348
Moxie	144 17 34.38	324 07 20.15	4.5109590
Foss	167 07 28.00	347 06 01.00	4.0812050
Russell	185 56 55.86	5 58 34.54	4.4672024
Guilford	218 48 20.34	39 00 49.07	4.5658139
Fogg	354 19 26.58	174 20 16.93	4.1998577

NEW HAMPSHIRE.

TRIANGULATION STATIONS.

Two fifteen-minute quadrangles in the southern portion of the State, covering portions of Hillsboro and Rockingham counties, were controlled by Mr. George T. Hawkins, who occupied six triangulation stations and located three others by intersections in May, 1903.

This work is based upon the positions of Unkonoonuc and Mason, United States standard datum of the Coast and Geodetic Survey.

FEDERAL, HILLSBORO COUNTY.

In the town of Milford, on the north slope of Federal Hill, $2\frac{1}{4}$ miles south of village of Milford, on land owned by Mr. Jewett and one-fourth mile east of his residence. The highest part of the hill is about 500 feet south of station and covered with high pine timber. Station located on north slope in order to see other signals.

Station mark: A bronze triangulation tablet cemented in solid ledge of granite.

[Latitude $42^{\circ} 48' 21.09''$. Longitude $71^{\circ} 37' 55.12''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mason	68 18 46.9	248 11 24.9	4.20218
Mount Vernon	163 19 21.9	343 17 51.9	4.01970
Unkonoonuc	190 08 54.6	10 10 40.6	4.30159
Turkey	233 54 48.6	53 59 07.9	4.02994

HUDSON, HILLSBORO COUNTY.

Is in town of Hudson, 4 miles northeast of Nashua, on bald hill (except for growth of pines on west end which prevents sight to Nashua), on land owned by Mr. A. C. Cross, and 200 yards south-west of his residence.

Station mark: A bronze triangulation tablet set in granite ledge.

[Latitude $43^{\circ} 47' 07.24''$. Longitude $71^{\circ} 23' 35.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Turkey	128 20 48.6	308 15 23.2	4.14157
Derry	185 34 45.9	5 35 23.7	4.11220

MANCHESTER, HILLSBORO COUNTY.

(Not occupied.)

A stone observatory in a park in northeast part of the city of Manchester.

Station mark: Center of observatory.

[Latitude $43^{\circ} 00' 04.3''$. Longitude $71^{\circ} 26' 21.1''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Unkonoonuc	80 47 50.7	260 41 43.6	4.09187
Derry	335 37 56.2	155 40 27.1	4.08553

MASON, HILLSBORO COUNTY.

A triangulation station of the United States Coast and Geodetic Survey south of Mason village on a hill locally known as "Barrett Hill."

Station mark: A hole drilled in solid rock around which is drilled a triangle.

[Latitude $42^{\circ} 45' 09.81''$. Longitude $71^{\circ} 48' 45.96''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Vernon	216 27 34.9	36 33 27.4	4.29670
Federal	248 11 24.9	68 18 46.9	4.20218
Nashua	268 00 51.9	88 14 39.0	4.44278

MOUNT VERNON, HILLSBORO COUNTY.

(Not occupied.)

A flag pole on dome of large summer hotel in town of Mount Vernon and a short distance east of village of same name.

[Latitude $42^{\circ} 53' 45.8''$. Longitude $71^{\circ} 40' 07.4''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mason	36 33 27.4	216 27 34.9	4.29670
Unkonoonuc	214 02 28.9	34 03 58.6	4.06739
Turkey	287 38 37.9	107 43 32.9	4.08779
Federal	343 17 51.9	163 19 21.9	4.01968

NASHUA, HILLSBORO COUNTY.

(Not occupied.)

The highest smokestack in the city of Nashua and about one-fourth mile west from business portions of the city.

Station mark: Center of smokestack.

[Latitude $43^{\circ} 45' 39.1''$. Longitude $71^{\circ} 28' 27.6''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mason	88 14 39.0	268 00 51.90	4.44278
Unkonoonnuc	159 19 22.7	339 14 42.6	4.42189

TURKEY, HILLSBORO COUNTY.

On a bald hill $1\frac{1}{2}$ miles west of the village of Merrimack, in town of Merrimack.

Station mark: The small pine signal tree 8 inches in diameter marked "U. S." near base.

[Latitude $42^{\circ} 51' 45.50''$. Longitude $71^{\circ} 31' 33.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Federal	53 59 07.93	233 54 48.63	4.02994
Mount Vernon	107 43 32.90	287 38 37.90	4.08779
Unkonoonnuc	159 07 43.20	339 05 09.60	4.15668
Derry	250 25 30.20	70 31 33.70	4.10925
Hudson	308 15 23.20	128 20 48.60	4.14157

UNKONOONUC, HILLSBORO COUNTY.

A triangulation station of the United States Coast and Geodetic Survey, in Goffstown, 10 miles west of Manchester, on the easterly summit of Unkonoonnuc Mountain.

Station mark: A hole drilled in solid rock.

[Latitude $42^{\circ} 58' 59.86''$. Longitude $71^{\circ} 35' 19.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Federal	10 10 40.6	190 08 54.6	4.30159
Mount Vernon	34 03 58.6	214 02 28.9	4.06739
Manchester	260 41 43.6	80 47 50.7	4.09187
Derry	297 46 53.6	117 55 31.1	4.28958
Turkey	339 05 09.6	159 07 43.2	4.15668

DERRY, ROCKINGHAM COUNTY.

In town of Londonderry, 3 miles a little north of west from village of Derry, 270 feet south of schoolhouse No. 8 on northwest of slope of hill. The summit, which is about 400 feet southeast of station, is covered by dense growth of pine.

Station mark: A bronze triangulation tablet cemented in large granite boulder.

[Latitude $42^{\circ} 54' 04.85''$. Longitude $71^{\circ} 22' 39.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hudson	5.35 23.7	185 34 45.9	4.11220
Turkey	70 31 33.7	250 25 30.2	4.10925
Unkonoonic	117 55 31.1	297 46 53.6	4.28958
Manchester	155 40 27.1	335 37 56.2	4.08553

NEW YORK.

TRIANGULATION STATIONS.

Mr. A. H. Thompson, geographer, extended triangulation westward from the vicinity of Olean nearly to the western border of the State, controlling 4 quadrangles in Cattaraugus and Chautauqua counties and he also located by triangulation 5 stations for the control of 2 quadrangles in Wyoming and Livingston counties.

Mr. Oscar Jones, topographer, controlled by triangulation the Carthage quadrangle in Lewis County by locating 5 stations from the line Elmer-Rock.

Mr. McNair controlled 2 fifteen-minute quadrangles in Genesee County by locating 5 stations from Conesus, Perry, and Scottsville. Positions are given on the U. S. standard datum.

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 $42^{\circ} 31' 02.22''$. Longitude $78^{\circ} 14' 36.23''$.]

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

FOSTER, CATTARAUGUS COUNTY.

Situated in the southern part of Mansfield Township, on a high hill about $1\frac{1}{2}$ miles a little east of north from the village of Little Valley, on land owned by A. Forster.

Station mark: A sandstone post 40 by 6 by 6 inches set under center of signal 36 inches in the ground, with bronze triangulation tablet cemented in top of post.

[Latitude $42^{\circ} 15' 57.91''$. Longitude $78^{\circ} 47' 23.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shutt	27 47 17.15	207 45 45.85	3.8248931
Tuy	104 24 10.02	284 18 42.06	4.0618700
McCarty	278 32 59.92	98 37 03.83	3.9246544
Townsend	334 32 40.94	154 36 17.21	4.2356988

LEARN, CATTARAUGUS COUNTY.

Situated in Ischua Township, 3 miles west of Bennett Creek post-office on land owned by Mr. Learn.

Station mark: A copper bolt sunk in granite post 4 feet long; bolt marked "U. S. G. S. 478 N. Y."

[Latitude $42^{\circ} 14' 13.27''$. Longitude $78^{\circ} 25' 53.77''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Flatiron	2 37 16.90	182 36 45.90	4.3683237
Townsend	61 05 16.40	240 54 26.5	4.4047580
McCarty	95 23 17.70	275 12 54.38	4.3293244
Mullaly	110 05 03.20	289 54 18.15	4.3689371

M'CARTY, CATTARAUGUS COUNTY.

Situated near the north line of Great Valley Township on a high hill $1\frac{1}{2}$ miles a little west of north of Ellicottville village on land owned by Daniel McCarty.

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

[Latitude $42^{\circ} 15' 17.24''$. Longitude $78^{\circ} 41' 20.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Townsend	3 44 43.06	183 44 15.72	4.1558183
Shutt	67 52 46.09	247 47 11.02	4.0914180
Foster	98 37 03.83	278 32 59.92	3.9246544
Mullaly	173 05 56.29	353 05 34.88	3.7830230
Learn	275 12 54.38	95 23 17.70	4.3293244

MULLALY, CATTARAUGUS COUNTY.

Situated on a high hill about $2\frac{1}{2}$ miles a little west of north from the village of Ellicottville, Ellicottville Township, on land owned by P. Mullaly.

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

[Latitude $42^{\circ} 18' 32.42''$. Longitude $78^{\circ} 41' 52.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shutt	45 05 04.96	224 59 51.10	4.1794295
Tuy Hill	84 15 23.73	264 06 06.09	4.2751144
Learn	289 54 18.15	110 05 03.20	4.3689371
McCarty	353 05 34.88	173 05 56.29	3.7830230

PINE HILL, CATTARAUGUS COUNTY.

Situated in lot 36 in Randolph Township, 4 miles south of the village of Randolph, on a high hill known as Pine Hill. Land owned by C. B. Bartlett.

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

[Latitude $42^{\circ} 06' 17.90''$. Longitude $78^{\circ} 59' 26.35''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Walrod	96 17 22.90	276 12 20.07	4.0185994
Highland	131 52 02.68	311 45 06.34	4.2811005
Tuy	194 33 14.35	14 35 52.35	4.3313226
Shutt	228 17 48.54	48 24 22.49	4.2560628
Townsend	264 17 50.31	84 29 30.93	4.3823034
Read	295 26 28.45	115 27 19.07	3.2836340

READ, CATTARAUGUS COUNTY.

Situated in the southern part of Randolph Township, in lot 10 of the Holland Company land survey, on a high hill known locally as "Mount Tuy." It is .5 miles south of village of East Randolph on land owned by B. Read.

Station mark: A stone post 40 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 42° 05' 51.14". Longitude 78° 58' 40.84".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pine	115 27 19.07	295 26 28.45	3.2836340
Shutt	222 27 45.78	42 33 28.58	4.2399748
Townsend	261 46 44.90	81 57 34.84	4.3520529

SHUTT, CATTARAUGUS COUNTY.

Situated in the eastern part of Napoli Township close to the Napoli and Little Valley Township line and about 4 miles southwest of Little Valley Village, on a high hill owned by John Shutt, known locally as Shutt's Hill.

Station mark: A stone post 40 by 6 by 6 inches set under center of signal 36 inches in the ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude 42° 12' 46.31". Longitude 78° 49' 39.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Foster	207 45 45.85	27 47 17.15	3.8248931
Read	42 33 28.58	222 27 45.78	4.2399748
Pine Hill	48 24 22.49	228 17 48.54	4.2560628
Tuy Hill	137 26 37.30	317 22 40.81	4.0760509
Mullaly	224 59 51.10	45 05 04.96	4.1794295
McCarthy	247 47 11.02	67 52 46.09	4.0914180
Townsend	312 27 23.39	132 32 30.71	4.1538723

TOWNSEND, CATTARAUGUS COUNTY.

Situated in Salamanca Township on what is locally known as "Townsend's Hill," about 3 miles southeast of Salamanca. There is a private road from the village of Salamanca to the station.

Station mark: Iron bench mark post marked "U. S. Geological Survey B. M. 480."

Theodolite elevated 15 feet.

[Latitude $42^{\circ} 07' 34.25''$. Longitude $78^{\circ} 42' 01.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Read	81 57 34.84	261 46 44.90	4.3520529
Pine	84 29 30.93	264 17 50.31	4.3823034
Shutt	132 32 30.71	312 27 23.39	4.1538723
Foster	154 36 17.21	334 32 40.94	4.2356988
McCarty	183 44 15.72	3 44 43.06	4.1558183
Learn	240 54 26.50	61 05 16.40	4.4047580

TUY HILL, CATTARAUGUS COUNTY.

Situated in the western part of New Albion Township, about 2 miles west of the village of New Albion, on a high hill known locally as Tuy Hill.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground under center of signal; in center of top of post is cemented a bronze triangulation tablet.

[Latitude $42^{\circ} 17' 30.59''$. Longitude $78^{\circ} 55' 31.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Foster	284 18 42.06	104 24 10.02	4.0618700
Mullaly	264 06 06.09	84 15 23.73	4.2751144
Pine	14 35 52.25	194 33 14.35	4.3313326
Walrod	38 49 59.78	218 42 18.39	4.4007680
Highland	67 50 11.25	247 40 35.99	4.3260574
Shutt	317 22 40.81	137 26 37.30	4.0760509

BATES, CHAUTAUQUA COUNTY.

Located in the northwestern part of Harmony Township on a commanding hill owned by George C. Bates, about one-fourth mile from the road between Sherman and Harmony townships.

Station mark: A stone post 40 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 42° 08' 24.02". Longitude 79° 31' 24.55".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clymer	29 53 24.01	209 50 37.21	4.0600192
Dewey	77 07 15.77	257 05 29.53	3.5717872
Caselar	158 49 07.99	338 48 11.00	3.7317280
Haynes	235 16 22.46	55 22 58.15	4.2159901
Highland	253 26 35.25	73 35 06.77	4.4923832
Meas	270 06 18.84	90 18 08.34	4.3853254
Panama	356 56 53.53	176 57 05.88	3.9004001

BUSTI, CHAUTAUQUA COUNTY.

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

Station mark: A stone post 40 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 42° 06' 32.55". Longitude 79° 16' 25.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Panama	108 08 36.83	287 58 46.96	4.3286072
Meas	194 05 59.78	14 07 45.77	4.1734905
Highland	201 20 39.98	21 25 02.32	4.4000139
Walrod	227 50 04.10	47 56 24.17	4.2451027

CASELAR, CHAUTAUQUA COUNTY.

Located in the southwestern corner of Chautauqua Township, on land owned by Mr. Caselar.

Station mark: A stone post 40 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 42° 11' 06.96". Longitude 79° 32' 49.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dewey	16 03 44.36	196 02 55.06	3.7851533
Haynes	254 18 23.71	74 25 56.60	4.2057444
Bates	338 48 11.00	158 49 07.99	3.7317280

CLYMER, CHAUTAUQUA COUNTY.

(Not occupied.)

About 3 miles northwest of the village of Clymer.

Station mark: A tall oak tree standing alone and in full view from all the surrounding country.

[Latitude 42° 03' 01.31". Longitude 79° 35' 33.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Dewey	192 49 38.79	12 50 39.43	3.9712038
Bates	209 50 37.21	29 53 24.01	4.0600192
Panama	251 47 45.19	71 50 43.22	3.8107174

DEWEY, CHAUTAUQUA COUNTY.

Located in Sherman Township, about 2 miles southeast of Sherman village, on land owned by Mr. Dewey.

Station mark: An aluminum bolt buried 16 inches in the ground; surface mark, a large boulder over bolt.

[Latitude 42° 07' 57.04". Longitude 79° 34' 02.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Clymer	12 50 39.43	192 49 38.79	3.9762038
Caselar	196 02 55.06	16 03 44.36	3.7851533
Bates	257 05 29.53	77 07 15.77	3.5717872

HAYNES, CHAUTAUQUA COUNTY.

In the northern part of Ellery Township, about 3 miles north of Ellery Center and one-eighth mile east of road leading from Ellery Center to Stockton. Land owned by Mrs. Eliza Haynes.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground.

[Latitude 42° 13' 27.20". Longitude 79° 21' 35.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bates	55 22 58.15	235 16 22.46	4.2159901
Caselar	74 25 56.60	254 18 23.71	4.2057444
Highland	271 43 57.27	91 51 53.50	4.2111548

HIGHLAND, CHAUTAUQUA COUNTY.

Located in the western part of Ellington Township, 3 miles directly west of Ellington village, on Highland farm owned by Morril Hoag. Commands view of whole country except directly north.

Station mark: A stone post 36 by 6 by 6 inches set 36 inches in the ground under center of signal.

[Latitude 42° 13' 10.66". Longitude 79° 09' 46.40".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Busti	21 25 02.32	201 20 39.98	4.4000139
Meas	31 44 22.96	211 41 41.49	4.0211111
Bates	73 35 06.77	253 20 35.25	4.4923832
Haynes	91 51 53.50	271 43 57.27	4.2111548
Tuy	247 40 35.99	67 50 11.25	4.3260574
Pine	311 45 06.34	131 52 02.68	4.2811005
Walrod	341 31 39.63	161 33 32.85	4.0873636

MEAS, CHAUTAUQUA COUNTY.

Located near the center of Ellicott Township on a high ridge about 3 miles north of the city of Jamestown and one-third mile south of the Jamestown and Ross Mills road. Land owned by P. A. Melquist.

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

[Latitude 42° 08' 21.22". Longitude 79° 13' 47.09".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Busti	14 07 45.77	194 05 59.78	4.1734905
Panama	71 53 22.33	251 41 45.66	4.4002458
Bates	90 18 08.34	270 06 18.84	4.3853254
Highlands	211 41 41.49	31 44 22.96	4.0211111
Walrod	285 49 02.01	105 53 36.45	3.9898545

PANAMA, CHAUTAUQUA COUNTY.

In the western part of Harmony Township 2 miles a little south of west from Panama village on land owned by J. Brooker.

Station mark: A stone post 40 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 42° 04' 06.70". Longitude 79° 31' 06.14".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clymer	71 50 43.22	251 47 45.19	3.8107174
Bates	176 57 05.88	356 56 53.53	3.9004001
Meas	251 41 45.66	71 53 22.33	4.4002458
Busti	287 58 46.96	108 08 36.83	4.3286072

WALROD, CHAUTAUQUA COUNTY.

Located near the center of Poland Township on a low, bluff-like hill, south of Conewango Creek and about 2 miles south of Kennedy village on land owned by P. Walrod. View not good to southeast but fine in all other directions.

Station mark: A stone post 40 by 6 by 6 inches set under center of signal 36 inches in ground, having a bronze triangulation tablet cemented in its top.

[Latitude 42° 06' 54.72". Longitude 79° 06' 57.95".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Busti	47 56 24.17	227 50 04.10	4.2451027
Meas	105 53 36.45	285 49 02.01	3.9898545
Highland	161 33 32.85	341 31 39.63	4.0873636
Tuy Hill	218 42 18.39	38 49 59.78	4.4007680
Pine Hill	276 12 20.07	96 17 22.90	4.0185994

LEROY, GENESEE COUNTY.

(Not occupied.)

Station mark: Center of standpipe.

[Latitude 42° 58' 37.1". Longitude 77° 59' 47.5".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Attica	4.40362
Conesus	4.60530
Scottsville	4.37105

CARTHAGE, JEFFERSON COUNTY.

(Not occupied.)

Station mark: Center of water-supply standpipe.

[Latitude 43° 59' 02.38". Longitude 75° 36' 16.95".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Croghan	295 24 55.6	115 33 44.7	4.27491
Rock	318 58 20.2	139 08 21.7	4.47068

M'QUILLEN, JEFFERSON COUNTY.

Station on a bare, rocky hill known as Mount McQuillen, 1 mile northeast of Carthage, on property of Mrs. Anna Harvey, who lives 500 yards west of station. Good view in all directions.

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

[Latitude 43° 59' 49.70". Longitude 75° 35' 27.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Smith	45 43 45.3	225 40 38.9	3.92225
Mound	296 00 10.3	116 03 55.6	3.90571
Croghan (new station)	300 57 28.2	121 05 43.2	4.26850
Denmark Church	355 22 06.2	175 22 34.3	4.04878

MOUND, JEFFERSON COUNTY.

(Not occupied.)

A well-defined granite mound sometimes known as Mount Tom, 5 miles southeast of Carthage, about one-fourth mile to the north of the Forest City or State road. The Carthage city electric-light pole line passes almost over the mound and near the residence of James Dalton.

Station mark: Center of mound.

[Latitude 43° 57' 55.26". Longitude 75° 30' 03.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Smith	80 09 40.3	260 02 48.9	4.12776
McQuillen	116 03 55.6	296 00 10.3	3.90571

SMITH, JEFFERSON COUNTY.

On the east side of an east-and-west timbered ridge 4 miles southwest of Carthage, one-half mile north of outlet of Pleasant Lake. Property of William Smith, who lives one-fourth mile south of station. View cut off from north 70° west around by north to north 45° east.

Station mark: Center of elm tree 12 inches in diameter, about which is piled a mound of stones. Tree in center of field, 300 feet from timber.

[Latitude $43^{\circ} 56' 40.52''$. Longitude $75^{\circ} 39' 56.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mound	260 02 48.9	80 09 40.3	4.12776
Croghan	279 33 43.7	99 45 04.7	4.34658
Elmer	335 44 13.5	155 47 08.0	4.13634

CROGHAN, LEWIS COUNTY.

(New station.)

Croghan Church, located by Mr. Sledge Tatum, topographer, in 1900, destroyed by fire.

The new station is on south end of a rocky ridge, 1 mile north of the village of Croghan, west side of Beaver River, on property of Christopher Parquet, who lives one-fourth mile east of station.

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

[Latitude $43^{\circ} 54' 39.80''$. Longitude $75^{\circ} 23' 34.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elmer	61 49 24.3	241 49 24.3	4.26717
Denmark Church	84 01 45.2	263 53 58.7	4.17885
Smith	99 45 04.7	279 33 43.7	4.34658
Carthage	115 33 44.7	295 24 55.6	4.27491
McQuillen	121 05 43.2	300 57 28.2	4.26850
Rock	350 35 27.7	170 36 40.7	4.15885

DENMARK CHURCH, LEWIS COUNTY.

(Not occupied.)

A large, white, square tower on church in the village of Denmark. Station mark: Center of tower.

[Latitude 43° 53' 48.38". Longitude 75° 34' 47.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McQuillen	175 22 34.3	355 22 06.2	4.04878
Croghan	263 53 58.7	84 01 45.2	4.17885

ELMER, LEWIS COUNTY.

Seven miles northwest of Lowville, N. Y., in the town of Harrisburg, 1 mile south of Harrisburg post-office, on land owned by E. G. Elmer, who lives 300 yards north of station.

Station mark: A marble post 48 by 8 by 8 inches set 36 inches in the ground, and in the center of top is cemented a bronze triangulation tablet.

[Latitude 43° 49' 56.12". Longitude 75° 35' 44.54".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Smith	155 47 08.0	335 44 13.5	4.13634
Croghan (new station)	241 40 58.5	61 49 24.3	4.26717
Rock	286 14 32.9	106 24 11.0	4.28901

ROCK, LEWIS COUNTY.

On a high, rocky ridge, in Watson Township, 8 miles east of Lowville, on land owned by George Venatti.

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

[Latitude 43° 46' 58.98". Longitude 75° 21' 49.26".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gum	32 23 03.2	212 18 07.9	4.25241
Elmer	106 24 11.0	286 14 32.9	4.28901
Carthage	139 08 21.7	318 58 20.2	4.47068
Croghan	170 36 40.7	350 35 27.7	4.15885

CALEDONIA, LIVINGSTON COUNTY.

(Not occupied.)

Station mark: Center of standpipe.

[Latitude $42^{\circ} 58' 29.8''$. Longitude $77^{\circ} 51' 59.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Scottsville.....			4. 11607
Conesus.....			4. 52169

CULLEY, LIVINGSTON COUNTY.

About 2 miles northwest of Lakeville, on low knoll with timber on northeast side, on land owned by R. H. Culley. Station is on east and west fence line, 7 feet west of north and south fence line and 30 feet west of center of road.

Station mark: A small round boulder set 1 foot below surface of ground. In top of boulder is drilled a hole one-fourth inch deep. Over the boulder is set a bronze triangulation tablet which is covered with earth and a stone on the surface.

[Latitude $42^{\circ} 51' 2.48''$. Longitude $77^{\circ} 44' 18.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Perry.....			4. 42857
Conesus.....			4. 20339

NUNDA, LIVINGSTON COUNTY.

Situated in the town of Nunda on the highest part of what is locally known as East Hill.

Station mark: A boulder 30 inches in diameter sunk flush with ground. In center of top is cemented a triangulation tablet. Station number, 514.

[Latitude $42^{\circ} 34' 24.32''$. Longitude $77^{\circ} 52' 47.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Davis.....	78 25 47.18	258 10 54.79	4. 4878673
Carpenter.....	109 34 18.32	289 18 54.91	4. 5179208
Felch.....	128 32 12.16	308 26 02.46	4. 2013176
Perry.....	147 23 40.42	327 16 44.05	4. 4136080
Ridge.....	165 22 48.65	345 21 19.84	4. 0730232

RETSEF, LIVINGSTON COUNTY.

(Not occupied.)

Station mark: Center of tallest brick chimney at the salt works.

[Latitude 42° 50' 5.1". Longitude 77° 53' 00.0".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Culley	4. 07855
Retsof	4. 86686

ATTICA, WYOMING COUNTY.

Situated in town of Attica, about 1 mile east of Attica Center on bare hill, on land owned by Charles H. Weber. Date post-office. Outlook good except to north.

Station mark: A triangular sandstone 8 inches thick and about 2 feet on each edge in top of which is cemented a bronze triangulation tablet. The stone is buried 1 foot below surface of ground.

Reference marks: (1) A round boulder containing about 1 cubic foot at west edge of stone pile. Hole drilled 2 inches deep in top. Distance, 166 feet. True azimuth, 239½°. (2) A hole drilled 1½ inches deep in top of irregular-shaped boulder embedded in ground. Surface exposed about 30 by 18 by 6 inches. Distance, 167½ feet. True azimuth, 47¼°. (3) A hole drilled 1½ inches deep in boulder embedded in ground, about 12 by 12 by 4 inches exposed. Distance, 50 feet. True azimuth, 117½°.

[Latitude 42° 48' 48.83". Longitude 78° 12' 45.94".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cobble	1 58 10.52	181 57 59.70	4. 0232432
Leroy .....	.....	.....	4. 40362
Scottsville .....	.....	.....	4. 66248
Conesus .....	.....	.....	4. 68021
Perry	289 42 24.00	109 49 08.00	4. 15762

CARPENTER, WYOMING COUNTY.

Located in Weathersfield Township, about 2½ miles northwest of the village of Hermitage, on land owned by B. H. Carpenter on a high, gravelly knoll one-eighth mile south of road leading from Gainesville to North Java.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in ground with bronze triangulation tablet cemented in top.

[Latitude $42^{\circ} 40' 19.74''$. Longitude $78^{\circ} 15' 20.09''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Davis	356 40 09.55	176 40 39.24	4.2363363
Perry	237 27 30.84	57 35 59.21	4.3055437
Felch	273 14 00.52	93 23 14.66	4.2706937
Nunda	289 18 54.91	109 34 18.32	4.5179208

COBBLE, WYOMING COUNTY.

On a high, rocky knoll, locally known as Cobble Knoll, in lot 11, Orangeville Township, $1\frac{1}{2}$ miles southwest of the crossroads known as Orangeville Center.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground; in the top is cemented a bronze triangulation tablet.

[Latitude $42^{\circ} 43' 07.18''$. Longitude $78^{\circ} 13' 01.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Perry	247 42 28.64	67 49 23.48	4.1766165
Attica	181 57 59.70	1 58 10.52	4.0232422

FELCH, WYOMING COUNTY.

Located in Castile Township, on land owned by William Felch, about 2 miles northeast of Castile village, on a small rocky knoll about one-eighth mile east of the Castile and Perry road.

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

[Latitude $42^{\circ} 39' 44.84''$. Longitude $78^{\circ} 01' 42.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nunda	308 26 02.46	128 32 12.16	4.2013176
Davis	47 38 39.19	227 29 55.55	4.3784343
Carpenter	93 23 14.66	273 14 00.52	4.2706937
Perry	172 34 57.57	352 34 11.18	4.0801722

PERRY, WYOMING COUNTY.

Situated in the town of Perry, 2 miles northwest of Perry Center, on the top of a small hill on the farm of Alfred McWethey. The

geodetic point is near the north line fence dividing the farms of Mr. McWethey and Mr. William Fish.

Station mark: A cut stone post 30 by 6 by 6 inches, set 27 inches in the ground. In center of top is cemented a bronze triangulation tablet.

Station number, 513.

[Latitude $42^{\circ} 46' 11.35''$. Longitude $78^{\circ} 02' 50.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ridge.....	313 17 28.44	133 22 56.22	4.1793698
Nunda.....	327 16 44.05	147 23 40.42	4.4136080
Felch.....	352 34 11.18	172 34 57.51	4.0801722
Carpenter.....	57 35 59.21	237 27 30.84	4.3055437
Cobble.....	67 49 23.48	247 42 28.64	4.1766165
Attica.....	109 49 08.00	289 42 24.00	4.1576200
Perry Center.....	305 38 49.38	125 40 26.73	3.6034672

PERRY CENTER CHURCH SPIRE, WYOMING COUNTY.

[Latitude $42^{\circ} 44' 55.57''$. Longitude $78^{\circ} 00' 27.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Perry.....	125 40 26.73	305 38 49.38	3.6034672
Ridge.....	316 03 45.00	136 07 35.82	4.0472403

MERIDIAN MARKS.

LITTLE VALLEY, CATTARAUGUS COUNTY.

Location of station: In the court-house grounds, near the southwest corner of same.

Station mark: A stone post 48 by 8 by 8 inches set 40 inches in the ground, in the center of top of which is cemented a bronze meridian tablet.

Distant mark: North of station 456 feet, near the northeast corner of grounds a stone post similar to station mark set 40 inches in the ground.

MAYVILLE, CHAUTAUQUA COUNTY.

Location of station: In schoolhouse grounds, near the southwestern line.

Station mark: A stone post 50 by 8 by 8 inches set 40 inches in the ground, 125 feet from street line. In the center of top of post is cemented a bronze meridian tablet.

Distant mark: North of station 369.8 feet a stone post 50 by 8 by 8 inches set 40 inches in the ground, 25 feet from street line. In center of top of post is cemented a bronze meridian tablet.

WARSAW, WYOMING COUNTY.

Location of station: In the western side of the public school grounds.

Station mark: A stone post 48 by 8 by 8 inches set 40 inches in the ground, in the center of top of which is cemented a bronze meridian tablet.

Distant mark: North of station 598.2 feet, a stone post similar to station mark set 40 inches in the ground.

PRIMARY TRAVERSE.

The following geographic positions for control of the Highmarket and Orwell quadrangles were obtained by primary traverse run in 1902 by Mr. Oscar Jones, topographer. The line starts at Gum triangulation station and follows highways westward to Lowrey triangulation station, thence southward via Thomas triangulation station to Florence triangulation station, and finally eastward and northward to the starting point.

Geographic positions along highways between Gum and Lowrey triangulation stations.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Gum triangulation station	43 38 49.5	75 28 56.6
Road to right	43 39 25.0	75 29 08.7
Turin and Martinsburg, township line between	43 39 56.5	75 29 54.0
Crossroads and railroad crossing	43 40 32.5	75 29 44.8
Road right	43 41 23.7	75 28 52.5
Road right	43 41 15.0	75 30 12.0
Schoolhouse, road left at	43 42 32.8	75 29 35.3
Road corners	43 42 32.4	75 30 54.9
Road east and west	43 43 23.3	75 31 10.2
Road forks	43 43 35.4	75 32 22.9
Road east and west	43 44 09.5	75 32 32.6
Road left	43 44 04.3	75 33 55.5
Road left	43 43 59.9	75 35 14.5
Road right	43 43 59.3	75 35 25.7
Widow Williams, opposite residence of	43 43 52.9	75 37 26.3
Highmarket and Montague, town line between	43 43 57.3	75 38 24.8
Road right	43 44 00.1	75 38 39.0
Road crossing	43 43 53.4	75 41 20.3
Creek right	43 43 02.0	75 41 14.1

Geographic positions along highways between Gum and Lowrey triangulation stations—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Branch right	43 42 45.5	75 42 08.6
Salmon River road	43 42 31.6	75 43 58.4
Salmon River, center of bridge	43 41 39.4	75 44 33.5
Creek right	43 40 30.4	75 45 13.2
Montague and Highmarket, town line between	43 39 26.9	75 46 07.1
Oswego and Jefferson, county line between	43 39 21.8	75 46 13.1
Creek right	43 39 17.3	75 46 18.3
Creek left	43 38 57.7	75 46 40.9
Salmon River	43 39 09.9	75 48 51.5
Creek left	43 38 57.1	75 50 14.9
Greenboro post-office, road at	43 38 37.5	75 53 20.8
Sandy Creek, road on left	43 39 11.1	75 53 58.7
Redfield and Boylston, town line between	43 39 11.8	75 53 59.2
Crossroads	43 39 56.5	75 54 40.7
Road left	43 40 56.8	75 55 23.2
Road left, leave State road, run west	43 41 45.9	75 56 03.2
Crossing county line and State road	43 42 00.0	75 56 13.1
Road left	43 41 23.7	75 58 20.2
North Boylston church, road corner at	43 41 01.2	76 00 06.6
Boylston triangulation station, flag on stump	43 40 43.1	76 00 03.8
Lowrey triangulation station (spur line from station 245)	43 41 47.4	75 59 55.9

Geographic positions along highways between Boylston and Thomas triangulation station.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads	43 40 19.4	75 58 16.4
Crossroads	43 39 36.2	75 57 53.0
Smartville post-office, crossroads at	43 38 28.9	75 57 44.9
Road left	43 37 28.9	75 58 27.2
Road right	43 37 14.5	75 58 25.5
Boylston and Orwell, town line between	43 36 35.3	75 58 21.9
Crossroads	43 36 03.5	75 58 19.6
Road right	43 35 27.7	75 58 17.4
Orwell and Redfield square, junction of roads	43 34 33.7	75 58 10.0
Thomas triangulation station	43 34 36.4	75 58 54.1

Geographic positions along highways between Thomas and Florence triangulation stations.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Schoolhouse, road on left at	43 34 26.8	75 57 45.0
Road forks	43 33 33.0	75 55 08.9
Crossroads	43 33 06.3	75 55 01.6
Creek right	43 33 08.3	75 53 59.4
Orwell and Redfield, town line between	43 33 05.4	75 53 28.1
Creek right	43 32 32.9	75 52 34.9
Schoolhouse, road on left at	43 32 14.6	75 51 28.2
Salmon River, center of bridge	43 32 05.3	75 51 04.4
Road right	43 31 59.8	75 50 50.3
Redfield, crossroads at	43 31 59.0	75 49 18.5
Road right	43 31 54.5	75 49 03.5
Road forks	43 31 43.0	75 48 39.0
Schoolhouse, road right at	43 31 29.8	75 47 51.0
Salmon River, center of bridge	43 31 27.0	75 47 14.4
Oswego and Lewis county line, road to right on	43 31 02.9	75 45 35.4
Road forks	43 31 57.9	75 44 50.8
Road right	43 31 54.4	75 44 03.1
Road forks	43 31 50.2	75 43 05.4
Road right	43 31 12.6	75 43 10.7
Osceola, crossroads at	43 30 00.7	75 43 21.0
Road right	43 29 23.7	75 43 26.5
Road left	43 29 05.4	75 43 28.9
Crossroads	43 28 14.3	75 43 36.2
Lewis and Oneida county line, road to left on	43 27 49.7	75 43 40.2
Creek left	43 27 00.0	75 44 06.8
Road left	43 26 38.6	75 44 15.8
Road forks	43 26 23.2	75 44 54.9
Florence, road forks at	43 26 18.3	75 45 00.7
Road left	43 24 51.7	75 43 26.8
Road left	43 24 15.8	75 43 04.3
Crossroads	43 23 33.0	75 42 26.1
Road forks	43 23 43.8	75 42 04.0
East Florence, road right	43 23 48.4	75 41 21.2
Florence triangulation station	43 23 14.5	75 39 36.3

Geographic positions along highways from Osceola, via Highmarket, to Gum triangulation station.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road right.....	43 29 57.7	75 42 38.7
Branch right.....	43 30 28.8	75 41 45.6
Creek right.....	43 30 30.8	75 40 46.5
Creek right.....	43 29 44.7	75 39 31.0
Osceola and Lewis, town line between.....	43 29 33.3	75 39 19.5
Salmon River right.....	43 29 21.4	75 39 06.2
Lischers Mill, road right at.....	43 29 07.8	75 38 18.4
Schoolhouse, forks of road at.....	43 27 44.4	75 36 12.4
Road forks.....	43 26 56.8	75 34 57.1
Creamery, forks of road at.....	43 26 57.3	75 34 49.2
Road forks.....	43 26 58.0	75 34 27.8
Branch left.....	43 28 07.2	75 33 45.9
Road forks.....	43 29 01.1	75 33 21.1
West Leyden, road right to.....	43 29 19.9	75 33 07.9
Road forks.....	43 30 54.7	75 31 51.6
Fish Creek, crossroads at.....	43 31 14.9	75 32 06.7
Road right.....	43 31 34.2	75 31 36.0
Road left.....	43 31 59.0	75 31 17.0
Road left.....	43 32 57.6	75 30 44.7
Barnes Corners, crossroads at.....	43 33 09.2	75 30 32.0
Road left.....	43 34 38.2	75 31 21.1
Highmarket post-office, forks of road at.....	43 35 06.5	75 31 08.1
Creamery, forks of road at.....	43 35 20.8	75 31 36.3
Road forks.....	43 36 20.0	75 31 49.4
Branch left.....	43 37 32.5	75 31 40.3
Road forks.....	43 38 13.5	75 31 27.9
Road forks.....	43 37 55.3	75 30 44.6
Gum triangulation station.....	43 38 49.5	75 28 56.6

PENNSYLVANIA.

TRIANGULATION STATIONS.

Mr. Sledge Tatum, topographer, extended triangulation westward from stations Berries and Little Mahanoy, so as to control 2 fifteen-minute quadrangles in Perry, Juniata, and Snyder counties. Five new stations were selected and occupied in September and October, 1902.

MILLERSTOWN, PERRY COUNTY.

A dome-shaped hill, 2 miles north of Millerstown and $\frac{3}{4}$ mile east of Juniata River. Summit is bald and very stony. A prominent point locally, though not as high as surrounding timbered ridges.

Station mark: A bronze triangulation tablet countersunk in solid rock 1 foot below surface of ground.

[Latitude $40^{\circ} 34' 05.1''$; Longitude $77^{\circ} 10' 00.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beavertown	188 42 24	8 43 34	4.22242
Little Mahanoy	235 23 23	55 36 28	4.53567
Spruce	293 00 34	113 04 59	4.01864
Newport	347 02 41	217 36 06	4.03919

NEWPORT, PERRY COUNTY.

Situated on timbered ridge 2 miles south of Newport. Summit cleared of timber, and a lone oak tree 8 inches in diameter left standing on highest point. Can be reached by following Duncannon road $1\frac{1}{2}$ miles south from Newport to old sawmill site, thence southwest by trail to summit.

Station mark: Center of lone signal tree.

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Millerstown	167 04 02	347 02 41	4.11684
Spruce	217 36 06	37 39 10	4.03919
Peters	4 54 14	184 53 30	4.26888

PETERS, PERRY COUNTY.

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

Station mark: A copper bolt cemented in solid rock.

Reference mark: The lone signal tree, true azimuth $331^{\circ} 09'$, 4 feet distant.

[Latitude $40^{\circ} 21' 52.7''$. Longitude $77^{\circ} 04' 19.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Newport	152 35 57	332 33 37	4.04464
Spruce	184 53 30	4 54 14	4.26888

SPRUCE, PERRY COUNTY.

(Not occupied.)

A tall spruce tree, 30 inches in diameter, on highest point of ridge, 4 miles west of Liverpool. Lower branches of tree removed, leaving tuft in top—a conspicuous object.

Station mark: Center of spruce tree.

[Latitude 40° 31' 52.6". Longitude 77° 03' 12.7".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Newport	37 39 10	217 36 06	4.03919
Millerstown	113 04 59	293 00 34	4.01864
Beavertown	161 04 51	341 01 36	4.33770

BEAVERTOWN, SNYDER COUNTY.

Situated on Black Log Mountain, about 4 miles south-southeast of Beavertown. Can be reached from Beavertown by following road south from Beavertown railway station to John Nepp's house, about 1 mile; take right hand and follow same to old sawmill site, about one-fourth mile; then take left hand, an abandoned log road, used as bridle trail; follow trail about $2\frac{1}{2}$ miles to signal. (Trail leads from Beavertown to Richland.)

Station mark: A sandstone post, 30 by 10 by 10 inches, with copper bolt set in top and post set flush with surface of ground.

Reference mark: A pine tree 12 inches in diameter, sawed off 20 feet above ground and used for tripod. True azimuth of tree 177° 31', 4 feet distant.

[Latitude 40° 42' 59.8". Longitude 77° 08' 13.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Millerstown	8 43 34	188 42 24	4.22242
L. Mahanoy	263 21 40	83 33 36	4.41336
Berries	320 24 59	140 33.00	4.43606
Spruce	341 01 36	161 04 51	4.33770

WEST VIRGINIA.

TRIANGULATION STATIONS.

Positions published herewith result from the field work of Mr. Sledge Tatum in 1901 and 1902 and from that of Mr. S. S. Gannett in 1902. Previous to the latter date positions depended upon Maryland Heights

and Sugar Loaf stations of the United States Coast and Geodetic Survey near Harpers Ferry, W. Va., but during the season of 1902 Mr. Gannett extended a belt of triangulation from Wray-Gebhardt stations in the transcontinental belt of United States Coast and Geodetic Survey near Huntington, W. Va., up the Ohio River, and connected with previous work near Parkersburg. The discrepancy in latitude and longitude was distributed arbitrarily so as not to disturb figure adjustments, and has been applied so as to reduce all positions to the U. S. standard datum as derived from Wray-Gebhardt.

EGYPT, BARBOUR COUNTY.

Situated on a high, flat-topped hill, locally known as Egypt Hill, 1 mile north of Pepper post-office and one-half mile east of Clarksburg, on Philippi pike.

Station mark: A large green oak tree 3 feet in diameter. A dead oak tree stands about 10 feet south.

[Latitude $39^{\circ} 12' 27.99''$. Longitude $80^{\circ} 10' 21.54''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bear	31 15 21.23	211 10 54.77	4.2914810
Mount Clare	91 36 03.45	271 29 58.25	4.1419390
Bald	157 56 02.38	337 53 29.74	4.1867375

UPTON, BARBOUR COUNTY.

Situated in a pasture on a high, dome-shaped hill, 5 miles east of Philippi, on land owned by Alva Upton, 1,000 feet south of his house.

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

[Latitude $39^{\circ} 09' 27.5''$. Longitude $79^{\circ} 59' 37.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nelson	188 22 42	8 24 56	4.53803
Laurel	268 54 43	89 01 01	4.15776

BELINGTON, BARBOUR-RANDOLPH COUNTIES.

A high, bald knob on Laurel Ridge on land owned by Henry Moore, 4 miles east of Belington. It can be reached from Belington by following county road to Moore's farm, thence by trail to summit.

Station mark: Center of cairn 7 feet high.

[Latitude 39° 01' 43.9". Longitude 79° 52' 36.4".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Limestone	218 52 15	39 00 07	4.45623
Shaver	261 08 17	81 17 24	4.32481

LAUREL, BARBOUR-TUCKER COUNTIES.

A high knob on Laurel Ridge, about 15 miles east of Philippi and 12 miles west of Parsons, 0.25 mile north of Philippi-Parson road on line between Barbour and Tucker counties. One-half mile from A. S. Phillips's house and store. Land owned by Shaffer estate.

Station mark: An aluminum bolt set in solid rock 2 feet northwest of chestnut signal tree.

[Latitude 39° 09' 35.7". Longitude 79° 49' 39.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Upton	89 01 01	268 54 42	4.15776
Nelson	164 40 54	344 36 48	4.54583
Brown	210 43 11	30 49 52	4.47230
Limestone	240 37 54	60 43 55	4.19614
Shaver	304 14 10	124 21 26	4.30300

SINGLETON, BRAXTON COUNTY.

A high timbered hill on land owned by Sam Singleton, about 7 miles southwest of Burnsville and one-half mile west of Singleton's house. Two acres cleared, giving good view in all directions except southeast.

[Latitude 38° 47' 20.8". Longitude 80° 42' 36.4".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sinking Creek	152 28 18.1	332 22 26.4	4.46450
Sugar Loaf	204 57 55.1	25 03 23.1	4.47749

INDEPENDENCE, BROOKS COUNTY.

Situated 2 miles southwest of the village of Independence, Pa., on a grass hill, on land owned by Mr. Gest. There is a small bunch of locust trees on south side of hill, also a short line of locust trees on east side near summit.

Station mark: A cut marble post 40 by 6 by 6 inches sunk 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 40° 15' 06.03". Longitude 80° 32' 27.92".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
West Liberty.....	33 01 42.51	212 59 23.54	3.9704538
Mount Pleasant.....	58 27 33.56	238 17 59.54	4.3938130
New Alexander.....	106 07 03.27	286 01 22.01	4.1133566
Cross Creek.....	232 43 06.69	52 47 51.53	4.1163183
West Middleton.....	276 28 07.59	96 31 51.88	3.9168898
Claysville.....	323 06 27.65	143 11 59.18	4.3069361

DAVIS, CABELL COUNTY.

A triangulation station of the United States Coast and Geodetic Survey on the ridge dividing the headwaters of Davis Creek from those of Four Mile Creek.

Station mark: A pottery pyramid buried 3 feet below ground, and over this is placed a pier of concrete 1 foot square rising 10 inches above the surface.

[Latitude 38° 21' 06.23". Longitude 82° 21' 12.31".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Piney.....	248 11 16.20	68 22 16.65	4.4436451
Pigeon.....	298 26 01.30	118 36 40.96	4.4556412
Turkey Knob.....	347 31 21.76	167 33 02.24	4.2618030

GEBHARDT, CABELL COUNTY.

A station in the transcontinental belt of the United States Coast and Geodetic Survey on Union Ridge, 4 miles east of Lesage, on land owned by William Gebhardt. Timber on northern slope of hill cuts off view northward; an unobstructed view can be had in other directions. Lines of sight were cut out toward Wray and Houck.

Station mark: A section of drain tile pipe 24 inches long, 6 inches in diameter, filled with concrete, set 22 inches in the ground.

Reference marks: Drain tile pipes 24 inches long, 4 inches in diameter, filled with concrete, buried 22 inches in the ground. One north, 5.95 feet distant; one south, 6.08 feet; one east, 5.95 feet; one west, 5.92 feet.

[Latitude 38° 31' 45.66". Longitude 82° 15' 11.05".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wray	112 00 33.64	291 52 47.45	4.2904979
Houck	158 15 28.36	338 02 32.74	4.2608573
Kennard	216 28 26.76	36 34 35.94	4.3810159

ARNETT, DODDRIDGE COUNTY.

Situated about 5 miles northeast of West Union and 2 miles north of Smithburg on a cleared dome-shaped hill with scattering fruit trees on top. Land owned by Absalom Arnett.

Station mark: A marble post 48 by 8 by 8 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 18' 22.76". Longitude 80° 42' 15.84".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Grove	19 13 18.05	199 10 51.27	4.2284800
McDougal	59 44 41.10	239 37 37.75	4.2689572
Childers	300 19 29.26	120 25 48.43	4.2213046

CROVE, DODDRIDGE COUNTY.

Situated about 9 miles south of West Union and 1 mile northeast of Grove post-office, on a high, sharp knob cleared of timber, but with scattering scrubby trees on southwest slope.

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

[Latitude 39° 09' 44.65". Longitude 80° 46' 07.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
King	81 18 18.75	261 07 27.08	^a 4.3994097
Pullman	92 41 08.17	272 33 08.60	^a 4.2612224
McDougal	122 13 55.29	302 09 19.26	^a 4.0929776
Arnett	199 10 51.27	19 13 18.05	4.2284800
Childers	249 09 26.47	69 18 11.71	4.3289945
Bailey	281 18 57.96	101 27 35.60	4.3029196
Sugar Loaf	308 38 53.20	128 46 38.97	4.3568815

^a Values from Beallsville-Galloway, through Ohio triangulation.

M'DOUGAL, DODDRIDGE COUNTY.

Situated 4 miles south of toll gate, on a high cleared hill, known locally as McDougal Hill.

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

[Latitude 39° 13' 18.68". Longitude 80° 53' 24.69".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pullman	53 20 29.86	233 17 06.04	3.9845751
Oak	179 27 43.34	359 27 40.78	4.0139852
Arnett	239 37 37.75	59 44 41.10	4.2689752
Grove	302 09 19.26	122 13 55.29	4.0929776

LOCUST, GILMER COUNTY.

A knob about 7 miles northwest of Burnsville; cleared on summit and partially timbered on west slope; owned by George Amos. Can be reached from Glenville by following Burnsville pike to Stouts Mill; take left-hand road to top of divide 3 miles to Smith's store, and then take right-hand road one-half mile.

Station mark: A copper bolt set in solid rock.

Réference mark: The lone-oak signal tree; true azimuth 81° 13' 17"; distance, 5.95 feet from station mark.

[Latitude 38° 53' 42.63". Longitude 80° 40' 57.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Miller	85 10 45.43	265 02 46.35	4.2662086
Sinking Creek	131 35 17.75	311 28 23.30	4.3263473
Sugar Loaf	213 39 32.72	33 44 01.59	4.2654511

MILLER, GILMER COUNTY.

A high, cleared knob, on land owned by George Miller, one-half mile east of Letter Gap post-office. Can be reached from Glenville by taking Letter Gap road 6 miles to George Miller's house, thence by trail one-half mile to summit.

Station mark: A copper bolt cemented in top of sandstone post 36 by 8 by 8 inches set flush with surface of ground.

[Latitude 38° 52' 51.46". Longitude 80° 53' 40.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pullman			4.5173111
Sinking Creek	189 05 25.88	9 06 31.23	4.1994330
Grove			4.5194893
Locust	265 02 46.35	85 10 45.43	4.2662086
Sugar Loaf	239 12 52.69	59 25 21.32	4.5229039

SINKING CREEK, GILMER COUNTY.

Situated about 10 miles northwest of Glenville at the head of Sinking Creek. Summit cleared on east, west, and south sides with an oak tree left standing for signal.

Station mark: Center of oak signal tree.

[Latitude 39° 01' 18.46". Longitude 80° 51' 56.16".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bailey	247 23 01.61	67 35 17.95	4.4828367
Sugar loaf	266 52 52.65	87 04 16.97	4.4179104
Locust	311 28 23.30	131 35 17.75	4.3263473
Miller	9 06 31.23	189 05 25.88	4.1994330

ALLISON, HANCOCK COUNTY.

Situated 3 miles south of the village of East Liverpool on a cleared hill on land owned by Mr. Allison.

Station mark: A cut marble post 48 by 6 by 6 inches sunk 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 40° 35' 42.41". Longitude 80° 34' 00.49".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Elders	89 54 31.77	269 43 49.10	4.3659427
Hammond	133 48 37.93	313 44 30.76	4.0918031
East Liverpool	172 45 31.96	352 45 16.88	3.6354340
Cow Pasture	209 41 34.97	29 43 00.50	3.7946464

BALD, HARRISON COUNTY.

Situated about 7 miles northeast of Clarksburg and one-half mile south of McAlpin post-office, on a dome-shaped hill in pasture owned by L. A. Righter.

Station mark: A sandstone post 48 by 8 by 8 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 20' 09.89''$. Longitude $80^{\circ} 14' 22.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bear	8 00 03.12	187 58 08.70	4.4952570
Mount Clare	30 13 00.61	210 09 27.55	4.2053374
Sardis	83 27 02.21	263 19 29.24	4.2364032
Jones	143 07 25.27	323 02 42.79	4.2486797
Rudy	237 58 14.68	58 05 11.02	4.2675001
Egypt	337 53 29.74	157 56 02.38	4.1867375

CHILDERS, HARRISON COUNTY.

Situated on a high cleared hill in pasture about 7 miles south of Salem. Land is owned by P. M. Childers, who lives one-half mile southwest of station.

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

[Latitude $39^{\circ} 13' 49.79''$. Longitude $80^{\circ} 32' 16.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bailey	1 19 35.49	181 19 28.47	4.0619538
Sugar Loaf	5 50 01.85	185 49 03.44	4.3404851
Grove	69 18 11.71	249 09 26.47	4.3289945
Arnett	120 25 48.43	300 19 29.26	4.2213046
Sardis	221 29 14.05	41 33 01.70	4.1140825
Mount Clare	276 51 15.05	96 59 01.57	4.2511139

MOUNT CLARE, HARRISON COUNTY.

Situated on a sharp peak in a cultivated field one-half mile southeast of Mount Clare post-office and one-fourth mile east of railroad on land owned by Mr. Hazleton.

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

[Latitude 39° 12' 40.16". Longitude 80° 19' 59.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugar Loaf.....	45 30 53.59	225 22 09.65	4.4470601
Bailey	62 30 24.65	242 22 31.63	4.3070570
Childers	96 59 01.57	276 51 15.05	4.2511139
Sardis.....	142 41 38.09	322 37 38.74	4.1745799
Jones	174 43 03.16	354 41 54.41	4.4496889
Bald	210 09 27.55	30 13 00.61	4.2053374
Egypt.....	271 29 58.25	91 36 03.45	4.1419390
Bear	347 40 14.46	167 41 52.60	4.2432856

SARDIS, HARRISON COUNTY.

Situated on a high dome-shaped hill about 7 miles northwest of Clarksburg and one-half mile west of Sardis post-office on land owned by William Strother.

Station mark: A marble post 48 by 6 by 6 inches, set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 19' 05.54". Longitude 80° 26' 17.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Childers	41 33 01.70	221 29 14.05	4.1140825
Jones	201 44 58.89	21 47 50.06	4.2405631
Bald	263 19 29.24	83 27 02.21	4.2364032
Mount Clare	322 37 38.74	142 41 38.09	4.1745779

MELHORN, JACKSON COUNTY.

A bald hill in Grant district 2 miles east of Muses Bottom and 6 miles south of Belleville. Land owned by J. R. Snodgrass, who lives 200 yards northeast of station. An extensive view can be had in all directions, although it is somewhat limited to the southeast.

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

[Latitude $39^{\circ} 03' 54.96''$; $39^{\circ} 03' 55.01''$. Longitude $81^{\circ} 45' 12.57''$; $81^{\circ} 45' 12.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Finlay	33 30 24.62	213 23 06.74	4.4833310
Greenler	279 28 14.79	99 41 07.07	4.4750063
Bond	155 53 06.15	335 49 20.01	4.3227202
Lyons	170 55 16.63	350 53 46.66	4.3354363
Wigal	205 43 32.53	25 46 22.69	4.1734691

a From Finlay-Greenler.

BAILEY, LEWIS COUNTY.

Situated about 10 miles northwest of Weston and $3\frac{1}{2}$ miles north of Trumansburg on a sharp cleared peak. Land owned by W. G. Bailey.

Station mark: A sandstone post 48 by 12 by 12 inches, set 44 inches in the ground, in top of which is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 07' 35.90''$. Longitude $80^{\circ} 32' 28.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugar Loaf	10 48 37.94	190 47 46.60	4.0188594
Sinking Creek	67 35 15.00	247 22 59.00	4.4828100
Grove	101 27 35.60	281 18 57.96	4.3029196
Childers	181 19 28.47	1 19 35.49	4.0619538
Mount Clare	242 22 31.63	62 30 24.65	4.3070570
Bear	289 29 08.13	109 38 38.41	4.3629902

SUGAR LOAF, LEWIS COUNTY.

Situated about 10 miles southwest of Weston at head of Murphys Creek. Summit of hill cleared of timber with lone tree left standing for signal.

Station mark: Center of lone signal tree.

[Latitude $39^{\circ} 02' 03.24''$. Longitude $80^{\circ} 33' 49.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sinking Creek	87 04 19.00	266 52 55.00	4.4178800
Grove	128 46 38.97	308 38 53.20	4.3568815
Childers	185 49 03.44	5 50 01.85	4.3404851
Bailey	190 47 46.60	10 48 37.94	4.0188594
Mount Clare	225 22 09.65	45 30 53.59	4.4470601
Bear	263 48 44.72	83 59 05.75	4.3773589

PIGEON, LINCOLN COUNTY.

A triangulation station of the United States Coast and Geodetic Survey on the land of Tom Huffman, at the head of Middle Creek, which flows into Mud River.

Station mark: A sandstone post 30 by 6 by 6 inches set 28 inches in the ground. Top of post marked

U S
+
C & G S

[Latitude 38° 13' 44.05". Longitude 82° 04' 00.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Table Rock.....	276 19 40.94	96 36 27.09	4.6002019
Ivy.....	313 55 13.01	134 16 28.69	4.8474083
Davis.....	118 36 40.96	298 26 01.30	4.4556412
Turkey Knob.....	78 49 50.72	258 40 52.54	4.3340906
Porter Knob.....	52 10 12.35	232 00 04.95	4.4822026
Cove.....	41 06 29.54	221 00 17.43	4.3488659

ERWIN, MARION COUNTY.

Situated on a high knob about 2½ miles west of Fairmont, on land owned by J. E. Erwin. Knob is cleared of timber with the exception of a few sugar trees standing near summit.

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

[Latitude 39° 29' 04.93". Longitude 80° 11' 12.53".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jones.....	81 20 49.47	261 14 05.66	4.1863712
Tennant.....	171 24 38.61	351 23 39.38	4.1718721
Waters.....	235 56 08.15	56 02 45.62	4.2550767
Halleck.....	272 21 54.19	92 30 52.64	4.3066065
Rudy.....	300 57 57.28	121 02 53.44	4.1139602

JACKSON, MARION COUNTY.

Situated about 7 miles northeast of Mannington and one-half mile northwest of Galletin, on land owned by Mr. Jackson.

Station mark: A sandstone post 36 by 10 by 10 inches set flush with top of ground, in center of top of which a bronze triangulation tablet is cemented.

[Latitude 39° 36' 43.44". Longitude 80° 19' 27.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jones	11 32 52.77	191 31 23.18	4.2254500
Evans	64 11 05.70	244 03 54.54	4.2540991
Cornfield	95 35 30.49	275 27 45.01	4.2428447
Littleton	128 49 52.41	308 44 06.94	4.2189038

JONES, MARION COUNTY.

Situated about 6 miles south of Mannington on a high, cleared knob, on land owned by Mr. Jones.

Station mark: A sandstone post 48 by 7 by 7 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

Reference mark: The locust signal tree; distance from station mark, 1.8 feet; true azimuth from same, 197°.

[Latitude 39° 27' 49.52". Longitude 80° 21' 47.56".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sardis	21 47 50.06	201 45 58.89	4.2405631
Tennant	217 13 18.63	37 19 03.77	4.3299984
Erwin	261 14 05.66	81 20 49.47	4.1863712
Rudy	279 19 41.91	99 31 21.55	4.4264067
Bald	323 02 42.79	143 07 25.27	4.2486797
Mount Clare	354 41 54.41	174 43 03.16	4.4496889

RUDY, MARION COUNTY.

Situated on a high, bald hill about 9 miles southeast of Fairmont and 3 miles east of Nuzums Mills.

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

[Latitude 39° 25' 27.77". Longitude 80° 03' 26.42".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bald	58 05 11.02	237 58 14.68	4.2675001
Jones	99 31 21.55	279 19 41.91	4.4264067
Erwin	121 02 53.44	300 57 57.28	4.1139602
Tennant	148 04 00.55	327 58 04.77	4.4016097
Waters	192 42 44.43	12 44 25.20	4.2350883
Halleck	237 18 53.64	57 22 55.62	4.0340057

RIGGS KNOB, MARSHALL COUNTY.

Situated 6 miles south of the town of Moundsville on the highest point of a cone-shaped hill, locally known as Riggs Knob.

Station mark: A lone locust tree 18 inches in diameter. Center of tree where first limb leaves trunk.

[Latitude $39^{\circ} 50' 51.66''$. Longitude $80^{\circ} 45' 21.94''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beallsville.....	89 53 56.89	269 45 19.11	4.2835700
Myers.....	164 43 47.81	344 41 46.06	4.2327314
Sherrard.....	199 18 53.15	19 21 27.57	4.2370223
Wilsons Knob.....	221 59 08.76	42 06 23.22	4.3802408
Rock Lick.....	263 41 30.14	83 50 12.37	4.2897152

ROCK LICK, MARSHALL COUNTY.

Situated on a bare hill one-half mile south of the town of Rock Lick. A county road passes over north side of hill.

Station mark: A cut marble post 48 by 6 by 6 inches set 36 inches in the ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 52' 00.29''$. Longitude $80^{\circ} 31' 47.16''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Riggs.....	83 50 12.37	263 41 30.14	4.2897152
Sherrard.....	136 09 00.37	316 02 51.78	4.2936870
Wilsons Knob.....	168 13 59.48	348 12 30.92	4.2053434

SHERRARD, MARSHALL COUNTY.

Situated 1 mile west of the village of Sherrard on a small hill in a cleared field on the farm of Mr. Joseph Koty, at the intersection of the Boggs Run and Benwood roads.

Station mark: A cut marble post 48 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 $39^{\circ} 59' 39.70''$. Longitude $80^{\circ} 41' 21.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Riggs	19 21 27.6	199 18 53.2	4.2370223
Myers	91 09 22.4	271 04 45.8	4.0090858
Centennial	124 04 47.5	304 01 30.3	3.9432300
Mount Pleasant	151 39 31.5	331 35 42.4	4.2492017
Clinton	193 03 24.5	13 04 52.8	4.1578221
Liberty	199 57 09.7	20 00 34.7	4.3437009
West Alexander	230 23 48.2	50 30 02.1	4.2521000
Wilson Knob	261 30 28.4	81 35 08.9	4.0196571
Rock Lick	316 02 51.8	136 09 00.4	4.2936870

WILSON KNOB, MARSHALL COUNTY.

Situated in Sand Hill district on the farm of Mr. G. H. Wilson, near the line fence between the lands of Mr. Wilson and Mr. Howard, where fence crosses summit of hill. The Moundsville and Washington pike passes over north side of hill.

Station mark: A cut marble post 48 by 6 by 6 inches set 40 inches in ground, in center of top of which is cemented a bronze triangulation tablet.

[Latitude $40^{\circ} 00' 29.57''$. Longitude $80^{\circ} 34' 05.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Riggs	42 06 23.22	221 59 08.76	4.3802408
Sherrard	81 35 08.88	261 30 28.43	4.0196571
Clinton	150 25 05.10	330 21 55.03	4.1567300
West Alexander	199 13 46.06	19 15 19.31	4.0179782

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. Owner of land, 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: The chestnut signal tree; azimuth from station mark, $25^{\circ} 53'$; distance, 29 feet.

[Latitude 38° 50' 11.56". Longitude 81° 56' 49.23".]

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

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 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° 42' 12.28". Longitude 82° 05' 19.52".]

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

HALLECK, MONONGALIA COUNTY.

Situated one-half mile west of Halleck (post-office) in a cultivated field owned by J. Smith.

Station mark: A sandstone post 36 by 10 by 10 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 28' 36.97". Longitude 79° 57' 05.70".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rudy	57 22 55.62	237 18 53.64	4.0340057
Erwin	92 30 52.64	272 21 54.17	4.3066065
Waters	154 05 30.80	334 03 09.26	4.0845244

NELSON, MONONGALIA COUNTY.

About 2 miles south of Halleck post-office, on land owned by the Nelson estate, on a high, flat-topped ridge in pasture.

Station mark: A bronze tablet countersunk in granite post 48 by 8 by 8 inches set flush with top of ground.

[Latitude $39^{\circ} 27' 54.7''$. Longitude $79^{\circ} 56' 07.5''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Upton.....	8 24 56.0	188 22 42	4.53803
Rock.....	263 55 08.0	84 02 17	4.21057
Brown.....	288 52 26.9	109 03 16	4.41227
Laurel.....	344 36 48.0	164 40 54	4.54583

TENNANT, MONONGALIA COUNTY.

Situated about halfway between Fairview and Center, in a cultivated field, on land owned by Enos Tennant.

Station mark: A granite post 48 by 8 by 8 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 37' 01.19''$. Longitude $80^{\circ} 12' 45.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jones.....	37 19 03.77	217 13 18.63	4.3299984
Morley.....	232 04 10.19	52 11 25.17	4.3132539
Waters.....	285 03 13.51	105 10 50.82	4.2487846
Rudy.....	327 58 04.77	148 04 00.55	4.4016097
Erwin.....	351 23 39.38	171 24 38.61	4.1718721

WYMP, MONONGALIA COUNTY.

On high summit 1 mile southwest of Wymp Gap in Chestnut Ridge, about 9 miles air-line distant northeast of Morgantown, W. Va., and 16 miles south of Uniontown, Pa.

Station mark: A stone post 36 by 12 by 12 inches set flush with surface of ground, in the center of top of which is cemented a copper bolt.

[Latitude 39° 42' 57.71". Longitude 79° 45' 39.08".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Reed.....	25 47 12.2	205 44 55.7	4.0688994
Waters.....	54 18 28.5	234 08 48.4	4.4268308
St. Clair.....	78 48 54.2	258 42 43.2	4.1494319
Morley.....	94 13 55.6	274 03 51.4	4.3536430
Pondfield.....	214 23 09.0	34 25 25.3	3.9532404
Mellon.....	261 57 14.8	82 07 39.3	4.3709214
Kelley.....	300 28 58.6	120 36 35.7	4.2970427
Piney Swamp.....	309 23 23.6	129 32 53.4	4.4407570

CLINTON, OHIO COUNTY.

(Secondary station; not occupied.)

A lone tree at intersection of fences on highest point of hill near Clinton post-office.

Station mark: Center of tree.

[Latitude 40° 07' 13.93". Longitude 80° 39' 04.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sherrard.....	13 04 52.8	193 03 24.5	4.1578221
Myers.....	44 17 53.0	224 11 47.7	4.2850889
Wilsons Knob.....	330 21 55.0	150 25 05.1	4.1567300

WEST ALEXANDER, OHIO COUNTY.

(Secondary station.)

Situated on a hill 1 mile west of the town of Alexander, Pa.

Station mark: A cut marble post 40 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 marks: A maple tree 2 feet in diameter bears N. 85° 56' W., distant 72.1 feet. A butternut tree 10 inches in diameter bears S. 52° 25' E., distant 15 feet.

[Latitude 40° 05' 48.62". Longitude 80° 31' 40.14".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wilsons Knob.....	19 15 19.31	199 13 46.06	4.0179782
Sherrard.....	50 30 02.08	230 23 48.15	4.2521001

WEST LIBERTY, OHIO COUNTY.

Situated one-half mile north of the village of West Liberty, on the highest point of a bare hill. A county road passes along east side of hill.

Station mark: A cut marble post 48 by 6 by 6 inches set 40 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude $40^{\circ} 10' 52.03''$. Longitude $80^{\circ} 36' 03.15''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sherrard	20 00 34.66	199 57 09.72	4.3437009
Mount Pleasant	72 16 23.96	252 09 09.19	4.2241846
New Alexander	147 07 42.89	327 04 20.90	4.1338984
Independence	212 59 23.54	33 01 42.51	3.9704538
West Middleton	242 31 47.76	62 37 50.86	4.1755802
Garrett	259 11 49.03	79 22 34.74	4.3816589
Claysville	295 51 35.55	115 59 25.59	4.2830742

GRIFFITH, PLEASANT COUNTY.

Situated 5 miles southwest of St. Marys on high, dome-shaped hill covered with small peach trees. Land owned by J. H. Griffith.

Station mark: Center of lone oak signal tree.

Reference mark: A sandstone post 48 by 8 by 8 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet. Post is 2 feet northeast of tree.

[Latitude $39^{\circ} 20' 46.94''$. Longitude $81^{\circ} 14' 46.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pinnacle	50 10 45.31	230 06 12.40	4.1286309
Pinkerton	110 57 40.75	290 46 50.36	4.4191325
Moore	174 57 55.01	354 57 28.03	4.0637096
Owlshead	247 28 13.79	67 39 14.62	4.4306899
McCullough	273 45 23.40	93 51 52.97	4.1687309

M'CULLOUGH, PLEASANT COUNTY.

Situated 9 miles northwest of Pennsboro on a cleared hill owned by William McCullough, who lives 500 feet west of station.

Station mark: A sandstone post 48 by 8 by 8 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet.

[Latitude 39° 20' 15.14". Longitude 81° 04' 32.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Freeman	12 12 49.86	192 11 22.94	4.1924485
Derrick	43 11 37.96	223 08 10.76	4.0591267
Griffith	93 51 52.97	273 45 23.40	4.1687309
Moore	128 34 48.44	308 27 51.47	4.3030833
Owlshead	222 08 51.38	42 13 22.20	4.1820996
Pullman	336 00 43.00	156 04 21.21	4.3088375

BROWN, PRESTON COUNTY.

In a cultivated field owned by "Junior" Brown 7 miles southeast of Kingwood and 2 miles west of Amblersburg, the nearest railroad station. It is 0.25 mile south of Amblersburg and Kingwood road.

Station mark: An aluminum bolt set in solid rock 4.8 feet east of locust signal tree.

[Latitude 39° 23' 22.5". Longitude 79° 39' 05.8".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Limestone	4 49 07	184 48 30	4.25191
Laurel	30 49 52	210 43 11	4.47230
Nelson	109 03 16	288 52 27	4.41237
St. Joseph Church	129 13 43	309 10 02	4.03270
Rock	140 42 17	320 38 38	4.11591
Reed	150 36 31	330 30 05	4.46982

FUNK, PRESTON COUNTY.

(Not occupied.)

A tall dead chestnut tree standing in cluster of small timber surrounded by cultivated land in field owned by Mr. Funk. Can be reached by following county road to top of Laurel Ridge, thence along ridge to Funk's house. Tree is about 0.25 mile south of house.

Station mark: Center of tree.

[Latitude 39° 17' 57.9". Longitude 79° 45' 54.9".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rock	184 17 01	4 17 41	4.30472
Limestone	313 06 39	133 10 18	4.05638

HOWESVILLE, ST. JOSEPH CHURCH SPIRE, PRESTON COUNTY.

Station mark: Center of church spire.

[Latitude 39° 27' 03.4". Longitude 79° 44' 55.1".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rock	181 21 23	1 21 25	3.51703
Brown	309 10 02	129 13 43	4.03270

KELLEY, PRESTON COUNTY.

On a bald knob locally known by that name, about 6 miles south of Brandonville and 8 miles north of Cranesville, W. Va.

Station mark: A copper bolt cemented in a stone post 36 by 12 by 12 inches set flush with surface of ground.

[Latitude 39° 37' 31.13". Longitude 79° 33' 43.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wymp	120 36 35.7	300 28 58.6	4.2970427
Pondfield	145 36 58.1	325 31 36.8	4.3261837
Mellon	204 59 31.0	25 02 17.6	4.1674360
Piney Swamp	330 28 17.6	150 30 10.5	3.9334630

LIMESTONE, PRESTON COUNTY.

On high point on Limestone Ridge, 7 miles north of St. George, on land owned by Thomas Fansler. Station is 0.25 mile south of Thomas Fansler's house, 500 feet west of county road.

Station mark: Center of lone maple signal tree.

[Latitude 39° 13' 45.1". Longitude 79° 40' 08.3".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Belington	39 00 07	218 52 15	4.45623
Laurel	60 43 55	240 37 54	4.19614
Funk	133 10 18	313 06 39	4.05638
Rock	166 21 04	346 18 05	4.45809
Brown	184 48 30	4 49 07	4.25191
Shaver	351 22 01	171 23 16	4.28398

PINEY SWAMP, PRESTON COUNTY.

About 1 mile northwest of Cranesville, on Piney Swamp Knob.

Station mark: A stone post 36 by 12 by 12 inches set flush with surface of ground, in center of top of which is cemented a copper bolt.

[Latitude 39° 33' 29.03". Longitude 79° 30' 45.90".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Reed	104 54 36.5	284 42 51.1	4.4365044
Wymp	129 32 53.4	309 23 23.6	4.4407570
Kelley	150 30 10.5	330 28 17.6	3.9334630
Mellon	185 28 53.8	5 29 47.3	4.3198719
Accident	248 16 18.1	68 24 40.0	4.3057954
Roman Nose	305 25 13.3	125 30 37.5	4.1744346

ROCK, PRESTON COUNTY.

Four miles west of Kingwood, 1,000 feet south of Morgantown and Kinkwood pike, on land owned by Frank Barlow.

Station mark: An aluminum bolt set in solid rock 20 feet square and 20 feet high.

Reference mark: The locust signal tree; true azimuth from station mark 42° 09' 17", distance 30.5 feet.

[Latitude 39° 28' 50.1". Longitude 79° 44' 51.8".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
St. Joseph Church	1 21 25	181 21 23	3.51703
Nelson	84 02 17	263 55 08	4.21057
Reed	158 14 09	338 11 23	4.22498
Piney Swamp	246 51 45	67 00 43	4.34167
Brown	320 38 38	140 42 17	4.11591
Limestone	346 18 05	166 21 04	4.45809

DERRICK, RITCHIE COUNTY.

(Not occupied.)

Situated 1 mile south of Goose Creek on summit of a high timbered ridge.

Station mark: Center of oil derrick No. 1.

[Latitude $39^{\circ} 15' 44.13''$. Longitude $81^{\circ} 09' 59.19''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McCullough	223 08 10.76	43 11 37.96	4.0591267
Freeman	326 26 11.96	146 28 12.01	3.9158432

FREEMAN, RITCHIE COUNTY.

Situated 3 miles southeast of Cairo on a high cleared knob, locally known as Freemans Knob. Land owned by Charley Freeman.

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

[Latitude $39^{\circ} 12' 01.48''$. Longitude $81^{\circ} 06' 49.38''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Derrick	146 28 12.01	326 26 11.96	3.9158432
McCullough	192 11 22.94	12 12 49.86	4.1924485
McDougal	262 53 51.00	83 02 19.71	4.2889691
Pullman	286 15 35.82	106 20 40.48	4.0812502
King	328 01 21.93	148 03 34.04	3.9771616

KING, RITCHIE COUNTY.

(Not occupied.)

Situated about 7 miles south of Harrisville on a dome-shaped hill, locally known as King Knob. The hill is cleared of timber, but has small scattering peach trees near the summit.

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

[Latitude $39^{\circ} 07' 40.44''$. Longitude $81^{\circ} 03' 20.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Freeman	148 03 34.04	328 01 21.93	3.9771616
Pullman	234 32 20.22	54 35 12.58	3.9055762
Grove	261 07 27.08	81 18 18.75	4.3994097

PULLMAN, RITCHIE COUNTY.

Situated about 6 miles east of Harrisville and $1\frac{1}{2}$ miles southeast of Pullman post-office on a high, sharp peak, cleared on top, with lone oak tree left for signal.

Station mark: Center of lone oak signal tree.

[Latitude $39^{\circ} 10' 11.72''$. Longitude $80^{\circ} 58' 47.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
King	54 35 12.58	234 32 20.22	3.9055762
Freeman	106 20 40.48	286 15 35.82	4.0812502
McCullough	156 04 21.21	336 00 43.00	4.3088375
Owlshead	183 45 05.38	3 45 57.27	4.4762861
Oak	205 21 35.06	25 24 56.52	4.2507363
McDougal	233 17 06.04	53 20 29.86	3.9845751
Grove	272 33 08.60	92 41 08.17	4.2612224

OAK, TYLER COUNTY.

Situated 1 mile northeast of Stanley post-office on a high, cleared hill in a cultivated field owned by J. C. Garner.

Station mark: A lone tree standing on highest point of hill.

[Latitude $39^{\circ} 18' 53.55''$. Longitude $80^{\circ} 53' 28.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pullman	25 24 56.52	205 21 35.06	4.2507363
Owlshead	157 41 32.90	337 39 02.83	4.1732622
McDougal	359 27 40.78	179 27 43.34	4.0139852

OWLSHEAD, TYLER COUNTY.

Situated about 3 miles northeast of Wick on a prominent bare hill, locally known as Owls Head.

Station mark: The quadripod signal.

[Latitude $39^{\circ} 26' 20.56''$. Longitude $80^{\circ} 57' 25.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McCullough	42 13 22.20	222 08 51.38	4.1820996
Griffith	67 39 14.62	247 28 13.79	4.4306899
Moore	92 50 53.05	272 39 24.48	4.4140545
Oak	337 39 02.88	157 41 32.90	4.1732622

SHAVER, TUCKER COUNTY.

A high, rocky mountain 2 miles south of Hendricks. Can best be reached by crossing river at Hendricks, thence by trail south about 1 mile, thence up rough, rocky mountain side 1 mile to signal.

Station mark: An aluminum bolt set in solid rock on highest bald summit.

[Latitude $39^{\circ} 03' 28.6''$. Longitude $79^{\circ} 38' 08.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Laurel	124 21 26	304 14 10	4.30300
Limestone.....	171 23 16	351 22 01	4.28398

PORTER KNOB, WAYNE COUNTY.

A very prominent knob of that name about 8 miles east of Dunlow and 3 miles southwest of Kiahsville, on land owned by Harrison Maynard, near Porter Knob schoolhouse. Summit was cleared of timber and signal erected on highest point.

Station mark: A copper bolt cemented in solid rock.

[Latitude $38^{\circ} 03' 39.12''$. Longitude $82^{\circ} 20' 23.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Turkey.....	190 48 40.38	10 49 50.36	4.1674556
Pigeon	232 00 04.95	52 10 12.35	4.4822026
Cove.....	258 54 59.84	78 58 54.81	3.9760875

TURKEY KNOB, WAYNE COUNTY.

A high, dome-shaped knob about 10 miles east of Wayne court-house and $2\frac{1}{2}$ miles southeast of Gilkerson, on land owned by Squire Skaggs. Summit timbered, with broad lines of sight cut out to other stations.

Station mark: A copper bolt cemented in top of sandstone post 36 by 8 by 8 inches set flush with top of ground.

[Latitude $38^{\circ} 11' 27.56''$. Longitude $82^{\circ} 18' 30.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Davis	167 33 02.24	347 31 21.76	4.2618030
Pigeon	258 40 52.54	78 49 50.72	4.3340906
Cove.....	332 40 13.67	152 42 58.99	4.1526839
Porter Knob	10 49 50.36	190 48 40.38	4.1674556

COVE ON LINE BETWEEN WAYNE AND LINCOLN COUNTIES.

A high, cleared knob about 1 mile south of Cove Gap on county-line ridge. It can be reached by following county road to top of divide in Cove Gap, thence southeast, by dim road along ridge, about 1 mile to station.

Station mark: A copper bolt cemented in solid rock.

Reference mark: The sassafras signal tree 4 inches in diameter; true azimuth from station mark $196^{\circ} 12' 18''$; distance 37 feet.

[Latitude $38^{\circ} 04' 37.96''$. Longitude $82^{\circ} 14' 02.35''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Porter Knob	78 58 54.81	258 54 59.84	3.9760875
Turkey	152 42 58.99	332 40 13.67	4.1526839
Pigeon	221 00 17.43	41 06 29.54	4.3488659

CORNFIELD, WETZEL COUNTY.

Situated on a high knob in a cultivated field owned by Christy Brookover, about three-fourths mile northwest of Kodol.

Station mark: Center of lone walnut tree 10 inches in diameter.

[Latitude $39^{\circ} 37' 38.07''$. Longitude $80^{\circ} 31' 36.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance
	° ' "	° ' "	Meters.
Lavelle	89 03 43.00	269 02 10.00	3.5416800
Littleton	207 21 24.11	27 23 24.52	3.9903050
Jackson	275 27 45.01	95 35 30.49	4.2428447
Jones	322 10 03.76	142 16 18.91	4.3610666
Evans	352 23 51.47	172 24 25.37	3.9824199

EVANS, WETZEL COUNTY.

Situated in a pasture on a high dome-shaped hill about 1 mile southwest of Brink, on land owned by E. B. Evans, about one-half mile west of county line.

Station mark: A bronze triangulation tablet countersunk and cemented in a sandstone post 36 by 12 by 12 inches set flush with surface of ground.

[Latitude $39^{\circ} 32' 29.41''$. Longitude $80^{\circ} 30' 43.77''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cornfield.....	172 24 25.37	352 23 51.47	3.9824199
Littleton.....	190 02 57.60	10 04 27.81	4.2668805
Jackson.....	244 03 54.54	64 11 05.70	4.2540991

LAVELLE, WETZEL COUNTY.

(Not occupied.)

A high, cleared knob about 4 miles west of Kodol on land owned by Anthony Lavelle.

Station mark: A lone tree on summit.

[Latitude $39^{\circ} 37' 36.2''$. Longitude $80^{\circ} 34' 02.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Smithfield.....	0 01 00	180 01 00	4.21193
Cornfield.....	269 02 10	89 03 43	3.54168
Evans.....	333 18 35	153 20 42	4.02481

LITTLETON, WETZEL COUNTY.

A high, dome-shaped hill in pasture 2 miles east of Littleton on land owned by Mrs. Meighen.

Station mark: A lone tree 9 inches in diameter, on the summit.

[Latitude $39^{\circ} 42' 19.63''$. Longitude $80^{\circ} 28' 28.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cornfield.....	27 23 24.52	207 21 24.11	3.9903050
Jackson.....	308 44 06.94	128 49 52.41	4.2189038

SMITHFIELD, WETZEL COUNTY.

Situated about 2 miles west of Smithfield on cleared knob of land owned by H. E. Edgell. It can be reached by a trail from Smithfield.

Station mark: A bronze triangulation tablet cemented in top of a sandstone post 36 by 8 by 8 inches set flush with surface of ground.

[Latitude 39° 28' 47.9". Longitude 80° 34' 03.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Lavelle	180 01 00	0 01 00	4.21193
Evans	214 52 35	34 54 42	3.92057

BEAR, UPSHUR COUNTY.

Situated 7 miles north of Buckhannon, on a sharp knob cleared of timber, with a lone oak tree left standing for signal.

Station mark: Center of lone oak signal tree.

[Latitude 39° 03' 25.41". Longitude 80° 17' 23.70".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sugar Loaf	83 59 05.75	263 48 44.72	4.3773589
Bailey	109 38 38.41	289 29 08.13	4.3629902
Mount Clare	167 41 52.60	347 40 14.46	4.2432856
Bald	187 58 08.70	8 00 03.12	4.4952570
Egypt	211 10 54.77	31 15 21.23	4.2914810

GOFF, WOOD COUNTY.

Situated on a high, cleared hill about 4 miles south of Parkersburg and one-half mile west of the Elizabeth pike. 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° 13' 18.75". Longitude 81° 33' 14.81".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wigal	69 50 00.78	249 45 17.54	4.0590737
Nolan	135 04 44.31	314 58 46.74	4.2822068

MOUNT OLIVE CHURCH, WOOD COUNTY.

(Not occupied.)

A prominent church situated on a high ridge near Powers post-office.
Station mark: Center of church spire.

[Latitude $39^{\circ} 05' 38.17''$. Longitude $81^{\circ} 38' 37.84''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Melhorn	71 29 19.8	251 25 11.0	4.0003208
Lyons			4.3483181
Wigal	163 40 18.4	343 38 59.5	4.0284663

PINNACLE, WOOD COUNTY.

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

Station mark: A stone post 36 by 6 by 6 inches, set 36 inches in the ground, in 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 to same, $250^{\circ} 00'$.

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goff	72 17 45.09	252 10 36.52	4.2319866
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

WIGAL, WOOD COUNTY.

A round, cleared knob, owned by J. F. Wigal, 2 miles southwest of Eli post-office, 12 miles by road southwest of Parkersburg. An extended view can be had in all directions excepting southeast, which is limited to 4 or 5 miles by higher knobs.

Station mark: A marble post 20 by 6 by 6 inches set 16 inches in a bed of concrete. In center of top of post is cemented a bronze triangulation tablet.

[Latitude $39^{\circ} 11' 10.43''$. Longitude $81^{\circ} 40' 42.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Melhorn	25 46 22.69	205 43 32.53	4.1734691
Bond	110 58 02.69	290 51 25.79	4.2074866
Lyons	128 49 58.11	308 45 37.51	4.1032825
Nolan	170 56 08.43	350 54 54.61	4.2486674
Goff	249 45 17.54	69 50 00.78	4.0590737

TENNESSEE—ALABAMA.

PRIMARY TRAVERSE.

Between November 15, 1902, and January 15, 1903, 154 miles of primary traverse were run by Mr. E. L. McNair, topographer, for the control of the Mannie sheet, embracing most of Wayne and a portion of Lawrence County. The line begins at Kelleys Landing, on the Tennessee River, a position determined by Mr. George T. Hawkins, topographer, in 1897, and runs south along country roads to the Alabama line; thence east near the State line to Iron City, Tenn., on the Louisville and Nashville Railway; thence north over country roads to Napier. A spur was also run from Iron City to Tusculumbia, Ala., along the Louisville and Nashville Railway; thence east along the Southern Railway to Tanyard triangulation station, near Town Creek.

This control was supplemented in March, 1903, by a line 32 miles in length run by Mr. Sledge Tatum, topographer, from a point near Abner post-office westward through Waynesboro across the quadrangle.

Geographic positions between Kelleys Landing and Iron City, along country roads.

Station.	Latitude.	Longitude.
Kelleys Landing, south azimuth mark (Hawkins, 1897)	35 31 50.2	87 58 29.9
Forks of road at creek crossing	35 30 36.8	87 57 41.3
White Oak Creek, southwest corner of Methodist Church on	35 28 12.9	87 57 20.2
Road northeast 0.75 mile north of Beech Creek crossing	35 26 08.8	87 57 35.7
Forks of road, 400 feet southwest of schoolhouse (road right to Glenkirk)	35 24 45.3	87 57 58.2
Clifton, Russ Hotel, corner Main and River streets, flagstaff on tower of	35 23 13.0	87 59 44.0
Clifton, 2.75 miles southeast of, road southwest	35 21 06.3	87 58 22.7
Huttons Branch, road east about three-fourths mile above mouth of	35 17 44.6	87 55 53.2
Forks of road, road southeast to Houston post-office	35 14 26.4	87 55 03.4
Martins Mills post-office, 600 feet southeast of, forks of road	35 12 34.6	87 57 10.9
Pinhook Church, southwest corner of	35 09 08.4	87 56 00.0
Pinhook Church, 2 miles southwest, of four corners, road west to Savannah	35 08 11.8	87 57 26.2
Forks of road	35 04 52.5	87 57 54.5
Stout post-office, 1 mile east of, southeast azimuth mark, a large nail in notched root of oak tree standing near middle of road, 62 feet south of chimney at east end of house	35 01 51.9	87 57 42.8

Geographic positions between Kelleys Landing and Iron City, etc.—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Stout post-office, northwest azimuth mark 297 feet distant, a nail in notched root of oak tree 4½ feet in circumference, which is 66 feet from southeast corner of store.....	35 01 52.7	87 57 46.2
Forks of road leaving valley of Second Creek.....	35 02 47.2	87 55 14.0
Forks of road.....	35 02 36.3	87 51 40.5
Cypress Inn post-office, 2 miles north of northeast corner of Masonic Hall.....	35 02 09.5	87 49 26.5
Holt's store, road east at.....	35 02 51.8	87 49 05.3
Forks of road, signboard "Iron City, 13 miles".....	35 03 56.6	87 46 37.2
Pleasant Pines M. E. Church, southeast corner of.....	35 03 46.9	87 43 42.7
Four corners, bed of old railway grade.....	35 02 15.3	87 40 19.4
Iron City, 1½ miles northwest of, forks of road.....	35 01 54.7	87 36 22.9

Geographic positions along Mining Branch of Louisville and Nashville Railway from Iron City to Pinkney.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wayland Spring station.....	35 03 37.2	87 34 09.9
Milepost 5, road crossing one-fourth mile south of.....	35 05 39.2	87 32 32.6
West Point station, center of track opposite.....	35 07 48.6	87 32 09.2
Pinkney Station, road crossing at.....	35 09 25.6	87 32 39.4

Geographic positions along country roads between Pinkney and Napier.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Forks of road at crossing of Waterloo road and Aarons Branch of Chisholms Creek.....	35 12 58.1	87 32 02.0
Top of ridge, main road at south end of clearing, 1¼ miles south of Oak Grove schoolhouse.....	35 14 47.1	87 31 02.7
Oak Grove schoolhouse and church, southeast corner of.....	35 15 54.0	87 31 09.4
Abner post-office, four corners at.....	35 18 08.4	87 28 31.5
Forks of road, signboard "Napier, 8 miles".....	35 19 19.0	87 28 12.4
Three corners, north side of fenced field.....	35 22 15.4	87 28 28.4
Napier station.....	35 26 38.7	87 28 33.9

Geographic positions along Louisville and Nashville Railway between Iron City, Tenn., and Tuscumbia, Ala.

Station.	Latitude.	Longitude.
Iron City station, $\frac{1}{4}$ mile southeast of, southwest azimuth mark $\frac{1}{8}$ chisel mark on capstone of bank abutments at northwest corner of 3-span truss bridge over Shoal Creek	35 01 14.6	87 34 47.0
Northeast azimuth mark 356.6 feet distant, chisel mark on capstone of bank abutment at northeast corner of same bridge	35 01 17.4	87 34 44.4
Tennessee-Alabama State line	35 00 12.4	87 36 28.8
ALABAMA.		
Pruittton station, northwest corner of station house.	34 59 23.7	87 36 46.0
Hines post-office and store, road crossing near	34 56 56.9	87 38 53.9
Road crossing near section houses	34 55 38.0	87 38 52.8
Jacksonburg station, center of track on block of mail crane	34 53 25.8	87 39 50.0
Milepost 4, road crossing 600 feet north of	34 51 28.0	87 40 04.6
Road crossing near section houses	34 49 28.6	87 40 14.2
Florence station	34 48 15.5	87 39 24.8
Tennessee River railway and road bridge, north end of swing span	34 47 09.1	87 40 13.4
Sheffield, 2 miles east of Louisville and Nashville Railway and Alabama Northern Railway crossing	34 45 02.7	87 41 01.8

Geographic positions along Southern Railway from Tuscumbia to Town Creek.

Station.	Latitude.	Longitude.
ALABAMA.		
Tuscumbia, Southern Railway station, $\frac{1}{4}$ mile east of switch stand at junction of Louisville and Nashville unused track and Southern Railway	34 43 56.1	87 42 03.4
Southern Railway and Alabama Northern Railway crossing	34 43 09.5	87 39 34.1
Milepost 401, road crossing 1,000 feet east of	34 42 39.5	87 36 44.5
Milepost 398, road crossing at	34 42 34.0	87 33 51.6
Leighton station, road crossing at	34 42 07.3	87 31 44.2
Town Creek, west end of iron bridge over	34 41 44.3	87 27 05.8
Town Creek station, road crossing 360 feet west of	34 41 04.6	87 24 21.3
Tanyard triangulation station, U. S. Coast and Geodetic Survey	34 39 11.1	87 23 01.1

*Geographic positions along highways from a point 1 mile west of Abner post-office,
westerly through Waynesboro.*

Station.	Latitude.	Longitude.
TENNESSEE.	° ' "	° ' "
Road fork	35 18 10.3	87 29 19.0
Crossroads	35 18 48.3	87 32 42.6
Road right (to Mannie)	35 19 23.4	87 35 05.9
Green River, center of	35 20 30.1	87 39 41.2
Road right, old Furnace	35 20 14.0	87 40 42.6
Road right	35 20 06.1	87 42 22.6
Waynesboro, court-house, southeast corner of	35 19 11.2	87 45 49.3
Road right	35 18 01.2	87 50 09.9
Road left	35 17 43.8	87 50 12.4
Road right (Leatherwood Church)	35 17 29.1	87 51 17.2
Road left	35 17 05.9	87 50 51.7
Road fork	35 14 21.4	87 53 31.5

CENTRAL SECTION OF TOPOGRAPHY.

J. H. RENSHAW, *Geographer in charge.*

OHIO.

TRIANGULATION STATIONS.

Positions in eastern Ohio published herewith result from the field work of Messrs. W. T. Griswold in 1900, A. H. Thompson in 1901, and G. T. Hawkins and S. S. Gannett in 1902.

Previous to the latter date positions depended upon Maryland Heights and Sugar Loaf stations of the United States Coast and Geodetic Survey, near Harpers Ferry, W. Va., but during the season of 1902 Mr. Gannett extended a belt of triangulation from Wray-Gebhardt stations in the transcontinental belt of United States Coast and Geodetic Survey near Huntington, W. Va., up the Ohio River and connected with previous work near Parkersburg, W. Va.

The discrepancy in latitude and longitude was distributed arbitrarily so as not to disturb figure adjustments, and has been applied so as to reduce all positions to the U. S. standard datum as derived from Wray-Gebhardt.

BOND, ATHENS COUNTY.

On a flat ridge covered with fruit trees in Carthage Township, 7 miles southeast of Guysville. Station is on eastern edge of summit, about 4 feet lower and 200 feet east of highest point, on land owned by William Bond, who lives 300 yards south.

Station mark: A sandstone post 38 by 9 by 9 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 14' 17.07''$. Longitude $81^{\circ} 51' 10.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fulton	106 34 55.98	286 28 31.40	4.1818210
White	129 06 44.67	308 58 43.68	4.3696920
Southland	179 06 54.47	359 06 47.89	4.2068403
Nolan	226 08 49.91	46 14 13.62	4.2298152
Lyons	247 00 38.53	67 02 55.00	3.7495497
Wigal	290 51 25.79	110 58 02.69	4.2074866
Melhorn	335 49 20.01	155 53 06.15	4.3227202

FULTON, ATHENS COUNTY.

A bare hogback ridge in Lodi Township, 7 miles southeast of Athens. Land owned by William Fulton.

Station mark: A sandstone post 36 by 12 by 12 inches, dressed 8 inches square on top, set 34 inches in the ground; in the center of top is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 16' 37.29''$. Longitude $82^{\circ} 01' 18.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Townsend (2)	103 28 43.53	283 25 56.81	3.8121631
White	160 49 23.38	340 47 47.32	4.0432222
Southland	230 29 38.61	50 35 57.22	4.2678598
Bond	286 28 31.40	106 34 55.98	4.1818210

LYONS, ATHENS COUNTY.

A bald hill in Troy Township, 1 mile north of Latrobe post-office (Coolville station). Land owned by Eli Lyons, who lives 200 yards southeast of station. A good view in nearly all directions excepting northward, which is limited to 2 miles.

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

[Latitude $39^{\circ} 15' 28.16''$. Longitude $81^{\circ} 47' 35.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bond	67 02 55.00	247 00 38.53	3.7495497
Nolan	216 30 09.55	36 33 16.71	4.0753794
Wigal	308 45 37.51	128 49 58.11	4.1032825
Melhorn	350 53 46.66	170 55 16.63	4.3354363

NEBO, ATHENS COUNTY.

A small knob in Dover Township, 6 miles by road north of Athens, owned by the Hibbard heirs. Summit covered with a peach orchard (trees mostly dead). A fine view can be had in all directions excepting eastward. The station was selected and occupied by the United States Coast and Geodetic Survey in 1881.

Station mark: A marble post 30 by 6 by 6 inches set 30 inches in the ground over a square earthen pyramid 5 inches high. Top of

post is marked,

U.	S.
C. &	G. S.

[Latitude 39° 24' 29.53". Longitude 82° 05' 13.90".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Townsend (2)	2 55 47.28	182 55 29.61	4.1162949
McDaniel	83 24 56.70	263 16 04.46	4.3054151
Brooks	124 00 23.75	303 54 52.42	4.1770814
White	334 05 08.78	154 06 01.99	3.6620298

SOUTHLAND, ATHENS COUNTY.

On a flat cultivated ridge owned by W. A. Wagoner, 2 miles north-east of Broadwell post-office, in eastern central part of the county, one-fourth mile west of the Washington County line.

Station mark: A sandstone post 44 by 8 by 8 inches set 40 inches in the ground, just south of fence about 60 yards east of brick house and on opposite side of road. In center of top of post is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 22' 59.09". Longitude 81° 51' 21.13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fulton	50 35 57.22	230 29 38.61	4.2678598
White	85 47 06.32	265 39 11.18	4.2546960
Nolan	289 09 05.68	109 14 36.48	4.1212888
Bond	359 06 47.89	179 06 54.47	4.2068403

TOWNSEND (2), ATHENS COUNTY.

In Athens Township, 3 miles by road south of Athens, on a flat cultivated ridge owned by Mary Townsend. Station about 50 yards east of a north and south road and 32 feet west of line fence.

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

[Latitude 39° 17' 26.25". Longitude 82° 05' 41.78".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McKnight	29 45 53.05	209 42 32.43	4.1858081
Zaleski	81 38 31.23	261 26 53.85	4.4264864
McDaniel	118 57 19.04	298 48 45.11	4.3458525
Nebo	182 55 29.61	2 55 47.28	4.1162949
White	196 40 59.96	16 42 10.77	3.9691971
Fulton	283 25 56.81	103 28 43.53	3.8121631
Greenler	359 42 36.35	179 42 39.02	4.3021055

WHITE, ATHENS COUNTY.

On a small knob 4 miles northeast of Athens, near the corner of Athens, Canaan, Ames, and Dover townships. The station is in Canaan Township, on land owned by D. C. White, 5.5 feet east of the southeast corner of a private cemetery, which occupies the summit of knob.

Station mark: A sandstone post 36 by 14 by 7 inches set 34 inches in ground. In center of top is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 22' 15.58''$. Longitude $82^{\circ} 03' 50.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Townsend (2)	16 42 10.77	196 40 59.96	3.9691971
McDaniel	94 42 43.35	274 32 58.10	4.3453947
Nebo	154 06 01.99	334 05 08.78	3.6620298
Southland	265 39 11.18	85 47 06.32	4.2546960
Bond	308 58 43.68	129 06 44.67	4.3696920
Fulton	340 47 47.32	160 49 23.38	4.0432222

CENTENNIAL, BELMONT COUNTY.

(Secondary station.)

Situated $2\frac{1}{2}$ miles northwest of the city of Bellaire, on land owned by William Nichol.

Station mark: A lone pine tree on highest point of hill.

[Latitude $40^{\circ} 02' 19.01''$. Longitude $80^{\circ} 46' 27.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Myers	31 55 37.0	211 54 17.4	3.7445933
Sherrard	304 01 30.3	124 04 47.5	3.9432353

CLARKS HILL, BELMONT COUNTY.

Situated 1 mile east of Bannock station, south of the Cleveland, Lorain and Wheeling Railway, on the summit of a hill owned by the heirs of Mr. Samuel Clark.

Station mark: A cut marble post 6 by 6 inches on top and extending to 6 by 12 inches at bottom. It is 24 inches long, sunk 25 inches in the ground, and set in cement. In the center of the top is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 06' 18.28". Longitude 80° 57' 45.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Galloway	4 07 10.89	184 06 50.55	4.0183310
Cadiz	170 13 03.93	350 11 27.43	4.3177623
Mount Pleasant	257 20 13.51	77 26 58.01	4.1827579

GALLOWAY, BELMONT COUNTY.

Situated 4 miles southeast of Belmont and 2 miles south of Lewis Mills, on the summit of a bare hill owned by Mr. Galloway.

Station mark: A cut marble post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 00' 40.94". Longitude 80° 58' 16.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beallsville	2 29 55.83	182 29 34.33	4.2612655
Clarks Hill	184 06 50.55	4 07 10.89	4.0183311
Mount Pleasant	228 38 05.78	48 45 10.24	4.3180322
Myers	276 53 33.03	96 59 49.03	4.1453970
Jacobsburg	299 35 16.63	119 38 37.92	3.9318086
Newcastle	32 41 30.82	212 37 30.44	4.2166459
Bryan	60 34 11.06	240 30 53.45	3.9231502

JACOBSTOWN, BELMONT COUNTY.

Situated on the top of Mr. Robert C. McKelvey's house. Signal was placed on roof within railing. The center comes at edge of second layer of tin from south railing and in center of cupola east and west.

[Latitude 39° 58' 24.01". Longitude 80° 53' 03.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beallsville	30 28 36.52	210 24 54.13	4.2108474
Galloway	119 38 37.92	299 35 16.63	3.9318086
Myers	248 31 07.18	68 34 01.77	3.8405264

MOUNT PLEASANT, BELMONT COUNTY.

Situated near Morningview post-office, on the north end of a bare hill on the west side of the Wheeling and Mount Pleasant pike, on land owned by Mr. Goff.

Station mark: A cut marble post 40 by 6 by 6 inches set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 08' 06.07". Longitude 80° 47' 16.28".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Myers.....	6 32 00.56	186 31 12.65	4.1908702
Galloway.....	48 45 10.24	228 38 05.78	4.3180322
St. Clairsville.....	58 03 07.29	237 58 45.00	4.0555471
Clarks Hill.....	77 26 58.01	257 20 13.51	4.1827579
Cadiz Court-house.....	130 39 47.88	210 31 40.34	4.3715300
Cadiz.....	133 05 59.66	312 57 37.85	4.4004381
Hopedale.....	165 20 26.93	345 17 50.68	4.3534510
New Alexander.....	207 17 14.17	27 21 07.51	4.2700856
Independence.....	238 17 59.54	58 27 33.56	4.3938130
West Liberty.....	252 09 09.19	72 16 23.96	4.2241846
Sherrard.....	331 35 42.42	151 39 31.51	4.2492017

MYERS, BELMONT COUNTY.

Situated 4 miles southwest of the city of Bellaire, on a cleared knob on land owned by Mr. P. B. Myers.

Station mark: A cut marble post 48 by 6 by 6 inches set 40 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 59' 46.16". Longitude 80° 48' 31.67".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Beallsville.....	41 39 03.80	221 32 26.97	4.3447990
Jacobsburg.....	68 34 01.77	248 31 07.18	3.8405264
Galloway.....	96 59 49.03	276 53 33.03	4.1453970
Mount Pleasant.....	186 31 12.65	6 32 00.56	4.1908702
Centennial.....	211 54 17.38	31 55 36.99	3.7445900
Clinton.....	224 11 47.70	44 17 52.97	4.2850900
Sherrard.....	271 04 45.82	91 09 22.42	4.0090858
Riggs.....	344 41 46.06	164 43 47.81	4.2327314

BARNESVILLE SCHOOLHOUSE, BELMONT COUNTY.

(Not occupied.)

High school in village of Barnesville, Warren Township.
Station mark: Center of cupola.

[Latitude 39° 59' 21.42". Longitude 81° 10' 45.33".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Steele	80 40 36.44	260 38 36.77	3.6510482
Newcastle	322 02 20.19	142 06 20.66	4.1604334

BRYAN, BELMONT COUNTY.

Situated on a high, partially cleared hill in Goshen Township, about 2 miles north of Hunter post-office and 4 miles a little east of south of Bethesda. Land owned by Mr. Patterson.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

Reference mark: The tall dead signal tree on highest part of hill. Distance from station mark, 6 feet; true azimuth 355° 13'.

[Latitude 39° 58' 27.33". Longitude 81° 03' 23.94".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Newcastle	9 15 31.48	189 14 48.57	3.9944416
Steele	93 39 27.39	273 33 44.12	4.1738583
Gallaway	240 30 53.44	60 34 11.06	3.9231502
Beallsville	335 13 05.87	155 16 01.67	4.1914760

FLUSHING, BELMONT COUNTY.

(Not occupied.)

In village of Flushing, in township of same name.

Station mark: Center of cupola on Dr. Burracough's house.

[Latitude 40° 08' 58.90". Longitude 81° 03' 50.24".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sewellsville	65 25 32.21	245 19 39.26	4.1542888
Prospect Hill	126 53 21.86	306 47 57.45	4.1720159

NEWCASTLE, BELMONT COUNTY.

Situated on a high, cleared hill in Wayne Township, about one-half mile southeast of the village of Newcastle. Land owned by Benjamin Pitman.

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

Reference mark: The tall poplar signal tree; distance from station mark, 8.15 feet; true azimuth $67^{\circ} 49'$.

[Latitude $39^{\circ} 53' 11.37''$. Longitude $81^{\circ} 04' 30.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wiedman	61 08 38.37	241 04 21.24	4.0370559
Steele	128 47 53.71	308 41 53.72	4.2323159
Bryan	189 14 48.57	9 15 31.48	3.9944416
Gallaway	212 37 30.44	32 41 30.82	4.2166459
Beallsville	298 18 11.29	118 21 49.78	3.9639688

SEWELLSVILLE, BELMONT COUNTY.

Situated on the summit of a high, sharp hill in the village of Sewellsville, Kirkwood Township. Land owned by J. R. Shepherd.

Station mark: A stone post 40 by 6 by 6 inches, set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $40^{\circ} 05' 46.19''$. Longitude $81^{\circ} 12' 57.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Steele	5 46 28.38	185 45 53.85	4.1023371
Warehime	43 11 35.43	223 05 20.85	4.3052324
McBride	112 07 52.73	292 03 17.71	4.0377941
Tippecanoe	167 35 37.71	347 33 48.12	4.2714644
Prospect Hill	184 05 36.80	4 06 05.81	4.1729676
Deersville	186 18 29.97	6 19 40.88	4.3730446
Cadiz	219 59 50.71	40 08 03.66	4.4482271

STEELE, BELMONT COUNTY.

Situated on a high, cleared hill in Warren Township, about 3 miles west of Barnesville and a few feet east of the Guernsey County line. Land owned by Isaac Steele.

Station mark: A stone post 36 by 6 by 6 inches set 30 inches in the ground and resting on solid rock. In center of top of post is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 58' 57.84". Longitude 81° 13' 51.50".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Calland	21 39 25.88	201 35 53.45	4.3293954
Tucker	46 59 57.57	226 53 52.54	4.2667725
Warehime	80 21 27.72	260 15 48.06	4.1047692
McBride	152 07 18.16	332 03 18.01	4.2763262
Sewellsville	185 45 53.85	5 46 28.38	4.1023371
Bryan	273 33 44.12	93 40 27.39	4.1738583
Beallsville	305 01 44.45	125 11 13.00	4.4179181
Newcastle	308 41 53.72	128 47 53.71	4.2323159
Wiedman	346 36 44.38	166 88 26.80	4.2146469

ST. CLAIRSVILLE COURT-HOUSE, BELMONT COUNTY.

(Not occupied.)

Station mark: Center of cupola on court-house.

[Latitude 40° 04' 50.90". Longitude 80° 54' 04.27".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Mount Pleasant	237 58 45.00	58 03 07.29	4.0555471
Sherrard	297 53 05.27	118 01 16.04	4.3112543

CARROLLTON, CARROLL COUNTY.

Situated 2½ miles east of the town of Carrollton, on the Scroggsfield road, on land owned by Mr. Campbell.

Station mark: A cut marble post 40 by 6 by 6 inches set 30 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 34' 35.51". Longitude 81° 01' 47.82".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kensington	204 06 05.89	24 09 27.05	4.2491471
Elders	262 50 29.70	82 57 51.91	4.2070630
Jefferson	340 45 32.78	160 48 24.64	4.2772402

KENSINGTON, CARROLL COUNTY.

Situated 1 mile south of Kensington on the highest point of a wooded hill. A county road passes over the south side of the hill.

Theodolite elevated 60 feet.

Station mark: A cut marble post 48 by 6 by 6 inches, sunk 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $40^{\circ} 43' 20.61''$. Longitude $80^{\circ} 56' 39.07''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carrollton.....	24 09 27.05	204 06 05.89	4.2491471
Hammond.....	283 34 21.24	103 44 59.61	4.3739205
Elders.....	328 26 39.02	148 30 40.69	4.2218375

PERRYVILLE, CARROLL COUNTY.

(Not occupied.)

Station mark: Center of church spire.

[Latitude $40^{\circ} 27' 54.90''$. Longitude $81^{\circ} 05' 53.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jefferson.....	294 32 31.88	114 38 03.15	4.1217691
Cadiz.....	337 39 22.36	157 43 02.21	4.3238587

EAST LIVERPOOL CHAPEL, COLUMBIANA COUNTY.

(Not occupied.)

Memorial Chapel in the cemetery at East Liverpool, Ohio.

Station mark: Cap on monument of soldier.

[Latitude $40^{\circ} 38' 15.62''$. Longitude $80^{\circ} 34' 22.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hammond.....	114 30 16.57	294 26 23.76	3.96492
Allison.....	353 41 30.73	173 41 45.23	3.67712

HAMMOND, COLUMBIANA COUNTY.

Situated 2 miles east of the village of Glasgow on the highest point of a knob, known locally as Hammonds Knob.

Station mark: A cut marble post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 40' 19.50". Longitude 80° 40' 20.06".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wintersville	9 29 54.97	189 27 36.41	4.4836287
Elders	58 57 24.93	238 50 48.93	4.2224370
Kensington	103 44 59.61	283 34 21.24	4.3739205
Allison	313 44 30.76	133 48 37.93	4.0918031

WIDDER, COSHOCTON COUNTY.

On land owned by Mr. Charles Widder, 2½ miles nearly south of New Comerstown, 50 feet west of north and south road, 1½ miles west of Baptist Church, and 600 feet southwest of White schoolhouse.

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

[Latitude 40° 14' 09.67". Longitude 81° 36' 54.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kennedy	32 21 19.42	212 17 49.89	4.1574000
Wasen	184 22 07.82	4 22 43.79	4.2359074
Stone Creek	198 41 15.69	18 43 44.26	4.2281117
Port Washington	226 23 39.00	46 27 45.00	4.0942600
Gilmore	245 08 36.06	65 15 18.37	4.2095562
Booth	283 15 05.76	103 17 39.33	3.7615799
Midway	337 39 01.10	157 42 44.98	4.3353514

BUCK, FAIRFIELD COUNTY.

On the farm of Noah Seifert, 7 miles east-southeast of Lancaster, in the southwest part of section 13, Berne Township, on a small mound in a cleared field 100 feet north of the east and west road which crosses summit of hill. Timber obstructs view to the southwest.

Station mark: A marble post 30 by 6 by 6 inches set 28 inches in the ground, over an earthenware pyramid.

[Latitude 39° 40' 44.49". Longitude 82° 30' 07.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brown	34 23 53.61	214 20 02.08	4.1858328
B. I. S. chimney	68 40 43.74	248 35 57.26	4.0607701
B. I. S. water tower			4.0605764
Pleasant (2)	122 42 18.23	302 38 44.12	3.9771162
Cook	318 30 42.80	138 36 43.24	4.3091667
Schultz	338 54 01.46	158 57 18.49	4.3120770

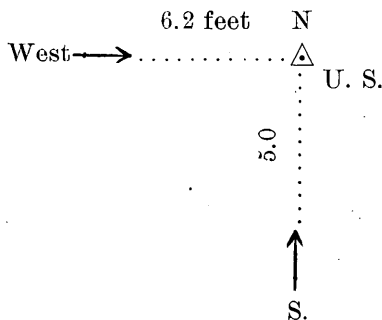
PLEASANT (2), FAIRFIELD COUNTY.

On summit of a bluff, locally called Mount Pleasant, about 300 feet above and 1 mile north of Lancaster, Ohio. Immediately east of fair grounds, on land owned by F. J. Buschemeyer.

Station mark: Center of iron windmill near western end of summit.

Reference mark: A \triangle cut in sandstone ledge, with arrows cut on edge of bluff pointing to station.

Azimuth from \triangle to center of windmill, $148^{\circ} 23'$; distance, 228 feet.



[Latitude $39^{\circ} 43' 30.56''$. Longitude $82^{\circ} 35' 42.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
B. I. S. chimney	16 17 55.89	196 16 42.49	3.9867933
B. I. S. water tower			3.9820877
Buck	302 38 44.12	122 42 18.23	3.9771162

GRAHAM, GALLIA COUNTY.

A flat, partly timbered ridge 9 miles by road, north-northwest of Gallipolis, $1\frac{1}{2}$ miles east of Evergreen post-office.

View eastward obstructed by timber, but in all other directions an extensive view can be had. Land owned by Charley Graham and rented by Mr. Sparrows.

Station mark: A marble post 30 by 6 by 6 inches, set 28 inches in the ground 7 feet east of signal tree and on south side of rail fence. In center of top is cemented a bronze triangulation tablet, "Ohio."

Reference mark: The oak signal tree on fence line on south side of road, azimuth from mark, $99^{\circ} 11'$; distance, 7 feet.

[Latitude 38° 54' 07.25". Longitude 82° 15' 07.55".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Houck	15 43 53.36	195 40 54.83	4.4049004
Wagner	57 07 05.39	236 58 47.15	4.3584636
Davis	114 12 13.18	294 03 37.74	4.3352839
Leonard	186 38 36.75	6 39 15.03	4.1024633
Finlay	285 15 10.50	105 26 39.74	4.4386594

HOUCK, GALLIA COUNTY.

In Harrison Township, on a bare hill owned by Noah Houck, 3 miles south of Lincoln and one-fourth mile north of Ruby post-office. A few locust trees still standing near summit of hill.

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

Reference mark: The locust signal tree, true azimuth from mark, 268° 05'; distance, 21.2 feet.

[Latitude 38° 40' 54.17". Longitude 82° 19' 52.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wray	49 35 13.43	229 30 22.22	4.1709604
Wagner	134 25 23.87	314 20 05.14	4.2358550
Graham	195 40 54.83	15 43 53.36	4.4049004
Finlay	242 38 56.49	62 53 22.49	4.5747505
Kennard	363 24 39.30	83 33 45.05	4.3270505
Gebhardt	338 02 32.74	158 05 28.36	4.2608573

WAGNER, GALLIA COUNTY.

A bald hill in Greenfield Township, 1½ miles northwest of Cadmus post-office; one-half mile south of the Gallia-Portsmouth pike, at a point 17 miles west of the former, on land owned by Jacob Wagner. A bunch of small locusts on southwest side of hill interferes with view in that direction; in all other directions an extended view can be had.

Station mark: A sandstone post 30 by 15 by 15 inches set 28 inches in the ground; top dressed 9 by 9 inches, having cemented in its center a bronze triangulation tablet, "Ohio."

[Latitude 38° 47' 24.58". Longitude 82° 28' 21.88".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Davis	178 19 50.05	358 19 33.89	4.3278387
Leonard	219 25 58.48	39 34 55.56	4.5104457
Graham	236 58 47.15	57 07 05.39	4.3584636
Houck	314 20 05.14	134 25 23.87	4.2358550
Wray	357 15 02.72	177 15 29.58	4.3360952

CLAYSVILLE, GUERNSEY COUNTY.

On a bald knob one-fourth mile northwest from village of Claysville.

Station mark: A bottle of ashes 2½ feet below surface, above which is a tile 30 by 4 by 4 inches set 30 inches in the ground.

[Latitude 39° 56' 25.33". Longitude 81° 40' 43.04".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sago	131 54 42.28	311 50 42.87	4.0746717
College	193 42 02.84	13 43 15.84	4.0557460
Midway	226 49 26.89	46 55 37.28	4.2725062
Warehime	264 12 48.08	84 24 23.41	4.4121452
Gregg	290 24 08.88	110 31 13.35	4.2245402

COLLEGE, GUERNSEY COUNTY.

In a field about 400 feet southeast from white schoolhouse, on what is known locally as College Hill, 2.5 miles northwest of Cambridge.

Station mark: A limestone post 40 by 7 by 7 inches set 39 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 02' 23.47". Longitude 81° 38' 49.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Claysville	13 43 15.84	193 42 02.84	4.0557460
Sago	74 54 42.29	254 49 29.58	4.0771353
Kennedy	152 47 17.23	332 45 02.42	4.0350419
Midway	260 51 24.41	80 56 22.09	4.0455896

KENNEDY, GUERNSEY COUNTY.

On east slope of hill, in field owned by Mr. Kennedy, about 5 miles west of Kimbolton and 3 miles northwest of Hopewell village.

Station mark: A sandstone post 40 by 7 by 7 inches set 36 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 07' 36.01". Longitude 81° 42' 18.85".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sago	27 14 31.91	207 11 33.69	4.1566993
Widder	212 17 49.89	32 21 19.42	4.1574000
Booth	230 51 07.97	50 57 10.87	4.2342578
Midway	296 16 48.49	116 24 01.27	4.2495411
College	332 45 02.42	152 47 17.23	4.0350419

MIDWAY, GUERNSEY COUNTY.

About 6 miles northeast of Cambridge and 1½ miles southeast of village of Midway, 200 feet west of north and south road and 300 feet northwest of schoolhouse, on a prominent bald hill.

Station mark: A limestone post 36 by 6 by 6 inches set 30 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 03' 20.47". Longitude 81° 31' 06.84".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Claysville	46 55 37.28	226 49 26.89	4.2725062
College	80 56 22.09	260 51 24.41	4.0455896
Kennedy	116 24 01.27	296 16 48.49	4.2495411
Widder	157 42 44.98	337 39 01.10	4.3353514
Booth	172 07 03.12	352 05 52.54	4.2759110
Warehime	310 23 54.26	130 29 19.95	4.1983205
Gregg	353 48 09.85	173 49 04.63	4.2735701

HALL'S KNOB, GUERNSEY COUNTY.

(Not occupied.)

A high knob in northern part of Millwood Township, locally known as Joe Hall's knob.

Station mark: Center of tobacco barn on highest part of knob.

[Latitude 39° 59' 57.14". Longitude 81° 17' 15.25".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sewellsville	209 31 02.83	29 33 48.43	4.0925218
Steele	290 41 37.89	110 43 48.80	3.7132089

M'BRIDE, GUERNSEY COUNTY.

Situated on a cleared hill about 2 miles northeast of the village of Antrim, in Londonderry Township. Land owned by J. E. McBride.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 07' 59.22". Longitude 81° 20' 04.72".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Warehime	11 05 17.55	191 03 37.47	4.2832082
Tippecanoe	203 13 59.21	23 16 45.07	4.1873542
Prospect Hill	226 01 54.41	46 06 58.83	4.1902726
Sewellsville	292 03 17.71	112 07 52.73	4.0377941
Steele	332 03 18.01	152 07 18.16	4.2763262

WAREHIME, GUERNSEY COUNTY.

Situated on a high cleared hill in Richland Township, about 2½ miles southeast of Gibson station. Land owned by Albert Warehime.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 57' 48.36". Longitude 81° 22' 40.22".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tucker	5 11 30.20	185 11 04.50	4.0219463
Pleasant	17 43 25.93	197 40 49.35	4.2799538
Gregg	49 56 24.57	229 51 54.19	4.1165523
McBride	191 03 37.47	11 05 17.55	4.2832082
Sewellsville	223 05 20.85	43 11 35.43	4.3052324
Steele	260 15 48.06	80 21 27.72	4.1047692
Wiedman	310 06 46.06	130 14 07.62	4.3304252
Calland	345 08 11.50	165 10 18.15	4.2628296

CADIZ, HARRISON COUNTY.

Situated $1\frac{1}{8}$ miles north of the town of Cadiz on a hill locally known as the sand lot, on land owned by Louis Rider. At forks of road to Hanover and Rumley.

Theodolite elevated 52 feet.

Station mark: A cut marble post 48 by 6 by 6 inches sunk 36 inches in the ground, in center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $40^{\circ} 17' 23.36''$. Longitude $81^{\circ} 00' 14.58''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jefferson	196 06 28.74	16 08 19.68	4.1631951
Hopedale	249 40 19.70	69 46 06.04	4.1295800
Mount Pleasant	312 57 37.85	133 05 59.66	4.4004381
Clarks Hill	350 11 27.43	170 13 03.92	4.3177623
Sewellsville	40 08 03.66	219 59 50.71	4.4482271
Deersville	97 22 22.94	277 15 19.98	4.1923301
Bowerston	124 38 35.25	304 31 25.13	4.2799048

CADIZ COURT-HOUSE, HARRISON COUNTY.

(Not occupied.)

Station mark: Center of cupola on court-house.

[Latitude $40^{\circ} 16' 22.39''$. Longitude $80^{\circ} 59' 52.62''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hopedale.	241 40 48.88	61 46 20.94	4.1388232
Mount Pleasant	310 31 40.34	130 39 47.88	4.3715307

JEFFERSON, HARRISON COUNTY.

Situated on a bare hill one-fourth mile northwest of the town of Jefferson, between the forks of the New Philadelphia and Carrollton roads, on land owned by Samuel Meed.

Station mark: A cut marble post 42 by 6 by 6 inches sunk 36 inches in the ground, in center of top of which is cemented a bronze triangulation tablet, "Ohio."

Bull. 216—03—7

[Latitude 40° 24' 55.88". Longitude 80° 57' 23.13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Cadiz	16 08 19.68	196 06 28.74	4.1631951
Carrollton	160 48 24.64	340 45 32.78	4.2772402
Elders	206 09 16.01	26 13 45.61	4.3452306
Wintersville	274 33 35.99	94 42 21.10	4.2824762
Hopedale	317 18 11.04	137 22 06.82	4.1028039
Deersville	58 24 40.31	238 15 45.68	4.3594835
Bowerston	80 54 37.31	260 45 35.42	4.3003187

BOWERSTON, HARRISON COUNTY.

Situated on a cleared hill in section 25, Monroe Township, about 2 miles south of the village of Bowerston, on land owned by J. E. Brown.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 23' 13.23". Longitude 81° 11' 18.71".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Tippecanoe	24 21 54.23	204 19 00.04	4.1880466
Jefferson	260 45 35.42	80 54 37.31	4.3003187
Cadiz	304 31 25.13	124 38 35.25	4.2799048
Deersville	358 23 14.06	178 23 20.87	3.9461666

DEERSVILLE, HARRISON COUNTY.

Situated in the village of Deersville, Franklin Township. Station is the spire or center of cupola of public school building in the eastern part of the village.

Station mark: Center of cupola.

[Latitude 40° 18' 26.93". Longitude 81° 11' 08.13".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sewellsville	6 19 40.88	186 18 29.97	4.3730446
Prospect	10 06 05.78	190 05 23.84	3.9417489
Tippecanoe	51 43 47.10	231 40 46.25	3.9252612
Bowerston	178 23 20.87	358 23 14.06	3.9461666
Jefferson	238 15 45.68	58 24 40.31	4.3594835
Cadiz	277 15 19.98	97 22 22.94	4.1923301

PROSPECT HILL, HARRISON COUNTY.

Situated on the summit of a sharp hill, about 4 miles northeast of Freeport and just east of the Freeport and Cadiz road. The hill is known locally as Prospect Hill and is the highest point for miles around. Land owned by Robert Moore.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 13' 47.80". Longitude 81° 12' 12.96".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Sewellsville	4 06 05.81	184 05 36.80	4.1729676
McBride	46 06 58.83	226 01 54.41	4.1902726
Tippecanoe	123 45 44.31	303 43 25.52	3.7857938
Deersville	190 05 23.84	10 06 05.78	3.9417489
Flushing	306 47 57.00	126 53 22.00	4.1720159

RUMLEY, HARRISON COUNTY.

(Not occupied.)

Station mark: Spire of Methodist Episcopal Church.

[Latitude 40° 24' 14.72". Longitude 81° 02' 04.54".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Jefferson	259 02 14.82	79 05 17.47	3.8303382
Cadiz	348 24 50.50	168 26 01.90	4.1130606

TIPPECANOE, HARRISON COUNTY.

Situated on the summit of a high, cleared hill in Washington Township, about 2 miles southeast of the village of Tippecanoe. Land owned by William Welch.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 15' 37.77". Longitude 81° 15' 47.79".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
McBride	23 16 45.07	203 13 59.21	4.1873542
Bowerston	204 19 00.04	24 21 54.23	4.1880466
Deersville	231 40 46.25	51 43 47.10	3.9252612
Prospect	303 43 25.52	123 45 44.31	3.7857938
Sewellsville	347 33 48.12	167 35 37.71	4.2714644

BARTON, HOCKING COUNTY.

On a flat cultivated ridge, in section 18, Washington Township, owned by William Barton, who lives one-fourth mile west of station. Selected and occupied by the United States Coast and Geodetic Survey in 1884-85.

Station mark: A marble post 30 by 6 by 6 inches set 28 inches in the ground over an earthenware pyramid. Top of post marked,

U.	S.
C. &	G. S.

Reference marks: Three marble posts 30 by 4 by 4 inches, set as follows:

- (1) True azimuth, $99^{\circ} 53'$; distance, 140.25 feet.
- (2) True azimuth, $54^{\circ} 41'$; distance, 175.8 feet.
- (3) True azimuth, $338^{\circ} 12'$; distance 437.75 feet.

[Latitude $39^{\circ} 26' 22.32''$. Longitude $82^{\circ} 29' 46.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brown	146 40 36.24	326 36 32.15	4.2220318
Schultz	222 46 20.65	42 49 24.02	4.0063768
Cook	228 57 23.90	49 03 10.28	4.2366543
Brooks	257 42 22.62	77 52 27.11	4.3666779
McDaniel	290 56 26.59	111 03 09.10	4.2107237
Zaleski	338 05 36.66	158 09 14.12	4.3433070

BOYS' INDUSTRIAL SCHOOL CHIMNEY, HOCKING COUNTY.

(Not occupied.)

In sections 35 and 36, Hocking Township, 6 miles south of Lancaster. Station mark: Center of tall brick chimney.

[Latitude $39^{\circ} 38' 28.64''$. Longitude $82^{\circ} 37' 36.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pleasant (2)	196 16 42.49	16 17 55.39	3.9867933
Buck	248 35 57.26	68 40 43.74	4.0607701
Schultz	309 29 26.62	129 37 29.82	4.3707116
Brown	346 20 02.87	166 20 57.88	3.9405008

BOYS' INDUSTRIAL SCHOOL WATER TOWER, HOCKING COUNTY.

(Not occupied.)

In sections 35 and 36, Hocking Township, 6 miles south of Lancaster. Station mark: Center of large white water tower.

[Latitude $39^{\circ} 38' 32.48''$. Longitude $82^{\circ} 37' 38.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pleasant (2)			3.9820877
Buck			4.0605764
Schultz	309 39 00.95	129 47 05.22	4.3726735
Brown	346 15 44.39	166 16 40.48	3.9466564

BROOKS, HOCKING COUNTY.

A station of the United States Coast and Geodetic Survey, on a wooded ridge near the northern line of section 19, Ward Township, about 3 miles north of Nelsonville.

Station mark: A marble post 29 by 6 by 6 inches, set 22 inches in the ground, above a square earthenware pyramid 5 inches high. Top

of post marked

U.	S.
C. &	G. S.

Reference marks: (1) A marble post 30 by 4 by 4 inches set 28 inches in the ground; azimuth from mark, $74^{\circ} 11'$; distance, 110.75 feet. (2) A marble post 30 by 4 by 4 inches, set 28 inches in the ground; azimuth from mark, $336^{\circ} 13'$; distance, 275 feet. (3) A marble post 30 by 4 by 4 inches, set 28 inches in the ground; azimuth from mark, $200^{\circ} 35'$; distance, 185.4 feet.

[Latitude $39^{\circ} 29' 01.86''$. Longitude $82^{\circ} 13' 55.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
McDaniel	35 15 15.27	215 11 53.84	4.1188828
Barton	77 52 27.11	257 42 22.62	4.3666779
Schultz	99 07 21.22	279 00 19.77	4.2050498
Cook	123 23 44.62	303 19 26.03	4.0653816
Nebo	303 54 52.42	124 00 23.75	4.1770814

BROWN, HOCKING COUNTY.

On the property of Isaac Brown, in the southeast quarter of section 30, Good Hope Township, 13 miles by road west of Logan, 13 miles south of Lancaster, 5 miles west of Rockbridge. Station is just east of a cemetery which occupies summit of hill and has a good view in nearly all directions.

Station mark: A marble post 30 by 6 by 6 inches set 28 inches in the ground, over an earthenware pyramid.

[Latitude $39^{\circ} 33' 53.90''$. Longitude $82^{\circ} 36' 10.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
B. I. S. water tower	166 16 40.48	346 15 44.39	3.9466564
B. I. S. chimney	166 20 57.88	346 20 02.87	3.9405008
Buck	214 20 02.08	34 23 53.61	4.1858328
Cook	276 38 41.55	96 48 32.74	4.3486753
Schultz	291 55 33.81	112 02 41.69	4.2383235
Barton	326 36 32.15	146 40 36.24	4.2220318

COOK, HOCKING COUNTY.

On the estate of John Cook, in the northeast quarter of section 23, Green Township, 4 miles east of Logan. A good view can be had in all directions excepting north 0° east to north 30° east, which is interfered with by timber at north end of ridge. This station was also occupied by the United States Coast and Geodetic Survey in 1881.

Station mark: A marble post 30 by 6 by 6 inches set 28 inches in the ground, immediately above an earthenware pyramid. Top of post

marked

U.	S.
C. &	G. S.

[Latitude $39^{\circ} 32' 29.14''$. Longitude $82^{\circ} 20' 41.83''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Barton	49 03 10.28	228 57 23.90	4.2366543
Schultz	57 44 19.75	237 41 36.70	3.8596674
Brown	96 48 32.74	276 38 41.55	4.3486753
Buck	138 36 43.24	318 30 42.80	4.3091667
Brooks	303 19 26.03	123 23 44.62	4.0653816
McDaniel	352 53 21.32	172 54 18.10	4.2371864

M'DANIEL, HOCKING COUNTY.

Situated in the southern edge of the southwest quarter, section 7, Starr Township, on the estate of George McDaniel, 8 miles southwest of Nelsonville post-office, 15 miles southeast of Logan, and 2 miles east of Starr. The knob is quite prominent and has only a few trees on its southwest side to interfere with view. Selected and occupied by the United States Coast and Geodetic Survey in 1882-83.

Station mark: A marble post 26 by 6 by 6 inches set 25 inches in the ground immediately above a square earthenware pyramid. Top of

post marked

U.	S.
C. &	G. S.

[Latitude 39° 23' 13.57". Longitude 82° 19' 12.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Zaleski	25 29 15.51	205 26 11.15	4.2098137
Barton	111 03 09.10	290 56 26.59	4.2107237
Schultz	148 07 04.09	328 03 24.55	4.1939372
Cook	172 54 18.10	352 53 21.32	4.2371864
Brooks	215 11 53.84	35 15 15.27	4.1188828
Nebo	263 16 04.46	83 24 56.70	4.3054151
White	274 32 58.10	94 42 43.35	4.3453947
Townsend (2)	298 48 45.11	118 57 19.04	4.3458525

SCHULTZ, HOCKING COUNTY.

A prominent knob 3 miles south of Logan on the estate of Daniel Schultz, in the west half of the northeast quarter of section 26, Falls Township. Summit has apple and peach trees which interfere somewhat with the view. This station was occupied by the United States Coast and Geodetic Survey in 1885.

Station mark: A marble post 30 by 6 by 6 inches set 28 inches in the ground immediately above an earthenware pyramid. Top of post

marked

U.	S.
C. &	G. S.

[Latitude, 39° 30' 23.76". Longitude, 82° 24' 58.05".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Barton	42 49 24.02	222 46 20.65	4.0033768
Brown	112 02 41.69	291 55 33.81	4.2383235
B. I. S. chimney	129 37 29.82	309 29 26.62	4.3707116
B. I. S. watertower	129 47 05.22	309 39 00.95	4.3726735
Buck	158 57 18.49	338 54 01.46	4.3120770
Cook	237 41 36.70	57 44 19.75	3.8596674
Brooks	279 00 19.77	99 07 21.22	4.2050498
McDaniel	328 03 24.55	148 07 04.09	4.1939372

DAVIS, JACKSON COUNTY.

On a cultivated hill in Bloomfield Township, 12 miles eastward from Jackson, 1½ miles north of Orpheus post-office, 3 miles east of Winchester (Rocky Hill post-office). Land owned by Evan D. Davis who lives about 500 feet west, southwest of station. An unobstructed view can be had for many miles toward the north, northwest, and west, and comparatively few trees obstruct view southwest.

Station mark: Center of wild cherry signal tree about 500 feet east-northeast of Mr. Davis's residence and 13 feet south of an east and west fence.

[Latitude $38^{\circ} 58' 54.17''$. Longitude $82^{\circ} 28' 47.63''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lawler.....	200 26 28.47	20 28 23.27	4.0984524
Graham.....	294 03 37.74	114 12 13.18	4.3352839
Wagner.....	358 19 33.89	178 19 50.05	4.3278387

ELDERS, JEFFERSON COUNTY.

Situated one-half mile south of the village of Monroeville on land owned by Mr. Elder.

Station mark: A cut marble post 48 by 6 by 6 inches set 40 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $40^{\circ} 35' 40.04''$. Longitude $80^{\circ} 50' 28.10''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Jefferson.....	26 13 45.61	206 09 16.01	4.3452306
Carrollton.....	82 57 51.91	262 50 29.70	4.2070630
Kensington.....	148 30 40.69	328 26 39.02	4.2218375
Hammond.....	238 50 48.93	58 57 24.93	4.2224370
Allison.....	269 43 49.10	89 54 31.77	4.3659427
Wintersville.....	336 29 21.40	156 33 37.87	4.3683786

HOPEDALE, JEFFERSON COUNTY.

Situated 2 miles west of Bloomingdale on the north side of the Bloomingdale and Hopedale pike, on the highest point of hill in cleared field belonging to Mr. S. N. Beall.

Station mark: A cut marble post 24 by 4 by 4 inches sunk 24 inches in the ground. "U. S. G. S." marked on top of post.

[Latitude $40^{\circ} 19' 53.80''$. Longitude $80^{\circ} 51' 19.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cadiz C. H.....	61 46 20.94	241 40 48.88	4.1388232
Cadiz.....	69 46 06.04	249 40 19.70	4.1295300
Jefferson.....	137 22 06.82	317 18 11.04	4.1028039
Wintersville.....	233 31 31.07	53 36 19.99	4.1166735
New Alexander.....	290 17 09.61	110 23 39.92	4.1817202
Mount Pleasant.....	345 17 50.68	165 20 26.93	4.3534510

NEW ALEXANDER, JEFFERSON COUNTY.

Situated 1 mile southwest of the village of New Alexander in a cleared field on west side of county road one-fourth mile beyond point at which it leaves the New Alexander and Bloomingdale pike.

Station mark: A cut marble post 24 by 6 by 6 inches sunk 2 feet under surface of the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

Reference marks: A large tree, true bearing N. 53° 20' E., distant 272 feet. A small tree, true bearing S. 1° 36' W., distant 131 feet. An old stump in field, true bearing N. 68° 36' W., distant 14.7 feet.

[Latitude 40° 17' 02.55". Longitude 80° 41' 15.83".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mount Pleasant	27 21 07.51	207 17 14.17	4.2700856
Hopedale	110 23 39.92	290 17 09.61	4.1817202
Wintersville	164 08 12.73	344 06 30.92	4.1325490
Independence	286 01 22.01	106 07 03.27	4.1133566
West Liberty	327 04 20.90	147 07 42.89	4.1338982

WINTERSVILLE, JEFFERSON COUNTY.

Situated 2 miles northwest of the village of Wintersville on a cone-shaped hill on land owned by Mr. Mayo. The Wintersville and New Richmond pike passes over east side of hill.

Station mark: A cut marble post 40 by 6 by 6 inches sunk 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 40° 24' 05.70". Longitude 80° 43' 53.11".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hopedale	53 36 19.99	233 31 31.07	4.1166735
Jefferson	94 42 21.10	274 33 35.99	4.2824762
Elder	156 33 37.87	336 29 21.35	4.3682786
Hammond	189 27 36.41	9 29 54.97	4.4836287
New Alexander	344 06 30.92	164 08 12.73	4.1325490

WRAY, LAWRENCE COUNTY.

A station in the transcontinental belt of the United States Coast and Geodetic Survey on Johnson Ridge, 2½ miles east of Marion (Aid post-office). Summit nearly cleared, giving a good view in all directions.

Station mark: A pottery pyramid buried 3 feet under ground (no surface mark 1902).

Reference marks: Drain tile pipes 4 inches in diameter, 2 feet long, filled with concrete and buried 22 inches in ground—one north, 5.93 feet distant; one south, 5.99 feet; one east, 5.98 feet; one west, 5.92 feet.

[Latitude $38^{\circ} 35' 42.24''$. Longitude $82^{\circ} 27' 38.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wagner	177 15 29.58	357 15 02.72	4.3360952
Houck	229 30 22.22	49 35 13.43	4.1709604
Gebhardt	291 52 47.45	112 00 33.64	4.2904979

GREENLER, MEIGS COUNTY.

On a cultivated ridge in Scipio Township, $2\frac{1}{2}$ miles southeast of Harrisonville and 9 miles northwest of Pomeroy. Land owned by the widow Greenler. An extended view can be had in all directions.

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

[Latitude $39^{\circ} 06' 36.10''$. Longitude $82^{\circ} 05' 37.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Leonard	49 22 32.39	229 17 11.56	4.2078401
McKnight	131 06 34.33	311 03 11.43	4.0103602
Townsend (2)	179 42 39.02	359 42 36.35	4.3021055
Bond			4.4013817
Melhorn	279 28 14.79	99 41 07.07	4.4750063
Finlay	337 13 28.07	157 19 00.37	4.5174129

LEONARD, MEIGS COUNTY.

On a partly timbered ridge in Salem Township, 12 miles by road west of Middleport, 4 miles north of Eno post-office. Timber interferes with view northeast and southeast, but in other directions the view is particularly good. Land owned by W. H. Leonard, who lives 300 yards north.

Station mark: A sandstone post 36 by 8 by 8 inches set 34 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

Reference mark: The poplar signal tree at roadside. True azimuth from station mark, $322^{\circ} 19'$; distance, 128.1 feet.

[Latitude 39° 00' 55.06". Longitude 82° 14' 06.67".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Graham	6 39 15.03	186 38 36.75	4.1024633
Wagner	39 34 55.56	219 25 58.48	4.5104457
Lawler	115 35 43.20	295 28 23.01	4.2699658
Zaleski	151 46 12.85	331 39 56.21	4.4807510
McKnight	194 38 18.41	14 40 16.75	4.2510681
Greenler	229 17 11.56	49 22 32.39	4.2078401
Finlay	308 21 37.63	128 32 29.47	4.5039347

M'KNIGHT, MEIGS COUNTY.

A cleared ridge in the northwestern part of Scipio Township, 2 miles east of Carpenter post-office and 5 miles south of Albany. Land owned by Thornton McKnight.

Station mark: A bluestone post 40 by 8 by 8 inches set 38 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 10' 14.34". Longitude 82° 10' 59.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Leonard	14 40 16.75	194 38 18.41	4.2510681
Zaleski	116 35 39.29	296 27 23.36	4.3229316
Townsend (2)	209 42 32.43	29 45 53.05	4.1858081
Greenler	311 03 11.43	131 06 34.33	4.0103602

BEALLSVILLE, MONROE COUNTY.

Situated 3 miles east of the town of Beallsville on the highest point of a bare hill on the farm of the Gale brothers.

Station mark: A cut marble post 48 by 6 by 6 inches set 40 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 50' 49.76". Longitude 80° 58' 49.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Gallaway	182 29 34.33	2 29 55.83	4.2612655
Jacobsburg	210 24 53.13	30 28 36.52	4.2108474
Myers	221 32 26.97	41 39 03.80	4.3447990
Riggs	269 45 19.11	89 53 56.89	4.2835700
Wiedman	87 09 57.20	267 02 01.79	4.2471021
Newcastle	118 21 49.78	298 18 11.29	3.9639688
Steele	125 11 13.00	305 01 44.45	4.4179181
Bryan	155 16 01.67	335 13 05.87	4.1914760

CALLAND, MONROE COUNTY.

Situated on a high cleared hill in Seneca Township, about 2 miles northeast of village of Summerfield, near the Noble-Monroe county line. Land owned by Mrs. Martha Calland.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 48' 14.31''$. Longitude $81^{\circ} 19' 22.61''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fulda	53 35 25.20	233 32 02.90	3.9709420
Pleasant	87 36 24.91	267 31 42.37	4.0215172
Tucker	142 01 12.68	321 58 40.51	3.9625705
Warehime	165 10 18.15	345 08 11.50	4.2628296
Steele	201 35 53.45	21 39 25.88	4.3293954
Wiedman	251 29 17.30	71 34 31.64	4.0901708

JERUSALEM SCHOOLHOUSE, MONROE COUNTY.

(Not occupied.)

Schoolhouse in Jerusalem, Sunbury Township.

Station mark: Center of cupola.

[Latitude $39^{\circ} 50' 54.00''$. Longitude $81^{\circ} 06' 06.45''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wiedman	81 59 06.96	261 55 51.27	3.8653255
Newcastle	208 14 14.47	28 15 15.85	3.6820293

ST. JOHNS, MONROE COUNTY.

(Not occupied.)

St. John's Church, situated about one-half mile west of village of Miltonsburg.

Station mark: Center of church spire.

[Latitude $39^{\circ} 50' 15.20''$. Longitude $81^{\circ} 10' 32.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Steele	163 40 24.15	343 38 16.46	4.2252598
Newcastle	237 40 56.39	57 44 48.27	4.0073924
Wiedman	-----	-----	2.9781631

DILLON, MONROE COUNTY.

Station mark: The chimney on Mr. J. D. Dillon's residence, 1 mile south of Way post-office.

[Latitude $39^{\circ} 37' 40.67''$. Longitude $81^{\circ} 10' 31.26''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Moore	19 50 50.56	199 47 41.01	4.3215874
Laws	65 40 13.26	245 36 29.65	3.9630466
Tank	216 55 13.70	36 57 28.00	3.9554300
High Knob.....	282 34 05.00	102 39 53.00	4.1253100
Glass	332 17 56.67	152 19 54.03	3.9758125

HIGH KNOB, MONROE COUNTY.

(Not occupied.)

A high peak near Sisterville on Ohio side of Ohio River, having a red tank on summit, which was located by intersections.

Station mark: Center of tank.

[Latitude $39^{\circ} 36' 06.2''$. Longitude $81^{\circ} 01' 25.3''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Glass	57 43 14	237 39 23	4.00930
Dillon.....	102 39 53	282 34 05	4.12531

TANK, MONROE COUNTY.

On the highest knob 6 miles south of Woodsfield and 5 miles north-east of Graysville. There are two tanks on top of the knob. The one located is the farthest west and is painted white.

Station mark: Center of tank.

[Latitude $39^{\circ} 41' 34.6''$. Longitude $81^{\circ} 06' 43.7''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Glass	3 48 12	183 47 44	4.19380
Dillon.....	36 57 28	216 55 14	3.95543
Laws	51 27 48	231 21 39	4.24646

WIEDMAN, MONROE COUNTY.

Situated on a cleared hill in Malaga Township, about 2 miles southwest of village of Miltonsburg. Land owned by Mr. Wiedman.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 50' 20.74''$. Longitude $81^{\circ} 11' 11.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Calland	71 34 31.64	251 29 17.30	4.0901708
Tucker	100 57 09.79	280 49 22.91	4.2463136
Warehime	130 14 07.62	310 06 46.06	4.3304252
Steele	166 38 26.80	346 36 44.38	4.2146469
Newcastle	241 04 21.24	61 08 38.37	4.0370559
Beallsville	267 02 01.79	87 09 57.20	4.2471021

WOODSFIELD COURT-HOUSE, MONROE COUNTY.

(Not occupied.)

Station mark: Center of court-house cupola.

[Latitude $39^{\circ} 45' 53.10''$. Longitude $81^{\circ} 07' 04.01''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Wiedman	144 29 15.26	324 26 36.62	4.0061831
Beallsville	232 04 06.58	52 09 22.97	4.1730814

SAGO, MUSKINGUM COUNTY.

On a bald hill 4 miles southwest of the village of Sago, on land owned by J. W. Carnes.

Station mark: A limestone post 40 by 7 by 7 inches set 39 inches in the ground, in the center of top of which is countersunk and cemented a bronze triangulation tablet, "Ohio."

[Latitude $40^{\circ} 00' 42.40''$. Longitude $81^{\circ} 46' 55.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Kennedy	207 11 33.69	27 14 31.91	4.1566993
College	254 49 29.58	74 54 42.29	4.0771353
Claysville	311 50 42.87	131 54 42.28	4.0746717

COFFEY, NOBLE COUNTY.

Situated in Jefferson Township, about 2 miles east of Macksburg and near the Noble-Washington county line. It is on a knob at the southern end of what is locally known as Coffey Ridge. Land belongs to the Coffey Brothers. A house surrounded by a peach orchard occupies the whole summit of knob.

Station mark: A stone post 15 by 6 by 6 inches set 15 inches in the ground, with a cross cut on upper surface.

Reference mark: The south chimney of house; distance from station 69 feet; azimuth $121^{\circ} 43'$.

Subsurface mark: An aluminum bolt buried 2 feet below surface underneath station mark.

[Latitude $39^{\circ} 38' 20.51''$. Longitude $81^{\circ} 25' 56.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Dovenbacker	21 34 03.43	201 32 41.16	3.9232258
Correy	134 02 58.60	313 58 36.21	4.1340788
Fulda	188 13 57.47	8 14 46.99	4.1102507
Laws	290 04 00.35	110 10 06.45	4.1639102

CORREY, NOBLE COUNTY.

Situated in Olive Township on summit of hill known locally as Correy Knob. Land belongs to John Hughes and is covered with a peach orchard.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 43' 27.31''$. Longitude $81^{\circ} 32' 47.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gregg	193 41 15.25	13 43 14.30	4.2709766
Pleasant	225 47 16.75	45 51 09.15	4.0813436
Fulda	254 08 13.79	74 13 26.06	4.0823867
Coffey	313 58 36.21	134 02 58.60	4.1340788
Dovenbecker	338 41 35.73	158 44 36.15	4.2675872
Fulda Church	270 09 40.00	90 14 41.00	4.0496191

FULDA, NOBLE COUNTY.

Situated on a cleared hill in Enoch Township about 2 miles north of Fulda post-office. Land owned by Mr. Bates.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 45' 14.16''$. Longitude $81^{\circ} 24' 38.75''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Coffey	8 14 46.99	188 13 57.47	4.1102507
Dovenbecker	13 29 38.34	193 27 26.49	4.3249454
Correy	74 13 26.06	254 08 13.79	4.0823867
Pleasant	149 46 36.80	329 45 16.75	3.7718484
Tucker	188 18 59.48	8 19 49.89	4.1112795
Calland	233 32 02.90	53 35 25.20	3.9709420
Laws	326 17 40.64	146 22 57.69	4.3294759

FULDA CHURCH SPIRE, NOBLE COUNTY.

(Not occupied.)

In village of Fulda.

Station mark: Center of church spire.

[Latitude $39^{\circ} 43' 26.01''$. Longitude $81^{\circ} 24' 56.52''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Correy	90 14 41.03	270 09 40.22	4.0496191
Fulda Δ	187 13 47.17	7 13 58.53	3.5265941

GREGG, NOBLE COUNTY.

Situated on a cleared hill in Wayne Township about 4 miles south of Senecaville and near the Noble-Seneca county line. Hill partly covered by an orchard. Land owned by Walter Gregg.

Station mark: A boulder 20 by 10 by 8 inches set in the ground, and having a cross (+) cut on its upper surface.

Subsurface mark: A bronze triangulation tablet buried 2 feet below surface immediately underneath cross on boulder.

[Latitude $39^{\circ} 53' 15.23''$. Longitude $81^{\circ} 29' 41.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Correy	13 43 14.30	193 41 15.25	4.2709766
Warehime	229 51 54.19	49 56 24.57	4.1165523
Tucker	282 43 32.96	102 47 37.40	3.9679631
Pleasant	336 31 55.44	156 33 49.16	4.0254160

PLEASANT, NOBLE COUNTY.

Situated on a high hill, with a few scattering trees on its summit, in Center Township, about 2 miles southeast of Sarahsville.

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

[Latitude $39^{\circ} 47' 59.84''$. Longitude $81^{\circ} 26' 43.92''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Correy	45 51 09.15	225 47 16.75	4.0818436
Gregg	156 33 49.09	336 31 55.44	4.0254160
Warehime	197 40 49.35	17 43 25.93	4.2799538
Tucker	212 14 38.28	32 16 48.80	3.9579200
Calland	267 31 42.37	87 36 24.91	4.0215172
Fulda	329 45 16.75	149 46 36.80	3.7718484

SUMMERFIELD SCHOOLHOUSE, NOBLE COUNTY.

(Not occupied.)

Station mark: Center of schoolhouse in village of Summerfield.

[Latitude $39^{\circ} 47' 55.47''$. Longitude $81^{\circ} 20' 16.71''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tucker	150 49 58.53	330 48 01.02	3.9516327
Calland	245 41 23.24	65 42 07.87	3.1498794

TUCKER, NOBLE COUNTY.

Situated on a partly cleared hill in Seneca Township, about 3 miles northeast of Mount Ephraim post-office. Land owned by John Tucker.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 52' 08.72''$. Longitude $81^{\circ} 23' 20.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pleasant	32 16 48.80	212 14 38.28	3.9579200
Gregg	102 47 37.40	282 43 32.96	3.9679631
Warehime	185 11 04.50	5 11 30.20	4.0219463
Steele	226 53 52.54	46 59 57.57	4.2667725
Calland	321 58 40.51	142 01 12.68	3.9625705
Fulda	8 19 49.89	188 18 59.48	4.1112795

BALDWIN, TUSCARAWAS COUNTY.

About 7 miles northeast from Uhrichsville, on a bald hill 100 yards east of ridge road, on land owned by David Baldwin.

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

[Latitude $40^{\circ} 27' 01.37''$. Longitude $81^{\circ} 17' 28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wainwright.....	75 00 27.85	254 54 15.71	4.1462651
Bowerston.....	308 57 08.21	129 01 07.70	4.0493365
Uhrichsville.....	355 40 02.51	175 40 20.53	3.9386187

BOOTH, TUSCARAWAS COUNTY.

On a sharp, bald knob, 5 miles southeast from New Comerstown, one-fourth mile south from Booth post-office, and 400 feet southeast of Mr. Walters's residence, on land owned by him.

Station mark: A sandstone post 36 by 7 by 7 inches set 34 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet, "Ohio."

[Latitude $40^{\circ} 13' 26.69''$. Longitude $81^{\circ} 32' 56.37''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kennedy.....	50 57 10.87	230 51 07.97	4.2342578
Widder.....	103 17 39.33	283 15 05.76	3.7615799
Wasen.....	166 55 12.11	346 53 04.26	4.2784021
Stone Creek.....	179 22 08.98	359 22 03.72	4.2391088
Gilmore.....	228 11 04.90	48 15 13.50	4.0860014
Midway.....	352 05 52.54	172 07 03.12	4.2759110

GILMORE, TUSCARAWAS COUNTY.

On a bald knob one-third mile north of the village of Gilmore, 300 feet from where road elbows to east going from Gilmore.

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

[Latitude 40° 17' 50.02". Longitude 81° 26' 31.76".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Widder	65 15 18.37	245 08 36.06	4.2095562
Port Washington.....	107 14 03.00	287 11 28.00	3.7758800
Stone Creek	134 52 35.59	314 48 21.35	4.1164240
Wainwright.....	176 58 27.78	356 58 08.37	4.1267768
Uhrichsville.....	238 12 02.93	58 18 12.91	4.2004975
Tippecanoe.....	284 58 09.52	105 05 05.88	4.1973700
Booth	48 15 13.50	228 11 04.90	4.0860014

PORT WASHINGTON, TUSCARAWAS COUNTY.

(Not occupied.)

A lone tree on prominent bald mound about 2 miles south of the village of Port Washington, on east side of river.

Station mark: Center of lone tree.

[Latitude 40° 18' 47.30". Longitude 81° 30' 33.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Widder	46 27 45	226 23 39	4.09426
Wasen	138 16 26	318 12 55	4.06184
Stone Creek	154 24 37	334 22 59	3.91720
Gilmore	287 11 28	107 14 03	3.77588

STONE CREEK, TUSCARAWAS COUNTY.

On a bald mound 1½ miles southeast of the village of Stone Creek, 100 yards east of road.

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

[Latitude 40° 22' 48.92". Longitude 81° 33' 04.48".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Widder	18 43 44.26	198 41 15.69	4.2281117
Wasen	105 39 23.20	285 37 30.42	3.6297872
Wainwright.....	244 04 51.38	64 08 46.51	3.9781630
Gilmore	314 48 21.35	134 52 35.59	4.1164240
Port Washington.....	334 22 59.00	154 24 37.00	3.9172000
Booth	359 22 03.72	179 22 08.98	4.2391088

UHRICHSVILLE, TUSCARAWAS COUNTY.

On a bald hill about 4 miles nearly east from Uhrichsville, 200 feet west of Ridge road, on land owned by Mr. Cox, and 200 yards north of his residence.

Station mark: The lone white oak signal tree 14 inches in diameter.

Reference mark: A sandstone post 36 by 6 by 6 inches set 30 inches in the ground, in center of top of which is countersunk and cemented a bronze triangulation tablet, "Ohio." Distance from tree, 26.6 feet; true azimuth $56^{\circ} 10' 30''$.

[Latitude $40^{\circ} 22' 20.70''$. Longitude $81^{\circ} 17' 00.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gilmore	58 18 12.91	238 12 02.93	4.2004975
Wainwright	109 32 49.03	289 26 19.17	4.1775531
Baldwin	175 40 20.53	355 40 02.51	3.9386187
Bowerston	258 40 32.66	78 44 13.95	3.9146861
Tippecanoe	352 09 53.49	172 10 40.33	4.0986574

WAINWRIGHT, TUSCARAWAS COUNTY.

In a field owned by the Wainwright Coal Company, and about $1\frac{1}{2}$ miles west of the mine and post-office of same name.

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

[Latitude $40^{\circ} 25' 03.52''$. Longitude $81^{\circ} 27' 01.78''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Stone Creek	64 08 46.51	244 04 51.38	3.9781630
Wasen	76 42 24.37	256 36 36.39	4.1142974
Baldwin	254 54 15.71	75 00 27.85	4.1462651
Uhrichsville	289 26 19.17	109 32 49.03	4.1775531
Gilmore	356 58 08.37	176 58 27.78	4.1267768

WASEN, TUSCARAWAS COUNTY.

About $2\frac{1}{2}$ miles nearly west from the village of Stone Creek on high knob in field 400 feet southeast from Mr. Wasen's residence.

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

[Latitude 40° 23' 26.19". Longitude 81° 35' 58.61".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Widder	4 22 43.79	184 22 07.82	4.2359074
Wainwright	256 36 36.39	76 42 24.37	4.1142974
Stone Creek	285 37 30.42	105 39 23.20	3.6297872
Port Washington	318 12 55.00	138 16 26.00	4.0618406
Booth	346 53 04.26	166 55 12.11	4.2784021

LAWLER, VINTON COUNTY, NEAR JACKSON COUNTY LINE.

A secondary station on a flat, partly timbered ridge 8 miles by road east-southeast of Wellston post-office. Land owned by Frank Lawler, but rented by Jim Kennison.

Station mark: South chimney on two-story house with red tin roof.

[Latitude 39° 05' 15.32". Longitude 82° 25' 45.35".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Davis	20 28 23.27	200 26 28.47	4.0984524
Leonard	295 28 23.01	115 35 43.20	4.2699658
Graham	323 15 25.71	143 22 07.04	4.4097687

ZALESKI, VINTON COUNTY.

A knob locally well known as the Pinnacle, 1½ miles south of Zaleski railroad station. Nearly all timber was cut down and one chestnut tree left for signal. An extended view can be had in all directions, excepting north 30° east to north 55° east, which is limited by a flat timbered ridge 2 miles distant.

Station mark: A marble post 30 by 6 by 6 inches set 20 inches in the ground, top marked,



Reference mark: The chestnut signal tree; azimuth from station mark, 237° 08'; distance, 32.8 feet.

[Latitude 30° 15' 18.96". Longitude 82° 24' 03.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Barton	158 09 14.12	338 05 36.66	4.3433070
McDaniel	205 26 11.15	25 29 15.51	4.2098137
Townsend (2)	261 26 53.85	81 38 31.23	4.4264864
McKnight	296 27 23.36	116 35 39.29	4.3229316
Leonard	331 39 56.21	151 46 12.85	4.4807510

DOVENBECKER, WASHINGTON COUNTY.

Situated about 5 miles southwest of Macksburg in pasture field on a high, cleared hill. Land owned by William Dovenbecker.

Station mark: A sandstone post 48 by 6 by 6 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 34' 07.79''$. Longitude $81^{\circ} 28' 05.23''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Correy	158 44 36.15	338 41 35.73	4.2675872
Fulda	193 27 26.49	13 29 38.34	4.3249454
Coffey	201 32 41.16	21 34 03.43	3.9232258
Laws	260 32 30.54	80 39 58.60	4.2307093
Moore	306 00 36.00	126 08 37.09	4.3492957

LAWS, WASHINGTON COUNTY.

Situated on a high, cleared, flat-topped hill in Liberty Township, about three-quarters of a mile south of the village of Lebanon. Land owned by Mr. Laws.

Station mark: A dead oak tree.

Reference mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of the top of which is cemented a bronze triangulation tablet, "Ohio." Distance to center of tree, 1.4 feet; true azimuth, $170^{\circ} 43'$.

[Latitude $39^{\circ} 35' 37.83''$. Longitude $81^{\circ} 16' 21.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pinkerton	50 51 42.70	230 41 51.34	4.4572810
Dovenbecker	80 39 58.60	260 32 30.54	4.2307093
Coffey	110 10 06.45	290 04 00.35	4.1639102
Fulda	146 22 57.69	326 17 40.64	4.3294759
Moore	355 27 25.12	175 27 58.83	4.2038199

GLASS, WASHINGTON COUNTY.

On north end of ridge, 0.5 mile east of Glass post-office and 100 feet south of road.

Station mark: A sandstone post 36 by 8 by 8 inches set 36 inches in the ground, with cross cut in center of top.

Reference mark: Chimney on a small frame house owned by John Newell, 14 feet south of station mark.

[Latitude 39° 33' 09.09". Longitude 81° 07' 27.10".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Moore	45 26 59.54	225 21 53.00	4.2086840
Laws	109 48 40.00	289 42 59.25	4.1324413
Dillon	152 19 54.03	332 17 56.67	3.9758125
Tank	183 47 44.00	3 48 12.00	4.1938000
High Knob	237 39 23.00	57 43 14.00	4.0093000

MOORE, WASHINGTON COUNTY.

Situated 4 miles north of Newport, Ohio, on a high cleared knob owned by Mr. Moore and known locally as Moore's Hill.

Station mark: A sandstone post 48 by 8 by 8 inches set 48 inches in the ground, and in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude 39° 27' 00.99". Longitude 81° 15' 29.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pinnacle	24 47 56.51	204 43 50.23	4.3462483
Seffens	64 45 45.97	244 33 51.52	4.4743073
Pinkerton	84 46 38.67	264 36 14.56	4.3728093
Dovenbecker	126 08 37.09	306 00 36.00	4.3492957
Laws	175 27 58.83	355 27 25.12	4.2038199
Owlshead	272 39 24.48	92 50 53.05	4.4140545
McCullough	308 27 51.47	128 34 48.44	4.3030833
Griffith	354 57 28.03	174 57 55.01	4.0637096

NOLAN, WASHINGTON COUNTY.

Situated in Dunham Township, about 2 miles west of Veto post-office and 4 miles southwest of Vincent railroad station. Summit of hill occupied by house surrounded by shade and fruit trees. Land owned by R. E. Sutton.

Station mark: A stone post 40 by 6 by 6 inches set 36 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

Reference mark: Chimney on north end of house; distance from station mark, 34 feet; true azimuth from station mark, 142° 29' 20".

[Latitude $39^{\circ} 20' 38.11''$. Longitude $81^{\circ} 42' 39.55''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lyons	36 33 16.71	216 30 09.55	4.0753794
Bond	46 14 13.63	236 08 49.91	4.2298152
Southland	109 14 36.48	289 09 05.68	4.1212888
Goff	314 58 46.74	135 04 44.31	4.2822068
Wigal	350 54 54.61	170 56 08.43	4.2486674

PINKERTON, WASHINGTON COUNTY.

Situated about 4 miles northwest of Marietta and 2 miles south of Churchtown on Pinkerton farm, 600 feet west of Pinkerton residence.

Station mark: A sandstone post 48 by 8 by 8 inches set 48 inches in the ground, in the center of top of which is cemented a bronze triangulation tablet, "Ohio."

[Latitude $39^{\circ} 25' 50.23''$. Longitude $81^{\circ} 31' 51.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Goff	4 55 52.16	184 54 59.34	4.3666186
Seffens	17 59 25.94	197 57 54.99	4.0458915
Nolan	58 13 59.25	238 07 08.00	4.0836942
Dovenbecker	199 23 14.85	19 25 38.76	4.2113735
Laws	230 41 51.34	50 51 42.70	4.4572810
Moore	264 36 14.56	84 46 38.67	4.3728093
Griffith	290 46 50.36	110 57 40.75	4.4191325
Pinnacle	321 34 57.99	141 41 14.67	4.3601976

SEFFENS, WASHINGTON COUNTY.

Situated on the summit of a cleared hill in Dunham Township about 1 mile west of Constitution railroad station. Land owned by William Seffens.

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

Reference mark: The southern one of three trees which occupy the extreme summit of hill; distance from station mark, 3.1 feet; true azimuth from station mark, $46^{\circ} 22'$.

[Latitude 39° 20' 07.43". Longitude 81° 34' 14.77".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Nolan	94 31 08.23	274 25 48.26	4.0836942
Pinkerton	197 57 54.99	17 59 25.94	4.0458915
Moore	244 33 51.52	64 45 45.97	4.4743073
Pinnacle	292 39 17.80	112 47 04.89	4.2822967
Goff	353 29 10.61	173 29 48.59	4.1032735

PRIMARY TRAVERSE.

The following geographic positions were determined from primary traverse run by J. R. Ellis in 1902. The line starts from Loveland, Baltimore and Ohio and Pennsylvania Railway crossing located by primary traverse in 1902 and follows the Pennsylvania Railway to Middletown Junction, thence along highways to Little Muddy Creek on Cincinnati, Lebanon and Northern Railway, following this road 3 miles, thence along highways to Red Lion, thence west through Blue Ball and Darton, west and south through Wood and Preston, thence south and east and connected with Madisonville station.

Geographic positions along the Pennsylvania Railroad between Loveland and Middletown Junction.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Loveland railroad crossing	39 16 00.6	84 15 31.9
Road crossing north and south	39 16 51.3	84 15 35.1
Road crossing under trestle	39 18 27.7	84 15 23.5
Foster, road crossing at	39 19 19.0	84 15 03.4
Road crossing north and south	39 21 05.1	84 14 27.8
Road crossing northeast and southwest	39 22 17.2	84 14 42.3

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads	39 23 30.0	84 14 52.9
Road crossing north and south	39 24 34.0	84 14 35.4
Road southeast	39 26 54.6	84 14 06.4
Bridge over creek south	39 28 06.1	84 14 16.2
Red Lion, T. 3 E., R. 4 N., center section 15	39 29 28.2	84 14 55.4
T. road south	39 29 31.1	84 16 23.7
T. road north	39 29 35.7	84 17 32.2
Crossroads	39 29 36.6	84 19 00.1
Blue Ball, crossroads at	39 29 37.4	84 20 09.6

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. road west.....	39 28 26.0	84 20 32.1
Middletown and Cincinnati Railroad at road crossing.....	39 28 30.0	84 21 49.1
T. 3 E., R. 4 N., corner secs. 20, 26, 25, 19.....	39 28 34.5	84 23 44.8
Electric railway crossing.....	39 28 52.1	84 25 09.3
Trenton, crossing State street and Cincinnati, Hamilton and Dayton Railroad.....	39 28 52.6	84 27 09.9
Ts. 4 and 5 N., Rs. 3 and 4 E., corner of.....	39 28 51.0	84 28 35.8
Ts. 4 and 5 N., R. 3 E., corner secs. 1, 2, 35, 36.....	39 28 49.8	84 29 43.5
Road crossing north and south.....	39 29 05.2	84 30 41.9
Road crossing north and south.....	39 29 30.9	84 31 58.7
T. 5 N., R. 3 E., corner secs. 28, 29, 32, 33.....	39 29 40.2	84 33 06.7
Seven-mile station, crossing Pittsburgh, Cincinnati, Chicago and St. Louis Railroad, 1 mile northwest of.....	39 29 39.3	84 34 15.6
Road crossing north and south.....	39 29 28.0	84 36 30.5
T. road north.....	39 29 37.6	84 38 13.8
T. 5 N., R. 3 E., corner secs. 27, 28, 33, 34.....	39 29 37.7	84 38 46.7
Road north and south.....	39 29 34.7	84 40 49.8
T. 5 N., Rs. 1 and 2 E., T. road east near corner secs. 30, 25, 36, 31.....	39 29 36.6	84 41 47.2
Pike northwest and southeast.....	39 28 49.9	84 42 43.5
Wood, crossing of Cincinnati, Hamilton and Dayton Railroad, west of station.....	39 27 30.1	84 43 00.1
T. 4 N., R. 1 E., corner secs. 11, 12, 13, 14.....	39 26 59.2	84 43 17.9
T. 4 N., R. 1 E., corner secs. 13, 14, 23, 24.....	39 26 07.1	84 43 17.5
Road northwest and southeast.....	39 25 13.6	84 43 44.6
St. Charles T., road north at.....	39 23 30.6	84 44 30.3
T. 3 N., R. 1 E., corner secs. 2, 3, 10, 11.....	39 22 40.5	84 44 21.3
T. 3 N., R. 1 E., corner secs. 10, 11, 14, 15.....	39 21 48.4	84 44 21.6
Crossing Cold Wail Pike.....	39 20 16.5	84 44 22.8
T. road south (gravel).....	39 19 00.8	84 43 50.4
Preston post-office, west end of bridge, one-half mile east of.....	39 16 33.8	84 43 51.9
T. 2 N., R. 1 E., corner secs. 14, 15, 22, 23.....	39 15 41.8	84 44 25.2
T. 2 N., Rs. 1 and 2 E., corner secs. 7, 12, 13, 18.....	39 16 33.9	84 42 11.4
Corner secs., numbers not given.....	39 16 33.8	84 41 03.9
Sater post-office, north end of iron bridge at.....	39 15 50.4	84 40 02.6
Sater post-office, corner sec. 1 mile southeast of.....	39 15 11.6	84 39 33.9
Barnesburg tollgate, crossroads at.....	39 13 58.5	84 37 41.4
Crossroads.....	39 13 15.6	84 36 04.9
Grossbeck, crossroads at.....	39 13 13.0	84 35 09.6
T. 3 N., R. 1 E., corner secs. 26, 32, 31, 25.....	39 13 05.3	84 32 57.7
Carthage, crossing Fifth street and Cincinnati, Hamilton and Dayton Railroad.....	39 11 54.5	84 28 56.9
Madisonville station.....	39 09 26.0	84 23 49.0

ALABAMA-GEORGIA.

PRIMARY TRAVERSE.

The following geographic position were obtained from primary traverse run in 1902 by Mr. J. R. Ellis. The line starts from the adjusted position at Opelika, Ala., established in 1901, and follows the Western Railway of Alabama to Lagrange, Ga., thence along the Macon and Birmingham Railway to Harris, thence along the Central of Georgia Railway, via Columbus, to Opelika.

Geographic positions along the Western Railway of Alabama between Opelika and West Point.

Station.	Latitude.	Longitude.
ALABAMA.	° ' "	° "
Opelika, water tank, established in 1901	32 38 25.5	85 23 23.6
Opelika, Central of Georgia Railway crossing	32 38 44.1	85 22 59.5
Forks of road, crossing at	32 39 18.8	85 22 28.4
Road crossing east and west	32 40 42.6	85 22 08.6
White, road crossing at	32 41 57.8	85 20 49.7
Road crossing east and west	32 43 11.2	85 19 47.2
Road crossing east and west	32 44 14.3	85 19 39.9
Road crossing east and west	32 45 07.5	85 19 42.5
Road crossing east and west	32 46 07.0	85 19 23.9
Cosseta station	32 47 03.1	85 18 27.4
Road crossing east and west	32 47 35.3	85 16 40.1
Road crossing east and west	32 48 25.9	85 15 16.4
Road crossing east and west	32 49 16.0	85 14 10.0
Road crossing east and west	32 49 42.1	85 13 18.3
Road crossing east and west	32 50 48.2	85 12 36.5
Chattahoochee Valley Railway crossing	32 51 16.1	85 11 31.3
Alabama-Georgia, State line, crossing of	32 52 14.7	85 11 08.8

Geographic positions along the Atlanta and West Point Railroad between West Point and Lagrange.

Station.	Latitude.	Longitude.
GEORGIA.	° ' "	° ' "
West Point station	32 52 31.8	85 11 01.6
Road crossing east and west	32 53 13.0	85 09 46.3
Road crossing east and west	32 54 38.5	85 08 40.0
Gabbettville station	32 56 41.6	85 08 02.0
Road crossing east and west	32 57 26.1	85 07 15.5
Road crossing north and south	32 57 56.5	85 06 19.6
Road crossing north and south	32 58 28.4	85 04 21.1
Road crossing northeast and southwest	32 58 57.1	85 03 54.6
Road crossing east and west	33 00 34.7	85 02 52.9
Lagrange station	33 02 08.1	85 01 46.4

Geographic positions along the Macon and Birmingham Railway between Lagrange and Harris.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west	33 02 36.1	85 00 27.8
Western Railway of Alabama crossing	33 02 38.1	84 59 40.3
Road crossing north and south	33 02 32.7	84 58 13.3
Road crossing north and south	33 02 29.7	84 56 53.0
Mutual, north and south road crossing at	33 03 13.1	84 55 24.5
Road crossing	33 02 24.1	84 53 21.8
Mountville station	33 02 24.5	84 52 34.3
Road crossing east and west	33 02 17.2	84 51 33.8
Road crossing north and south	33 01 58.0	84 50 33.6
Road crossing northeast and southwest	33 01 10.3	84 49 28.6
Road crossing north and south	33 00 31.4	84 48 55.7
Road crossing north and south	32 59 44.7	84 47 28.0
Road crossing north and south	32 58 49.7	84 45 30.1
Road crossing north and south	32 58 24.3	84 44 13.1
Harris, Central of Georgia Railway crossing	32 58 05.7	84 42 47.5

Geographic positions along Central of Georgia Railway from Harris, Ga., via Columbus, to Opelika, Ala.

Station.	Latitude.	Longitude.
	° ' "	° ' "
GEORGIA.		
Road crossing north and south	32 56 21.2	84 43 46.0
Road crossing north and south	32 55 45.9	84 44 19.2
Stinson blacksmith shop, road crossing near	32 55 21.4	84 46 04.5
Road crossing east and west	32 54 18.5	84 47 31.7
Brandywine, north and south road crossing at	32 53 38.3	84 48 21.9
Road crossing north and south	32 52 56.6	84 49 19.1
Road crossing east and west	32 52 54.7	84 50 26.4
Chipley station	32 51 53.8	84 51 18.0
Road crossing east and west	32 51 06.9	84 50 49.2
Trestle, road crossing under	32 50 05.5	84 50 28.4
Tip Top, road crossing at	32 48 12.9	84 52 10.4
Road crossing east and west	32 46 49.6	84 53 16.5
Hamilton station	32 45 37.3	84 52 37.0
Road crossing north and south	32 44 42.5	84 52 15.0
Road crossing north and south	32 43 52.2	84 52 31.8
Road crossing east and west	32 42 36.5	84 52 31.4
Road crossing east and west	32 40 58.9	84 52 05.8

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

Station.	Latitude.	Longitude.
GEORGIA—continued.		
Road crossing north and south	32 39 20.3	84 52 06.6
Mobley, road crossing at	32 38 43.8	84 52 49.7
Road crossing east and west	32 37 35.3	84 54 26.5
Forston, north and south road crossing at	32 36 26.7	84 56 13.0
Road crossing east and west	32 35 35.5	84 56 41.0
Trestle 9 B, road crossing under	32 34 38.0	84 56 49.2
Nankipoo, road crossing at	32 33 24.5	84 56 45.7
Road crossing east and west	32 32 27.0	84 57 25.1
Road crossing northeast and southwest	32 31 38.4	84 57 58.8
Road crossing	32 30 26.9	84 58 51.5
Columbus, First avenue crossing	32 28 39.1	84 59 29.8
Phoenix station	32 28 38.8	85 00 26.7
ALABAMA.		
Road crossing east and west	32 29 28.1	85 01 52.4
Road crossing north and south	32 29 59.0	85 03 00.1
Road crossing northwest and southeast	32 31 13.4	85 04 37.9
Smith station	32 32 12.9	85 05 40.8
Road crossing east and west	32 33 17.7	85 07 15.9
Road crossing north and south	32 34 48.3	85 10 01.2
Panstown, north and south road crossing at	32 35 04.7	85 11 02.5
Road crossing east and west	32 35 37.2	85 13 10.8
Salem station	32 35 49.6	85 14 18.8
Road crossing east and west	32 36 19.3	85 15 48.2
Road crossing over railway	32 37 23.3	85 17 19.7
Road crossing north and south	32 37 30.3	85 18 49.7
Chewachee station	32 37 12.3	85 20 14.8
Road crossing east and west	32 37 18.1	85 21 36.3

KENTUCKY.

PRIMARY TRAVERSE.

The following geographic positions were determined from primary traverse run in 1902 by Mr. J. R. Ellis. The line starts from the United States Coast and Geodetic Survey astronomic pier at Henderson and follows the Louisville and Nashville Railway to Elmwood, thence east and north along highways to Floral and connects with the line run in 1900.

Geographic positions along the Louisville and Nashville Railway between Henderson and Elmwood.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Henderson astronomic pier	37 50 24.8	87 35 26.1
Henderson, Washington street, crossing of	37 49 45.6	87 34 32.0
Road crossing north and south	37 48 27.7	87 34 29.7
Road crossing east and west	37 47 01.7	87 34 35.4
Road crossing, private	37 46 06.2	87 34 25.3
Road crossing	37 44 18.4	87 33 59.2
Road crossing east and west	37 42 47.5	87 33 37.1
Road crossing, private	37 41 18.5	87 33 06.7
Robard station	37 40 33.3	87 32 46.1
Road crossing east and west	37 39 04.6	87 32 14.3
Road crossing	37 37 20.6	87 31 30.4
Sebree, Main street crossing of	37 36 30.1	87 31 47.3
Road crossing	37 35 54.0	87 31 50.2
Road crossing east and west	37 35 10.2	87 31 25.9
Road crossing east and west	37 33 48.2	87 31 31.4
Road crossing east and west	37 33 05.4	87 31 23.9
Elmwood, road, crossing at	37 31 42.7	87 29 24.8

Geographic positions along highways between Elmwood and Floral.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Crossroads	37 30 47.2	87 29 46.2
Belcourt, road north at	37 31 54.4	87 28 40.4
T. road east	37 32 53.9	87 27 57.0
T. road east	37 33 05.9	87 27 06.4
Ashby's store, road south at	37 33 19.0	87 26 10.2
T. road south	37 32 38.2	87 25 20.5
Ashbyburg, Leodguard's store, road crossing at	37 32 02.9	87 22 01.8
Road north	37 31 43.2	87 20 45.1
Shutt's Chapel, road in front of	37 31 43.4	87 19 40.0
Road south	37 31 59.4	87 18 30.4
Three roads, junction of	37 31 17.1	87 17 00.2
Rumsey, road south at	37 31 50.5	87 15 37.1
Road south	37 30 35.7	87 13 09.5
Road south	37 30 23.5	87 12 07.5
Road north and south	37 30 04.7	87 09 56.2
Crossroads	37 30 04.9	87 09 12.9
Livermore; Sixth and Main streets, crossing of	37 29 31.0	87 08 05.5

Geographic positions along highways between Elmwood and Floral—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Railway crossing	37 30 12.6	87 07 13.9
Nuckols, railway crossing at	37 31 26.0	87 06 54.6
Hillside schoolhouse, T. road, 900 feet north of	37 31 21.4	87 05 25.6
Crossroads	37 30 55.8	87 04 07.6
Schoolhouse, T. road, 400 feet south of	37 30 34.3	87 02 32.0
Crossroads	37 30 21.2	87 01 06.2
Heffin post office	37 30 25.6	87 00 25.7
Road north	37 29 57.9	86 58 58.0
Noe Creek post-office, road south at	37 28 58.1	86 58 10.1
T. road south	37 28 39.6	86 56 39.4
Hartford; Union and Market streets, corner of	37 27 07.5	86 54 29.6
Hayti schoolhouse T. road south at	37 27 25.0	86 53 42.3
T. road west	37 27 41.9	86 52 32.3
Crossroads	37 28 31.0	86 51 34.8
Road north	37 29 26.2	86 50 15.2
Jingo post-office, junction roads at	37 29 58.7	86 48 26.4
Road west	37 31 33.2	86 47 54.8
Sulphur Springs, crossroads at	37 32 10.9	86 46 33.4
Dundee, T. road west at	37 33 32.6	86 46 19.3
Road east	37 34 34.6	86 46 19.6
Bacham schoolhouse, crossroads at	37 35 19.8	86 46 23.0
Farmers' store, road southeast at	37 37 08.3	86 47 18.1
Friendship Church, crossroads at	37 38 33.1	86 46 24.0
Reynolds, railway crossing at	37 39 43.4	86 45 46.6
Haynesville, forks of road at	37 41 06.3	86 45 20.3
Lyonia, crossroads 1 mile west of	37 42 31.4	86 45 46.7
Catholic Church, crossroads northeast of	37 43 23.9	86 46 34.3
T. road east	37 44 18.1	86 47 36.4
Pellville, entrance to cemetery, T. road south at	37 45 13.8	86 48 32.0

Line from the United States Coast and Geodetic Survey astronomic pier at Henderson along the Illinois Central Railway to Morganfield and Uniontown, across the Ohio River, to a land-survey corner in Indiana.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Henderson astronomic pier	37 50 24.8	87 35 26.1
Henderson, Madisonville road crossing	37 49 02.5	87 35 00.4
Road crossing under trestle	37 47 41.8	87 37 08.6
Cedar Grove, road crossing at	37 47 27.9	87 38 03.0

Line from Henderson across Ohio River—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Wilson, road crossing at	37 46 52.4	87 39 19.6
Corydon, Negro Church, road crossing at	37 44 50.1	87 41 51.3
Dixie, road crossing at	37 44 08.4	87 42 03.0
Road crossing north and south	37 43 16.0	87 43 18.3
Highland station	37 43 17.2	87 44 34.4
Road crossing north and south	37 43 11.2	87 46 11.3
Road crossing north and south (telephone line)	37 42 55.0	87 48 19.7
Road crossing northwest and southeast	37 42 40.9	87 49 13.1
St. Vincent, road crossing at	37 42 22.8	87 50 21.3
Flournoy station	37 41 53.7	87 51 36.0
Road crossing northwest and southeast	37 41 41.4	87 52 49.9
Morganfield brickyard, road crossing at	37 41 25.5	87 54 26.3
Road crossing east and west	37 42 55.3	87 54 50.7
Road crossing east and west	37 44 00.3	87 55 15.1
Road crossing north and south	37 45 10.2	87 55 35.2
Uniontown, Mill street crossing of	37 46 06.2	87 55 53.9
INDIANA.		
T. 8 S., R. 14 W., $\frac{1}{4}$ corner between secs. 35 and 36 ..	37 47 01.9	87 56 46.9

Line from the adjusted position at Nuckols along the Louisville and Nashville Railway to Owensboro, connecting with position determined by primary traverse in 1899.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Nuckols, railway crossing at	37 31 26.0	87 06 54.6
Road crossing north and south	37 32 34.8	87 06 25.4
Livia station	37 34 07.4	87 06 00.7
Road crossing east and west	37 34 41.3	87 05 50.7
Road crossing northeast and southwest	37 35 55.8	87 06 25.7
Road crossing east and west	37 37 18.2	87 07 11.2
Road crossing east and west	37 38 24.4	87 07 03.3
Sutherland, road crossing at	37 40 15.7	87 07 13.3
Road crossing east and west	37 41 36.6	87 07 10.2
Road crossing east and west	37 42 33.5	87 06 59.7
Owensboro, Hickman Park, road crossing at	37 44 29.2	87 06 23.7

MISSISSIPPI.

PRIMARY TRAVERSE.

The following geographic positions were determined from primary traverse by Mr. J. R. Ellis in 1902 and 1903. The line between Vicksburg and Jackson was run and duplicated, giving a double value for

Jackson which was based on United States Mississippi River Commission triangulation station Trinity Church spire. This line follows the Alabama and Vicksburg Railway. A spur line was run northward from Jackson along the Yazoo and Mississippi Valley Railway to Pocahontas. A spur line was also run southward from Jackson following the Illinois Central Railway to the line between Hinds and Copiah counties. Another line was run eastward from Jackson along the Alabama and Vicksburg Railway to range line between Rs. 3 and 4 E.

Geographic positions along the Alabama and Vicksburg Railway between Vicksburg and Jackson.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Vicksburg, Trinity Church spire	32 20 49.2	90 52 49.5
Overhead road crossing north and south	32 20 24.2	90 50 58.5
Beechwoods, road crossing at	32 19 44.1	90 48 49.2
Overhead road crossing north and south	32 20 12.6	90 47 38.1
Newman, north and south road crossing at	32 20 43.9	90 46 15.3
Road crossing north and south	32 20 50.7	90 45 29.3
Bovina station	32 21 04.2	90 44 06.5
Road crossing east and west	32 20 42.3	90 42 52.0
T. 6 N., R. 5 W., corner secs. 22, 23, 26, 27	32 20 31.7	90 41 23.3
Smith station	32 20 21.1	90 40 24.9
Road crossing north and south	32 20 07.3	90 39 19.7
Road crossing north and south	32 19 54.6	90 38 06.3
Edwards, Main street, crossing of	32 19 46.3	90 36 21.7
Road crossing northwest and southeast	32 19 55.1	90 34 58.2
T. 6 N., Rs. 4 and 3 W., corner secs. 19, 24, 25, 30	32 20 29.0	90 33 22.1
T. 6 N., R. 3 W., $\frac{1}{4}$ corner between secs. 20, 21	32 20 56.7	90 31 11.3
Sec. corner (no numbers)	32 20 56.6	90 29 07.5
Bolton station	32 20 50.2	90 27 29.1
Road crossing north and south	32 21 03.1	90 25 45.3
T. 6 N., R. 2 W., corner secs. 15, 16, 21, 22	32 21 22.9	90 23 58.9
Stone culvert, U. S. Coast and Geodetic Survey bench mark on	32 20 50.1	90 20 19.9
T. 6 N., R. 1 W., corner secs. 19, 20, 29, 30	32 20 29.3	90 19 50.3
Road crossing northeast and southwest	32 20 02.6	90 17 40.3
Dixon, north and south road crossing at	32 19 30.4	90 15 12.2
T. 6 N., R. 1 E., corner secs. 29, 30, 31, 32	32 19 37.1	90 13 43.2
Jackson, north and south road crossing, 1 mile northwest of	32 19 05.9	90 12 39.0

Geographic positions along the Illinois Central Railway from Jackson to line between Hinds and Copiah counties.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Jackson station	32 18 01.3	90 11 30.6
Jackson, Illinois Central and Alabama and Vicksburg railways, crossing of	32 17 54.9	90 11 30.0
T. 5 N., R. 1 E., corner secs. 3, 4, 9, 10	32 17 48.2	90 11 35.6
Road crossing east and west	32 16 19.3	90 12 26.3
Road crossing east and west	32 14 51.6	90 12 38.8
Pearl, road crossing east and west at	32 13 12.2	90 13 12.2
Road crossing east and west	32 11 45.3	90 13 47.5
Byram station	32 10 44.7	90 14 41.4
Road crossing east and west	32 09 30.5	90 15 26.4
Road crossing east and west	32 07 13.8	90 16 15.3
Road crossing east and west	32 06 03.7	90 17 14.6
Terry station	32 05 38.8	90 17 38.0
Road crossing east and west	32 04 52.5	90 18 21.3
Road crossing east and west	32 04 02.3	90 19 08.3
Ts. 2 and 3 N., R. 1 W., corner secs. 5, 6, 31, 32	32 02 56.3	90 19 52.8
Hinds and Copiah county line, crossing of	32 02 54.9	90 20 04.9

Geographic positions along the Alabama and Vicksburg Railway from Jackson eastward to line between ranges 3 and 4.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west	32 16 31.6	90 09 59.2
Road crossing north and south	32 15 33.3	90 09 12.0
Pearson, road crossing at	32 14 48.8	90 07 56.4
Road crossing north and south	32 14 33.1	90 06 47.4
Road crossing north and south	32 14 06.0	90 05 33.1
Road crossing north and south	32 14 09.5	90 04 22.5
Greenfield, road crossing east and west at	32 14 53.9	90 03 13.7
Rice, station-board	32 15 59.0	90 02 18.7
Road crossing north and south	32 16 43.5	90 00 17.9
Brandon station	32 17 08.0	89 59 44.4
Road crossing north and south	32 17 28.6	89 58 39.3
T. 5 N., Rs. 3 and 4 E., $\frac{1}{4}$ corner between secs. 7 and 12	32 17 25.4	89 56 15.4

Geographic positions along the Yazoo and Mississippi Valley Railway from Jackson northeastward.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west	32 19 33.9	90 11 15.3
Road crossing northeast and southwest.....	32 20 24.3	90 11 54.1
T. 6 N., R. 1 E., corner secs. 16, 17, 20, 21	32 21 19.4	90 12 37.4
Road crossing northeast and southwest.....	32 22 00.0	90 13 15.5
Road crossing north and south	32 23 09.9	90 14 01.4
Cynthia, road crossing at	32 24 03.6	90 14 55.2
Greene Crossing, road east and west	32 26 12.6	90 16 00.3
Road crossing east and west	32 27 22.5	90 16 46.3
Pocahontas station	32 28 19.5	90 17 16.9
Hinds and Madison county line, crossing of.....	32 29 13.1	90 17 19.0
Ts. 7 and 8 N., R. 1 W., corner secs. 2, 3, 34, 35.....	32 29 13.7	90 16 43.3

ILLINOIS.

PRIMARY TRAVERSE.

The following geographic positions were determined by primary traverse run in 1902 by Mr. J. R. Ellis. Starting from adjusted position of the Chicago, Peoria and St. Louis Railway station at Havana, the line follows that railway to a point about 3.5 miles northeast of Parkland, thence east along wagon roads to southeast corner of Peoria quadrangle, thence north to Morton, thence north on Vandalia Railway to Farmdale, thence north and west through Peoria, thence west and south by wagon roads to Reed City, thence east by Toledo, Peoria and Western Railway to Pekin, thence southwest to point where line first left railway over Chicago, Peoria and St. Louis Railway.

Geographic positions along the Chicago, Peoria and St. Louis Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Havana station.....	40 17 37.2	90 03 56.0
Road crossing north and south (private)	40 29 51.3	89 43 07.1

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
T. 24 N., R. 5 W., corner secs. 29, 30, 31, and 32 ...	40 29 37.0	89 42 07.7
T. 24 N., R. 5 W., corner secs. 28, 29, 32, and 33 ...	40 29 38.7	89 40 58.3
T. 24 N., R. 5 W., corner secs. 26, 27, 34, and 35 ...	40 29 39.9	89 38 41.2
T. 24 N., R. 5 W., corner secs. 25, 26, 35, and 36 ...	40 29 40.4	89 37 32.7

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ts. 23 and 24, N. Rs. 4 and 5 W., corner of	40 28 49.2	89 36 22.5
T. 24 N., R. 4 W., corner secs. 28, 29, 32, and 33 ...	40 29 41.8	89 34 05.5
T. 24 N., R. 4 W., corner secs. 27, 28, 33, and 34 ...	40 29 42.2	89 32 58.2
T. 24 N., R. 4 W., corner secs. 26, 27, 34, and 35 ...	40 29 42.9	89 31 49.9
T. 24 N., R. 4 W., corner secs. 25, 26, 35, and 36 ...	40 29 43.4	89 30 42.3
T. 24 N., R. 3 and 4 W., corner secs. 25, 30, 31, and 36	40 29 43.9	89 29 34.4
T. 24 N., R. 4 W., $\frac{1}{4}$ corner between secs. 25 and 30 ..	40 30 10.6	89 29 34.7
Road, corner in	40 30 11.5	89 28 18.6
Road east and west	40 31 30.0	89 28 20.1
T. 24 N., R. 4 W., corner secs. 7, 8, 17, and 18	40 32 22.1	89 28 37.7
T. 24 N., R. 4 W., corner secs. 5, 6, 7, and 8	40 33 14.4	89 28 38.9
Ts. 24 and 25 N., R. 4 W., corner secs. 5, 6, 31, and 32	40 34 06.6	89 28 42.2
Maple Grove schoolhouse, road corner at	40 35 25.3	89 28 30.6

Geographic positions along the Vandalia Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Morton crossing of Tremont and St. Louisa Railway ..	40 36 30.7	89 27 48.1
Road crossing east and west	40 37 25.5	89 29 00.2
Road crossing east and west	40 39 35.8	89 30 06.3
Road crossing north and south	40 40 16.1	89 31 21.5

Geographic positions along highways.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Three roads, junction of	40 40 57.7	89 33 13.4
Creek northwest, bridge over	40 41 41.8	89 32 26.7
Creek west, bridge over	40 42 49.0	89 31 46.6
Crossroads	40 43 30.7	89 31 24.5
T. 26 N., R. 4 W., corner secs. 1, 2, 11, and 12	40 43 56.8	89 31 18.8
Pitt and mound 45 feet south of road on top of hill ..	40 43 58.2	89 30 30.8
Illinois River, center draw to wagon bridge, over ..	40 43 27.9	89 32 52.9
Peoria, North Perry street and Abingdon avenue, corner of	40 42 35.3	89 34 17.6
Peoria, Knoxville, and Frye avenues, corner of	40 42 44.4	89 35 38.8
Peoria, Elizabeth, and Nebraska avenues, corner of ..	40 42 37.9	89 36 13.5

Geographic positions along highways—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Peoria, Main and Franklin streets, corner of	40 41 59.4	89 36 33.6
Road west	40 42 17.0	89 38 08.9
Pottstown, railway crossing at	40 43 05.3	89 39 39.5
T. 9 N., R. 7 E., $\frac{1}{4}$ corner between secs. 27 and 34 ..	40 43 32.1	89 41 23.3
T. 9 N., R. 11 E., corner secs. 27, 28, 33, and 34 ..	40 43 32.2	89 41 57.6
T. road north	40 43 32.3	89 43 06.7
T. road east	40 43 06.1	89 44 50.1
Ts. 8 and 9 N., R. 7 E., $\frac{1}{4}$ corner between secs. 6 and 31	40 42 39.9	89 44 50.6
Hale, crossing Iowa Central Railway at	40 41 29.3	89 44 49.6
T. 8 N., Rs. 6 and 7 E., corner 7, 12, 13, and 18	40 40 55.1	89 45 25.2
Gravel road east and west	40 39 38.3	89 46 07.6
Ts. 7 and 8 N., Rs. 6 and 7 E., corner of	40 37 27.0	89 45 24.4
T. road east	40 36 20.8	89 45 23.6
T. road east	40 35 16.0	89 45 22.9

Geographic positions along the Toledo, Peoria and Western Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Reed City, railway crossing at	40 34 32.5	89 45 03.2
Road crossing north and south	40 33 59.0	89 43 50.2
Roads crossing north, east, south, and west	40 34 21.2	89 42 31.5
Road crossing east and west	40 34 48.5	89 41 30.0
Orchard Mines, road crossing at	40 35 20.1	89 40 41.5
Pekin, center of draw in wagon bridge	40 34 22.3	89 39 18.2

Geographic positions along the Chicago, Peoria and St. Louis Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Chicago, Peoria and St. Louis Railway and Peoria and Pekin Union Railway, crossing of	40 33 38.8	89 39 21.8
Globe Distillery, east and west road crossing at	40 33 03.5	89 39 55.9
Road crossing east and west	40 32 16.1	89 40 44.7
T. 24 N., R. 5 W., $\frac{1}{4}$ corner between secs. 17 and 20 ..	40 31 22.8	89 41 35.0

MICHIGAN.

PRIMARY TRAVERSE.

The following positions were obtained by primary traverse run by Mr. J. R. Ellis in 1902. Line starts from adjusted position of Plymouth railway station, located by primary traverse in 1901, and follows highways south to Monroe triangulation station of Lake Survey:

Geographic positions from Plymouth station southward.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Plymouth station.....	42 22 50.0	83 27 42.3
Road crossing north and south.....	42 22 38.4	83 30 36.0
T. road north.....	42 22 30.2	83 32 19.1
T. road east.....	42 21 49.7	83 32 53.6
Ts. 1 and 2 S., Rs. 7 and 8 E., corner of.....	42 20 56.7	83 32 50.3
T. 2 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, 12.....	42 20 04.7	83 32 48.4
T. 2 S., Rs. 7 and 8 E., corner secs. 18, 7, 12, 13.....	42 19 12.7	83 32 46.0
T. 2 S., Rs. 7 and 8 E., corner secs. 18, 19, 24, 13.....	42 18 20.6	83 32 43.3
Road northeast and southwest.....	42 17 31.0	83 32 43.1
T. 2 S., Rs. 7 and 8 E., corner secs. 31, 30, 36, 25.....	42 16 35.8	83 33 15.1
T. road east.....	42 15 43.5	83 33 12.2
T. 3 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, 12.....	42 14 49.5	83 32 39.7
T. 3 S., Rs. 7 and 8 E., corner secs. 7, 18, 13, 12.....	42 13 57.7	83 32 38.9
T. road west.....	42 12 49.1	83 32 36.4
Road southeast.....	42 11 52.7	83 32 34.4
Ts. 3 and 4 S., Rs. 7 and 8 E., corner of.....	42 10 27.2	83 32 31.4
T. 4 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, 12.....	42 09 30.7	83 32 29.2
Road east and west.....	42 08 37.8	83 32 27.5
T. road west.....	42 07 45.3	83 32 26.0
T. 4 S., Rs. 7 and 8 E., corner secs. 19, 30, 25, 24.....	42 06 52.3	83 32 24.2
T. 4 S., Rs. 7 and 8 E., corner secs. 30, 31, 36, 25.....	42 06 00.0	83 32 22.7
Ts. 4 and 5 S., Rs. 7 and 8 E., corner of.....	42 05 07.8	83 32 21.1
T. 5 S., Rs. 7 and 8 E., corner secs. 1, 6, 7, 12.....	42 04 21.1	83 32 19.9
Road northwest and southeast.....	42 03 28.5	83 32 18.5
T. road east.....	42 02 06.9	83 32 16.8
Road northwest and southeast.....	42 01 06.9	83 32 15.4
Road west.....	42 00 24.5	83 31 38.1
Road east and west.....	41 58 52.9	83 32 07.1
T. road north.....	41 57 55.5	83 32 38.6
T. road southwest.....	41 56 54.0	83 31 47.2
T. road northwest.....	41 56 29.2	83 30 48.3
T. road north and south.....	41 56 13.5	83 29 22.7
Monroe County Poor House, crossroads, 800 feet west of.....	41 55 59.4	83 27 47.1
Monroe, triangulation station U. S. Lake Survey.....	41 55 04.3	83 28 15.3

MISSOURI.

PRIMARY TRAVERSE.

The following geographic positions were determined from primary traverse run by Mr. J. R. Ellis in 1902. The line starts from United States Coast and Geodetic Survey triangulation station Hughes and follows highways south and east to Bagnell, thence north along Missouri Pacific Railway to a point near Olean, thence north and west along highways to United States Coast and Geodetic Survey triangulation station Highpoint. Positions are given on the U. S. Standard datum:

Geographic positions along highways from Hughes triangulation station to Bagnell.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Hughes triangulation station United States Coast and Geodetic Survey	38 25 56.5	92 55 52.1
Crossroads	38 25 53.7	92 57 15.7
T. road north	38 25 47.8	92 57 59.3
T. road west	38 24 57.7	92 58 51.8
Harden Williams's residence road, east at	38 24 00.8	92 58 56.1
Road west	38 23 14.6	92 59 31.4
Spear's mill, road east and west to	38 22 07.9	92 58 58.7
Ts. 41 and 42 N., Rs. 18 and 19 W., corner of	38 21 26.1	92 57 41.9
T. road	38 18 56.7	92 56 27.0
Southeast corner field, crossroads at	38 18 15.2	92 56 57.1
County road north	38 17 24.6	92 56 38.8
T. 40 N., R. 18 W., center sec. 8	38 14 50.1	92 56 27.2
Proctors Ferry, frame house 300 yards east of, on the north bank Osage River	38 13 55.6	92 57 06.4
Road east	38 12 46.3	92 57 07.3
Ts. 33 and 40 N., Rs. 18 and 19 W., corner of	38 10 57.6	92 58 39.5
Hankins's residence, crossroads at	38 10 13.0	92 58 42.1
Road south	38 09 26.7	92 57 58.3
Signboard Iron-ton, 4 miles, crossroads at	38 09 09.6	92 57 26.0
Signboard Rainy Creek, 6 miles, T. road at	38 08 44.0	92 56 25.0
T. road west	38 07 17.6	92 54 32.6
Abram's store, crossroads 150 yards west of	38 06 36.2	92 54 34.3
Road south	38 06 09.0	92 53 25.4
Southwest corner of field, road north at	38 06 21.5	92 52 16.8
Corner of field, road southeast at	38 05 53.4	92 50 38.6
Signboard Clin-nax Springs, 13 miles, crossroads at	38 05 39.3	92 49 51.4
Road north	38 05 43.8	92 49 07.3
Cemetery, east fence to	38 05 39.5	92 47 49.5
T. 39 N., R. 17 W., $\frac{1}{4}$ corner between secs. 26 and 35	38 05 00.5	92 45 42.5
Ts. 38 and 39 N., Rs. 16 and 17 W., corner of	38 04 05.9	92 44 06.8
Brumell, road east to	38 04 53.4	92 43 29.9

Geographic positions along highways, etc.—Continued.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Three roads, junction of	38 05 45.0	92 42 53.9
Road south	38 05 56.3	92 41 56.3
Damsel post-office	38 06 38.9	92 41 17.4
Schoolhouse (concrete)	38 07 35.4	92 39 57.4
Creek, forks of road in	38 07 12.1	92 38 04.4
Road east	38 07 58.7	92 37 20.1
Crossroads	38 10 11.7	92 35 15.6
Bagnell, crossroads 3 miles south of	38 11 34.8	92 34 29.0
Road east	38 12 55.9	92 35 00.2
Signboard, "Brumley 12 miles, Tuscumbia 12 miles," T. road at	38 13 07.8	92 35 26.0

Geographic positions along the Missouri Pacific Railway between Bagnell and Olean.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Bagnell station	38 13 33.4	92 36 02.8
East and west road crossing	38 14 07.7	92 37 03.9
East and west road crossing	38 14 45.4	92 35 42.5
Road crossing under trestle	38 16 22.2	92 36 23.8
North and south road crossing	38 16 54.5	92 36 28.9
Aurora station	38 18 49.7	92 35 48.8
East and west road crossing	38 19 35.1	92 36 19.3
Missouri Pacific and Chicago, Rock Island railways, crossing of	38 20 45.0	92 35 03.1
East and west road crossing	38 21 51.8	92 33 36.5
Private road crossing	38 23 48.6	92 32 45.4
North and south road crossing	38 24 14.1	92 32 20.7

Geographic positions along highways from near Olean to Highpoint triangulation station.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Telegraph line, T. road	38 24 40.6	92 32 26.2
Road west	38 26 07.2	92 32 53.2
Mett's blacksmith shop. T. road at	38 27 16.9	92 33 16.4
Creek east, bridge over	38 27 58.6	92 33 34.1
South entrance to I. O. O. F. Cemetery, road at	38 28 51.8	92 34 34.3
Highpoint triangulation station United States Coast and Geodetic Survey	38 29 29.4	92 34 59.7

KANSAS.

PRIMARY TRAVERSE.

Two 30-minute quadrangles in southeastern Kansas were controlled by 150 miles of primary traverse run by Mr. J. R. Ellis, field assistant, in 1902. Positions are based upon the astronomic station at Fort Scott.

Geographic positions along Missouri, Kansas and Texas Railway between Fort Scott and Walnut.

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Fort Scott, Kans., astr. pier	37	50	25.76	94	42	26.75
Corner of Bridal Veil Park, road crossing at	37	50	26.13	94	43	21.16
Road north and south	37	49	35.72	94	45	37.37
Road north and south	37	49	00.74	94	46	09.83
Bridge 174, road crossing under	37	48	43.95	94	46	48.91
Ronald, road crossing east and west at	37	47	29.28	94	48	23.05
Road crossing east and west	37	46	36.56	94	49	16.62
T. 26 S., Rs. 23 and 24 E., corner secs. 19, 24, 25, and 30	37	45	44.29	94	49	55.73
Road crossing east and west	37	44	52.32	94	50	51.79
Road crossing east and west	37	44	00.74	94	51	43.69
Hiattville station	37	43	21.40	94	52	13.85
Road crossing north and south	37	42	45.01	94	53	14.71
T. 27 S., R. 23 E., corner secs. 8, 9, 16, and 17	37	42	16.06	94	54	21.64
Road crossing north and south	37	41	35.50	94	55	28.45
Road crossing north and south	37	40	51.48	94	56	33.10
Bourbon-Crawford county line, road crossing on	37	40	31.69	94	57	05.33
Hepler station	37	39	50.60	94	58	12.56
T. 27 S., R. 22 E., corner secs. 26, 27, 34, and 35	37	39	39.06	94	58	43.84
Ts. 27, 28 S., R. 22 E., corner secs. 33, 34, 4, and 3	37	38	46.65	94	59	49.52
Road crossing north and south	37	38	10.99	95	00	55.47
Road crossing north and south	37	37	31.19	95	02	00.47
Road crossing north and south	37	36	51.85	95	03	04.68
T. 28 S., R. 21 E., corner secs. 13, 14, 23, and 24	37	36	08.90	95	04	10.86
Walnut, Atchison, Topeka and Santa Fe Railway crossing	37	36	05.62	95	04	20.13

Geographic positions along branch line of Atchison, Topeka and Santa Fe Railway between Walnut and Chanute.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south	37 36 32.17	95 05 16.67
Road crossing north and south	37 36 17.81	95 06 22.24
Road crossing north and south	37 35 30.83	95 07 27.94
Road crossing north and south	37 35 01.02	95 08 33.60
Road crossing north and south	37 34 56.03	95 09 39.19
Trent, road crossing north and south at	37 34 55.25	95 10 46.85
T. 28 S., R. 20 E., corner secs. 22, 23, 26, and 27	37 35 14.66	95 11 52.02
Road crossing north and south	37 34 55.95	95 12 57.64
Missouri, Kansas and Texas Railway, crossing of	37 34 36.67	95 14 11.54
Road crossing north and south	37 34 38.28	95 15 09.00
T. 28 S., R. 19 E., corner secs. 23, 24, 25, and 26	37 35 14.29	95 17 18.92
Road crossing north and south	37 35 42.43	95 18 24.78
Shaw station	37 36 06.71	95 19 04.10
Road crossing east and west (not public)	37 37 06.38	95 19 09.05
Rollin, north and south road crossing at	37 38 18.28	95 21 40.66
Road crossing north and south	37 38 32.84	95 22 45.64
Ts. 27, 28 S., R. 18 E., corner secs. 35, 36, 2, 1	37 38 46.10	95 23 51.46
Road crossing north and south	37 39 02.30	95 24 57.20
Missouri, Kansas and Texas Railway, crossing of	37 39 12.85	95 25 44.30
T. 27 S., R. 18 E., corner secs. 28, 29, 32, 33	37 39 39.00	95 27 09.30
Chanute, crossing of main line Atchison, Topeka and Santa Fe and Missouri, Kansas and Texas railways	37 39 53.19	95 27 28.18
Chanute station	37 40 54.95	95 27 11.20
Chanute crossing of Missouri, Kansas and Texas and Atchison, Topeka and Santa Fe railways	37 41 42.25	95 26 57.78

Geographic positions along main line Atchison, Topeka and Santa Fe Railway between Chanute and Colony.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing east and west	37 43 07.63	95 26 20.55
Count line, Neosho and Allen counties, $\frac{1}{4}$ sec. corner between secs. 3 and 34, Ts. 26 and 27, R. 18 E. on	37 44 13.63	95 25 29.38
Road crossing east and west	37 45 34.88	95 25 47.38
Road crossing east and west	37 46 38.34	95 25 45.51
Road crossing northeast and southwest	37 47 34.40	95 25 43.87
Humboldt station	37 48 42.76	95 25 42.62
Road crossing east and west	37 50 07.86	95 25 38.74
Road crossing east and west	37 51 00.19	95 25 25.03
T. 25 S., R. 18 E., $\frac{1}{4}$ corner between secs. 15 and 22	37 51 52.59	95 25 06.67

*Geographic positions along main line Atchison, Topeka and Santa Fe Railway
between Chanute and Colony—Continued.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
T. 25 S., R. 18 E., $\frac{1}{4}$ corner between secs. 10 and 15	37	52	18.78	95	25	06.73
Road crossing east and west	37	53	11.20	95	24	50.67
Road crossing east and west	37	54	43.58	95	24	38.21
Iola station	37	55	21.78	95	24	38.52
Road crossing north and south	37	56	10.52	95	24	32.15
Road crossing east and west	37	57	07.15	95	24	12.70
Road crossing east and west	37	57	59.61	95	23	50.93
Trestle, crossing under	37	58	54.29	95	23	26.97
Carlisle station	37	59	43.18	95	23	16.85
Ts. 23 and 24 S., R. 18 E., corner secs. 36, 35, 2, and 1	37	59	44.80	95	23	24.64
Road crossing east and west	38	00	36.95	95	23	05.71
Road crossing east and west	38	01	29.38	95	22	52.24
Road crossing east and west	38	02	21.76	95	22	38.78
Road crossing east and west	38	03	14.32	95	22	25.27
Corner secs. 1, 6, 7, and 12	38	04	06.53	95	22	16.91
Colony station	38	04	18.14	95	22	05.61
Missouri Pacific Railway crossing	38	04	43.59	95	21	56.99

*Geographic positions along Missouri Pacific Railway between Colony and Blue
Mound.*

Station.	Latitude.			Longitude.		
	°	'	"	°	'	"
Road crossing north and south	38	04	43.14	95	19	36.29
Road crossing north and south	38	04	44.04	95	18	30.36
Road crossing north and south	38	04	42.72	95	16	51.04
Road crossing north and south R	38	04	44.01	95	15	45.42
Corner secs. 5, 6, 31, and 32	38	04	53.97	95	14	35.62
Road crossing north and south	38	04	43.29	95	13	28.90
Road crossing north and south	38	04	23.51	95	11	15.72
Road crossing north and south	38	04	44.02	95	10	09.46
Kincaid station	38	04	55.46	95	09	17.53
Missouri, Kansas and Texas Railway, crossing of	38	04	56.29	95	09	01.06
Road crossing north and south	38	05	19.44	95	07	23.49
Road crossing north and south	38	05	22.10	95	06	50.32
Trestle 81, crossing under	38	05	22.09	95	05	43.28
Anderson-Linn County line, crossing on, north and south	38	05	28.78	95	04	37.69
Road crossing, north and south	38	05	34.29	95	03	31.42
Trestle 74, crossing under	38	05	33.96	95	02	25.25

Geographic positions along or near the ninety-fifth meridian between Blue Mound and Uniontown.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south.....	38 05 33.69	95 01 30.28
Ts. 22 and 23 S., R. 22 E., $\frac{1}{4}$ corner secs. 32 and 5....	38 04 54.78	95 00 57.15
Ts. 22 and 23 S., R. 22 E., corner secs. 33, 32, 4, and 5.....	38 04 54.92	95 00 23.68
T. 23 S., R. 22 E., corner secs. 4, 5, 8, 9.....	38 04 02.38	95 00 23.63
T. 23 S., R. 22 E., corner secs. 8, 9, 16, and 17.....	38 03 10.14	95 00 23.40
Road crossing, east and west.....	38 02 18.10	95 00 22.96
Road crossing, north, south, east, and west.....	38 01 25.87	95 00 23.66
Little Osage River, center iron bridge, over.....	38 01 06.40	94 59 15.97
Ts. 23 and 24 S., R. 22 E., corner secs. 33, 34, 3, and 4.....	37 59 40.92	94 59 16.36
Road crossing north, east, south, and west.....	37 57 48.22	94 59 49.13
Road junction.....	37 56 36.90	94 59 49.65
T. 24 S., R. 22 E., corner secs. 21, 28, 27, and 22.....	37 56 12.08	94 59 16.38
T. 24 S., R. 22 E., corner secs. 22, 23, 26, 27.....	37 56 12.23	94 58 10.98
Roads north, south, east, and west.....	37 55 06.88	94 57 38.19
Roads north, south, east, and west.....	37 54 27.65	94 57 54.62
Roads north, south, east, and west.....	37 53 35.46	94 57 54.77
T. 25 S., R. 22 E., corner secs. 2, 3, 10, and 11.....	37 53 35.18	94 58 11.31
Road junction.....	37 52 34.78	94 58 11.38
T. 25 S., R. 22 E., corner secs. 14, 15, 22, and 23.....	37 51 50.75	94 58 11.51
T. 25 S., R. 22 E., corner secs. 22, 23, 26, and 27.....	37 50 58.41	94 58 11.59

Geographic positions along the Missouri Pacific Railway, between Uniontown and Fort Scott.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Roads north, east, south, and west.....	37 50 52.72	94 57 15.18
Road crossing north and south.....	37 50 37.79	94 55 27.07
Road crossing north and south.....	37 50 20.41	94 55 02.10
Trestle 17, road crossing under, north and south.....	37 50 09.44	94 53 14.38
Redfield station.....	37 50 07.61	94 52 55.96
T. 25 S., R. 23 E., corner secs. 27, 28, 33, and 34.....	37 50 05.91	94 52 41.74
Road crossing north and south.....	37 49 52.99	94 50 29.81
Marmaton station.....	37 49 53.53	94 49 29.82
T. 25 S., Rs. 23 and 24 E., corner secs. 25, 30, 31, and 36.....	37 50 05.94	94 49 24.03
Road crossing north and south.....	37 50 20.90	94 48 18.32
Road crossing north and south.....	37 50 42.32	94 47 12.71
Road crossing north and south.....	37 50 48.18	94 45 50.27
Fort Scott; road crossing $\frac{1}{2}$ mile west of.....	37 50 34.88	94 43 21.11

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

Station.	Latitude.	Longitude.
	° ' "	° ' "
Chanute; Missouri, Kansas and Texas and Atchison, Topeka and Santa Fe railways, crossing of	37 39 53.19	95 27.28.18
Road crossing east and west	37 38 47.61	95 27 46.16
Road crossing east and west	37 37 53.65	95 28 00.93
T. 28 S., R. 18 E., corner secs. 7, 8, 17, and 18	37 37 01.29	95 28 14.34
Road crossing east and west	37 36 09.20	95 28 14.65
Earleton station	37 35 17.30	95 28 14.35
T. 28 S., R. 18 E., corner secs. 19, 20, 29, and 30	37 35 16.61	95 28 14.35
Road crossing east and west	37 34 23.96	95 28 14.03
Road crossing east and west	37 33 34.18	95 28 13.72
Road crossing east and west	37 32 39.36	95 28 13.39
Road crossing east and west	37 31 46.72	95 28 13.07
Road crossing east and west	37 30 54.67	95 28 12.75
Road crossing east and west	37 29 37.11	95 28 12.24
Thayer station	37 29 21.29	95 28 12.15

NORTH DAKOTA—MINNESOTA.

PRIMARY TRAVERSE.

The following geographic positions were determined from primary traverse run by Mr. Geo. T. Hawkins in 1902. The line starts from a position determined by traverse, at Fargo, and follows the Northern Pacific Railway to Warren, thence south along highways to Kindred; thence along Great Northern Railway to Colfax, thence along highways to Hankinson, thence by "Soo Line" to Fairmount, thence by Chicago, Milwaukee and St. Paul Railway to Wahpeton, thence by Great Northern Railway to starting point.

Geographic positions along the Great Northern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Fargo, crossing of Broadway and Northern Pacific Railway	46 52 25.5	96 47 08.9
Road crossing east and west on north edge of Wahpeton quadrangle	46 29 56.0	96 53 50.8
Colfax, road crossing east and west in north part of	46 28 11.8	96 52 27.1

Geographic positions along highways between Colfax and Hankinson.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Ts. 134 and 135 N., R. 49 W., corner secs. 5, 6, 31, and 32	46 27 19.6	96 52 50.1
Ts. 134 and 135 N., R. 49 W., corner secs. 17, 18, 19, and 20	46 24 42.8	96 52 47.5
Ts. 134 and 133 N., R. 49 W., corner secs. 5, 6, 31, and 32	46 22 06.3	96 52 49.3
Ts. 134 and 135 N., R. 49 W., corner secs. 17, 18, 19, and 20	46 19 29.8	96 52 49.0
Ts. 134 and 135 N., R. 49 W., corner secs. 31 and 32	46 16 53.7	96 52 50.0
Mooreton, railway crossing $\frac{1}{2}$ mile west of	46 16 04.9	96 52 58.4
T. 132 N., Rs. 49 and 50 W., corner secs. 18, 19, 24, and 13	46 14 21.0	96 52 59.0
Ts. 131 and 132 N., Rs. 49 and 50 W., corner of	46 11 44.3	96 53 01.1
T. 131 N., Rs. 49 and 50 W., corner secs. 18, 19, 24, and 13	46 09 07.8	96 53 00.7
Ts. 130 and 131 N., Rs. 49 and 50 W., corner of	46 06 31.9	96 53 02.9
Hankinson, crossing range line and Chicago, Milwaukee and St. Paul Railway, east of	46 04 15.9	96 53 04.6

Geographic positions along the "Soo Line" between Hankinson and Fairmount.

Station.	Latitude.	Longitude.
	° ' "	° ' "
Road crossing north and south	46 03 47.2	96 49 22.0
Road crossing north and south	46 03 29.3	96 45 36.9
T. 130 N., R. 48 W., $\frac{1}{4}$ corner between secs. 20 and 21	46 03 28.8	96 43 06.0
T. 130 N., R. 48 W., $\frac{1}{4}$ corner between secs. 23 and 24	46 03 27.8	96 39 21.9
T. 130 N., Rs. 47 and 48 W., $\frac{1}{4}$ corner sec. between 19 and 24	46 03 27.5	96 38 07.4
Fairmount, crossing of Chicago, Milwaukee and St. Paul Railway	46 03 27.0	96 36 15.3

*Geographic positions along the Chicago, Milwaukee, and St. Paul Railway,
between Fairmount and Wahpeton.*

Station.	Latitude.	Longitude.
	° ' "	° ' "
Fairmount, crossing of the Great Northern and Chicago, Milwaukee and St. Paul railways.....	46 03 53.1	96 36 15.3
Ts. 130 and 131 N., R. 47 W., $\frac{1}{4}$ corner between secs. 5 and 32	46 06 28.8	96 36 14.4
Tyler, railway crossing at.....	46 08 53.1	96 36 13.4
Ts. 131 and 132 N., R. 47 W., corner secs. 19, 20, 29, 30.	46 13 26.8	96 36 49.1
Wahpeton, crossing Northern Pacific Railway.....	46 15 29.7	96 36 42.8
Wahpeton, crossing Great Northern Railway.....	46 15 43.7	96 36 42.8
T. 132 N., R. 47 W., north corner secs. 5 and 6.....	46 16 53.5	96 36 48.1
Wahpeton, crossing Great Northern Railway, north of	46 18 56.3	96 37 47.1
Brushville, $\frac{1}{4}$ sec. corner at.....	46 22 07.2	96 38 29.0

Geographic positions along the Great Northern Railway.

Station.	Latitude.	Longitude.
	° ' "	° ' "
MINNESOTA.		
School house, railway crossing at.....	46 24 17.9	96 39 47.2
Kent station	46 26 10.4	96 40 54.4
Township line, east and west crossing on	46 27 19.7	96 41 35.9
T. 135 N., R. 48 W., corner secs. 15, 16, 21, and 22..	46 29 55.8	96 43 01.7
Road crossing east and west	46 30 47.7	96 42 56.1

ROCKY MOUNTAIN SECTION OF TOPOGRAPHY.

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

COLORADO-WYOMING.

TRIANGULATION STATIONS.

In the fall of 1902 Mr. R. H. Chapman extended triangulation northward from stations Cleveland, Harrison, and Hogback west of Greeley, Colo., to stations County Road, Lindsey, and Quartzite, near Laramie, Wyo. Besides reoccupying these six stations he monumented and occupied eleven new stations and located sixteen points by intersections. Positions are given on the U. S. standard datum as derived from Morrison-Table Mound stations in the transeontinental triangulation of the Coast and Geodetic Survey near Denver.

COLORADO-WYOMING LINE.

About $1\frac{1}{2}$ miles west of south from Terry triangulation station and about one-half mile southeast from "Terry ranch," the home ranch of the Warren Live Stock Company, about 12 miles south from Cheyenne, Wyo., on Denver pike.

Station mark: Dressed red sandstone post marked "44 M" on east, "Wyoming" on north, "41° N. L. 1873 yards" on west, "Colorado" on south.

[Latitude 41° 00' 21.38". Longitude 104° 53' 11.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Maxwell	67 39 31	247 26 40	4.47414
Terry	207 42 56	27 43 29	3.39986

Colorado.

FORT COLLINS, LARIMER COUNTY.

Station mark: Center of tower of court-house.

[Latitude 40° 35' 11.64". Longitude 105° 04' 45.30".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Horsetooth	62 19 28.8	242 14 55.1	4.04865
Pizen	232 27 44.3	52 33 12.9	4.17453

HORSETOOTH, LARIMER COUNTY.

A high, bare, rocky point on divide immediately east of Redstone Creek, about 3 miles northeast of Masonville and about 8 miles south of west from Fort Collins. It is best reached from Fort Collins by taking the Masonville road and diverging from it at a point a little west from where the road passes the southeast ridge of the peak, and taking a trail, visible from the road, up the above ridge.

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

[Latitude 40° 32' 23.00". Longitude 105° 11' 46.21".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Harrison	300 30 20.72	120 44 23.09	4.5507671
Cleveland	333 17 51.90	153 29 08.64	4.7414387
Livermore	161 31 44.63	341 28 00.49	4.4061105
Pizen	236 36 22.09	56 46 24.43	4.4155868
Maxwell	177 55 51.51	357 55 10.83	4.6066170
Hogback	000 06 45.57	180 06 43.76	4.5275527

LIVERMORE, LARIMER COUNTY.

On highest point of a rocky mountain, about 3 miles southwest of Livermore post-office. It is between Lone Pine Creek and Main North Fork of Cache la Poudre River. It is about 4 miles north of "Grey Rock," a bare peak with cliff on east, south, and west. Horses ridden to station. Easily reached via long ridge southwest from Livermore post-office via Griffith's ranch.

Station mark: A bronze tablet cemented in solid rock.

[Latitude 40° 45' 26.18". Longitude 105° 17' 30.29".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Horsetooth	341 28 00.49	161 31 44.63	4.4061105
Pizen	288 11 30.05	108 25 18.16	4.4967751
East Twin	183 37 55.88	3 38 53.41	4.5103976
Gale	141 56 35.40	321 44 53.11	4.6089354
Maxwell	202 05 53.64	22 08 57.83	4.2437306

MAXWELL, LARIMER COUNTY.

On southern end of a timbered ridge, about 7 miles northeast of Forks post-office, about 3 miles northeast of Steamboat Rock, and about 2.5 miles south of east of Fred. Maxwell's ranch, at east foot of

Red Mountain. The summit is gray limestone which shows as a continuous cliff about 20 feet high on west face of ridge.

Station mark: A bronze tablet cemented in solid white limestone.

[Latitude $40^{\circ} 54' 12.57''$. Longitude $105^{\circ} 12' 48.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pizen	318 19 11.41	138 29 56.71	4.5427375
Horsetooth	357 55 10.83	177 55 51.51	4.6066170
Terry	244 32 04.96	64 45 29.64	4.5018860
Gale	116 31 23.84	296 16 35.78	4.5484084
East Twin	164 16 53.35	344 14 46.23	4.2230452
Livermore	22 08 57.83	202 05 53.64	4.2437306

PIZEN, LARIMER COUNTY.

About 10 miles northeast of Fort Collins, on a high, open prairie; edge of bluff overlooking valley of Cache la Poudre River. On highest point in that vicinity, about 3 miles north of "Pizen Hole" and 1 mile south and 2.5 miles east of Fred Herdig's ranch.

Station mark: An iron bench-mark post set 45 inches in the ground.

[Latitude $40^{\circ} 40' 06.55''$. Longitude $104^{\circ} 56' 20.72''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hogback	24 35 11.55	204 25 09.25	4.7221606
Horsetooth	56 46 24.43	236 36 22.09	4.4155868
Livermore	108 25 18.16	288 11 30.05	4.4967751
Maxwell	138 29 56.71	318 19 11.41	4.6066170
East Twin	146 50 14.06	326 37 20.99	4.7028818
Terry	188 01 26.95	8 04 03.62	4.6030505
Harrison	344 49 07.15	164 53 09.28	4.5259602

Wyoming.

COUNTY ROAD, ALBANY COUNTY.

About 6 miles from Laramie, $2\frac{1}{2}$ miles north of a west line. It is about 25 feet north of road, between road and bluff. It is one-fourth mile east of stone at section corner marked \equiv on south and \equiv on east (southwest corner of sec. 16, T. 16 N., R. 74 W.), and three-fourths mile west of stone at section corner marked \equiv on south (southeast corner of same section).

Station mark: A stone about 6 by 4 inches projecting about 3 inches above surface, with one-fourth inch hole one-half inch deep in center.

Reference mark: An iron bench-mark post set 36 inches in the ground, 18 inches east of station mark.

[Latitude $41^{\circ} 21' 00.63''$. Longitude $105^{\circ} 42' 22.99''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow.....	300 17 28.18	120 27 56.95	4.4099220
Gale.....	343 50 57.49	163 55 34.19	4.5474458
Lindsey.....	348 18 20.37	168 21 00.06	4.4455330
Pilot.....	281 33 21.06	101 43 44.77	4.3365760
Quartzite.....	247 48 29.10	67 58 36.84	4.3481574

CROW, ALBANY COUNTY.

On a high, partly timbered summit, on ridge running nearly north and south, 10 miles southeast from Laramie, about 10 miles north of Ames monument at old Sherman, and about 10 miles north of Tie Siding. Old road running along crest of ridge passes 100 yards east of station, is reached by road north from Tie Siding via Aug. Borgerman's ranch. Station is three-fourths of a mile south of Laramie-Cheyenne road at Cheyenne Pass.

Station mark: A bench-mark tablet cemented in solid sandstone, stamped "8878 feet."

[Latitude $41^{\circ} 13' 59.35''$. Longitude $105^{\circ} 26' 30.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gale.....	30 47 24.10	210 41 33.61	4.3857278
East Twin.....	324 26 33.40	144 33 26.38	4.4015676
Ragged.....	199 36 58.20	19 40 50.12	4.3852928
Pilot.....	174 02 33.18	354 02 07.68	3.9376136
County road.....	120 27 56.95	300 17 28.18	4.4099220
Lindsey.....	49 12 58.86	229 05 11.13	4.3403873

GALE, ALBANY COUNTY.

A prominent rocky peak, near north end of Boulder Ridge, about $1\frac{1}{2}$ miles north of Colorado-Wyoming line. About 9 miles southwest of Tie Siding and 500 yards north of road from there to North Park, via Boulder Ridge. About 5 miles northwest of well-known rocky peak called "Diamond Peak."

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

[Latitude $41^{\circ} 02' 42.12''$. Longitude $105^{\circ} 35' 22.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
County road	163 55 34.19	343 50 57.50	4.5474458
Crow	210 41 33.61	30 47 24.10	4.3857278
East Twin	269 07 00.78	89 19 42.82	4.4330476
Maxwell	296 16 35.78	116 31 23.84	4.5484084
Livermore	321 44 53.11	141 56 35.40	4.6089354

GREENTOP, ALBANY COUNTY.

(Not occupied.)

A secondary point on a timbered rocky peak, about 3 miles southwest from Horse triangulation station and about 5 miles south of Horse Creek.

Station mark: Highest point located.

[Latitude $41^{\circ} 21' 01.0''$. Longitude $105^{\circ} 19' 48.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow	35 42 46	215 08 21	4.20444
Pilot	66 48 30	246 43 40	4.04666

HORSE, ALBANY COUNTY.

A low, rocky, bare butte between branches of Horse Creek, about 5 miles northeast of E. C. Lapash's ranch, and about 2 miles northeast of "Greentop," a timbered rocky butte known locally, and $2\frac{1}{2}$ miles almost south of prominent rocky point, which looks like a beehive, known as "Ragged Top," and 2 miles southeast of "V K" ranch.

Station mark: A bronze tablet set in solid rock.

[Latitude $41^{\circ} 23' 06.97''$. Longitude $105^{\circ} 18' 15.8''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Crow	34 17 10	214 11 53	4.31040
Ragged	150 54 32	330 52 57	3.83495

LINDSEY, ALBANY COUNTY.

On a butte of a long bare ridge, running north from high timbered mesa, 20 miles south of Laramie. About 4 miles southwest of McGibbon ranch.

Station mark: A bench-mark tablet with triangle cut in top cemented in block of rock about 14 by 12 by 10 inches, set level with surface and cemented in place.

[Latitude $41^{\circ}06'15.08''$. Longitude $105^{\circ}38'20.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
County road	168 21 00.06	348 18 20.37	4.4455330
Crow	229 05 11.13	49 12 58.86	4.3403873

MOUND, ALBANY COUNTY.

Bare grassy ridge 2 miles southwest of Twin Peak, 10 miles south of Sherman.

Station mark: Highest point.

[Latitude $41^{\circ}00'20.42''$. Longitude $105^{\circ}17'33.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Gale	100 01 25.4	279 49 43.6	4.40411
Livermore	359 49 51.1	179 49 53.4	4.44068

PILOT, ALBANY COUNTY.

On highest point of long high ridge east of Laramie, from which it appears as timbered; about 5 miles north of Cheyenne Pass; accessible to wagon from there or from road, crossing ridge one-half mile north of station. About 1 mile southwest of Big Indian Spring.

Station mark: A bronze bench-mark tablet cemented in solid rock 6 inches beneath surface, over which is a loose cairn 1 foot high.

[Latitude $41^{\circ}18'38.61''$. Longitude $105^{\circ}27'08.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
County road	101 43 44.77	281 33 21.06	4.3365760
Quartzite	177 22 19.72	357 22 03.06	4.1066498
Ragged	212 24 01.44	32 28 19.09	4.2275853
Crow	354 02 07.68	174 02 33.18	3.9376136

QUARTZITE, ALBANY COUNTY.

On a high ridge 10 miles northeast of Laramie, about $1\frac{1}{2}$ miles south of main wagon-road crossing.

Station mark: A bench-mark tablet cemented in solid rock at point where + was cut in 1892.

[Latitude $41^{\circ} 25' 32.55''$. Longitude $105^{\circ} 27' 34.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
County road	67 58 36.84	247 48 49.10	4.3481574
Ragged	261 12 35.86	81 17 10.49	3.9889947
Pilot	357 22 03.06	177 22 19.72	4.1066498

RAGGED, ALBANY COUNTY.

On highest rock of group of pinnacles about 3 miles north of "V K" ranch on Horse Creek, locally known as "Ragged Top."

Station mark: A bench-mark tablet in solid rock, with triangle cut in top.

[Latitude $41^{\circ} 26' 20.64''$. Longitude $105^{\circ} 20' 39.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Crow	19 40 50.12	199 36 58.20	4.3852928
East Twin	351 31 58.06	171 35 00.39	4.6421429
Pilot	32 28 19.09	212 24 01.44	4.2275853
Quartzite	81 17 10.49	261 12 35.86	3.9889947

"ROCK S. E." ALBANY COUNTY.

(Not occupied.)

A secondary point on easternmost rocky butte, about 3 miles south of Pole Creek and 3 miles east of Pole Mountain.

Station mark: Highest point of rock.

[Latitude $41^{\circ} 14' 12.6''$. Longitude $105^{\circ} 19' 03.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Pilot	126 04 26	305 59 06	4.14474
Ragged	174 23 08	354 22 06	4.35355

EAST TWIN, LARAMIE COUNTY.

Easternmost and higher of two rocky peaks known as "Twin Mountains," about 10 miles southeast of Sherman and 20 miles a little south of west from Cheyenne. Easily ascended by saddle horses.

Station mark: A bronze tablet cemented in flat surface of solid rock.

[Latitude $41^{\circ} 02' 54.04''$. Longitude $105^{\circ} 16' 02.43''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Livermore	3 38 53.41	183 37 55.88	4.5103976
Pizen	326 37 20.99	146 50 14.06	4.7028818
Crow	144 33 26.38	324 26 33.40	4.4015676
Ragged	171 35 00.39	351 31 58.06	4.6421429
Maxwell	344 14 46.23	164 16 53.35	4.2230452
Terry	274 08 12.42	94 24 45.54	4.5223308
Gale	89 19 42.82	269 07 00.78	4.4330476

TERRY, LARAMIE COUNTY, WYO.

A round, conical, bare hill about 10 miles south of Cheyenne; about 2 miles northeast of old "Terry Ranch," now "Home Ranch" of Warren L. S. Co.; about $1\frac{1}{2}$ miles east of Cheyenne-Fort Collins road.

Station mark: An iron bench-mark post set 3 feet in ground around which is a small mound of rock.

[Latitude $41^{\circ} 01' 33.44''$. Longitude $104^{\circ} 52' 21.17''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pizen	8 04 03.62	188 01 26.95	4.6030505
Maxwell	64 45 29.64	244 32 04.96	4.5018860
East Twin	94 24 45.54	274 08 12.42	4.5223308

ARIZONA.

TRIANGULATION STATIONS.

Mr. H. L. Baldwin, topographer, was engaged in March and April, 1902, in extending triangulation northward from the base New River-Union for the purpose of furnishing control for the survey of the Grand Canyon Forest Reserve.

He established and marked the position of 18 primary stations which control 7 thirty-minute quadrangles and 5 secondary stations which control the Jerome special quadrangle, observing for azimuth at two stations.

BISSEL, COCONINO COUNTY.

About 7 miles northeast of Grand View Hotel; reached by wagon road. Lines of sight were cleared to San Francisco Mountain and Kendrick.

Station mark: A bronze B. M. tablet set in solid rock.

[Latitude $36^{\circ} 00' 52.00''$. Longitude $111^{\circ} 54' 45.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kendrick	355 17 40	175 19 44	4.830226
Middle	107 17 06	287 11 02	4.20968
Point Sublime	123 43 47	303 31 49	4.56358

FLOYD, COCONINO COUNTY.

On summit of mountain of that name, 10 miles northeast of Seligman.

Station mark: A rock 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 monument, $290^{\circ} 23'$; distance, 12 feet.

[Latitude $35^{\circ} 23' 29.88''$. Longitude $112^{\circ} 43' 29.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Picacho	4 45 03.24	184 44 28.91	4.2584423
Rowe	214 10 05.72	34 30 04.66	4.9612843
Red Butte	230 17 27.69	50 39 37.68	4.8724051
Middle	217 54 56.04	38 17 22.48	4.9727543
Williams	294 12 18.34	114 30 18.21	4.7146324

KENDRICK, COCONINO COUNTY.

On summit of Mount Kendrick.

Station mark: A bronze tablet set in solid Malapai rock, over which was erected a signal of rocks and pine boughs, 10 feet base and 8 feet high.

[Latitude $35^{\circ} 24' 24.83''$. Longitude $111^{\circ} 51' 05.35''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Picacho	76 31 55.77	256 01 03.88	4.9206164
Williams	54 29 31.81	234 17 15.00	4.5979301
Red Butte	154 45 37.08	334 37 16.56	4.7041812

MIDDLE, COCONINO COUNTY.

Station is located on the northwest point of the prominent headland about 3 miles east of the Bright Angel Hotel.

Station mark: A bronze tablet set in the flat limestone ledge.

Reference mark: A small pine tree. True azimuth from tablet, 223° 40'; distance, 6.17 feet.

[Latitude 36° 03' 27.91". Longitude 112° 05' 03.37".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Red Butte.....	1 10 12.23	181 09 49.60	4.4227904
Williams.....	6 37 05.06	186 32 50.51	4.9818901
Floyd.....	38 17 22.48	217 54 56.04	4.9727543
Rowe.....	104 26 01.86	284 23 32.93	3.8153410

RED BUTTE, COCONINO COUNTY.

On the highest point of well-known mountain of that name.

Station mark: A bronze tablet set in a malapai rock.

[Latitude 35° 49' 09.18". Longitude 112° 05' 24.90".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Williams.....	8 41 01.11	188 36 59.81	4.8426625
Floyd.....	50 39 37.68	230 17 27.69	4.8724051
Rowe.....	168 21 10.24	348 18 54.38	4.4576742
Middle.....	181 09 49.60	1 10 12.23	4.4227904
Kendrick.....	334 37 16.56	154 45 37.08	4.7041812

ROWE, COCONINO COUNTY.

On the headland of that name, 1.5 miles by road northwest from the Bright Angel Hotel.

Station mark: A bronze tablet set in solid limestone ledge, 1.5 feet below surface of ground and nearly below the center of a Piñon stump 10 feet high, which served as a support for the instrument.

[Latitude 36° 04' 20.70". Longitude 112° 09' 16.34".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Williams.....	2 44 59.69	182 43 12.48	4.9868657
Floyd.....	34 30 04.66	214 10 05.72	4.9612843
Middle.....	284 23 32.93	104 26 01.86	3.8153410
Red Butte.....	348 18 54.38	168 21 10.24	4.4576742

WILLIAMS, COCONINO COUNTY.

On Bill Williams Mountain, 4 miles south of the town of Williams.
Station mark: A bronze tablet set in solid rock projecting 2 feet above ground.

Reference mark: A rock cairn 7 feet high. True azimuth, $305^{\circ} 04'$; distance, 7.4 feet.

[Latitude $35^{\circ} 11' 56.22''$. Longitude $112^{\circ} 12' 20.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Granite	27 07 31.70	206 55 34.32	4.8451720
Simmons	40 08 43.42	219 56 08.29	4.7147958
Picacho	94 02 01.04	273 43 29.09	4.6891695
Floyd	114 30 18.21	294 12 18.34	4.7146324
Rowe	182 43 12.48	2 44 59.69	4.9868657
Red Butte	188 36 59.81	8 41 01.12	4.8426625
Middle	186 32 50.51	6 37 05.06	4.9818901
Kendrick	234 17 15.00	54 29 31.81	4.5979301
Bald	343 45 02.15	163 54 01.08	4.9349310

AZIMUTH, GILA COUNTY.

On the low, grassy divide between Salt and Gila rivers drainage, about 2 miles southeast of Globe, one-fourth mile south of the wagon road crossing of the Globe, Gila Valley and Northern Railroad on the above divide.

Station mark: A bronze tablet cemented in solid rock and centered under a rock monument.

[Latitude $33^{\circ} 22' 04.59''$. Longitude $110^{\circ} 45' 22.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pinal	{ ^a 41 36 27.02 ^b 41 36 33.07	{ 221 33 48.00 221 33 54.05	{ 4.0521882
Black Hawk	{ ^a 172 08 56.68 ^b 172 09 02.73	{ 352 08 34.49 352 08 40.54	{ 3.8812944

^a Computed from Maricopa.

^b Observed.

BLAIR, GILA COUNTY.

(Apache Indian Reservation.)

On the highest point of a long ridge, bluffly on the north end, 15 miles southeast of Globe, 10 miles south and a little west of Gilson water tank on the Globe, Gila Valley and Northern Railroad.

Station mark: A bronze tablet cemented in solid rock and centered under a rock monument.

[Latitude 33° 15' 10.23". Longitude 110° 38' 15.43".]

To station—	Azimuth.	Back azimuth.	Log distance.
	° ' "	° ' "	Meters.
Pioneer	61 44 28.00	241 40 32.70	4.1013236
Final	103 12 31.42	283 05 58.60	4.2794265
Black Hawk	149 18 03.02	329 13 46.42	4.3732750
Coal	341 58 15.25	162 00 16.86	4.2700257

COAL, GILA COUNTY.

On the summit of the limestone divide between Gila River and Deer Creek, 3 miles northeast of the lower coal fields, 18 miles northeast of Dudleyville, and about 15 miles southeast of San Carlos, 6 miles north of Manningo ranch on Deer Creek. An old Indian trail from Dudleyville to San Carlos crosses the ridge one-fourth mile west of station.

Station mark: A nail cemented in a hole drilled in solid rock, centered under a rock monument.

[Latitude 33° 05' 35.38". Longitude 110° 34' 33.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ripsey	73 12 40.39	252 59 50.83	4.5829189
Kelvin	101 51 23.83	281 39 54.91	4.5235581
Pioneer	124 49 01.79	304 43 05.47	4.3130220
Black Hawk	154 55 01.46	334 48 43.50	4.6231189
Blair	162 00 16.86	341 58 15.25	4.2700257
Triplets	217 11 30.46	37 18 55.33	4.5408219
Gila	259 07 57.83	79 28 24.66	4.7722287
Turnbull	274 21 23.30	94 31 40.94	4.4688635

KELVIN, GILA COUNTY.

On the highest round hill on the divide between Gila River, Mineral and Dripping Spring creeks, 3 miles east of the Ray mine on Mineral Creek, 2 miles west of the Gray mining camp on the Globe-Riverside wagon road where it crosses the divide 8 miles north of Riverside.

Station mark: Three nails cemented in a hole drilled in the solid rock, over which is centered a rock monument.

[Latitude 33° 09' 16.27". Longitude 110° 55' 34.00".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ripsey	12 18 20.80	192 16 58.59	4.2636308
Grayback	61 29 58.57	241 24 12.47	4.2640522
Kings Crown	145 13 11.80	325 08 18.55	4.3756044
Pinal	208 42 30.15	28 45 26.88	4.2399056
Pioneer	252 38 26.06	72 43 59.40	4.2182857
Coal	281 39 54.91	101 51 23.83	4.5235581

PIONEER, GILA COUNTY.

On the highest point of a black ridge, with a bluff on its north end, about 5 miles east of the old Pioneer mining camp (stage station) on the Globe and Riverside wagon road.

Station mark: A hole drilled in a large boulder, above which is built a rock monument 6 feet high.

[Latitude 33° 11' 55.96". Longitude 110° 45' 24.86".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Ripsey	40 49 45.04	220 42 50.17	4.4795748
Kelvin	72 43 59.40	252 38 26.06	4.2182857
Kings Crown	116 31 03.98	296 20 36.53	4.5151398
Black Hawk	177 53 43.95	357 53 23.41	4.4200375
Blair	241 40 32.72	61 44 28.00	4.1013235
Coal	304 43 05.47	124 49 01.79	4.3130220
Pinal	144 17 52.01	324 15 14.90	4.1040238

PINNACLE, MOHAVE COUNTY.

(Not occupied.)

[Latitude 36° 09' 05.58". Longitude 112° 05' 57.14".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Middle	352 38 00	172 38 28	4.02094
Rowe	29 35 14	209 33 17	4.00413

POINT SUBLIME, MOHAVE COUNTY.

(Not occupied.)

On point of same name on north side of Grand Canyon.

Station mark: Evergreen tree about 15 feet high.

[Latitude 36° 11' 49.94". Longitude 112° 15' 03.71".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bissel	303 31 49.00	123 43 47.00	4.56358
Middle	315 48 59.48	135 54 53.42	4.3336057
Floyd	25 44 25.98	205 27 48.40	4.9961237

SHIVAS, MOHAVE COUNTY.

(Not occupied.)

[Latitude 36° 08' 24.00". Longitude 112° 08' 15.92".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Middle	332 09 30	152 11 23	4.01363
Rowe	11 24 03	191 23 27	3.88363

VISHNU TEMPLE, MOHAVE COUNTY.

(Unoccupied.)

Station mark: Center of rock spire.

[Latitude 36° 05' 15.57". Longitude 111° 56' 10.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Middle	76 04 54	255 59 40	4.13838
Rowe	85 09 05	265 01 22	4.29549

RIPSEY, PINAL COUNTY.

On a high hill at the head of the Ripsey wash, 1 mile south of the old Ripsey mine, 12 miles south of Kelvin and Riverside.

Station mark: A hole drilled in a large boulder, above which is built a large rock monument.

[Latitude 32° 59' 34.28". Longitude 110° 58' 04.64".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Gray Back	126 49 08.44	306 44 45.20	4.1842064
Kings Crown	165 32 33.80	345 29 03.58	4.5871790
Kelvin	192 16 58.59	12 18 20.80	4.2636308
Pioneer	220 42 50.17	40 49 45.04	4.4795748
Coal	252 59 50.83	73 12 40.39	4.5829189

AZIMUTH, YAVAPAI COUNTY.

On a small hill one-third mile south of Crookton station, on the Atchison, Topeka and Santa Fe Railroad.

Station mark: A 10-penny nail in the ground.

Azimuth mark: Small nail in window sill west of door in telegraph station.

[Latitude $35^{\circ} 17' 14.83''$. Longitude $112^{\circ} 42' 28.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Picacho	25 03 33.82	205 02 24.33	3.8565762
Floyd	173 24 48.17	352 24 12.89	4.0667159

BALD MOUNTAIN, YAVAPAI COUNTY.

On mountain of that name, 10 miles southwest of Camp Verde.

Station mark: A bronze tablet set in malpais rock 2 by 3 feet and projecting 1 foot above ground.

Reference mark: A large juniper tree. True azimuth, $350^{\circ} 53'$; distance, 22.4 feet.

[Latitude $34^{\circ} 27' 13.17''$. Longitude $111^{\circ} 56' 36.67''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
New River	7 04 02.86	187 01 56.84	4.6690657
Union	84 11 25.14	263 55 45.78	4.6298541
Granite	110 06 11.10	289 45 25.31	4.7751434
Carter	140 42 38.87	320 34 21.88	4.5465106
Williams	163 54 01.08	343 45 02.15	4.9349810

CAMP WOODS, YAVAPAI COUNTY.

About 15 miles west of Simmons post-office, on the Camp Woods road, on the eastern and lower of two prominent points of nearly equal height.

Station mark: A bronze tablet set in solid sandstone rock.

[Latitude $34^{\circ} 50' 02.61''$. Longitude $112^{\circ} 55' 08.77''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Simmons	268 27 49.37	88 41 44.91	4.5029074
Granite	303 05 14.96	123 17 44.32	4.6018457
Kirkland	349 56 57.69	170 00 39.41	4.7575935
Picacho	200 14 51.58	20 22 59.01	4.6692858

CARTER, YAVAPAI COUNTY.

On the high bluff, 2 miles west of summit of Prescott and Jerome wagon road.

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

[Latitude $34^{\circ} 41' 56.36''$. Longitude $112^{\circ} 11' 12.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Union	32 24 12.30	212 16 46.75	4.5732755
Simmons	114 14 25.74	294 01 16.58	4.5861179
West Edge	190 37 56.51	10 38 19.56	3.7466252
Bald	320 34 21.88	140 42 38.87	4.5465106

EAST ANTELOPE, YAVAPAI COUNTY.

On highest peak, 4 miles east of Antelope Peak.

Station mark: A bronze tablet cemented in solid malpais rock, over which is erected a rock cairn 7 feet high and 6 feet base.

[Latitude $34^{\circ} 13' 10.71''$. Longitude $112^{\circ} 40' 29.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kirkland			4.2352428
Del Pasco	266 56 26.10	87 06 46.69	4.4514305
Silver	292 12 38.31	112 21 39.55	4.4260126

ERROR, YAVAPAI COUNTY.

About one-half mile northwest of the summit of the abandoned Prescott and Jerome wagon road over Mingus Mesa.

Station mark: A bronze tablet cemented in solid rock.

Reference mark: A pine tree; lower branches trimmed off. True azimuth $333^{\circ} 15'$; distance, 7.7 feet.

[Latitude $34^{\circ} 42' 39.97''$. Longitude $112^{\circ} 09' 23.94''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carter	64 03 07	244 02 05	3.48713
East Edge	176 51 44	356 51 38	3.66890
Mineral	218 49 44	38 50 56	3.70736

EAST EDGE, YAVAPAI COUNTY.

On the east edge of the Mingus Mesa and overlooking the town of Jerome.

Station mark: A bronze B. M. tablet, set in solid ledge and surrounded by a small rock monument.

[Latitude $34^{\circ} 45' 11.16''$. Longitude $112^{\circ} 09' 33.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
West Edge	70 37 48.79	250 37 15.76	3.193765
Carter	22 39 11.32	202 38 15.26	3.813154
Error	356 51 38.00	176 51 44.00	3.668903
Mineral	281 15 43.00	101 17 00.00	3.546446
Limestone	257 09 33.00	77 11 13.00	3.66052

FAITH, YAVAPAI COUNTY.

On highest peak of ridge south of where Hassayampa Creek enters the desert and 6 miles northeast of Wickenburg.

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

[Latitude $34^{\circ} 01' 35.01''$. Longitude $112^{\circ} 45' 15.02''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
East Antelope	187 10 19.90	7 11 19.02	4.3345530
Del Pasco	233 25 27.86	53 36 46.02	4.5856772

GRANITE, YAVAPAI COUNTY.

On mountain of that name 9 miles northwest of Prescott.

Station mark: A bronze tablet cemented in highest granite boulder.

[Latitude $34^{\circ} 38' 12.34''$. Longitude $112^{\circ} 33' 13.61''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Camp Woods	123 17 44.32	303 05 14.96	4.6018457
Simmons	175 59 11.71	355 58 36.04	4.3564571
Williams	206 55 34.32	27 07 31.70	4.8451720
West Edge	250 13 31.22	70 26 26.25	4.5659158
Bald	289 45 25.31	110 06 11.10	4.7751434
Union	331 02 01.74	151 07 05.85	4.4509915

KIRKLAND, YAVAPAI COUNTY.

On highest peak of Weaver Mountains, 10 miles southwest of the town of Kirkland.

Station mark: A bronze tablet cemented in solid rock at the summit.

[Latitude $34^{\circ} 19' 33.78''$. Longitude $112^{\circ} 48' 38.11''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Camp Woods	170 00 39.41	349 56 57.69	4.7575935
Granite	214 19 02.74	34 27 46.14	4.6208307
Union	255 15 07.19	75 28 51.52	4.5861435
East Antelope			4.2352428

LIMESTONE, YAVAPAI COUNTY.

One-half mile north of the town of Jerome, on the north end of the limestone hill.

Station mark: A bronze tablet set in solid limestone ledge, over which is placed a small rock monument.

[Latitude $34^{\circ} 45' 44.11''$. Longitude $112^{\circ} 06' 38.53''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mineral	30 41 13	210 40 50	3.29696
East Edge	77 11 13	257 09 33	3.66052
North Mingus	2 47 30	182 47 23	3.78025

MINERAL, YAVAPAI COUNTY.

Station is near a mineral monument on the high point one-fourth mile south of the town of Jerome.

Station mark: A bronze tablet set in the solid rock over which is erected a rock monument 3 feet high.

Reference mark: A mineral monument. True azimuth, $110^{\circ} 45'$; distance, 4.36 feet.

[Latitude $34^{\circ} 44' 48.82''$. Longitude $112^{\circ} 07' 18.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Error	38 50 56	218 49 44	3.70736
East Edge	101 17 00	281 15 43	3.54646
Limestone	210 40 50	30 41 13	3.29696
North Mingus	350 34 59	170 35 15	3.64142

NORTH MINGUS, YAVAPAI COUNTY.

On the north end of the Mingus Mesa, 3 miles south of Jerome.

Station mark: A bronze tablet set in malpais rock.

[Latitude $34^{\circ} 42' 28.57''$. Longitude $112^{\circ} 06' 50.14''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carter	81 33 50.86	261 31 21.51	3.829173
West Edge	128 32 13.96	308 30 07.56	3.858072
Mineral	170 35 15.00	350 34 59.00	3.641420
Limestone	182 47 23.00	2 47 30.00	3.780250

PICACHO, YAVAPAI COUNTY.

On north end of Picacho Butte, 10 miles southeast of Seligman railroad station.

Station mark: A bronze tablet set in a large boulder on the summit, over which a rock cairn 5-foot base and 6 feet high was erected.

[Latitude $35^{\circ} 13' 43.54''$. Longitude $112^{\circ} 44' 28.69''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Floyd	184 44 28.91	4 45 03.24	4.2584423
Kendrick	256 01 03.88	76 31 55.77	4.9206164
Williams	273 43 29.09	94 02 01.03	4.6891695
Camp Woods	20 22 59.01	200 14 51.58	4.6692858

SIMMONS, YAVAPAI COUNTY.

On highest of the prominent hills 4 miles northeast of Simmons post-office.

Station mark: A bronze tablet set in solid granitic sandstone on summit.

[Latitude $34^{\circ} 50' 27.92''$. Longitude $112^{\circ} 34' 16.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Camp Woods	88 41 44.91	268 27 49.37	4.5029074
Picacho	160 11 59.98	340 06 08.37	4.6601424
Williams	219 56 08.29	40 08 43.42	4.7147958
Carter	294 01 16.58	114 14 25.74	4.5861179
Granite	355 58 36.04	175 59 11.71	4.3564571

SOUTH MINGUS, YAVAPAI COUNTY.

On the south side of the Mingus Mesa, near east end.

Station mark: A pine tree, lower branches trimmed.

Reference mark: A bronze B. M. tablet cemented in malpais rock, bears approximately south, 20 feet distant.

[Latitude $34^{\circ} 42' 16.99''$. Longitude $112^{\circ} 06' 48.70''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bald	330 41 51	150 47 38	4.504080
New River	352 21 11	172 24 50	4.874078

WEST EDGE, YAVAPAI COUNTY.

Near highest west edge of the volcanic mesa, 5 miles west of Jerome.

Station mark: A bronze tablet set in solid rock.

Reference mark: A large juniper tree. True azimuth, $138^{\circ} 36'$; distance, 16 feet.

[Latitude $34^{\circ} 44' 54.33''$. Longitude $112^{\circ} 10' 31.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Carter	10 38 19.36	190 37 56.51	3.7466252
Union	29 37 46.60	209 29 57.79	4.6300912
Granite	70 26 26.25	250 13 31.22	4.5659158

UTAH.

SECONDARY TRIANGULATION STATIONS.

Secondary triangulation for control of the Park City Special quadrangle was extended from primary stations Wanship and Clayton by Messrs. E. M. Douglas, geographer, and Pearson Chapman, topographer, in 1901-2.

Positions are given on the U. S. standard datum.

Geographic positions of principal mines at Park City.

Name of mine.	Point located.	Latitude.	Longitude.
		° ' "	° ' "
Ontario No. 2	Flag pole	40 37 23.05	111 29 36.86
Ontario No. 2	Hoisting rope	40 37 23.02	111 29 36.93
Silver King	Flag pole	40 37 51.89	111 30 46.24
Silver King	North shaft	40 37 51.88	111 30 46.22
Daly No. 2	Flag pole	40 37 15.03	111 30 20.96
Daly West	Flag pole	40 36 56.04	111 30 42.56
Daly West	Hoisting rope	40 36 56.08	111 30 42.58
Quincy	Hoisting rope	40 36 47.25	111 30 32.15
Anchor	Flag pole	40 36 46.91	111 31 12.10
Anchor	Hoisting rope	40 36 46.84	111 31 12.06

PACIFIC SECTION OF TOPOGRAPHY.

R. U. GOODE, *Geographer in charge.*

ARIZONA—CALIFORNIA.

TRIANGULATION STATIONS.

During the fall and winter of 1902-3, Mr. R. B. Robinson extended a system of quadrilaterals down the valley of the Colorado River from the vicinity of Needles, Cal., to Yuma, Ariz., a lineal distance of 175 miles. Forty stations were occupied and 24 located by intersections. This work depends upon stations in the expansion of the secondary base of the United States Coast and Geodetic Survey near Needles, and a check was obtained by connecting with stations Pilot and Azimuth of the United States and Mexican Boundary Survey Commission near Yuma. Positions are given on the United States standard datum as derived from the transcontinental belt of the Coast and Geodetic Survey through the secondary triangulation along the California-Nevada boundary line from Lake Tahoe to Needles. A few of the stations in the vicinity of Yuma were selected, built, and occupied by Mr. A. H. Sylvester, topographer, earlier in the season.

Arizona.

CONE, MOHAVE COUNTY.

A sharp, rocky peak, well known as "the Boundary Cone," about 17 miles northeast of Needles, Cal. The road to Kingman via the Snow Ball mine passes by the base of the peak. To go to Cone from Needles, take road to Snow Ball mine, past the Cone. Stop at the first big wash road crosses after passing the peak and go up the wash a short distance—the best and perhaps the only way up. Horses can not be taken much farther than the wash. There are several springs within 2 or 3 miles of the station and plenty of water at Leland mine, about 3 miles a little west of north.

Station mark: A bronze triangulation tablet wedged in solid rock, about 2 inches underground, under center of a cairn 7 feet high.

[Latitude 34° 59' 01.39". Longitude 114° 24' 54.54".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sphinx	333 32 18.97	153 36 43.44	4.4215004
Knoll	49 51 22.25	229 44 04.98	4.4047806
Hill	69 08 44.90	248 59 57.08	4.3985648
Peak	95 48 47.00	275 39 14.25	4.4057480
Powell	356 11 33.97	176 12 24.71	4.5321828
Whale	19 26 32.62	199 22 08.57	4.5484345

FRIANT, MOHAVE COUNTY.

On one of the several rocky peaks about 2 miles from the Colorado River, at Pete McGuire's house on the California side of the river. Friant's place is 3 miles down the river from McGuire's. Station can easily be reached from either place. Signal can be seen from 50 yards below McGuire's house (it looks as if it were on the side of the hill from here). To go from McGuire's follow wash which leads up to the east side of peak, and take a ridge to the left.

Station mark: A bronze triangulation tablet cemented in rock even with top of ground.

[Latitude 34° 21' 54.05". Longitude 114° 10' 11.29".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Axtel	75 51 30.71	255 43 21.63	4.3590878
Rocky	122 12 24.49	302 00 22.25	4.5850746
Red	153 20 23.47	333 16 55.78	4.3194664
Gier	347 45 54.63	167 47 03.53	4.1692339

MELLEN, MOHAVE COUNTY.

On the edge of mesa where it breaks off to the river, at Mellen Station, Ariz. The triangulation station is 135 steps north 85° west from Mellen railroad station, and 75 steps north 25° east from end of railroad bridge.

Station mark: A bronze triangulation tablet set in a solid round rock.

[Latitude 34° 43' 03.63". Longitude 114° 29' 06.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cone	192 12 01.12	12 14 24.90	4.47998
Hill	140 26 16.24	320 19 53.79	4.42657
Peak	-----	-----	4.57115

NO. 2, MOHAVE COUNTY.

On the highest part of white gravel and sand hills overlooking the Colorado River, about 300 yards east of the Mellen and Parker trail. Station is about 1 mile northeast of the Bill Wiles's place and is on the group of white hills to the north of a big wash which meets the river at this point.

Station mark: A rock 8 inches square on top set in ground with top a little above surface of ground and marked "U Δ S."

[Latitude $34^{\circ} 32' 29.63''$. Longitude $114^{\circ} 23' 00.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Whale	136 58 01.92	316 52 34.53	4.33245
Powell	177 33 41.11	357 32 59.75	4.17850
Red			4.01257
Rocky			4.11280
No. 1			3.90156
No. 3			4.01711
No. 4			4.19184

PARKER SCHOOL, MOHAVE COUNTY.

(Not occupied.)

Station mark: Center of cupola.

[Latitude $34^{\circ} 07' 41.82''$. Longitude $114^{\circ} 18' 35.08''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Low mesa	113 42 52.11	293 38 53.20	4.07574
Axtel	155 47 11.49	335 43 47.23	4.35494
Gier			4.29935
Black			3.96011

POWELL, MOHAVE COUNTY.

On a rocky peak about 4 miles south of Powell station, on the Santa Fe Railway, on the range of mountains of which the Needles form a part. It is the highest point on that range and is in view from Powell and Mellen. Station is easily reached from Powell by going up first big wash, leading south, east of Powell, but can be approached from any side. Horses can be taken to the base of peak.

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

[Latitude 34° 40' 38.68". Longitude 114° 23' 25.717".] M184

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Rocky	40 52 39.83	220 48 05.98	4.2737480
Whale	92 38 07.11	272 32 53.53	4.1474805
Knoll	129 06 00.24	308 57 54.01	4.4459924
Cone	176 12 24.71	356 11 33.97	4.5321828
Sphinx	222 33 25.62	42 36 58.47	4.1476673
Red	325 45 04.47	145 49 07.12	4.2869195

RED, MOHAVE COUNTY.

On the highest point of a group of foothills which lie at the base of the Chemehuevi Mountain on the west side. These hills are red, light red at the base and darker in color as they get higher. Station is about 7 miles east of the Bill Wiles place. A big wash leads from the Bill Wiles place to base of peak which signal is on. There is an old wagon road which can be followed all the way.

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

[Latitude 34° 31' 59.11". Longitude 114° 16' 18.45".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Axtel	27 47 36.52	207 42 53.95	4.4378911
Rocky	94 30 40.52	274 22 04.91	4.3665687
Whale	123 48 34.19	303 39 18.51	4.4767442
Powell	145 49 07.12	325 45 04.47	4.2869195
Friant	333 16 55.78	153 20 23.47	4.3194664
Gier	339 15 11.73	159 19 48.13	4.5484957

SPHINX, MOHAVE COUNTY.

On a small rocky peak about 4 miles north 25° west from Franconia station, on Santa Fe Railway. It is the peak lying farthest south of a range of peaks at the foot of the higher mountains. To reach station go straight from anywhere along the railroad, traveling the washes or mesa as seems best.

Station mark: A bronze triangulation tablet wedged in solid rock about 2 inches under surface of ground. Rocks piled around each leg of tripod. There is also a cairn, marking a mining claim, on summit of the peak.

[Latitude $34^{\circ} 46' 14.37''$. Longitude $114^{\circ} 17' 12.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Powell	42 36 58.47	222 33 25.62	4.1476673
Whale	67 38 58.68	247 30 11.86	4.4057412
Knoll	103 10 25.65	282 58 45.57	4.5052585
Hill	112 47 11.50	292 34 00.88	4.5810662
Peak	125 19 18.28	305 05 22.51	4.6571412
Cone	153 36 43.44	333 32 18.97	4.4215004

AGENCY, YUMA COUNTY.

About 14 miles south of Parker and 8 miles from the Colorado River at the nearest point. It is the farthest south peak of several making the range known by some people as the Hacawa Range. Station is not on the highest point, but lies about 3 miles west of the highest. The high water road down the river from Parker passes within 4 miles of station and from this road it is good traveling to the base of the peak.

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

[Latitude $33^{\circ} 58' 02.46''$. Longitude $114^{\circ} 18' 54.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tyson	22 29 38.48	202 26 49.04	4.3103898
Marie	56 14 14.33	236 04 12.65	4.5236625
Riverside (2)	112 05 02.80	291 58 14.74	4.3053637
Low Mesa	155 19 12.74	335 15 25.58	4.3964387
Black	208 51 41.37	28 55 11.69	4.2990559

BLACK, YUMA COUNTY.

On the first high point about 5 miles east of Parker and close to the eastern corner of the Colorado River Indian Reservation. There are several small rock cairns on this peak, but there is no danger of signal being confounded with them, as it is 10 feet high. It is good traveling from Parker straight to foot of mountain and good foot traveling from there to summit.

Station mark: A bronze triangulation tablet cemented in a rock under center of a cairn 10 feet high.

[Latitude 34° 07' 28.20". Longitude 114° 12' 39.47".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Agency	28 55 11.69	208 51 41.37	4.2990559
Riverside (2)	70 54 04.79	250 43 45.40	4.4769682
Low Mesa	104 37 42.07	284 30 23.58	4.3154914
Axtel	138 55 20.98	318 48 36.74	4.4467056
Gier	209 27 54.09	29 30 26.03	4.1483215

CHOCOLATE, YUMA COUNTY.

On a high, sharp peak of the Chocolate Mountains, overlooking the Colorado River Valley, about 200 yards south of the "Needles Eye." Both peaks are very prominent, and the "Needles Eye" shows plainly from the north or south. From the river, the best place to reach station is from Apache Island, about 1½ miles below No. 19 Station. Trails lead out from here to the main road running up and down the river. Follow the road up a short distance and take a right-hand road leading toward the mesa via Mrs. Hart's stamp mill. From this mill station bears 3° south of east and is about 6 miles off.

Station mark: A bronze triangulation tablet cemented in rock and placed under center of cairn 9 feet high.

[Latitude 33° 16' 44.84". Longitude 114° 33' 46.63".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Clip	6 05 34.17	186 04 49.70	4.2976493
Lava	44 12 29.87	224 06 37.64	4.3786581
Fort Gass	105 38 19.19	285 31 16.39	4.3155582
Hodges	144 05 27.78	323 59 29.27	4.4575619
Mulewash	179 34 38.99	359 34 36.08	4.2677230

CLIP, YUMA COUNTY.

On a high peak on a range of hills lying about 8 miles a little east of north of Picacho, in sight of the water tanks of the Gold King Mining Company at Picacho. The best way to go to station is to take the road from Picacho to the Red Cloud Mine about north 65° east.

Station mark: A bronze triangulation tablet cemented in rock and placed under center of cairn 9 feet high.

[Latitude $33^{\circ} 06' 04.80''$. Longitude $114^{\circ} 35' 07.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
American	30 02 27.81	209 57 00.53	4.4945347
Quartz	86 30 37.22	266 22 50.93	4.3461066
Lava	100 04 17.14	279 59 10.13	4.1701718
Fort Gass	144 51 15.20	324 44 57.89	4.4905956
Chocolate	186 04 49.70	6 05 34.17	4.2976493
Ridge	354 46 43.66	174 47 27.17	4.3582402

EHRENBERG, YUMA COUNTY.

On a flat sand and gravel mesa on the north bank of Weaver Wash, which runs into the Colorado River, about one-fourth mile above Ehrenberg. Station is about $2\frac{1}{2}$ miles east of Ehrenberg, and can be reached by taking road up the river from Ehrenberg until it crosses Weaver Wash. Leave road and follow the wash about 2 miles. Station is on top of mesa on north side of wash about 20 steps from edge of bluff.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground level with surface.

[Latitude $33^{\circ} 36' 11.17''$. Longitude $114^{\circ} 29' 25.24''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Mulewash	21 35 18.38	201 32 51.10	4.2723120
Hodges	61 42 01.87	241 33 37.38	4.4276039
Blythe	97 53 48.26	277 47 24.38	4.2563456
Marie	152 07 15.33	332 03 06.48	4.3921984
Tyson	201 20 19.79	21 23 21.13	4.3636828

GIER, YUMA COUNTY.

About 2 miles from Mrs. Gier's place on the Colorado River. It is south 51° east from Gier's, and 3 miles north 38° east from Brown's house at Empire Flat, on a high, mesa-topped peak, and is in plain view from the river in this vicinity.

Station mark: A bronze triangulation tablet cemented in a rock buried in ground under center of a cairn 10 feet high.

[Latitude 34° 14' 05.72". Longitude 114° 08' 09.03".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Agency	29 11 13.94	209 05 12.06	4.5312160
Black	29 30 26.03	209 27 54.09	4.1483215
Riverside (2)	58 00 22.69	237 47 31.02	4.6190262
Low Mesa	75 24 47.37	255 14 56.23	4.4445210
Axtel	109 17 23.90	289 08 06.78	4.4281081
Rocky	134 24 51.99	314 11 41.88	4.6983570
Red	159 19 48.13	339 15 11.73	4.5484957
Friant	167 47 03.53	347 45 54.63	4.1692339

NO. 13, YUMA COUNTY.

About 2½ miles north 63° east from Ehrenberg post-office on top of a flat sand mesa, about one-half mile from Colorado River and about the same distance from the wagon road from Ehrenberg to Parkers Station, overlooks the river. Take the Parker wagon road from Ehrenberg and follow it 2 miles, then turn at right angles and go about one-half mile, and station will be found on the point of sand mesa where it breaks off to the river bottom.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground level with surface.

[Latitude 33° 36' 58.40". Longitude 114° 29' 53.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marie	152 03 10.83	331 59 17.87	4.36247
Tyson	204 30 15.73	24 33 33.04	4.34345
Blythe	-----	-----	4.23459
Ehrenberg	-----	-----	3.21279

NO. 14, YUMA COUNTY.

(Not occupied.)

On the edge of a white bluff, close to the Colorado River, about 5 miles below Ehrenberg, being the first place below Ehrenberg where the river washes the bluff.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground level with surface.

[Latitude $33^{\circ} 32' 22.76''$. Longitude $114^{\circ} 32' 03.56''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Blythe	124 35 06.88	304 30 10.88	4.22410
Ehrenberg	210 06 45.51	30 08 13.06	3.91042
Hodges .....	.....	.....	4.30722

NO. 15, YUMA COUNTY.

(Not occupied.)

On the edge of a white bluff, about 15 miles below Ehrenberg, and is the second bluff which comes close to water of Colorado River below Ehrenberg. The river strikes this bluff about 1 mile above station and keeps close to bluff, with here and there a narrow strip of bottom between bluff and water, until at the point station is on bluff recedes from the river and river bottom begins to widen. There is about 60 or 70 yards of bottom between river and bluff, which signal is on. The road from Ehrenberg down the river passes about 2 miles east of station.

Station mark: A bronze triangulation cemented in rock and placed in ground level with surface under center of signal.

[Latitude $33^{\circ} 28' 44.37''$. Longitude $114^{\circ} 36' 01.27''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hodges	94 31 26.51	274 26 41.34	4.12665
Mulewash	317 28 58.40	137 30 09.72	2.69402
Ehrenberg .....	.....	.....	4.23409
Blythe .....	.....	.....	4.25407

NO. 16, YUMA COUNTY.

(Not occupied.)

On point of bluff where mesa breaks off to the Colorado River, about 20 miles below Ehrenberg, and is 300 yards from water's edge. The road from Ehrenberg to Picacho, on the Arizona side of river, passes between the river and station and is about 200 yards distant at the nearest point. The bluff on which station is located overlooks a big wash and forms the south bank of it. This is the same wash which passes on the south side of Mulewash station and is the first big wash the road crosses below Mulewash.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground level with surface.

[Latitude 33° 25' 51.55". Longitude 114° 37' 28.36".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hodges	119 53 14.53	299 49 17.55	4.10715
Mulewash	253 15 27.14	73 17 26.41	3.76625
Fort Gass			4.25812
Chocolate			4.25022
No. 17			4.10664
No. 18			4.13086

NO. 24, YUMA COUNTY.

(Not occupied.)

On a small peak about 1 mile south of Castle Dome Landing and three-fourths of a mile east of the river.

Station mark: A bronze triangulation tablet cemented in solid rock, above which is built a cairn 6 feet high.

[Latitude 32° 56' 26.34". Longitude 114° 27' 45.98".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugarloaf	7 20 25.05	187 19 40.57	4.22250
Ridge	62 25 43.23	242 22 26.50	4.02587
American			4.45700

RHO, YUMA COUNTY.

On the highest point of a small 'peak' in a low range of hills just east of the Colorado River and north of the choke in the valley above Yuma. It is about 16 miles from Yuma and the wagon road from Yuma to Ehrenberg runs within a mile of it (to the west).

Station mark: A large stone was set into the ground and marked with a triangle and drill hole. Over this was built a cairn 6 feet high.

[Latitude 32° 51' 56.90". Longitude 114° 25' 14.12".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sugarloaf	36 23 59.99	216 21 53.23	4.01086
Ridge	104 15 05.24	284 10 26.27	4.13925
Yuma Azimuth			4.40176

SUGARLOAF, YUMA COUNTY.

On a prominent rocky peak between the Colorado and Gila rivers about 14 miles northeast of Yuma. The wagon road from Yuma to Ehrenberg runs within a mile of it. It has a hard capping overlying softer rock, hence its upper hundred feet approaches the perpendicular, particularly on the river side. It is shaped like the sole of a boot and on some maps is called Boot Peak, but the older and more common name seems to be Laguna which it gets from a good-sized laguna lying just north of it. There is just barely room to set up a tripod on its top.

Station mark: A copper bolt set in the solid rock and stamped U. S. Δ G. S. Over this was built a cairn 3 feet high.

[Latitude $32^{\circ} 47' 28.93''$. Longitude $114^{\circ} 29' 07.93''$.]

To station—	Azimuth. °	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yuma Azimuth	54 32 59.44	234 28 40.95	4.1839943
Pilot	75 01 33.12	254 53 04.41	4.4037670
American	106 22 49.75	286 14 08.73	4.4157937
Ridge	147 59 01.62	327 56 29.74	4.1376339

TYSON, YUMA COUNTY.

On a rocky peak, one of a range of low mountains which extend out into the Colorado River Valley or bottom land. It can be reached with horses from Riverside Landing by a trail, which goes around the thick growth of brush close to river, to a Mexican ranch. Signal bears south 25° east from Riverside Landing and south 76° east from triangulation station No. 11.

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

[Latitude $33^{\circ} 47' 49.54''$. Longitude $114^{\circ} 23' 58.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ehrenberg	21 23 21.13	201 20 19.79	4.3636828
Blythe	54 07 34.87	233 58 08.62	4.5112583
Marie	90 52 43.41	270 45 32.12	4.2998503
Riverside (2)	157 34 32.78	337 30 35.21	4.4568470
Agency	202 26 49.04	22 29 38.48	4.3103898

YUMA AZIMUTH, YUMA COUNTY.

Established by the United States and Mexican Boundary Survey on the highest point of a granite butte one-fourth mile south of Southern Pacific Railway yards at Yuma.

Station mark: A brick pier 15 inches square set in a foundation of concrete and extending 36 inches above ground, having an iron bolt set in center of top.

[Latitude $32^{\circ} 42' 41.07''$; $32^{\circ} 42' 39.54''$.^a Longitude $114^{\circ} 37' 05.72''$; $114^{\circ} 37' 07.44''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Pilot	100 48 27.64	280 44 17.76	4.0882718
American	142 10 39.78	322 06 18.04	4.3116694
Ridge	194 04 11.71	14 05 58.85	4.3251262
Sugarloaf	234 28 40.95	54 32 59.44	4.1839943

^aPosition on Yuma data of the United States and Mexican Boundary Survey Commission.

California.

NO. 7, COLORADO RIVER INDIAN RESERVATION.

(Not occupied.)

On a white bluff where the bluff comes close to the river the first time, about 3 miles by the river below Parker.

Station mark: A bronze triangulation tablet cemented in a rock and placed in ground level with surface.

[Latitude $34^{\circ} 07' 24.09''$. Longitude $114^{\circ} 22' 08.74''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gier	240 00 55.75	60 08 47.49	4.39465
Black	269 27 30.87	89 32 50.22	4.16400
No. 6			4.06416
Low Mesa			3.88115
Agency			4.25547
Axtel			4.33319

NO. 8, COLORADO RIVER INDIAN RESERVATION.

(Not occupied.)

On a white bluff where the bluff comes close to the river the third time below Parker. Up the river from here about 2 miles the river divides, forming a long island. Station is at the lower end of this island, very little below where the two channels of the river join.

Station mark: A bronze triangulation tablet cemented in rock placed in ground level with surface.

[Latitude $34^{\circ} 04' 08.03''$. Longitude $114^{\circ} 26' 19.76''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Low Mesa.....	185 02 07.24	5 02 29.18	4.05739
Black	253 35 15.97	73 42 55.81	4.34071
Agency			4.20529
Riverside			3.96312

BLYTHE, RIVERSIDE COUNTY.

About 10 miles west of Ehrenberg post-office, on top of a flat sand mesa on a point as high as any about a mile from where the sand hills join the Colorado River bottom. To reach it from Ehrenberg take the road to Blythe's ranch until roads fork, then take left-hand road a short distance, then leave the road and go straight toward a flat-top peak, which shows to be toward the south end of the McCoy Mountains. Keep this direction until the valley is crossed and a flat sand mesa is reached. Signal is on this mesa and will show for several miles in any direction.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground.

[Latitude $33^{\circ} 37' 31.10''$. Longitude $114^{\circ} 40' 58.68''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hodges.....	20 28 13.68	200 26 12.35	4.2095854
Marie	198 02 39.26	18 04 55.21	4.3083779
Tyson.....	233 58 08.62	54 07 34.87	4.5112583
Ehrenberg	277 47 24.38	97 53 48.26	4.2563456
Mulewash.....	330 58 34.62	151 02 30.38	4.3563840

HODGES, RIVERSIDE COUNTY.

On the edge of bluff of sand mesa where mesa breaks off to the Colorado River bottom, which is wide at this point, and station is at least 6 miles from the river at the nearest point. Hodges mines bear north 62° west and are about 5 miles distant. A windmill in river flat and distant about 4 miles bears south 76° west.

Station mark: A bronze triangulation tablet placed in ground under center of signal.

[Latitude 33° 29' 18.34". Longitude 114° 44' 38.17".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fort Gass	9 50 36.16	189 49 30.93	4.2534061
Blythe	200 26 12.35	20 28 13.68	4.2095854
Ehrenberg	241 33 37.38	61 42 01.87	4.4276039
Mulewash	285 39 03.74	105 45 00.12	4.2389082
Chocolate	323 59 29.27	144 05 27.78	4.4575619

MARIE, RIVERSIDE COUNTY.

On a high rocky peak of what is known as the "Marie Range" of mountains. It is not on the highest summit, but on a sharp, prominent peak overlooking the Colorado River Valley. Riverside Landing bears N. 27° E. from Marie and is about 15 miles off.

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

[Latitude 33° 47' 58.79". Longitude 114° 36' 53.73".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Blythe	18 04 55.21	198 02 39.26	4.3083779
Riverside	198 54 24.01	18 57 39.06	4.4420501
Agency	236 04 12.65	56 14 14.33	4.5236625
Tyson	270 45 32.12	90 52 43.41	4.2998503
Ehrenberg	332 03 06.48	152 07 15.33	4.3921984

MULE WASH, YUMA COUNTY, ARIZ.

On top of flat gravel mesa, on south side of mule wash and about 4 miles from where sand wash joins the river. There is another big wash a little to south of station, which runs into river by station 16. Either of these washes lead close by station, but the upper one, or mule wash, is the smoothest. The road from Ehrenberg to Picacho, on the Arizona side of the Colorado River, passes within 2 miles of station. Where this road crosses mule wash, leave it and go up the wash about 2 miles to where wash forks—the right hand passes very close to station, but the left is probably the smoothest, and the divide between them is good traveling.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground, with top about 3 inches above surface, under center of signal.

[Latitude 33° 26' 46.08". Longitude 114° 33' 51.92".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fort Gass	56 47 15.95	236 40 15.12	4.3736406
Hodges	105 45 00.12	285 39 03.74	4.2389082
Blythe	151 02 30.38	330 58 34.62	4.3563840
Ehrenberg	201 32 51.10	21 35 18.38	4.2723120
Chocolate	359 34 36.08	179 34 38.99	4.2677230

NO. 9, RIVERSIDE COUNTY.

On a sand hill close to water's edge of Colorado River and about one-half mile up the river from Riverside Landing, a camp and subpost-office for the mines in the Riverside Mountains. A road runs close by station going from Riverside Landing up the river, a little below the south line of the Colorado River Indian Reservation.

Station mark: A bronze triangulation tablet cemented in a rock placed in ground level with surface.

[Latitude 33° 59' 02.34". Longitude 114° 29' 52.52".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Agency	276 10 58.13	96 17 05.86	4.23025
Tyson	336 16 29.08	156 19 46.52	4.35484
Riverside			3.55098
Marie			4.36422

NO. 10, RIVERSIDE COUNTY.

On the point of a black rocky ridge which comes close to the Colorado River, about 5 miles below Riverside Landing. This is the first ridge of the kind after leaving that place. Station is very low down on the point of ridge closest to river and is about one-half mile from water's edge. There are at least two other small rock cairns on different parts of the ridge, but No. 10 is much lower down than they are. Station is in sight of the river for a considerable distance up and down and can be reached by a trail from Riverside Landing.

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

[Latitude 33° 54' 51.11". Longitude 114° 32' 20.18".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
No. 9	206 05 04.16	26 06 26.63	3.93552
Agency	254 01 52.15	74 09 21.99	4.33273
Riverside			4.05230

NO. 11, RIVERSIDE COUNTY.

On edge of a low mesa, where it breaks off into the Colorado River bottom, about one-half mile from the water's edge at the nearest point, about 15 miles by the river from Riverside Landing and 20 miles above Ehrenberg. About 400 yards up the river from station the lower end of a big slough joins the river on the Arizona side.

Station mark: A bronze triangulation tablet cemented in rock placed in ground level with surface.

[Latitude $33^{\circ} 49' 21.70''$. Longitude $114^{\circ} 32' 10.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Agency	231 50 30.41	51 57 54.57	4.41506
Tyson	282 35 38.28	102 40 12.37	4.11340
Riverside			4.32796
No. 10			4.00655
Marie			3.88686
No. 12			3.91457

NO. 12, RIVERSIDE COUNTY.

(Not occupied.)

On summit of a low rocky hill which comes close to the Colorado River, about 10 miles from Ehrenberg. There is a house close under this hill in the river bottom. Station is on point of the second rocky ridge which comes close to river below Riverside Landing and the first one above Ehrenberg and is about one-half mile from water's edge.

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

[Latitude $33^{\circ} 44' 58.34''$. Longitude $114^{\circ} 31' 21.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marie	123 02 55.64	302 59 50.83	4.00867
Tyson	245 07 42.08	65 11 48.28	4.09889
No. 11			3.91457
Ehrenberg			4.21787

RIVERSIDE, RIVERSIDE COUNTY.

On a prominent peak of the Riverside Mountain range overlooking the Colorado River, though it is not the highest peak of the range, Riverside (2) triangulation station being on the highest peak, which lies north 15° west from here. The southwest corner of the Colorado River

Indian Reservation is close to station, which is about 4 miles north-northwest of Riverside Landing, or, as it is sometimes called, Walter's Camp. To go to station, camp at Riverside Landing and take road leading up the river to forks of road about 200 yards from the house, in a wash. Take left-hand road and follow it out until it becomes a trail, keep this trail about a mile and a half, where it stops at a prospect hole. From here keep up the ridge to the highest peak of this part of the range. Signal is not on quite the highest point, but is on a summit a hundred yards northeast of it.

Station mark: A bronze triangulation tablet set in a rock and placed under center of a cairn 9 feet high.

[Latitude $34^{\circ} 00' 48.72''$. Longitude $114^{\circ} 30' 46.28''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Low Mesa	204 04 59.08	24 07 50.39	4.28290
Black	246 05 09.07	66 15 17.89	4.48380
No. 8			3.96312
Agency			4.27814
No. 9			3.55098

RIVERSIDE (2), RIVERSIDE COUNTY.

On the highest point of the Riverside Mountain range, close to the southwest corner of the Colorado River Indian Reservation, about 4 miles from the Colorado River at the nearest point.

Station mark: An aluminum bolt, marked U. S. G. S. Δ , set in a rock and placed in ground level with surface under center of a cairn 6 feet high.

[Latitude $34^{\circ} 02' 08.35''$. Longitude $114^{\circ} 31' 04.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Marie	18 57 39.06	198 54 24.01	4.4420501
Low Mesa	208 49 12.80	28 52 14.59	4.2352388
Gier	237 47 31.02	58 00 22.69	4.6190262
Black	250 43 45.40	70 54 04.79	4.4769682
Agency	291 58 14.74	112 05 02.80	4.3053637
Tyson	337 30 35.21	157 34 32.78	4.4568470

AXTEL, SAN BERNARDINO COUNTY.

About 14 miles north 26° west from Parker Indian Agency and is on the highest point of the highest range in that part of the country.

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

[Latitude $34^{\circ} 18' 51.93''$. Longitude $114^{\circ} 24' 38.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Low Mesa	5 44 48.78	185 44 13.70	4.2026604
Rocky	158 10 02.78	338 06 11.23	4.4483279
Red	207 42 53.95	27 47 36.52	4.4378911
Friant	255 43 21.63	75 51 30.71	4.3590878
Gier	289 08 06.78	109 17 23.90	4.4281081
Black	318 48 36.74	138 55 20.98	4.4467056

HILL, SAN BERNARDINO COUNTY.

A United States Coast and Geodetic Survey triangulation station 6 miles northwest of town of Needles and 2 miles west from the river, 2 miles northwest of ranch of Mr. Dinsmore on the highest of the hill just before going down into the first great wash after leaving the Dinsmore ranch.

Station mark: A bottle buried $2\frac{1}{2}$ feet below the surface of ground, above which was placed a redwood stake 24 by 4 by 4 inches.

[Latitude $34^{\circ} 54' 11.20''$. Longitude $114^{\circ} 40' 16.06''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Peak	170 20 03.6	350 19 19.4	4.0663630
Cone	248 59 57.08	69 08 44.90	4.3985648
Sphinx	292 34 00.88	112 47 11.50	4.5810662
Knoll	331 45 56.68	151 47 26.69	3.9272155

KNOLL, SAN BERNARDINO COUNTY.

A United States Coast and Geodetic Survey triangulation station about $1\frac{1}{2}$ miles due west from the schoolhouse at the Needles, on a sharp, rounded peak or sand hill well covered with rocks.

Station mark: A bottle buried $2\frac{1}{2}$ feet below surface of ground, above which was placed a large irregular mass of rocks, its top being 2 inches above surface of ground.

[Latitude $34^{\circ} 50' 09.38''$. Longitude $114^{\circ} 37' 38.60''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hill	151 47 26.69	331 45 56.68	3.9272155
Peak	162 33 45.08	342 31 30.78	4.2977878
Cone	229 44 04.98	49 51 22.25	4.4047806
Sphinx	282 58 45.57	103 10 25.65	4.5052585
Powell	308 57 54.01	129 06 00.24	4.4459924
Whale	335 36 57.55	155 39 49.61	4.2696918

LOW MESA, SAN BERNARDINO COUNTY.

This station is not on any prominent point and is difficult to describe. The country for miles around it is much alike. The best way to reach it is to take the road from Parker to Needles and follow it until the 6-mile post is passed. About 200 yards beyond the 6-mile post the road goes over a high narrow backbone of mesa and down into a low wide stretch of wash country. From the road at this high place signal is in sight about 2 miles south, 66° west, on a white mesa ridge, with a long black hill in the distance for a background. Get the direction from this place, then follow the road a little farther, then leave it to the right and go straight across low flats and washes until the main wash is crossed close under station.

Station mark: A bronze triangulation tablet set in a rock and placed in the ground level with surface.

[Latitude $34^{\circ} 10' 16.99''$. Longitude $114^{\circ} 25' 40.65''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Riverside (2)	28 52 14.59	208 49 12.80	4.2352388
Axtel	185 44 13.70	5 44 48.78	4.2026604
Gier	255 14 56.23	75 24 47.37	4.4445210
Black	284 30 23.58	104 37 42.07	4.3154911
Agency	335 15 25.58	155 19 12.74	4.3964387

MONUMENT, SAN BERNARDINO COUNTY.

A high sharp rock column, the farthest north corner of the Colorado River Indian Reservation, in sight from anywhere in the Parker country, and is a well-known peak.

Station mark: Summit of sharp peak.

[Latitude $34^{\circ} 16' 51.54''$. Longitude $114^{\circ} 15' 16.47''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Low Mesa	152 46 47.65	232 40 56.58	4.30266
Black	346 56 57.99	166 58 26.25	4.25083
Gier			4.08172
Black			4.25083

NO. 1, SAN BERNARDINO COUNTY.

(Not occupied.)

About 1 mile down the river from Mojave Rock. Going down the Colorado River after passing Mojave Rock the river makes a bend to the right, and runs toward a white honeycombed bluff; station is on the highest part of this bluff.

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

[Latitude $34^{\circ} 35' 40.26''$. Longitude $114^{\circ} 26' 31.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Whale	136 37 57.64	316 34 30.20	4.13128
Powell	207 15 38.39	27 17 24.19	4.01476
Red			4.23192
No. 2			3.90156

NO. 3, SAN BERNARDINO COUNTY.

Station is at the lower end of Chemehuevis Valley, on the highest point of the mesa, where it comes nearly to the water's edge, immediately below where a big wash joins the river from the southwest. The point which signal is on is not quite as high as the rest of the bluff, and it forms a small hill in itself, there being the big wash on the north side and a small wash on the south or southeast side. Station is in a well-known bend of the river where it bends to the south, then east, forming a half circle at the lower end of the valley.

Station mark: A bronze triangulation tablet cemented in rock flush with top of ground and a few rocks piled over it, with a pile of gravel and sand around each of the tripod legs.

[Latitude $34^{\circ} 26' 52.06''$. Longitude $114^{\circ} 22' 58.73''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky	130 58 06.30	310 53 17.96	4.23528
Red	227 09 27.12	47 13 13.79	4.14370
Axtel			4.17642
No. 2			4.01711
No. 4			3.91477

NO. 4, SAN BERNARDINO COUNTY.

(Not occupied.)

About 300 yards from the water edge, on a black rocky hill across the river from what is known as the black mesa range of hills, and is about 2 miles up the river from Grennan's mill. The range which station is on consists of a number of black hills and it is on the lowest one down the river of any consequence. There is a very red bluff across the river and a little below.

Station mark: A bronze triangulation tablet cemented in rock and set in loose rock level with surface of ground.

[Latitude $34^{\circ} 25' 09.73''$. Longitude $114^{\circ} 18' 01.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Rocky	125 04 48.06	304 57 11.53	4.40005
Red	191 46 01.55	11 46 59.88	4.11010
Friant			4.12839
Axtel			4.18857
No. 3			3.91477
No. 2			4.19184

NO. 5, SAN BERNARDINO COUNTY.

On a very rocky peak, the side next the river being a nearly perpendicular rock bluff several hundred feet high. It is about $1\frac{1}{2}$ miles up the river from Mrs. Gier's place and about $2\frac{1}{2}$ miles down from the mouth of the Bill Williams Fork. To reach station take the wash that joins the river just below the peak and follow it for one-half mile, then take a small wash to right for a hundred yards and go up ridge to right of it, which is rather steep for a short distance. Follow this ridge to station.

Station mark: A bronze triangulation tablet cemented in solid sandstone under center of a cairn 7 feet high.

[Latitude $34^{\circ} 16' 28.01''$. Longitude $114^{\circ} 08' 25.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Black	21 22 56.28	201 20 33.45	4.25187
No. 6	47 29 53.48	227 25 43.61	4.18837
Gier			3.64886

NO. 6, SAN BERNARDINO COUNTY.

On a very rough, black little peak on the Colorado River, about one-half mile from the river, and is about three-fourths of a mile N. 30° E. from Headgate Rock, a rock bluff that comes to the water's edge on the Arizona side. Station is about 4 miles up the river from the pump house at Parker and is easily reached from the river.

Station mark: A bronze triangulation tablet set in solid rock, a small pile of rock around each leg of tripod.

[Latitude $34^{\circ} 10' 49.45''$. Longitude $114^{\circ} 15' 49.59''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Gier	242 48 37.37	62 52 56.68	4.12224
Black	321 50 13.12	141 51 59.85	3.89679
No. 5			4.18837
Axtel			4.30322
No. 7			4.06416

PEAK, SAN BERNARDINO COUNTY.

A United States Coast and Geodetic Survey triangulation station on the highest peak of the foot hills, 2 miles due west of Von Schmidt.

Station mark: A shallow hole drilled in top of a large irregular mass of hard rock set in ground.

[Latitude $35^{\circ} 00' 23.91''$. Longitude $114^{\circ} 41' 33.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Cone	275 39 14.25	95 48 47.00	4.4057480
Sphinx	305 05 22.51	125 19 18.28	4.6571412
Knoll	342 31 30.78	162 33 45.08	4.2977878
Hill	350 19 19.40	170 20 03.60	4.0663630

ROCKY, SAN BERNARDINO COUNTY.

A very rocky peak on a high point of the Mojave range of mountains, about 6 miles southwest of Mojave Rock, a well-known rock on the east bank of the Colorado River, a little below where river leaves Needles Canyon. There is another signal of same description 2 miles northeast, on a lower point of same range. To go to Rocky, take a big wash which comes into river above Mojave Rock and follow it to foot of mountain. Good traveling for horses for some distance; no water except after rain. Station can be reached from anywhere along the river.

Station mark: A bronze triangulation tablet cemented under center of monument 9 feet high.

[Latitude $34^{\circ} 32' 57.54''$. Longitude $114^{\circ} 31' 27.81''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Whale	173 15 06.19	353 14 26.99	4.1745934
Powell	220 48 05.98	40 52 39.83	4.2737480
Red	274 22 04.91	94 30 40.52	4.3665687
Friant	302 00 22.25	122 12 24.49	4.5850746
Gier	314 11 41.88	134 24 51.99	4.6983570
Axtel	338 06 11.23	158 10 02.78	4.4483279

WHALE, SAN BERNARDINO COUNTY.

On the highest point of a high, rocky range of mountains overlooking the Colorado River Valley, and can be seen from the river from Mellen up to Needles and beyond. It is about 6 miles south 65° east from Mellen station. To go there from Mellen, cross railway bridge and take up first big wash which crosses railway track. Stay in wash until a straight up-and-down bluff, 7 or 8 feet high, is passed. Go about one-half mile beyond here, then go up a spur to right, crossing no canyons until station is reached. Horses can not be taken this way.

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

[Latitude $34^{\circ} 40' 59.29''$. Longitude $114^{\circ} 32' 36.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Knoll	155 39 49.61	335 36 57.55	4.2696918
Cone	199 22 08.57	19 26 32.62	4.5484345
Sphinx	247 30 11.86	67 38 58.68	4.4057412
Powell	272 32 53.53	92 38 07.11	4.1474805
Red	303 39 18.51	123 48 34.19	4.4767442
Rocky	353 14 26.99	173 15 06.19	4.1745934

AMERICAN, SAN DIEGO COUNTY.

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

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

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

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quartz	165 40 41.19	345 38 23.65	4.4231629
Clip	209 57 00.53	30 02 27.81	4.4945347
Ridge	256 13 38.72	76 19 48.46	4.2607025
Sugarloaf	286 14 08.73	106 22 49.75	4.4157937
Yuma Azimuth	322 06 18.04	142 10 39.78	4.3116694
Pilot	357 44 03.76	177 44 15.19	4.1430949

DELTA, SAN DIEGO COUNTY.

On a small bump near the east end of the black ridge bounding the Yuma Valley on the north, on the west or California side of the Colorado River. Reached from Fort Yuma, Cal., by wagon road to foot of ridge. Follow the Potholes road for 10 miles, more or less, then turn off across desert for one-half mile to foot of ridge. There is a 500-foot climb from where wagon is left to the station.

Station mark: A large bowlder marked with drill holes, triangles,

and letters, thus: $\begin{array}{c} U \\ \Delta \\ G \end{array} \begin{array}{c} S \\ \\ S \end{array}$. Over the mark is built a cairn 6 feet high.

[Latitude $32^{\circ} 50' 34.39''$. Longitude $114^{\circ} 31' 26.90''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
American	94 20 47.57	274 13 21.57	4.33122
Ridge	148 15 11.28	328 13 54.72	3.84313
Azimuth	-----	-----	4.23145
Sugarloaf	-----	-----	3.82999

FORT GASS, SAN DIEGO COUNTY.

On the summit of a very prominent rocky peak, about $3\frac{1}{2}$ miles from the Colorado River at the nearest point, and the same distance from the wagon road from Ehrenberg to Picacho, on the California side of river. Station is about 30 miles up the river from Picacho,

and is west of the upper end of Apache Island. This is the most prominent peak in this part of the country, and is known by some as "Fort Gass" and others as "Milpitas."

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

[Latitude $33^{\circ} 19' 45.13''$. Longitude $114^{\circ} 46' 36.64''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Quartz	9 07 38.33	189 06 07.87	4.4314275
Hodges	189 49 30.93	9 50 36.16	4.2534061
Mulewash	236 40 15.12	56 47 15.95	4.3736406
Chocolate	285 31 16.39	105 38 19.19	4.3155582
Clip	324 44 57.89	144 51 15.20	4.4905956
Lava	351 45 55.50	171 47 04.97	4.3607200

HEDGES, SAN DIEGO COUNTY.

(Not occupied.)

On the highest point of a range of white mountains, about 15 miles northwest of Yuma, about 3 miles northeast of Hedges mine, and 3 miles a little west of north of American gold mine. A good road from Yuma to Hedges, and from latter place the station can be seen.

Station mark: An aluminum bolt cemented in rock under center of a cairn 8 feet high.

[Latitude $32^{\circ} 53' 32.32''$. Longitude $114^{\circ} 47' 53.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ridge	268 46 44.59	88 54 23.69	4.34195
American	312 14 49.78	132 16 18.93	3.76109
Clip			4.48460
Quartz			4.34067
Lava			4.41960
Pilot			4.26514
Azimuth			4.41828

LAVA, SAN DIEGO COUNTY.

On a high rocky peak about 4 miles from the Colorado River at the nearest point, and is south 59° west from Draper's Ranch, and can be seen from his house or the rock close by it. Take road from Picacho or Ehrenberg on California side of river which goes by Drapers. Go up first big wash below Draper's and follow it to base of peak, then

go up the way which looks best. A very rough country around this station, and animals can only go a short distance. Plenty of water after rain—for months—in big wash east of station.

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

[Latitude $33^{\circ} 07' 27.94''$. Longitude $114^{\circ} 44' 29.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Quartz	62 27 09.90	242 24 30.43	3.9314387
Fort Gass	171 47 04.97	351 45 55.50	4.3607200
Chocolate	224 06 37.64	44 12 29.87	4.3786581
Clip	279 59 10.13	100 04 17.14	4.1701718

NO. 17, SAN DIEGO COUNTY.

(Not occupied.)

On edge of second bench of low mesa about 1 mile from Colorado River, and is about $1\frac{1}{2}$ miles above upper end of slough which forms Apache Island, on the Arizona side of the river. Can best be reached by getting directions from No. 18 or Fort Gass. Station is close to river bottom and is $2\frac{1}{2}$ miles north 25° west from No. 18, and $3\frac{1}{2}$ miles north 78° east from Fort Gass. The wagon road from Ehrenberg to Picacho passes close on the east side of station.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground level with surface. A pit opposite each leg of tripod and a mound around each leg.

[Latitude $33^{\circ} 22' 01.64''$. Longitude $114^{\circ} 44' 20.16''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Fort Gass	30 00 36.78	219 59 21.76	3.73956
Chocolate	300 43 48.21	120 49 36.24	4.28041
Mulewash			4.26595
Hodges			4.12910
No. 16			4.10664
No. 18			3.55739

NO. 18, SAN DIEGO COUNTY.

On a little rocky peak about 400 yards from the Colorado River, at the lower end of a small slough. The wagon road from Ehrenberg to Picacho passes on the west side of the peak about 300 yards, the peak being between the road and the river. The bluff is very close to

water's edge at this point of the river. Station is about 35 miles by the river below Ehrenberg and 30 miles up the river from Picacho.

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

[Latitude $33^{\circ} 20' 19.96''$. Longitude $114^{\circ} 43' 10.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fort Gass	78 36 56.80	258 35 03.20	3.73479
Chocolate	294 22 48.62	114 27 58.44	4.20491
Mulewash			4.27211
Hodges			4.22373
No. 17			3.55739
No. 16			4.13086
No. 19			3.98436

NO. 19, SAN DIEGO COUNTY.

(Not occupied.)

On the edge of mesa where it bluffs to the Colorado River bottom, and is about one-half mile from the river at the nearest point. At the lower end of Apache Island the river makes a horseshoe bend to the east-northeast; about the middle of this bend the slough forming this island rejoins the river. No. 19 is about the middle of the heel of this horseshoe.

Station mark: A bronze triangulation tablet cemented in rock and placed in ground level with surface.

[Latitude $33^{\circ} 15' 13.52''$. Longitude $114^{\circ} 41' 54.39''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fort Gass	138 54 31.93	318 51 57.01	4.04557
Chocolate	257 23 58.78	77 28 26.34	4.11172
Lava			4.17314
No. 18			3.98436
Quartz			4.33563

NO. 20, SAN DIEGO COUNTY.

(Not occupied.)

On summit of a sharp rocky peak about a mile from the Colorado River and about the same distance from Draper's ranch at Light-house Rock, and bears north 39° west from Mr. Draper's, about 18 miles up the river from Picacho.

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

[Latitude $33^{\circ} 10' 00.66''$. Longitude $114^{\circ} 41' 41.91''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lava	42 47 18.43	222 45 46.60	3.80682
Fort Gass	157 03 32.98	337 00 51.39	4.29127
Chocolate			4.24321
Clip			4.09842

NO. 21, SAN DIEGO COUNTY.

(Not occupied.)

On a rocky hill, the highest point of a group of hills lying close to the Colorado River and about 10 miles by river or wagon road, up the river from Picacho. The road passes on the south side of the station and the river on the north side. Station is about one-half mile from the river and one-fourth mile from the road.

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

[Latitude $33^{\circ} 04' 31.87''$. Longitude $114^{\circ} 41' 35.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
American	12 54 33.43	192 52 37.38	4.39485
Clip	254 10 07.37	74 13 39.17	4.01938
Lava			3.84857

NO. 22, SAN DIEGO COUNTY.

(Not occupied.)

On summit of first peak south of Picacho and is in plain view and is about three-fourths mile distant from town. There is a small rock cairn on highest point which is a mining location corner. Signal is close by and is a little lower but not enough to prevent a good view in every direction.

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

[Latitude $33^{\circ} 00' 59.63''$. Longitude $114^{\circ} 36' 21.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
American	37 52 01.06	217 47 14.08	4.34942
Ridge	343 21 50.04	163 23 13.44	4.14358
Quartz			4.33800
Lava			4.24125
Clip			3.98123

NO. 23, SAN DIEGO COUNTY.

(Not occupied.)

On a very prominent sharp peak, about 4 miles southeast of Picacho, and visible from that place. A wood road leads to foot of peak from Picacho. Peak is hard to climb, but can be occupied.

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

[Latitude $32^{\circ} 59' 48.33''$. Longitude $114^{\circ} 33' 07.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Ridge	5 20 48.71	185 20 26.89	4.04876
American	50 31 31.41	230 24 59.36	4.38550
Clip			4.07897
Lava			4.35529
Quartz			4.43544

PICACHO, SAN DIEGO COUNTY.

(Not occupied.)

A well-known sharp peak, about 6 miles southwest of Picacho town.

Station mark: Center of highest monument.

[Latitude $32^{\circ} 58' 18.94''$. Longitude $114^{\circ} 39' 50.18''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
American	33 07 52.61	213 04 59.31	4.18105
Ridge	311 40 45.02	131 44 01.94	4.10051
Clip			4.20680
Quartz			4.29443

PILOT, SAN DIEGO COUNTY.

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

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

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

[Latitude $32^{\circ} 43' 55.42''$; $32^{\circ} 43' 53.83''$.^a Longitude $114^{\circ} 44' 47.99''$; $114^{\circ} 44' 49.68''$.^a]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
American	177 44 15.19	357 44 03.76	4.1430949
Ridge	223 15 29.56	43 21 27.24	4.3984893
Sugarloaf	254 53 04.41	75 01 33.12	4.4037670
Yuma azimuth	280 44 17.76	100 48 27.64	4.0882718

^a Position on Yuma data of the United States and Mexican Boundary Survey Commission.

QUARTZ, SAN DIEGO COUNTY.

On the highest point of a range of mountains lying between the Southern Pacific Railway and the Colorado River, about 8 miles from the river at Draper's ranch and probably 15 miles from the railway.

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

[Latitude $33^{\circ} 05' 19.64''$. Longitude $114^{\circ} 49' 21.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Fort Gass	189 06 07.87	9 07 38.33	4.4314275
Lava	242 24 30.43	62 27 09.90	3.9314387
Clip	266 22 50.93	86 30 37.22	4.3461066
American	345 38 23.65	165 40 41.19	4.4231629

RIDGE, SAN DIEGO COUNTY.

On summit of a high black ridge lying about 14 miles north, 10° west, of Yuma, Ariz. This ridge is long and wide, being several miles across it either way. Station is on one of the highest points where

ridge breaks off to the north, giving a good view of the lowlands of the Colorado River in the big bend east of Picacho. The best way to go there is from Potholes, 12 miles from Yuma by road.

Station mark: A bronze triangulation tablet cemented in rock in place under a cairn 9 feet high.

[Latitude $32^{\circ} 53' 46.72''$. Longitude $114^{\circ} 33' 47.98''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Yuma azimuth	14 05 58.85	194 04 11.71	4.3251262
Pilot	43 21 27.24	223 15 29.56	4.3984893
American	76 19 48.46	256 13 38.72	4.2607025
Clip	174 47 27.17	354 46 43.66	4.3582402
Sugar Loaf	327 56 29.74	147 59 01.62	4.1376339

Four new stations for the control of the Coalinga Special Map in Fresno County were occupied by Mr. A. H. Sylvester in October, 1902. This work was based upon the positions of Hepsedam and Castle Mount on the standard datum of the United States Coast and Geodetic Survey.

HEPSEDAM, SAN BENITO COUNTY.

A station of the United States Coast and Geodetic Survey on a prominent peak of the Mount Diablo range, in the southern part of the county. It can be reached from Coalinga by road via King City, Marthan Canon, Priest Valley, and down Lewis Creek to Captain Holletts.

Station mark: A hole drilled in outcropping rock and filled with lead.

[Latitude $36^{\circ} 18' 53.60''$. Longitude $120^{\circ} 49' 26.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Oak Flat	299 44 51.81	119 55 16.47	4.4829865
Center Peak	304 30 56.00	124 38 04.00	4.3414790
Castle Mount	313 34 08.71	133 51 16.62	4.7804191

CASTLE MOUNT, MONTEREY-FRESNO COUNTIES.

A station of the United States Coast and Geodetic Survey on a high hogback, locally known as Black Mountain. It can be reached from Coalinga by rough road and trail via Parkfield, Turkey Flat, and Taylor's ranch, where accommodations can be had.

Station mark: A copper bolt in center of top of theodolite pier.

[Latitude 35° 56' 21.84". Longitude 120° 20' 22.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hepsedam	133 51 16.62	313 34 08.71	4.7804191
Center Peak			4.5887373
Oak Flat	147 07 51.82	327 01 07.45	4.5001282
Alcalde	164 49 51.29	344 47 38.90	4.3325900
Oil City	178 11 52.42	358 11 24.69	4.5722254
Black Tank	181 45 18.82	1 45 35.92	4.3727723
Kinney	191 42 50.45	11 45 05.29	4.4500045

OAK FLAT, FRESNO COUNTY.

On the highest point of a range of mountains east of Pleasant Valley and between the Marthan Creek drainage on the south and Los Gatos Creek drainage on the north. It is best reached from Coalinga via Oak Flat. Kinney, the hotel and stable man at Coalinga can give directions. There is an unoccupied house and a spring at Oak Flat. From there a horse can be ridden to the station, about 2 miles distant, though there is no trail. It is better to keep up the Oak Flat canyon for half a mile above the flat and take up a ridge between two forks of the canyon.

Station mark: A bowlder was planted firmly in the earth and marked with a drill hole and triangle and the letters U. S. G. S.

[Latitude 36° 10' 42.80". Longitude 120° 31' 49.89".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Hepsedam	119 55 16.47	299 44 51.81	4.4829865
Oil City	235 57 38.45	56 03 56.64	4.2849789
Kinney	267 18 42.12	87 27 42.88	4.3600623
Black Tank	279 22 04.45	90 29 06.89	4.2585579
Alcalde	296 36 42.27	116 41 14.75	4.1112119
Castle Mount	327 01 07.45	147 07 51.82	4.5001282

OIL CITY, FRESNO COUNTY.

This station is on a round topped hill about 0.5 mile northeast of Oil City. When going to it from Coalinga take road to Oil City, but turn to right up another when in sight but before passing a large black iron tank. Follow this road and it will lead to within 200 yards of signal. A team can be driven to signal, though it is rather steep.

Station mark: A boulder set solidly into the earth and marked with a drill hole and triangle and the letters U S G S.

U S
△
G S

[Latitude 36° 16' 32.37". Longitude 120° 21' 09.97".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Alcalde	15 03 48.84	195 00 51.45	4.2344037
Oakflat	56 03 56.64	235 57 38.45	4.2849789
Kinney	324 39 52.94	144 42 31.98	4.0764584
Castle Mount	358 11 24.69	178 11 52.42	4.5722254

KINNEY, FRESNO COUNTY.

On the highest part of the south end of the low ridge bounding Pleasant Valley on the east. It is about 5 miles northeast of Coalinga, and the signal can be seen from town. A team can be driven directly to the station.

Station mark: A large stone was set solidly into the earth and marked with a drill hole and triangle and the letters U S G S.

[Latitude 36° 11' 16.68". Longitude 120° 16' 33.91".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Castle Mount	11 45 05.29	191 42 50.45	4.4500045
Black Tank	51 15 35.29	231 14 04.09	3.8070674
Alcalde	58 58 05.85	238 53 37.93	4.1222781
Oakflat	87 27 42.88	267 18 42.12	4.3600623
Oil City	144 42 31.98	324 39 52.94	4.0764584

ALCALDE, FRESNO COUNTY.

On the highest point of the first ridge west of Pleasant Valley, about 3 miles from town of Coalinga. A team can be driven within 100 yards of top.

Station mark: The regulation 4-brace center mast sawed timber signal, 10 feet high. The mast is set into the ground 3 feet.

[Latitude 36° 07' 34.80". Longitude 120° 24' 07.99".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Oakflat	116 41 14.75	296 36 42.27	4.1112119
Oil City	195 00 51.45	15 02 48.84	4.2344037
Kinney	238 53 37.93	58 58 05.85	4.1222781
Black Tank	246 00 04.45	66 02 34.59	3.8419342
Castle Mount	344 47 38.90	164 49 51.29	4.3325900

BLACK TANK, FRESNO COUNTY.

(Not occupied.)

The third tank, counting from the east, standing by the railroad, east of Coalinga.

Station mark: Center of tank.

[Latitude 36° 09' 06.43". Longitude 120° 19' 54.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Castle Mount	1 45 35.92	181 45 18.82	4.3727723
Alcalde	66 02 34.59	246 00 04.45	3.8419342
Oakflat	99 29 06.89	279 22 04.45	4.2585579
Kinney	231 14 04.09	51 15 35.29	3.8070674

Additional control in the vicinity of Redding was obtained by Mr. Geo. T. Hawkins, topographer, who located three new secondary stations from Bass and Redding court-house, previously located by the 3-point method from mounts Lassen, Linn, and Shasta.

SOUTH FORK, SHASTA COUNTY.

On South Fork Mountain, three-fourths mile nearly south of the Mountain copper mine, on southern of double-topped mountains. Scattering trees on summit.

Station mark: The tall pine signal tree 36 inches in diameter, marked U S at base.

[Latitude 40° 39' 10.0". Longitude 122° 31' 31.2".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Shirt	164 46 17.00	344 45 11.00	3.95903
Sugar loaf	196 53 21.00	16 53 53.00	3.59760
Bass	236 45 09.00	56 51 19.00	4.20237
Redding	306 12 40.00	126 17 41.00	4.12993

SUGAR LOAF, SHASTA COUNTY.

About 2 miles northeast of the Mountain Copper Mine on a sharp peak locally known as Sugar Loaf. Most of timber cleared from top.

Station mark: The pine signal tree trimmed up with tuft left at top, 18 inches in diameter and marked "U. S." at base.

[Latitude $40^{\circ} 41' 12.8''$. Longitude $122^{\circ} 30' 42.2''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bass	247 53 42	67 59 20	4.11873
Redding	320 23 24	140 27 53	4.18361
South Fork	16 53 53	196 53 21	3.59760
Shirt	144 40 09	324 38 31	3.78661

SHIRT, SHASTA COUNTY.

On the western of two bald knobs, about 6 miles north and 1 mile west of the Mountain Copper Mine and 1 mile northeast of the Gladstone Mine.

Station mark: A cairn 6 feet high and 4 feet diameter at base, erected over a + and "U. S." cut in solid rock.

[Latitude $40^{\circ} 43' 54.5''$. Longitude $122^{\circ} 33' 12.9''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bass	270 07 32	90 14 49	4.19631
Sugarloaf	324 38 31	144 40 09	3.78661
South	344 45 11	164 46 17	3.95903

OREGON.

TRIANGULATION STATIONS.

Triangulation in northeastern Oregon was extended from stations in the expansion of the Baker City base so as to control 3 thirty-minute quadrangles. Fourteen stations were occupied by Mr. C. F. Urquhart, topographer.

IMNAHA, BAKER COUNTY.

On the highest summit in southeast corner of Eagle Mountains, about 2 miles east from corner of Baker, Union, and Wallowa counties, probably in Baker County, and is sometimes known as Red Mount. The Imnaha River (Kettle Creek) heads at its base and flows eastnortheast. Little Eagle Creek flows southwest and Pine Creek

flows southeast. The Joseph and Cornucopia trail passing about 3 miles east from station at a point 7 or 8 miles from latter. The best route to mountain is by trail up Kettle Creek from the north side. Camp at head of Kettle Creek; station will be in sight. From the south this point can be reached from the Union and Cornucopia road by leaving road at a point 4 miles east from the Eagle Creek bridge, thence north by road to Reid's mine, thence by trail to head of Kettle Creek.

Station mark: A bronze triangulation tablet set in loose rock, with a cairn 6 feet at base, $7\frac{1}{2}$ feet high, built over it.

[Latitude $45^{\circ} 03' 54.09''$. Longitude $117^{\circ} 14' 50.49''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lookout.....	2 53 26.56	182 52 04.81	4.7049400
Little Lookout	12 48 44.60	192 43 44.00	4.6263384
Sparta	19 04 42.26	199 01 01.00	4.3225192
Lone Pine.....	48 36 32.34	228 15 38.01	4.7167727
Magpie.....	73 10 53.44	252 47 05.72	4.6650302
China Cap.....	116 08 21.25	295 57 07.51	4.3643332
Fanny	125 35 52.92	305 15 16.81	4.6691541
Hurricane.....	163 49 50.28	343 45 38.80	4.4430293
Aneroid.....	188 16 24.02	8 17 29.55	4.1469960

LITTLE LOOKOUT, BAKER COUNTY.

Station is on highest point of Little Lookout Mountain and near the source of Lawrence Creek on the north and Durkee Creek on the south. There is a road from Baker City to sawmill on Lawrence Creek, thence up creek to Mr. S. W. Dean's residence, thence southwest up ridge, about 2 miles to signal. Can ride on ridge anywhere.

Station mark: A bronze triangulation tablet set in solid rock, with a cairn 6 feet at base and 7 feet high built over it.

[Latitude $44^{\circ} 41' 37.69''$. Longitude $117^{\circ} 21' 56.50''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lone Pine.....	102 49 06.09	282 33 15.62	4.4838587
Magpie.....	128 32 10.63	308 13 27.82	4.6497947
China Cap.....	167 25 46.08	347 19 35.34	4.7216992
Sparta	186 36 52.07	6 38 11.69	4.3331114
Imnaha	192 43 44.00	12 48 44.60	4.6263384
Lookout.....	323 53 01.94	143 56 39.86	4.0644696

LOOKOUT, BAKER COUNTY.

On the summit of Big Lookout Mountain a well-known high point near the head of Manning Creek. There is a wagon road from Durkee or Express to the head of Manning Creek.

Station mark: A cairn 8 or 9 feet at base and 10 feet high.

[Latitude $44^{\circ} 36' 33.99''$. Longitude $117^{\circ} 16' 46.42''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lone Pine	113 52 32.67	293 33 04.86	4.6015032
Magpie	131 44 39.42	311 23 19.04	4.7475534
Little Lookout	143 56 39.86	323 53 01.94	4.0644696
Sparta	171 59 54.71	351 57 36.52	4.4923373
Imnaha	182 52 04.81	2 53 26.56	4.7049400

SPARTA, BAKER COUNTY.

Station is on summit of a bald hill locally known as "Little Baldy," about 1 mile north-northwest from Sparta, a small mining town and post-office 32 miles east-northeast from Baker City. There is also a pole about 30 feet high used for Fourth of July purposes near the summit of hill. This pole was not used for signal, but a cairn about 6 feet high on highest point.

Station mark: A bronze triangulation tablet set in solid rock, over which was built a cairn 6 feet high.

[Latitude $44^{\circ} 53' 10.62''$. Longitude $117^{\circ} 20' 03.48''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Lookout	351 57 36.52	171 59 54.71	4.4923373
Little Lookout	6 38 11.69	186 36 52.07	4.3331114
Lone Pine	65 34 51.51	245 17 39.76	4.5484964
Magpie	99 46 12.88	279 26 08.38	4.5792338
Imnaha	199 01 01.00	19 04 42.26	4.3225192

CHINA CAP, UNION COUNTY.

Station is on the summit of a high, red mountain near the source of Catherine Creek and on the range of mountains between Catherine Creek and Minum River. There is a sharp red peak about 1 mile south from station with a small monument on it. This point is the first red peak, all of the high mountains east-southeast being white granite. To reach station from the south, a steep trail passes to the east and near the base of the peak. At this point the signal can be

plainly seen about 1 mile north. There is a trail (good) from Medicine Springs to the head of Big Creek, thence northwest down steep hill to Catherine Creek, thence northwest over end of ridge to sheep camp, thence up bare ridge to low place in mountains near foot of small peak, from which station can be seen. Head of Big Creek can also be reached via road to Basin mine, which leaves Union and Cornucopia road 4 miles west from Sanger.

Station mark: A bronze triangulation tablet set in solid rock, with a cairn 7 feet at base and 9 feet high built over it.

[Latitude $45^{\circ} 09' 23.20''$. Longitude $117^{\circ} 30' 41.46''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Imnaha	295 57 07.51	116 08 21.25	4.3643332
Little Lookout	347 19 35.34	167 25 46.08	4.7216992
Magpie	44 42 49.38	224 30 13.55	4.5221799
Craig	95 33 54.01	275 16 28.66	4.5096415
Fanny	134 27 58.41	314 18 36.49	4.3830935
Hurricane	218 14 39.52	38 21 42.97	4.3220569
Aneroid	260 37 11.97	80 49 32.02	4.3633677

CRAIG, UNION COUNTY.

On the highest point of Craig Mountain, about 4 miles southwest from Union. The shortest way to reach it is by trail. Cross the railroad and enter pasture at Union station, thence up rather steep hill to summit. It can also be reached by road by leaving Union and Baker City road 5 miles from the former, cross small valley in lane, thence up canyon to summit of ridge. Station will be in view.

Station mark: A bronze triangulation tablet set in loose rock between two large rocks. A cairn 6 feet at base, 7 feet high, built over tablet.

[Latitude $45^{\circ} 11' 02.13''$. Longitude $117^{\circ} 55' 15.44''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Emily	184 10 12.18	4 11 20.18	4.4561684
Fanny	227 00 07.82	47 08 12.49	4.3081147
China Cap	275 16 28.66	95 33 54.01	4.5096415
Magpie	341 35 18.42	161 40 05.82	4.4499851

EMILY, UNION COUNTY.

On highest point of ridge between Indian Creek and the Grande Ronde River. The mountain is called Mount Emily by some people, but others call the highest ridge on the west side of the valley by that name. The best way to reach the station is from Mr. Childers's residence, which is near the summit of ridge. Road comes up the ridge from lower cove. From Mr. Childers travel Indian Creek road 1 mile, then take all left roads until cabin is reached, thence to the right and up ridge to spring, thence up to station, 4 miles from Mr. Childers. There is a bunch of trees northwest from signal higher.

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

[Latitude $45^{\circ} 26' 25.67''$. Longitude $117^{\circ} 53' 39.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Huckleberry	273 02 46.60	93 19 46.43	4.4936632
Hurricane	289 09 20.46	109 32 45.89	4.6584362
Fanny	318 53 35.55	139 00 33.22	4.2888142
Craig	4 11 20.18	184 10 12.18	4.4561684

FANNY, UNION COUNTY.

On highest point on rocky mountain about one-fourth mile east-southeast from Mount Fanny, a well-known mountain about 5 miles east from Cove, Oreg. There is a trail from Mr. Murphy's residence, 2 miles east from Cove, to station.

Station mark: A bronze triangulation tablet set in solid rock, with a cairn 6 feet base and 6 feet high (tree in center) built over it.

[Latitude $45^{\circ} 18' 30.65''$. Longitude $117^{\circ} 43' 52.93''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Craig	47 08 12.49	227 00 07.82	4.3081147
Emily	139 00 33.22	318 53 35.55	4.2888142
Huckleberry	234 47 21.90	54 57 22.96	4.3516867
Hurricane	270 40 17.63	90 56 44.28	4.4805756
Imnaha	305 15 16.81	125 35 52.92	4.6691541
China Cap	314 18 36.49	134 27 58.41	4.3830935
Magpie	8 29 39.82	188 26 23.87	4.6132078

ANEROID, WALLOWA COUNTY.

About 2 miles southwest from Aneroid Lake. Water flows into the Wallowa, East Wallowa, and Imnaha from the point. The Joseph and Cornucopia trail passes about 1 mile east of station at a point 15 or 16 miles from Joseph. To reach station by trail, travel on the Joseph and Cornucopia trail until the summit or divide between East Wallowa and Imnaha is reached, thence west up ridge 1 mile to station. Monument can be seen from trail on summit.

Station mark: A bronze triangulation tablet set in loose rock with a cairn 6 feet at base, 7 feet high, built over it.

[Latitude 45° 11' 23.77". Longitude 117° 13' 18.02".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Imnaha	8 17 29.55	188 16 24.02	4.1469960
China Gap	80 49 32.02	260 37 11.97	4.3633677
Hurricane	142 38 52.91	322 33 35.48	4.2054926

BRUMBACK, WALLOWA COUNTY.

Station is on the highest part of a prominent bald butte about one-half mile east from Mr. E. Brumback's residence, and is in the south-east quarter of section 24, T. 1 N., R. 46 E. The butte is the most northern of two buttes about 3 miles from each other. By wagon road it is 18 miles east-northeast from Enterprise, and about the same distance from Joseph.

Station mark: A bronze triangulation tablet set in solid rock over which is erected a cairn 6½ feet at base and 9½ feet high.

[Latitude 45° 32' 46.78". Longitude 116° 59' 38.72".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Hurricane	45 49 59.04	225 34 57.01	4.5850060
Huckleberry	71 13 18.68	250 51 48.31	4.6185922

HURRICANE, WALLOWA COUNTY.

The highest and most southeastern of two very sharp peaks, sometimes called "The Sisters," on the highest part of ridge between Hurricane Creek and the most eastern fork of the South Fork of the Wallowa River. To reach station, take trail up Hurricane Creek about 3 miles, when the second creek coming into Hurricane from the west is reached, peak can be seen up this stream. From this point to station (about 3 miles) it is too steep and rough to travel with horses.

Station mark: A bronze triangulation tablet set in soft rock on summit of peak.

[Latitude $45^{\circ} 18' 16.83''$. Longitude $117^{\circ} 20' 45.00''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Aneroid	322 33 35.48	142 38 52.91	4.2054926
Imnaha	343 45 38.80	163 49 50.28	4.4430293
China Gap	38 21 42.97	218 14 39.52	4.3220569
Fanny	90 56 44.28	270 40 17.63	4.4805756
Emily	109 32 45.89	289 09 20.46	4.6584362
Huckleberry	138 32 27.20	318 26 00.60	4.2513815
Brumback	225 34 57.01	45 49 59.04	4.5850060

HUCKLEBERRY, WALLOWA COUNTY.

A high bald ridge between the East Fork of Bear Creek and Little Bear Creek, about 1 mile north-northwest from head of Little Bear Creek, and 7 miles by trail south-southwest from Lostine post-office. Follow wagon road about 1 mile to Mr. McCubbin's ranch; thence 1 mile by road to gulch; thence up steep trail to summit of timbered ridge. From summit of this ridge the station can be seen. Follow trail about south, cross Little Bear Creek, thence up steep trail to summit of bald ridge.

Station mark: A bronze triangulation tablet set in loose rock 1 foot below surface, over which is a rock marked $\frac{U}{G} \Delta_S^S$

[Latitude $45^{\circ} 25' 29.53''$. Longitude $117^{\circ} 29' 48.30''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Brumback	250 51 48.31	71 13 18.68	4.6185922
Hurricane	318 26 00.60	138 32 27.20	4.2513815
Fanny	54 57 22.96	234 47 21.90	4.3516867
Emily	93 19 46.43	273 02 46.60	4.4936632

WASHINGTON—IDAHO.

TRIANGULATION STATIONS.

Triangulation for control of 3 thirty-minute quadrangles in southeastern Washington was extended southward from stations in the expansion of the Spokane base. Besides reoccupying 2 old stations 17 new stations were built and occupied and 4 points located by inter-sections by Mr. George T. Hawkins, topographer in 1902.

Washington.

ANATONE, ASOTIN COUNTY.

On a bald knob 6.5 miles southwest from Anatone and 250 feet south of Anatone and Grande Ronde Valley road, 0.25 mile south of big wooded butte.

Station mark: + cut in rock and pile of stone over it.

[Latitude $46^{\circ} 06' 29.23''$. Longitude $117^{\circ} 15' 21.22''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White	162 40 01.34	342 35 48.08	4.40120
Windmill	233 30 39.56	53 39 06.74	4.27300
Billy Creek	273 38 04.46	93 54 05.32	4.46123

WHITE, ASOTIN COUNTY.

On a high bald knob in a field 400 feet north of Lewiston and Peola road, 20 miles from Lewiston and 8 miles from Peola.

Station mark: U. S. + cut in solid rock.

[Latitude $46^{\circ} 19' 27.80''$. Longitude $117^{\circ} 21' 12.01''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Valentine	183 39 39.03	3 40 22.94	4.3062636
Snake	228 03 20.72	48 13 21.11	4.3762899
Windmill	299 39 38.88	119 52 20.44	4.4149990
Anatone	342 35 48.08	162 40 01.34	4.4012000

WINDMILL, ASOTIN COUNTY.

Center of windmill at east end of Mr. Bolock's barn, 12 miles south of Asotin and 0.5 mile east of Asotin and Anatone road.

Station mark: Center of windmill.

[Latitude $46^{\circ} 12' 29.72''$. Longitude $117^{\circ} 03' 38.03''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Anatone	53 39 06.74	233 30 39.56	4.2730000
White	119 52 20.44	299 39 38.88	4.4149990
Valentine	147 25 22.04	327 13 23.19	4.5947866
Snake	170 32 12.41	350 29 29.75	4.4650820
Billy Creek	313 24 47.81	133 32 29.72	4.2774400

CHENEY, SPOKANE COUNTY.

About 4 miles northwest of Cheney and same distance southeast of Medical Lake on highest bald knob in that vicinity.

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

[Latitude $47^{\circ} 32' 54.26''$. Longitude $117^{\circ} 36' 40.32''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Tompkinson	210 05 42.97	30 12 31.93	4.3617486
Little Baldy	229 53 39.91	50 06 02.07	4.4374457
Paradise	280 40 58.56	100 50 10.43	4.2021346
Waverly	303 55 42.06	124 16 49.80	4.6390466
Plaza	332 45 41.14	152 53 00.52	4.4372139

PARADISE, SPOKANE COUNTY.

About 1 mile from Paradise post-office, on a prominent wooded hill. Part of timber cut down.

Station mark: A pine tree 10 inches in diameter on line of east and west fence.

[Latitude $47^{\circ} 31' 17.98''$. Longitude $117^{\circ} 24' 13.21''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Plaza	8 28 14.74	188 26 23.12	4.3345800
Cheney	100 50 10.43	280 40 58.56	4.2021347
Tompkinson	169 56 24.74	349 54 00.95	4.3658765
Little Baldy	194 33 55.19	14 37 04.62	4.3275653
Waverly	316 20 36.95	136 32 33.51	4.4712470

PLAZA, SPOKANE COUNTY.

On a cleared hill 2.5 miles west and 1 mile north of Plaza, and 0.25 mile southwest from Mr. Lybecker's residence 150 feet east of road in field.

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

[Latitude $47^{\circ} 19' 45.97''$. Longitude $117^{\circ} 26' 44.79''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sunset	2 36 22.53	182 35 38.82	4.4414637
Cheney	152 53 00.52	332 45 41.14	4.4372139
Paradise	188 26 23.12	8 28 14.74	4.3345800
Waverly	270 04 21.24	90 18 08.14	4.3731774
Steptoe	341 15 49.85	161 22 19.28	4.5428294

WAVERLY, SPOKANE COUNTY.

On a bald butte 4.5 miles east of Waverly.

Station mark: A stone block 20 by 8 by 8 inches set 24 inches in ground; top marked "+ U. S."

[Latitude 47° 19' 43.47". Longitude 117° 08' 00.15".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Steptoe	20 49 03.51	200 41 48.02	4.5474520
Plaza	90 48 08.14	270 04 21.24	4.3731774
Cheney	124 16 49.80	303 55 42.06	4.6390466
Paradise	136 32 33.51	316 20 36.95	4.4712470
Ladow	352 16 07.44	172 19 03.97	4.5776636

VALENTINE, GARFIELD COUNTY.

On land owned by Mr. Ed. Davis 1.5 miles northeast of Valentine post-office, about 0.5 mile northwest of his residence, in field.

Station mark: A sandstone block 30 by 25 by 15 inches set 30 inches in the ground; top marked "+ U. S."

[Latitude 46° 30' 22.03". Longitude 117° 20' 11.39".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White	3 40 22.94	183 39 39.03	4.3062636
Wawawai	188 57 02.26	8 58 41.36	4.2703883
Colton	243 06 16.93	63 12 36.63	4.0967792
Snake	284 43 02.46	104 52 19.79	4.2292579
Windmill	327 13 23.19	147 25 22.04	4.5947866

BALD, WHITMAN COUNTY.

On a high bald butte, 2.5 miles east of Johnsons, near southeast corner sec. 1, T. 13, R. 45.

Station mark: An iron bench-mark post set 38 inches in the ground.

[Latitude 46° 37' 59.29". Longitude 117° 05' 22.23".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Snake	7 56 35.86	187 55 08.27	4.2701383
Colton	42 37 09.70	222 32 43.82	4.0611784
Wawawai	105 04 52.91	284 55 45.52	4.2193539
Kamiak	166 39 07.99	346 35 40.55	4.4171589
Ladow	182 30 52.52	2 31 52.93	4.6009249

COLFAX, WHITMAN COUNTY.

About 5 miles nearly west from Colfax, on mound in field 250 feet south of road.

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

[Latitude $46^{\circ} 51' 31.28''$. Longitude $117^{\circ} 27' 14.82''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Sunset	178 33 24.24	358 33 02.65	4.3933151
Step toe	211 33 29.96	31 40 19.86	4.3547119
Kamiak	268 58 40.51	89 11 10.47	4.3379294
Wawawai	330 11 26.06	150 18 13.94	4.3791007

COLTON, WHITMAN COUNTY.

On east end of mound in a field 2.5 miles nearly west from Colton, in sec. 5, T. 12, R. 45.

Station mark: An iron bench-mark post set 42 inches in the ground.

[Latitude $46^{\circ} 33' 24.77''$. Longitude $117^{\circ} 11' 28.20''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Valentine	63 12 36.63	243 06 16.93	4.0967792
Wawawai	147 13 56.63	327 09 15.55	4.1815599
Bald	222 32 43.82	42 37 09.70	4.0611784
Snake	332 17 56.68	152 20 54.67	4.0515403

KAMIAK, WHITMAN COUNTY.

On highest point of Kamiak butte, 7 miles southwest from Palouse and about 8 miles south and east from Colfax. Most of timber cut down.

Station mark: The pine signal tree 18 inches in diameter trimmed and marked U. S.

[Latitude $46^{\circ} 51' 42.57''$. Longitude $117^{\circ} 10' 07.04''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Wawawai	25 12 52.35	205 07 11.43	4.3682540
Colfax	89 11 10.47	268 58 40.51	4.3379295
Step toe	152 29 48.23	332 24 07.12	4.3292802
Ladow	208 16 47.71	28 21 16.27	4.2147588
Bald	346 35 40.55	166 39 07.99	4.4171589

LADOW, WHITMAN COUNTY.

On a bald butte 6 miles north of Palouse and 3.5 miles nearly east of Garfield, near corner secs. 1, 6, 7, 12, T. —, Rs. 45, 46.

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

[Latitude $46^{\circ} 59' 30.01''$. Longitude $117^{\circ} 03' 59.40''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Bald	2 31 52.93	182 30 52.52	4.6009249
Kamiak	28 21 16.27	208 16 47.71	4.2147588
Steptoe	104 22 25.20	284 12 14.80	4.2598009
Waverly	172 19 03.97	352 16 07.44	4.5776636

PULLMAN, WHITMAN COUNTY.

(Not occupied.)

The water tower in grounds of Agricultural College at Pullman.

Station mark: Center of water tower.

[Latitude $46^{\circ} 43' 49.08''$. Longitude $117^{\circ} 09' 49.34''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Kamiak	178 31 53.44	358 31 40.55	4.16520
Bald	332 14 33.66	152 17 47.99	4.08635

SNAKE, WHITMAN COUNTY.

On a high point 6 miles south and 1 mile west of Uniontown, on edge of Snake River Canyon.

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

[Latitude $46^{\circ} 28' 01.83''$. Longitude $117^{\circ} 07' 22.88''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
White	48 13 21.11	228 03 20.72	4.3762899
Valentine	104 52 19.79	284 43 02.46	4.2292579
Colton	152 20 54.67	332 17 56.68	4.0515403
Bald	187 55 08.28	7 56 35.86	4.2701383
Billy Creek	336 00 52.15	156 11 17.75	4.6602700
Windmill	350 29 29.75	170 32 12.41	4.4650820

STEPTOE, WHITMAN COUNTY.

On cupola of hotel on top of Steptoe butte, about 7 miles nearly south from Oakesdale.

Station mark: Center of cupola.

Reference mark: + cut in solid rock 55 feet due north of center of cupola.

[Latitude $47^{\circ} 01' 55.88''$. Longitude $117^{\circ} 17' 53.86''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Colfax	31 40 19.86	211 33 29.96	4.3547119
Sunset	113 41 54.62	293 34 42.36	4.1336609
Plaza	161 22 19.28	341 15 49.85	4.5428294
Waverly	200 41 48.02	20 49 03.51	4.5474520
Ladow	284 12 14.80	104 22 25.20	4.2598009
Kamiak	332 24 07.12	152 29 48.23	4.3292801

SUNSET, WHITMAN COUNTY.

On a mound in a field 2.5 miles south and 0.5 mile east of Sunset, 0.25 mile east of Mr. Macklin's residence.

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

[Latitude $47^{\circ} 04' 52.02''$. Longitude $117^{\circ} 27' 44.36''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Plaza	182 35 38.82	2 36 22.53	4.4414637
Steptoe	293 34 42.36	113 41 54.62	4.1336609
Colfax	358 33 02.65	178 33 24.24	4.3933151

WAWAWAI, WHITMAN COUNTY.

On mound in a field 8 miles southwest of Pullman in northeast quarter sec. 29, T. 14, R. 44.

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

[Latitude $46^{\circ} 40' 18.24''$. Longitude $117^{\circ} 17' 54.97''$.]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	Meters.
Valentine	8 58 41.36	188 57 02.26	4.2703883
Colfax	150 18 13.94	330 11 26.06	4.3791007
Kamiak	205 07 11.43	25 12 52.35	4.3682540
Bald	284 55 45.52	105 04 52.91	4.2193539
Cotton	327 09 15.55	147 13 56.63	4.1815599

Idaho.

MOSCOW, LATAH COUNTY.

(Not occupied.)

Station mark: Center of water tower at Moscow.

[Latitude 46° 44' 05.88". Longitude 116° 59' 57.63".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Bald	31 24 00.17	211 20 03.99	4.12231
Kamiak	137 34 04.78	317 26 40.55	4.28175

BILLY CREEK, NEZ PERCES COUNTY.

On a high mountain spur running out from the Billy Creek range, about 30 miles southeast from Lewiston and 5 miles east of Snake River.

Station mark: The lone pine signal tree.

[Latitude 46° 05' 27.59". Longitude 116° 52' 57.51".]

To station—	Azimuth.	Back azimuth.	Log. distance.
	° ' "	° ' "	<i>Meters.</i>
Anatone	93 54 05.32	273 38 04.46	4.46123
Windmill	133 32 29.72	313 24 47.81	4.27744
Snake	156 11 17.75	336 00 52.15	4.66027

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[Bulletin No. 216.]

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