

# INDIANA.

## PRIMARY TRAVERSE.

Birds, Merom, Montuers Pond, Oaktown, and Vincennes quadrangles.

### SULLIVAN AND KNOX COUNTIES.

The following geographic positions on North American datum were determined from primary traverse run by C. B. Kendall in 1913. The line begins with position of Merom triangulation. United States Coast and Geodetic Survey, and follows public roads east and south via Busseron to Vincennes, where it is tied to United States Coast and Geodetic Survey astronomic station, Vincennes. The line is also tied to the United States Corps of Engineers' traverse line along the Wabash River at Riverton and Vincennes.

### BIRDS QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Four corners, public crossroads (dup.).....	39 00 45.3	87 31 20.6	.....
Tps. 6 and 7 N., R. 10 W., corner secs. 3, 4, 33, and 34, $\frac{1}{2}$ mile west of; public T road north, second-class road west.....	38 59 53.6	87 31 21.2	5,231
T. 6 N., R. 10 W. (north) corner secs. 3 and 4, center of east and west road in line with two elm trees in field to south and the east edge of Jonesville schoolhouse on north.....	38 59 53.3	87 31 07.8	1,060
NOTE.—250 feet east of the above is T. 7 N., R. 10 W., south corner secs. 33 and 34.			
T. 6 N., R. 10 W., north corner secs. 3 and 4, 710 feet east of; 15 feet south and 20 feet west of center of public T roads, 720 feet east of Jonesville schoolhouse, inside of wire fences; iron post stamped "Prim. Trav. Sta. No. 1, 1913, Indiana".....	38 59 53.0	87 30 58.9	700
Jonesville schoolhouse, $\frac{1}{2}$ mile south of, public T road south, 15 feet south to center of triangle, 35 feet northwest to sycamore, center sec. 10, T. 6 N., R. 10 W.....	38 58 46.0	87 30 37.9	6,972
T. 6 N., R. 10 W., quarter corner between secs. 10 and 15, public T road south, 150 feet east of public T road north.....	38 58 21.2	87 30 34.6	2,532
T. 6 N., R. 10 W., quarter corner between secs. 15 and 22, public T road north.....	38 57 28.5	87 30 34.5	5,325
T. 6 N., R. 10 W., corner secs. 14, 15, 22, and 23, center of east-west road at wire fence south.....	38 57 28.3	87 30 00.7	2,670

Magnetic declination for east border of quadrangle, 3° 03' E.

### MEROM QUADRANGLE.

Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Merom triangulation station, U. S. C. & G. S.....	39 03 02.71	87 33 53.02	.....
Riverton, U. S. Engineers iron bench mark No. 32, described as follows: "Riverton, 150 feet back from river, on left bank, 600 feet below east abutment of Illinois Central R. R. drawbridge, on east slope of levee, on land of P. H. Blue, 35 feet northeast of Houseboat shack outside of levee, residence of Richard Meek, 50 feet southeast of houseboat shack outside of levee, residence of Arthur Meek; iron pipe (U. S. C. E. b. m. No. 32)".....	39 01 07.99	87 34 04.55	11,644

## MEROM QUADRANGLE—Continued.

## Along public roads—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
Riverton, 1 mile east of, public T road west, center of north and south road at.....	° ' "	° ' "	Feet.
T. 7 N., R. 10 W., quarter corner between secs. 28 and 29.....	39 01 17.2	87 33 01.2	5,084
T. 7 N., R. 10 W., quarter corner between secs. 28 and 29, 1,200 feet east of; public T road west, 140 feet west of 90° bend of road to south.....	39 01 12.2	87 32 10.9	4,007
T. 7 N., R. 10 W., corner secs. 28, 29, 32, and 33, $\frac{1}{4}$ mile east of; public T road north.....	39 01 12.0	87 31 55.9	1,180
NOTE.—1,320 feet west of the above is T. 7 N., R. 10 W., corner secs. 28, 29, 32, and 33 at cross fences.	39 00 45.8	87 31 54.0	2,647
Four corners, public crossroads.....	39 00 45.3	87 31 20.6	2,604
NOTE.—1,310 feet east of the above is T. 7 N., R. 10 W., corner secs. 27, 28, 33, and 34.			

Magnetic declination for south border of quadrangle, 3° 07' E.

## MONTUERS POND QUADRANGLE.

## Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
Oak schoolhouse, $\frac{1}{2}$ miles southwest of, three-corner public T road northeast, center of triangle at, 20 feet east to mail box No. 44, on fence post, 25 feet north to corner fence post.....	° ' "	° ' "	Feet.
Ellis schoolhouse, 500 feet southwest of, on the southeast edge of the Vincennes-Terre Haute public road, 30 feet south and 10 feet west of center of public T road southeast, 10 feet west of large corner post of wire fence and 15 feet east of a large elm tree; iron post stamped "Prim. Trav. Sta. No. 3, 1913, Indiana".....	38 44 36.7	87 28 15.4	
Ellis schoolhouse, 1 mile southwest of; second class T road southeast, 15 feet east to telephone pole, 20 feet south to corner of fence.....	38 44 12.1	87 28 13.3	2,496
Bridge over Snaps Creek, $\frac{1}{2}$ mile north of, four-cornered public crossroad, center of pike at.....	38 43 40.6	87 29 09.8	5,489
Snaps Creek, bridge, 500 feet north of; public roads north and northeast, 12 feet east to telephone pole.....	38 42 50.9	87 29 41.8	5,632
	38.42.08.5	87 29 53.2	4,389

Magnetic declination for northwest border of quadrangle, 3° 04' E.

## OAKTOWN QUADRANGLE.

## Along public roads.

Station.	Latitude.	Longitude.	Distance between stations.
T. 6 N., R. 10 W., corner secs. 13, 14, 23, and 24, public T road south.	° ' "	° ' "	Feet.
T. 6 N., R. 10 W., corner secs. 23, 24, 25, and 26, second-class crossroad.....	38 57 27.9	87 28 52.3	
Busseron Creek, center of iron bridge over.....	38 56 34.6	87 28 52.7	5,400
T. 6 N., R. 10 W., corner secs. 25, 26, 35, and 36, center of north-south road at fences east and west, 70 feet south of T road west.	38 55 56.9	87 28 52.6	3,805
T. 6 N., R. 10 W., corner secs. 25, 26, 35, and 36, $\frac{1}{4}$ mile south of; public crossroads.....	38 55 41.2	87 28 52.6	1,590
T. 6 N., R. 10 W., (south) corner secs. 35 and 36, public T road north (120 feet east of the above may be T. 5 N., R. 10 W., stone north corner of secs. 1 and 2).....	38 55 27.7	87 28 52.5	1,370
Three-corners, public T road north.....	38 54 47.8	87 28 52.4	4,030
Oaktown, about 1 mile north and $\frac{1}{2}$ miles west of; three-corners public T road south, 20 feet south to center of triangle.....	38 53 22.8	87 28 48.5	8,608
Oaktown, $\frac{1}{2}$ mile north and $\frac{1}{2}$ miles west of, in sec. 13, T. 5 N., R. 10 W., on west edge of north-south road opposite and in line with center of public T road east to Oaktown; iron post stamped "Prim. Trav. Sta. No. 2, 1913, Indiana".....	38 53 24.3	87 28 19.0	2,336
	38 52 30.7	87 28 20.1	5,422

## OAKTOWN QUADRANGLE—Continued.

## Along public roads—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
Oaktown, about 2½ miles west of; forks, public roads west and northwest, 12 feet south to corner wire fence.....	° ' " 38 51 34.7	° ' " 87 28 17.6	<i>Feet.</i> 5,666
Oaktown, about 2 miles southwest of; four-corners public cross-roads.....	38 50 55.4	87 27 31.3	5,406
Busseron station, 75 feet southwest of; public road crossing Chicago & Eastern Illinois R. R., center of main track at.....	38 50 09.0	87 26 59.1	5,347
Busseron station, 1½ miles southeast of; forks public roads west and southwest, 15 feet southwest to center of triangle.....	38 48 40.3	87 26 35.6	9,159
Briar Creek Bridge, ¼ mile northwest of; large sycamore tree at public T road west to Emison.....	38 47 54.9	87 26 31.8	4,605
Briar Creek, center of iron bridge over.....	38 47 42.2	87 26 22.1	1,496
Briar Creek, center of iron bridge over, 1,000 feet south of; forks, public roads south and southwest 30 feet north to telephone pole, 75 feet southwest to telephone pole and sign "Vincennes 12 miles".....	38 47 33.1	87 26 21.6	923
Briar Creek Bridge, 1 mile southwest of, second-class fork southeast; large elm tree in center of triangle at.....	38 46 59.8	87 27 01.3	4,609
Oak schoolhouse, ¼ mile northeast of; three-corners public T road southeast, 10 feet southeast to center of triangle, 18 feet northwest to telephone pole and mail box.....	38 46 16.9	87 27 20.6	4,610
Oak schoolhouse, at forks northeast and north; chimney in center of house.....	38 45 50.7	87 27 53.1	3,690
Oak schoolhouse, ¼ mile southwest of; center of bridge over Small's creek.....	38 45 15.2	87 28 09.7	3,825

Magnetic declination for west border of quadrangle, 3° 03' E.

## VINCENNES QUADRANGLE.

## Along public road and streets in Vincennes.

Station.	Latitude.	Longitude.	Distance between stations.
Snaps Creek Bridge, ¼ mile southwest of, Vincennes, 1½ miles northeast of; Vincennes-Terre Haute public road crossing the Chicago & Eastern Illinois R. R., center of track at.....	° ' " 38 41 57.5	° ' " 87 30 13.6	<i>Feet.</i> .....
Vincennes, about 1 mile northeast of; four-corners near east end of bridge over Kelsaw Creek.....	38 41 54.3	87 30 34.9	1,721
Vincennes, First Street and Lyndale Avenue, center of intersection of.....	38 41 21.5	87 30 54.6	3,666
Vincennes, Baltimore & Ohio R. R. crossing First Street, center of main track at.....	38 41 04.2	87 31 32.3	3,465
Vincennes, U. S. Coast and Geodetic Survey astronomic station.....	38 40 35.70	87 31 35.05	2,888

Magnetic declination for northeast border, 3° 14' E.

## Farmland, Fort Recovery, Lynn, and Redkey quadrangles.

## RANDOLPH AND WAYNE COUNTIES.

The following geographic positions on North American datum were determined by J. H. Wilson in 1915 and are based on primary traverse positions, on and near the Indiana-Ohio State line, determined in 1910.

## FARMLAND QUADRANGLE.

## Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 21 N., Rs. 13 and 14 E., corner of secs. 25, 36, 30, and 31, cross-roads 0.5 mile west of Clarke.....	° ' " 40 14 12.2	° ' " 85 00 59.2	<i>Feet.</i> .....
Tps. 20 and 21 N., Rs. 13 and 14 E., corner of; crossroads.....	40 13 20.0	85 00 58.7	5,280
Bethel M. E. Church, T road east, west corner of secs. 6 and 7.... (300 feet south of above corner is T. 20 N., R. 13 E., east corner of secs. 1 and 12, T road west)	40 12 31.1	85 00 58.4	4,950

## FARMLAND QUADRANGLE—Continued.

## Along highways near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Fect.</i>
T. 20 N., R. 13 E., east corner of secs. 12 and 13, T road west.....	40 11 36.2	85 00 58.2	5,560
White River, north end of bridge over.....	40 10 55.5	85 00 58.1	4,120
T. 20 N., R. 14 E., west corner of secs. 18 and 19, 130 feet north of Big Four R. R. crossing.....	40 10 44.8	85 00 58.1	1,080
Lykins station on traction line, crossroads 1.5 miles west of Winchester.....	40 10 19.3	85 00 58.0	2,580
T. 20 N., R. 14 E., west corner of secs. 19 and 30, fence east..... (65 feet south of above corner is T. 20 N., R. 13 E., east corner of secs. 24 and 25.)	40 09 52.8	85 00 57.9	2,680
T. 20 N., R. 13 E., east corner of secs. 25 and 36, fence west.....	40 09 00.3	85 00 57.4	5,315
Tps. 19 and 20 N., Rs. 13 and 14 E., corner of, right angle bend in road.....	40 08 08.3	85 00 57.2	5,260
T. 19 N., R. 13 E., west corner of secs. 1 and 12, 5 feet north and 15 feet east of, and T. 19 N., R. 14 E., east corner of secs. 6 and 7, 155 feet south and 15 feet east of, on east side of north and south road at T road west; iron post stamped "Prim. Trav. Sta. No. 2, 1915".....	40 07 16.4	85 00 56.8	5,259
T. 19 N., R. 14 E., west corner of secs. 7 and 13, T road east..... (175 feet south of above corner is T. 19 N., R. 13 E., east corner of secs. 12 and 13, T road west.)	40 06 26.0	85 00 56.6	5,100
T. 19 N., R. 14 E., west corner of secs. 18 and 19, T road east..... (95 feet south of above corner is T. 19 N., R. 14 E., east corner of secs. 13 and 24, T road west.)	40 05 33.1	85 00 56.3	5,355
T. 19 N., R. 14 E., west corner of secs. 19 and 30, T road east..... (80 feet south of above corner is T. 19 N., R. 13 E., east corner of secs. 24 and 25, T road west.)	40 04 40.7	85 00 56.1	5,295
T. 19 N., R. 14 E., west corner of secs. 30 and 31, T road east..... (190 feet south of above corner is T. 19 N., R. 13 E., east corner of secs. 25 and 36, T road west.)	40 03 49.8	85 00 55.9	5,160
Tps. 18 and 19 N., Rs. 13 and 14 E., corner of, T road north.....	40 02 55.8	85 00 55.8	5,456
T. 18 N., R. 13 E., stone quarter corner between secs. 1 and 12, T road west.....	40 02 03.5	85 01 29.5	5,914
T. 18 N., Rs. 13 and 14 E., quarter corner between secs. 7 and 12, T road south.....	40 01 37.4	85 00 55.5	3,738
T. 18 N., Rs. 13 and 14 E., corner of secs. 12, 13, 7, and 18, crossroads.....	40 01 11.4	85 00 55.5	2,630
T. 18 N., Rs. 13 and 14 E., corner of secs. 13, 24, 18, and 19, 15 feet north and 13 feet west of, at northwest corner of crossroads on Randolph-Wayne County line; iron post stamped "Prim. Trav. Sta. No. 4, 1915".....	40 00 19.3	85 00 55.6	5,274

Magnetic declination for east border of quadrangle, 0° 45' E.

## FORT RECOVERY QUADRANGLE.

## Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Fect.</i>
T. 21 N., R. 15 E., corner of secs. 14, 15, 22, and 23, T road west at abandoned schoolhouse.....	40 15 59.2	84 49 26.6	.....
T. 21 N., R. 15 E., corner of secs. 15, 16, 21, and 22, crossroads 0.5 mile east of Jackson school.....	40 15 59.6	84 50 34.8	5,283
T. 21 N., R. 15 E., corner of secs. 16, 17, 20, and 21, crossroads 0.5 mile west of Jackson school.....	40 15 57.6	84 51 43.0	5,290
T. 21 N., R. 15 E., corner of secs. 17, 18, 19, and 20, crossroads at abandoned schoolhouse.....	40 15 59.3	84 52 51.9	5,350
T. 21 N., Rs. 14 and 15 E., corner of secs. 13, 24, 18, and 19, crossroads.....	40 15 58.4	84 54 00.7	5,330
T. 21 N., R. 14 E., corner of secs. 13, 14, 23, and 24, T road east at abandoned schoolhouse.....	40 15 58.3	84 55 08.7	5,270
T. 21 N., R. and E. corner of secs. 14, 15, 22, and 23, center of north and south road, 150 feet north of crossroads.....	40 15 59.1	84 56 16.4	5,251
T. 21 N., R. 14 E., corner of secs. 15, 16, 21, and 22, crossroads just south of abandoned schoolhouse.....	40 15 58.4	84 57 25.1	5,322
Randolph railroad crossing, north track, 90 feet north of corner of secs. 16, 17, 20, and 21, T. 21 N., R. 14 E.....	40 15 58.8	84 58 33.6	5,314
T. 21 N., R. 14 E., quarter corner between secs. 20 and 21, crossroads.....	40 15 31.8	84 58 33.6	2,725
T. 21 N., R. 14 E., quarter corner between secs. 19 and 20, crossroads.....	40 15 31.1	84 59 42.1	5,310

Magnetic declination for south border of quadrangle, 1° E.

## LYNN QUADRANGLE.

Along Randolph-Wayne county line near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 18 N., R. 14 E., corner of secs. 17, 18, 19, and 20, crossroads.....	40 00 19.8	84 59 47.0	.....
T. 18 N., R. 14 E., corner of secs. 16, 17, 20, and 21, crossroads.....	40 00 19.6	84 58 39.1	5,280
T. 18 N., R. 14 E., stone corner of secs. 15, 16, 21, and 22, crossroads.....	40 00 20.0	84 57 30.8	5,320
Lynn, 3 miles south of, crossroads, corner of secs. 14, 15, 22, and 23, T. 18 N., R. 14 E.....	40 00 20.2	84 56 22.5	5,310
T. 18 N., R. 14 E., corner of secs. 13, 14, 23, and 24, center of east and west road at fence north.....	40 00 20.1	84 55 14.1	5,320
T. 18 N., R. 14 E., east corner of secs. 13 and 14, on line with telephone line west.....	40 00 19.8	84 54 08.1	5,139
(160 feet north of above corner is T. 18 N., R. 15 E., west corner of secs. 18 and 19, fence corner in line with telephone line east.)			
T. 18 N., R. 15 E., east corner of fractional secs. 18 and 19, center of road on Greenville treaty line at telephone line west.....	40 00 20.5	84 53 34.3	2,629
Tps. 10 and 11 N., R. 1 W., west corner of fractional secs. 5 and 32, T road east on county line.....	40 00 23.8	84 53 33.4	342
Tps. 10 and 11 N., R. 1 W., corner of secs. 4, 5, 32, and 33, fence south.....	40 00 23.6	84 53 10.2	1,807
T. 11 N., R. 1 W., south corner of secs. 33 and 34, 30 feet west of crossroads just south of Arba.....	40 00 22.6	84 52 01.0	5,380
(65 feet east of above corner is T. 10 N., R. 1 W., north corner of secs. 3 and 4, 35 feet east of crossroads.)			
Tps. 10 and 11 N., R. 1 W., corner of secs. 2, 3, 34, and 35, T road south.....	40 00 21.6	84 50 52.6	5,320
T. 10 N., R. 1 W., north corner of secs. 1 and 2, in line with road south.....	40 00 20.5	84 49 46.6	5,140
(30 feet east of above corner is T. 11 N., R. 1 W., south corner of secs. 35 and 36, in line with road north.)			
Tps. 10 and 11 N., Rs. 1 E. and 1 W., corner of, Ohio-Indiana State line, at east corner of Randolph and Wayne counties, Ind.....	40 00 19.3	84 48 37.9	5,350
Prim. Trav. Sta. No. 10, 1910, Ohio (Bulletin 552).....	40 01 11.4	84 47 51.9	6,373

Along highways through center of quadrangle.

T. 19 N., R. 14 E., corner of secs. 5, 6, 7, and 8, center of east and west road at fence south.....	40 07 17.4	84 59 39.8	.....
Crossroads.....	40 07 17.2	84 59 14.7	1,955
T. 19 N., R. 14 E., corner of secs. 4, 5, 8, and 9, crossroads 1,620 feet west of Grand Rapids & Indiana R. R. crossing.....	40 07 16.2	84 58 32.5	3,275
T. 19 N., R. 14 E., corner of secs. 3, 4, 9, and 10, T road south, 50 feet west of crossroads.....	40 07 17.2	84 57 25.2	5,230
T. 19 N., R. 14 E., corner of secs. 2, 3, 10, and 11, T road south.....	40 07 16.5	84 56 18.0	5,219
T. 19 N., R. 14 E., corner of secs. 1, 2, 11, and 12, crossroads.....	40 07 14.9	84 55 10.4	5,260
T. 19 N., Rs. 14 and 15 E., corner of secs. 1, 12, 6, and 7, crossroads.....	40 07 16.7	84 54 05.1	5,075
Tps. 19 and 20 N., Rs. 14 and 15 E., 20 feet west and 570 feet south of, at northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, 1915".....	40 08 03.2	84 54 05.1	4,710
T. 19 N., R. 15 E., line between secs. 5 and 6, crossroads at abandoned schoolhouse.....	40 07 36.0	84 52 57.6	5,918
T. 19 N., R. 15 E., fence west on line between secs. 5 and 8, 60 feet northwest of road south.....	40 07 17.0	84 52 07.6	4,340
Crossroads on old Ohio-Indiana boundary line; line between sec. 9, T. 19 N., R. 15 E., and sec. 27, T. 12 N., R. 1 W.....	40 07 05.7	84 51 38.5	2,531
Bartonia; crossroads.....	40 06 56.0	84 51 02.7	2,946
T. 12 N., R. 1 W., line between secs. 22 and 27, east and west fence line at bend in road.....	40 07 21.2	84 51 02.2	2,551
T. 12 N., R. 1 W., quarter corner between secs. 22 and 23, center of east and west road at north and south fence line, 440 feet east of road east.....	40 07 47.0	84 50 43.0	3,012
T. 12 N., R. 1 W., quarter corner between secs. 23 and 24, crossroads at abandoned schoolhouse.....	40 07 46.4	84 49 35.9	5,210
T. 12 N., R. 1 W., east quarter corner of sec. 24, road west 25 feet north road east, State line.....	40 07 45.8	84 48 27.4	5,320
T. 12 N., R. 1 W., east corner of secs. 13 and 24.....	40 08 12.0	84 48 26.7	2,650
Prim. Trav. Sta. No. 41, 1910, Ohio (Bulletin 552).....	40 09 04.8	84 48 25.0	5,343

Near north border of quadrangle.

T road east, just north of church and cemetery.....	40 14 46.5	84 49 26.7	.....
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Magnetic declination for north border of quadrangle, 1° E.; for west border, 1° E.; for south border, 1½° E.; through center, 1½° E.

## REDKEY QUADRANGLE.

Near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 21 N., R. 14 E., quarter corner, west side of sec. 19, 5 feet north and 15 feet west of, on west side of north and south road at T road east, 590 feet north of Grand Rapids & Indiana Railroad crossing; iron post stamped "Prim. Trav. Sta. No. 1, 1915".....	° ' "	° ' "	Feet.
T. 21 N., R. 14 E., west corner of secs. 19 and 30, crossroads.....	40 15 30.4	85 01 00.1	.....
(25 feet south of above corner is T. 21 N., R. 13 E., east corner of secs. 24 and 25.)	40 15 04.2	85 00 59.7	2,650

# MICHIGAN AND INDIANA.

## PRIMARY TRAVERSE.

Jones, Leonidas, Schoolcraft, Sturgis, and Three Rivers quadrangles, Mich.; Shipshewana quadrangle, Ind.

ST. JOSEPH COUNTY, MICH.; ELKHART AND LAGRANGE COUNTIES, IND.

The following geographic positions on North American datum were determined by primary traverse run in 1913 by J. H. Wilson and are based on positions located in west part of Three Rivers quadrangle in 1911, described in Bulletin 551, from Porter triangulation station, United States Lake Survey, and were tied to Sherman triangulation station of latter survey.

### JONES QUADRANGLE.

South along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Mottville, south end of bridge over St. Joseph River.....	41 48 00.0	85 45 18.3	.....
T. 8 S., R. 12 W., quarter corner between secs. 6 and 7, center of north and south road.....	41 47 40.1	85 45 00.6	2,424
T. 8 S., R. 12 W., quarter corner between secs. 7 and 81, center of north and south road, 30 feet south of road west and 30 feet south of road west and 30 feet north of bridge over White Pigeon River..	41 46 47.6	85 45 00.8	5,310
T. 8 S., R. 12 W., quarter corner between secs. 18 and 19, crossroads at church.....	41 45 55.0	85 45 01.0	5,320
Vistula, about 0.5 mile north and 1 mile west of; iron bench mark post set at southeast corner of crossroads, 40 feet south and 15 feet east of quarter corner, south side of sec. 19, T. 8 S., R. 12 W. (This corner is on the State line which is the north edge of the east and west road); post stamped "Prim. Trav. Sta. No. 20, 1913".....	41 45 32.3	85 45 00.8	2,305

Magnetic declination for east border of quadrangle, 0° 33' E.

### STURGIS QUADRANGLE.

North along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 8 S., R. 10 W., corner of secs. 8, 9, 16, 17, crossroads.....	41 46 50.9	85 29 11.2	.....
Sturgis, 3.5 mile west of, crossroads 700 feet south of railroad crossing.....	41 47 39.9	85 29 11.6	4,960
Ts. 7 and 8 S., R. 10 W., stone corner of sections 32, 33, 4, and 5, crossroads at schoolhouse.....	41 48 35.8	85 29 11.8	5,065
T. 7 S., R. 10 W., south quarter (stone) of sections 33 and 34, crossroads.....	41 48 36.4	85 28 01.8	5,300
T. 7 S., R. 10 W., corner of secs. 21, 22, 27, and 28, 20 feet west of center of crossroads.....	41 50 20.8	85 28 03.0	10,570
T. 7 S., R. 10 W., stone quarter corner between secs. 22 and 27, T road south.....	41 50 21.2	85 27 28.0	2,650
Sherman triangulation station of the Lake Survey, in northeast quarter sec. 22, T. 7 S., R. 10 W., about 4 miles northwest from Sturgis. A stone post below surface, with another one directly over it as a surface mark.....	41 50 48.5	85 27 11.7	3,028
T. 7 S., R. 10 W., corner of sections 15, 16, 21, and 22, crossroads.....	41 51 13.3	85 28 03.8	4,680
T. 7 S., R. 10 W., corner of sections 16, 17, 20, and 21, crossroads.....	41 51 12.8	85 29 13.8	5,300
T. 6 S., R. 10 W., quarter corner between secs. 28 and 29, crossroads.....	41 55 08.2	85 29 15.4	.....
T. 6 S., R. 10 W., corner of secs. 20, 21, 28, 29, crossroads at schoolhouse.....	41 55 34.3	85 29 15.8	2,650
T. 6 S., R. 10 W., corner of secs. 16, 17, 20, and 21, 25 feet north of center of T road east.....	41 56 26.9	85 29 16.4	5,320
T. 6 S., R. 10 W., corner of secs. 8, 9, 16, and 17, T road south.....	41 57 19.4	85 29 17.1	5,330
East and west section line, center of east and west road at crossroads, in line with road north.....	41 58 12.1	85 28 50.7	5,688
East and west township line, center of road at road south.....	41 59 04.1	85 28 37.8	5,350
St. Joseph River, north end of bridge over.....	41 59 07.2	85 28 52.0	1,119
T. 5 S., R. 10 W., corner of secs. 28, 29, 32, and 33, T road west.....	41 59 56.3	85 29 17.8	5,341

Magnetic declination for west border of quadrangle, 0° 7' E.

**LEONIDAS QUADRANGLE.**  
Near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Mendon, 1.5 miles west of, north side of east and west road at T road south, 25 feet north of quarter corner between secs. 28 and 29, T. 5 S., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 24, 1913, Mich."	° ' " 42 00 22.7	° ' " 85 29 18.0	Feet. ....

**SCHOOLCRAFT QUADRANGLE.**  
West along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 5 S., R. 10 W., quarter corner between secs. 29 and 30, T road south.....	° ' " 42 00 22.0	° ' " 85 30 28.4	Feet. ....
T. 5 S., R. 10 W., quarter corner, west side of section 30 (5 feet south of above corner is T. 5 S., R. 11 W., quarter corner east side of sec. 25).....	42 00 21.6	85 31 41.9	.....
T. 5 S., R. 11 W., quarter corner between secs. 25 and 26, T road east.....	42 00 21.2	85 32 51.8	5,280
Parkville, crossroads at south edge of, corner of secs. 23, 24, 25, and 26, T. 5 S., R. 11 W.....	42 00 47.6	85 32 52.0	2,670
T. 5 S., R. 11 W., corner of secs. 22, 23, 26, and 27, crossroads.....	42 00 47.0	85 34 02.0	5,282
T. 5 S., R. 11 W., corner of secs. 21, 22, 27, and 28, crossroads at schoolhouse.....	42 00 46.7	85 35 12.7	5,340
T. 5 S., R. 11 W., corner of secs. 20, 21, 28, and 29, center of east and west road.....	42 00 46.8	85 36 22.5	5,270
Moore Park, 1 mile east of, at southwest corner of crossroads, 20 feet south and 45 feet west of quarter corner between secs. 20, 29, T. 5 S., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 25, 1913, Mich."	42 00 46.4	85 36 58.4	2,712
T. 5 S., R. 11 W., corner of secs. 19, 20, 29, and 30; center of east and west road.....	42 00 46.5	85 37 32.8	2,600
Moore Park, railroad at east and west road crossing just south of depot.....	42 00 46.4	85 37 59.3	2,000
Moore Park, quarter corner in center of sec. 30, T. 5 S., R. 11 W., T road west.....	42 00 20.2	85 38 07.7	2,721
Rocky River, south end of bridge over.....	42 00 19.8	85 38 48.1	3,050
T. 5 S., R. 12 W., quarter corner between secs. 25 and 26, crossroads.....	42 00 20.1	85 39 51.1	4,758
T. 5 S., R. 12 W., quarter corner between secs. 26 and 27, crossroads.....	42 00 19.7	85 41 01.4	5,310
T. 5 S., R. 12 W., quarter corner between secs. 27 and 28, T road east.....	42 00 19.3	85 42 11.2	5,270

Magnetic declination for south border of quadrangle, 0° 16' E.

**SHIPSHEWANA QUADRANGLE.**  
East along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Vistula, center of north and south road at railroad crossing.....	° ' " 41 44 59.2	° ' " 85 43 40.6	Feet. ....
T. 38 N., R. 8 E., quarter corner between secs. 16 and 17, crossroads at schoolhouse.....	41 44 53.0	85 37 17.7	.....
T. 38 N., R. 8 E., quarter corner between secs. 15 and 16, crossroads.....	41 44 54.0	85 36 07.1	5,348
T. 38 N., R. 8 E., quarter corner between secs. 14 and 15, crossroads.....	41 44 55.0	85 34 57.4	5,288
White Pigeon River, west end of bridge over.....	41 44 54.7	85 34 35.4	1,666
Scott, four corners, church on northwest corner.....	41 44 30.1	85 33 23.4	6,005
T. 38 N., Rs. 8 and 9 E., corner of secs. 13, 24, 18, and 19, T road north ½ mile east of Scott.....	41 44 29.9	85 32 35.8	3,609
T. 38 N., R. 9 E., stone corner of secs. 17, 18, 19, and 20, 15 feet north of center of east and west road.....	41 44 31.1	85 31 28.8	5,079
Evangelical Church, 200 feet north of, center of crossroads.....	41 44 29.8	85 30 53.6	2,674
T. 38 N., R. 9 E., corner of secs. 16, 17, 20, 21, center of east and west road.....	41 44 33.5	85 30 18.8	2,667

Magnetic declination for north border of quadrangle, 0° 19' E.



## THREE RIVERS QUADRANGLE.

East along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 8 S., R. 12 W., south corner of secs. 19 and 20, north edge of east and west road along Michigan-Indiana State line.	41 45 32.5	85 44 26.1	Feet.
T. 38 N., R. 7 E., north corner of secs. 8 and 9 (Indiana data), 15 feet north of T road south.	41 45 32.5	85 44 16.6	720
T. 38 N., R. 7 E., quarter corner, north side of sec. 9, State line, 20 feet north of center of crossroads.	41 45 32.5	85 43 41.4	2,670
T. 8 S., R. 12 W., corner of secs. 13, 14, 23, and 24, T road west.	41 45 56.2	85 39 45.3	2,420
T. 8 S., Rs. 11 and 12 W., corner of secs. 18, 19, 13 and 24, T road north.	41 45 56.3	85 38 35.5	5,290
Michigan-Indiana State line, 15 feet east of north corner of fractional secs. 8 and 9, T. 38 N., R. 8 E., and 285 feet east of south corner of fractional secs. 19 and 20, T. 8 S., R. 11 W., iron bench mark post stamped "Prim. Trav. Sta. No. 21, 1913"	41 45 32.5	85 37 19.0	6,280

North along highways near east border of quadrangle.

Michigan-Indiana State line, east side of north and south road at south corner of fractional secs. 19 and 20, T. 8 S., R. 10 W., and 35 feet east of north corner of fractional secs. 8 and 9, T. 38 N., R. 9 E.; iron post stamped "Prim. Trav. Sta. No. 22, 1913"	41 45 33.5	85 30 21.0	.....
T. 8 S., R. 10 W., corner of secs. 17, 18, 19, and 20, center of north and south road at ditch.	41 45 58.2	85 30 21.3	2,500
T. 8 S., R. 10 W., corner of secs. 7, 8, 17, and 18, crossroads at schoolhouse.	41 46 50.5	85 30 21.4	5,300
T. 8 S., R. 10 W., corner of secs. 17, 18, 19, and 20, crossroads.	41 51 12.5	85 30 23.6	.....
T. 7 S., R. 10 W., corner of secs. 7, 8, 17, and 18, crossroads just west of German Lutheran Church.	41 52 04.8	85 30 24.0	5,300
T. 7 S., R. 10 W., corner secs. 5, 6, 7, and 8, T road west.	41 52 57.4	85 30 24.6	5,320
T. 7 S., R. 10 W., quarter corner between secs. 5 and 6, T road west just north of schoolhouse.	41 53 23.7	85 30 24.8	2,660
Tps. 6 and 7 S., R. 10 W., corner of secs. 31, 32, 5, and 6, center of north and south road.	41 53 49.1	85 30 24.9	2,580
T. 6 S., R. 10 W., corner of secs. 29, 30, 31, and 32, center of north and south road.	41 54 41.7	85 30 25.2	5,320
Centerville, 1 mile east of quarter corner between secs. 29 and 30, T. 6 S., R. 10 W., center of triangulation at road forks.	41 55 07.8	85 30 25.7	2,650

Near northwest corner of quadrangle.

T. 5 S., R. 12 W., stone corner of secs. 28, 29, 32, and 33, T road west	41 59 52.9	85 43 20.7	.....
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West along highways through center of quadrangle.

T. 7 S., R. 10 W., quarter corner west side of sec. 6, T road east at big oak tree.	41 53 23.2	85 31 37.7	.....
Centerville, 1 mile south of, corner of Ts. 6 and 7 S., Rs. 10 and 11 W., T road west.	41 53 48.7	85 31 38.2	2,580
T. 7 S., R. 11 W., north corner of secs. 1 and 2, 25 feet east of center of crossroads.	41 53 48.2	85 32 48.1	5,290
T. 7 S., R. 11 W., north corner of secs. 2 and 3.	41 53 47.8	85 33 57.3	5,240
(25 feet west of above corner is T. 6 S., R. 11 W., south corner of secs. 34 and 35, center of crossroads at schoolhouse.)			
T. 7 S., R. 11 W., north corner of secs. 3 and 4, 15 feet east of center of T road south (40 feet west of above corner is T. 6 S., R. 11 W., south corner of secs. 33 and 34.)	41 53 47.4	85 35 07.5	5,310
T. 7 S., R. 11 W., north corner of secs. 4 and 5, T road south.	41 53 47.1	85 36 17.5	5,300
Three Rivers, 3 miles south of, at southeast corner of crossroads 20 feet south and 35 feet east of north corner of secs. 5 and 6, T. 7 S., R. 11 W., and 20 feet south and 65 feet east of south corner of secs. 31 and 32, T. 6 S., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 23, 1913, Mich."	41 53 46.7	85 37 27.0	5,258
T road east on township line, 7 feet north and 15 feet west of mail box 53 and 1,230 feet west of railroad crossing.	41 53 46.7	85 38 20.1	4,020
Florence station, T road west about 300 feet northwest of.	41 53 21.9	85 38 19.5	2,510
St. Joseph River, east end of bridge over.	41 53 21.3	85 38 54.0	2,609
T. 7 S., R. 12 W., quarter corner between secs. 1 and 2, T road east.	41 53 20.3	85 39 48.9	4,159
T road north quarter mile east of north corner of secs. 2 and 3, T. 7 S., R. 12 W.	41 53 46.7	85 40 40.4	4,728
Center of east and west road at north and south section line.	41 53 59.6	85 40 58.0	1,869
Road at north and south section line, 10 feet east of center of road south.	41 53 51.8	85 42 08.5	5,391

Magnetic declination for east border of quadrangle, 0° 7' E.; through center, 0° 10' E.

## THREE RIVERS QUADRANGLE—Continued.

South along highways near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T road north about $\frac{1}{2}$ mile south of center of sec. 31.....	41 48 48.9	85 44 59.9	.....
T. 38 N., R. 7 E., quarter corner between secs. 9 and 16, center of north and south road.....	41 45 16.2	85 43 41.0	.....
Vistula, center of north and south road at railroad crossing.....	41 44 59.2	85 43 40.6	1,724
Center of east and west road at north and south section line.....	41 45 03.4	85 43 05.7	2,682
T road south on north and south section line.....	41 45 03.6	85 41 56.2	5,269
T. 38 N., R. 7 E., corner of secs. 1, 2, 11, and 12, 260 feet west of crossroads.....	41 45 17.6	85 40 46.3	5,487
T. 38 N., R. 7 E., east corner of secs. 1 and 2, right angle turn in road (50 feet north of above corner is T. 38 N., R. 8 E., west corner of secs. 7 and 18, line between Elkhart and La Grange counties, Indiana).....	41 45 17.9	85 39 35.3	5,350
T. 8 S., R. 12 W., south corner of fractional secs. 23 and 24, center of north and south road at State line.....	41 45 32.3	85 39 45.3	1,649
T. 38 N., R. 8 E., corner of secs. 8, 9, 16, and 17, T road east.....	41 45 19.2	85 37 18.7	1,350

Magnetic declination near south border of quadrangle,  $0^{\circ} 19' E.$

# MICHIGAN.

## PRIMARY TRAVERSE.

Cement City, Rives Junction, Spring Arbor, Springport, and Stockbridge quadrangles.

JACKSON, INGHAM, EATON, AND CALHOUN COUNTIES.

The following geographic positions were determined by Oscar Jones in 1915, and are based on primary traverse positions determined by J. R. Ellis in 1912 and C. B. Kendall in 1908. (See Bulletins 551 and 440.)

### CEMENT CITY QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
McCain Corners, corner of secs. 1, 6, 7, and 12, T. 2 S., Rs. 1 and 2 W., center of T road west.....	42 13 57.6	84 28 58.3	.....
Crossroads.....	42 13 59.4	84 27 45.7	5,463
Jackson, center of Fourth and West Franklin streets.....	42 14 36.8	84 25 07.4	12,495
Jackson, center of Milwaukee and East Franklin streets.....	42 14 37.0	84 24 02.2	4,897
Jackson, center of Bridge and Belden streets.....	42 14 21.6	84 23 50.3	1,796
Jackson, center of Page Avenue and South Elm Avenue.....	42 14 35.9	84 23 04.7	3,723
Jackson, 1 mile east of, 10 feet north by 28 feet west, quarter corner between secs. 1 and 6, T. 3 S., R. 1 W., and 1 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915".....	42 14 24.9	84 21 54.6	5,388
T road south.....	42 14 18.7	84 20 48.4	5,013
T road south.....	42 13 58.0	84 19 37.5	5,730
Ballard Corner, crossroads.....	42 13 59.6	84 18 50.1	3,566
Donleys Corner, corner of secs. 2, 3, 10, and 11, T. 1 S., R. 2 W., center of crossroads.....	42 13 57.3	84 17 19.3	6,830
Grass Lake, 3 miles west, 1 mile south of, 28 feet north by 30 feet east, corner of secs. 1, 2, 11, and 12, T. 3 S., R. 1 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915".....	42 13 57.4	84 16 09.4	5,254
Leoni, crossroads at.....	42 14 37.6	84 16 09.9	4,087

Magnetic declination for north border of quadrangle, 0° 45' W.

### RIVES JUNCTION QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 2 S., R. 1 E., corner of secs. 25, 26, 35, and 36, center of T road west.....	42 15 45.9	84 16 11.9	.....
T road south.....	42 17 12.0	84 16 29.8	8,826
T. 2 S., R. 1 E., corner of secs. 11, 12, 13, and 14, center of T road west.....	42 18 23.2	84 16 12.1	7,324
T. 2 S., R. 1 E., corner of secs. 1, 2, 11, and 12, center of T road south.....	42 19 15.6	84 16 12.4	5,305
T road east.....	42 19 15.0	84 18 13.0	9,063
Road fork.....	42 20 10.5	84 18 51.0	6,302
Grand Trunk Railroad crossing.....	42 20 29.0	84 18 51.2	1,879
Marietta, Grand Trunk Railroad crossing at.....	42 21 50.9	84 17 05.2	11,500
Munith, 1 mile southwest of, 42 feet north and 6 feet west, crossing of Grand Trunk R. R.; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915".....	42 22 44.0	84 15 57.4	7,400
Munith, crossing of Grand Trunk R. R., 260 feet northeast of station.....	42 23 26.1	84 15 02.0	5,949
T. 1 S., Rs. 1 and 2 E., corner of secs. 7, 12, 13, and 18, center of T road west.....	42 23 36.8	84 15 01.8	1,082

## RIVES JUNCTION QUADRANGLE—Continued.

## Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T. 1 N., Rs. 1 and 2 E., corner of secs. 31 and 36, center of T road north.....	° ' " 42 25 28.4	° ' " 84 15 29.8	Feet. ....
T. 1 N., R. 1 E., corner of secs. 25 and 36, center of T road west.....	42 26 20.6	84 15 30.2	5,290
T. 1 N., R. 1 E., corner of secs. 24 and 25, center of T road west....	42 27 13.3	84 15 30.0	5,335
T. 1 N., R. 1 E., corner of secs. 12 and 13, center of crossroads.....	42 28 58.9	84 15 29.8	10,683
T. 1 N., R. 1 E., quarter corner between secs. 10 and 11, center of T road north.....	42 29 22.8	84 17 40.01	10,052
T. 1 N., R. 1 E., corner of secs. 2, 3, 10, and 11, center road fork....	42 29 48.8	84 17 50.6	2,744

## Near west border of quadrangle.

Michigan Central Railroad crossing.....	42 23 47.9	84 29 19.1	.....
Rives Junction, 2 miles west of, 21 feet south by 23 feet west of center of sec. 13, T. 1 S., R. 2 W., center of T road east; iron post stamped "Prim. Trav. Sta. No. 7, Mich. 1915".....	42 23 0.91	84 29 33.1	4,068
T. 1 S., R. 2 W., center of sec. 24, center of crossroads.....	42 22 16.1	84 29 33.7	5,360
T. 1 S., R. 2 W., quarter corner between secs. 25 and 36, center of T road west.....	42 20 57.4	84 29 33.7	7,974
T road west.....	42 20 50.4	84 28 58.4	2,740
Magoon Corners, corner of secs. 19 and 30, T. 2 S., R. 1 W.....	42 16 35.0	84 29 00.0	.....
T. 2 S., R. 2 W., corner of secs. 13 and 24, fence line.....	42 17 27.3	84 28 59.8	5,285
T. 2 S., R. 2 W., corner of secs. 12 and 13, fence line.....	42 18 19.7	84 28 59.5	5,305
Crossroads.....	42 19 50.0	84 28 58.9	9,142
Tps. 1 and 2 S., Rs. 1 and 2 W., corner of secs. 1, 6, 31, and 36, fence line.....	42 20 04.7	84 28 58.7	1,485

## Through center of quadrangle.

T. 1 S., R. 1 E., corner of secs. 13, 14, 23, and 24, fence line.....	42 22 44.0	84 16 12.8	.....
T. 1 S., R. 1 E., quarter corner between secs. 14 and 23, center of crossroads.....	42 22 43.9	84 16 48.2	2,655
T. 1 S., R. 1 E., corner of secs. 14, 15, 22, and 23, fence line.....	42 22 43.9	84 17 23.7	2,660
T road west.....	42 23 06.4	84 18 00.9	3,599
T. 1 S., R. 1 E., corner of secs. 16, 17, 20, and 21, center of T road north.....	42 22 48.2	84 19 46.4	8,125
Henrietta Corners, corner of secs. 17, 18, 19, and 20, T. 1 S., R. 1 E., center of crossroads.....	42 22 48.1	84 20 57.5	5,337
T. 1 S., R. 1 W., corner of secs. 13 and 24, fence line.....	42 22 41.9	84 21 53.5	4,242
Henrietta, 1.5 miles west of, 29 feet south by 35 feet east of quarter corner between secs. 13 and 24, T. 1 S., R. 1 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915".....	42 22 41.5	84 22 28.2	2,605
T. 1 S., R. 1 W., corner of secs. 13, 14, 23, and 24, fence line.....	42 22 41.7	84 23 04.0	2,679
Road fork.....	42 22 34.8	84 24 14.6	5,345
T. 1 S., R. 1 W., quarter corner between secs. 15 and 16, center of crossroads.....	42 22 42.3	84 25 43.0	6,669
T. 1 S., R. 1 W., corner of secs. 16, 17, 20, and 21, center of crossroads.....	42 22 42.6	84 26 36.1	3,984
T road west.....	42 23 09.1	84 27 19.5	4,216
T. 1 S., R. 1 W., center of sec. 7, crossroads.....	42 24 00.4	84 28 23.1	7,054
T road southwest.....	42 24 09.2	84 29 03.6	3,167
T road west, at schoolhouse.....	42 24 27.7	84 29 32.0	2,831
Crossroads.....	42 25 15.9	84 29 50.0	5,362
Crossroads.....	42 26 10.9	84 29 49.7	5,263

Magnetic declination for east border of quadrangle, 1° 15' W.; for west border, 0° 45' W.; for center border, 1° W.

## SPRING ARBOR QUADRANGLE.

## Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Tps. 2 and 3 S., Rs. 3 and 4 W., quarter corner between secs. 6 and 31, center of T road north.....	° ' " 42 14 48.0	° ' " 84 42 30.2	Feet. ....
Tps. 2 and 3 S., R. 3 W., corner of secs. 4, 5, 32, and 33, center of crossroads.....	42 14 48.7	84 40 42.6	8,097
Tps. 2 and 3 S., R. 3 W., quarter corner between secs. 3 and 34, center of crossroads.....	42 14 49.1	84 38 56.8	7,957
Michigan Central R. R. crossing.....	42 14 49.8	84 37 22.6	7,086

**SPRING ARBOR QUADRANGLE—Continued.**

Near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
Parma, 0.6 mile south and 1 mile west of, 21 feet north by 35 feet east of corner of secs. 1, 2, 35, and 36, Tps. 2 and 3 S., R. 3 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915".....	° ' " 42 14 50.0	° ' " 84 37 10.4	Feet. 921
Tps. 2 and 3 S., Rs. 2 and 3 W., corner of secs. 1, 6, 31, and 36, center of T road west.....	42 14 50.3	84 35 59.7	5,325
T. 3 S., Rs. 2 and 3 W., corner of secs. 1, 6, 7, and 12, center of T road east.....	42 13 57.8	84 35 56.8	5,320
T. 3 S., R. 2 W., quarter corner between secs. 5 and 8, center of T road north.....	42 13 57.7	84 34 16.2	7,574
T. 3 S., R. 2 W., corner of secs. 4, 5, 8, and 9, center of crossroads.....	42 13 57.7	84 33 40.6	2,680
Crossroads.....	42 13 57.9	84 32 27.4	5,506
Crossroads.....	42 13 58.1	84 31 01.9	6,439
Jackson, 5 miles west of, 26 feet south by 25 feet east of corner of secs. 1, 2, 11, and 12, T. 3 S., R. 2 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915".....	42 13 57.8	84 30 08.9	3,983

Magnetic declination for north border of quadrangle, 0° 30' W.

**SPRINGPORT QUADRANGLE.**

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Crossroads.....	° ' " 42 15 59.6	° ' " 84 44 12.7	Feet. ....
T road north.....	42 15 58.9	84 43 02.6	5,270
Crossroads.....	42 15 28.4	84 42 30.5	3,917

Near east border of quadrangle.

Cohoon Corners, crossroads at.....	42 15 09.1	84 31 04.5	.....
T road west.....	42 15 42.6	84 31 04.6	3,390
T. 2 S., R. 2 W., corner of secs. 23, 24, 25, and 26, center of T road north.....	42 16 34.9	84 30 11.5	6,637
T. 1 N., R. 2 W., corner of secs. 23, 24, 25, and 26, center of T road north.....	42 27 02.9	84 30 07.5	.....
T. 1 N., R. 2 W., corner of secs. 13, 14, 23, and 24, center crossroads.....	42 27 55.0	84 30 07.5	5,270
T. 1 N., R. 2 W., corner of secs. 11, 12, 13, and 14, center of crossroads.....	42 28 47.2	84 30 08.0	5,280
T. 1 N., R. 2 W., corner of secs. 1, 2, 11, and 12, center of T road east.....	42 29 39.2	84 30 08.6	5,265
Tps. 1 and 2 N., R. 2 W., corner of secs. 1 and 2, center of crossroads, 15 feet west is corner secs. 35 and 36, T. 2 N., R. 2 W.....	42 30 33.6	84 30 09.1	5,513

Through center of quadrangle.

T. 1 S., R. 2 W., quarter corner between secs. 22 and 23, center of T road south.....	42 22 16.6	84 31 20.0	.....
Tompson Corner, T road north.....	42 22 21.9	84 32 30.6	5,330
T road west.....	42 22 42.8	84 33 20.3	4,290
T. 1 S., R. 2 W., corner secs. 17, 18, 19, and 20, center of T road north.....	42 22 42.7	84 34 51.3	6,834
T. 1 S., Rs. 2 and 3 W., corner of secs. 13, 18, 19, and 24, center of crossroads.....	42 22 42.6	84 36 02.0	5,310
Springport, 4 miles east of, 25 feet south by 29 feet east of corner of secs. 13, 14, 23, and 24, T. 1 S., R. 3 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915".....	42 22 41.2	84 37 12.8	5,316
T road east.....	42 22 41.8	84 38 06.0	3,995
T. 1 S., R. 3 W., corner of secs. 15, 16, 21, and 22, center of T road west.....	42 22 41.7	84 39 34.8	6,066
T. 1 S., R. 3 W., corner of secs. 16, 17, 20, and 21, center of crossroads.....	42 22 41.5	84 40 45.8	5,330
Springport, New York Central R. R. crossing.....	42 22 41.4	84 41 33.6	3,590
T. 1 S., R. 3 W., corner of secs. 17, 18, 19, and 20, center of crossroads.....	42 22 41.2	84 41 56.5	1,719
T. 1 S., Rs. 3 and 4 W., corner of secs. 18 and 19, fence line.....	42 22 41.5	84 43 07.3	5,320
Crossroads.....	42 22 53.8	84 44 00.3	4,169

Magnetic declination through center of quadrangle, 1° W.; for east border, 0° 45' W.; for south border, 0° 30' W.

## STOCKBRIDGE QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Crossroads at schoolhouse.....	42 24 12.4	84 14 47.1	.....
T road south.....	42 25 28.5	84 14 36.2	7,742

## Galesburg, Hasting, Kalamazoo, and Wayland quadrangles.

## ALLEGAN, BARRY, AND KALAMAZOO COUNTIES.

The following geographic positions were determined by Oscar Jones in 1915 and are based on primary traverse positions by J. R. Ellis, 1911. (See Bulletin 551.) All are on North American datum.

## GALESBURG QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 2 S., R. 10 W., corner of secs. 16, 17, 20, and 21, center of T road north.....	42 17 18.5	85 29 33.2	.....
T. 2 S., R. 10 W., corner of secs. 8, 9, 16, and 17, center of T road south.....	42 18 10.8	85 29 33.5	5,300
T. 2 S., R. 10 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	42 18 10.7	85 28 23.3	5,270
T. 2 S., R. 10 W., corner of secs. 3, 4, 9, and 10, center of T road south.....	42 19 02.9	85 28 23.9	5,288
T. 2 S., R. 10 W., corner of secs. 4, 5, 8, and 9, center of T road north.....	42 19 03.0	85 29 34.3	5,287
T. 2 S., R. 10 W., corner of secs. 4 and 5, center of T road south.....	42 19 57.6	85 29 34.8	5,540
Crossroads.....	42 20 24.9	85 29 36.7	2,770
T. 1 S., R. 10 W., corner of secs. 28, 29, 32, and 33, center of T road west.....	42 20 49.8	85 29 37.3	2,519
T. 1 S., R. 10 W., corner of secs. 20, 21, 28, and 29, center of T road west.....	42 21 42.0	85 29 38.6	5,291
Springbrook, 2 miles south of, 24 feet south by 28 feet east, corner of secs. 16, 17, 20, and 21, T. 1 S., R. 10 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915.".....	42 22 34.4	85 29 40.2	5,314

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Springbrook, crossing of Kalamazoo, Lake Shore & Chicago Ry. with Michigan Electric interurban.....	42 24 04.3	85 29 48.8	.....
Springbrook, 1 mile northeast of, at crossing of Kalamazoo, Lake Shore & Chicago Ry.....	42 24 45.0	85 29 15.2	4,831
T. 1 N., R. 10 W., quarter corner between secs. 33 and 34, center of crossroads.....	42 25 41.9	85 29 03.3	5,822
T road west.....	42 27 26.7	85 29 24.4	10,725
Crossroads.....	42 27 52.9	85 29 33.7	2,750
T. 1 N., R. 10 W., quarter corner between secs. 9 and 16, center of crossroads.....	42 28 45.1	85 29 38.1	5,287
Crossroads.....	42 29 46.2	85 29 38.3	6,188

Magnetic declination for west border of quadrangle, 1° 20' E.

**HASTING QUADRANGLE.**  
Near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Prairieville, 2 miles west of, 7 feet east of quarter corner of sec. 4, T. 1 N., R. 10 W., 35 feet south by 30 feet west of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915"	° ' "	° ' "	Feet.
	42 30 30.7	85 29 39.2	.....

Magnetic declination for southwest corner of quadrangle, 2° 0' E.

**KALAMAZOO QUADRANGLE.**  
Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 2 S., R. 12 W., quarter corner between secs. 20 and 21, center of crossroads.....	° ' "	° ' "	Feet.
T. 2 S., R. 12 W., corner of secs. 20, 21, 28, and 29, center of T road east.....	42 16 52.0	85 43 34.2	.....
T. 2 S., R. 12 W., quarter corner between secs. 28 and 29, center of T road east.....	42 16 25.8	85 43 34.3	2,640
Miller, crossing Michigan Central R. R.....	42 15 59.6	85 43 34.6	2,650
T. 2 S., R. 12 W., quarter corner between secs. 26 and 27, center of T road west.....	42 16 00.3	85 42 29.9	4,870
Oshetmo, crossroads at.....	42 16 00.5	85 41 14.8	5,648
T. 2 S., Rs. 11 and 12 W., corner of secs. 25, 20, 31, and 36, center of crossroads.....	42 15 32.5	85 40 39.8	3,863
T road west.....	42 15 35.5	85 38 54.6	7,916
T. 2 S., R. 11 W., corner of secs. 27, 28, 33, and 34, center of T road east.....	42 15 34.8	85 36 51.3	9,278
Burdock Street school, center of crossroads at school.....	42 15 34.8	85 35 23.2	6,625
T. 2 S., R. 11 W., corner of secs. 25, 26, 35, and 36, center of T road north.....	42 15 34.4	85 34 47.7	2,668
T. 2 S., Rs. 10 and 11 W., corner of secs. 25 and 26, center of T road west.....	42 15 34.3	85 33 02.5	7,908
Comstock, 2 miles south of, 30 feet east of center of T road east, and corner of secs. 29, 30, 31, and 32, T. 2 S., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915".....	42 15 34.1	85 31 51.4	5,350
	42 15 34.1	85 30 42.6	5,170

North near east border of quadrangle.

Comstock, T road south at.....	42 17 18.6	85 30 48.6	10,587
Springbrook, 1 mile southwest of Kalamazoo, Lake Shore & Chicago Ry. crossing.....	42 23 30.7	85 30 15.8	.....

Through center of quadrangle.

T road west.....	42 22 47.6	85 30 14.8	.....
T. 1 S., Rs. 10 and 11 W., quarter corner between secs. 13 and 18, center of T road east.....	42 23 01.2	85 31 55.2	7,662
T. 1 S., Rs. 10 and 11 W., corner of secs. 13, 24, 18, and 19, center of T road west.....	42 22 34.6	85 31 55.3	2,691
Crossroads at cemetery.....	42 22 34.5	85 33 09.5	5,567
Coopers, crossing, Lake Shore & Michigan Southern R. R.....	42 22 34.7	85 34 27.7	5,870
T. 1 S., R. 11 W., corner of secs. 15, 16, 21, and 22, center of T road south.....	42 22 35.3	85 35 26.5	4,415
Cooper Center, 20 feet north by 50 feet east of corner of secs. 16, 17, 20, and 21, T. 1 S., R. 11 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915".....	42 22 35.5	85 36 36.8	5,276
T. 1 S., R. 11 W., corner of secs. 17, 18, 19, and 20, center of crossroads.....	42 22 35.3	85 37 48.7	5,397
T. 1 S., Rs. 11 and 12 W., corner of secs. 18 and 19, corner of secs. 13 and 24, 25 feet south of crossroads.....	42 22 35.3	85 38 57.3	5,149
T. 1 S., R. 12 W., corner of secs. 13, 14, 23, and 24, fence line.....	42 22 32.8	85 40 08.2	5,328
T. 1 S., R. 12 W., corner of secs. 15, 16, 21, and 22, center of crossroads at Alamo.....	42 22 30.1	85 42 28.7	10,552
T. 1 S., R. 12 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	42 23 22.2	85 42 31.0	5,283
T. 1 S., R. 12 W., corner of secs. 8, 9, 16, and 17, fence line north and south.....	42 23 22.1	85 43 41.5	5,289

Magnetic declination for south border of quadrangle, 0° 30' E.; for center, 1° 30' E.

**WAYLAND QUADRANGLE.**  
Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Crossroads.....	42 30 30.7	85 30 40.2	.....
T road northwest.....	42 30 16.6	85 32 01.9	6,275
T road southwest.....	42 30 53.0	85 32 34.9	4,432
T road west.....	42 30 31.6	85 32 58.2	2,780
Hooper station, road crossing of Michigan Ry. Co. electric line....	42 30 36.6	85 33 46.5	3,653
T. 2 N., R. 10 W., corner of secs. 35 and 36.....	42 30 31.9	85 33 47.0	480
T. 2 N., R. 10 W., corner of secs. 34 and 35, center of T road north..	42 30 31.8	85 34 57.4	5,270
T. 2 N., R. 10 W., corner of secs. 33 and 34, center of T road north..	42 30 31.4	85 36 08.0	5,290
Monteith, 1 mile south of, 23 feet north by 72 feet west of, corner of secs. 32 and 33, T. 2 N., R. 10 W., center of T road north, 23 feet north by 63 feet east of, corner of secs. 4 and 5, T. 1 N., R. 10 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915".....	42 30 30.8	85 37 19.9	5,381
T. 2 N., R. 11 W., corner of secs. 31 and 32, 30 feet west of center of crossroads.....	42 30 29.6	85 38 29.4	5,210
Tps. 1 and 2 N., Rs. 11 and 12 W., township corner, center of T road north.....	42 30 28.6	85 39 43.0	5,510
Tps. 1 and 2 N., R. 12 W., corner of secs. 1, 2, 35, and 36, center of crossroads.....	42 30 28.5	85 40 53.6	5,288
T. 2 N., R. 12 W., corner of secs. 34 and 35, center of T road north..	42 30 28.4	85 42 04.0	5,270
T. 1 N., R. 12 W. corner of secs. 3 and 4, center of T road south....	42 30 28.3	85 43 15.0	5,320
Abronia, Lake Shore & Michigan Southern R. R. crossing, 360 feet south of station.....	42 30 31.1	85 44 28.1	5,481

Magnetic declination for south border of quadrangle, 1° 0' E.

**Cedar Springs, Grove, Ravenna, and Smyrna quadrangles.**

**KENT COUNTY.**

The following geographic positions on approximate North American datum were determined by primary traverse in 1915, by Oscar Jones, based upon positions of 1911, published in Bulletin No. 551.

**CEDAR SPRINGS QUADRANGLE.**  
Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 10 N., R. 10 W., corner secs. 16, 17, 20, and 21; T road west....	43 14 58.3	85 30 41.3	.....
T. 10 N., R. 10 W., corner secs. 17, 18, 19, and 20; T road east....	43 14 58.1	85 31 53.2	5,320
T. 10 N., R. 10 W., corner secs. 19, 20, 29, and 30; crossroads.....	43 14 05.5	85 31 52.4	5,320
T road east.....	43 13 54.3	85 33 05.8	5,546
T. 10 N., R. 11 W., quarter corner between secs. 23 and 24; T road west.....	43 14 30.0	85 34 17.5	.....
T. 10 N., R. 11 W., quarter corner between secs. 22 and 23, crossroads.....	43 14 29.6	85 35 29.4	5,320
T. 10 N., R. 11 W., corner of secs. 14, 15, 22, and 23; T road west..	43 14 55.6	85 35 29.7	2,630
Cedar Springs, 3 miles west and 2 miles north of, 34 feet west by 30 feet south of crossroads and corner of secs. 15, 16, 21, and 22, T. 10 N., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915".....	43 14 54.6	85 36 42.0	5,354
T. 10 N., R. 11 W., corner secs. 17, 18, 19, and 20; T road north....	43 14 54.8	85 39 04.8	10,568
T. 10 N., Rs. 11 and 12 W., corner secs. 13, 18, 19, and 24; stone post..	43 14 56.0	85 40 20.9	5,635
T road west.....	43 14 03.5	85 40 20.3	5,321
T road north.....	43 14 04.2	85 41 32.6	5,350
T. 10 N., R. 12 W., corner secs. 22, 23, 26, and 27; T road south....	43 14 04.0	85 42 43.8	5,275
T. 10 N., R. 12 W., quarter corner secs. 22 and 27; crossroads at schoolhouse.....	43 14 04.1	85 43 19.4	2,630
T. 10 N., R. 12 W., quarter corner between secs. 15 and 22; crossroads.....	43 14 56.5	85 43 20.1	5,298
T. 10 N., R. 12 W., corner secs. 15, 16, 21, and 22; crossroads.....	43 14 56.4	85 43 55.6	2,630
T. 8 N., R. 12 W., corner secs. 4, 5, 8, and 9; crossroads.....	43 06 09.6	85 44 56.3	.....
T. 8 N., R. 12 W., corner secs. 8, 9, 16, and 17; crossroads.....	43 05 17.7	85 44 55.6	5,260
T. 8 N., R. 12 W., corner secs. 16, 17, 20, and 21; crossroads.....	43 04 25.5	85 44 55.5	5,280
T. 8 N., R. 12 W., corner secs. 20, 21, 25, and 29; T case north.....	43 03 33.7	85 44 55.9	5,250
Tps. 7 and 8 N., R. 12 W., quarter corner between secs. 4 and 33; crossroads.....	43 01 48.7	85 44 20.5	10,946
T. 8 N., R. 12 W., quarter corner between secs. 4 and 9; T road north.....	43 00 55.5	85 44 19.4	5,391



## CEDAR SPRINGS QUADRANGLE—Continued.

East through center of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 9 N., R. 12 W., corner secs. 33 and 34; fence line north.....	43 07 02.8	85 43 49.0	.....
T. 9 N., R. 12 W., corner secs. 34 and 35; T road north.....	43 07 01.7	85 42 37.4	5,310
T. 8 N., R. 12 W., corner secs. 1 and 2; crossroads.....	43 07 00.6	85 41 25.5	5,336
Tps. 8 and 9 N., Rs. 11 and 12 W., corner of secs. 1, 6, 31, and 36; crossroads.....	43 07 00.1	85 40 13.9	5,305
Tps. 8 and 9 N., R. 11 W., corner of secs. 5, 6, 31, and 32; T road north.....	43 07 00.3	85 39 03.8	5,200
Rockford, 3 miles west of, 32 feet north by 32 feet east, T road north, corner of secs. 4, 5, 32, and 33, Tps. 8 and 9 N., R. 11 W.; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915".....	43 07 01.6	85 36 39.7	10,690
T road north.....	43 07 02.0	85 35 07.7	6,824
T road south.....	43 07 02.8	85 33 57.2	5,230
Rockford, center of main track Grand Rapids & Indiana R. R., 460 feet south of station.....	43 07 11.6	85 33 41.5	1,465
Tps. 8 and 9 N., Rs. 10 and 11 W., corner secs. 1, 6, 31 and 36....	43 07 03.1	85 33 04.0	2,914
T road north.....	43 07 13.6	85 31 51.1	5,506
Tps. 8 and 9 N., R. 10 W., corner of secs. 4, 5, 32, and 33, road fork..	43 07 03.6	85 30 39.6	5,409

Magnetic declination for north border of quadrangle, 0° 40' W.; for center, 0° 0'.

## GROVE QUADRANGLE.

Near south border.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 10 N., R. 11 W., quarter corner between secs. 13 and 18; crossroads.....	43 15 22.8	85 33 06.1	.....
White Creek school and church, T. 10 N., R. 11 W., quarter corner secs. 14 and 13; crossroads.....	43 15 22.0	85 34 17.4	5,278

## RAVENNA QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Kent City, 2 miles north of, 34 feet south by 24 feet west of, corner of secs. 16, 17, 20, and 21, T. 10 N., R. 12 W., at crossroads; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915.".....	43 14 55.3	85 45 07.3	.....
T. 10 N., R. 12 W., corner of secs. 20, 21, 28, and 29; crossroads....	43 14 03.2	85 45 06.5	5,278
Kent City, corner of secs. 28, 29, 32, and 33, T. 10 N., R. 12 W., crossroads.....	43 13 10.7	85 45 05.4	5,316
T. 10 N., R. 12 W., corner of secs. 32 and 33; 20 feet east is corner of secs. 4, 5, T. 9 N., R. 12 W.....	43 12 18.4	85 45 04.5	5,300
T. 9 N., R. 12 W., corner of secs. 4, 5, 8, and 9; crossroads.....	43 11 26.2	85 45 03.6	5,279
T. 9 N., R. 12 W., corner of secs. 8, 9, 16, and 17, crossroads at schoolhouse.....	43 10 33.7	85 45 02.8	5,320
T. 9 N., R. 12 W., corner of secs. 16, 17, 20, and 21; crossroads....	43 09 41.3	85 45 01.7	5,300
T. 9 N., R. 12 W., corner of secs. 20, 21, 28, and 29; crossroads....	43 08 48.9	85 45 01.2	5,310
T. 9 N., R. 12 W., corner of secs. 28, 29, 32, and 33; T road east....	43 07 56.5	85 45 00.8	5,299
Ballardsville, 3 miles west of; 31 feet south by 24 feet east of T road north and corner of secs. 32 and 33, T. 9 N., R. 12 W.; iron post stamped "Prim. Trav. Sta. No 4, Mich. 1915.".....	43 07 03.6	85 45 00.4	5,358
T. 8 N., R. 12 W., corner of secs. 5, 6, 7, and 8; T road south.....	43 00 57.8	85 46 06.1	.....
Walker station, at crossroads, 30 feet south by 30 feet west of corner of secs. 7, 8, 17, and 18, T. 7 N., R. 12 W.; iron post stamped "Prim. Trav. Sta. No. 11, Mich. 1911.".....	43 00 05.0	85 46 04.1	5,340

Magnetic declination for northeast corner of quadrangle, 1° 20' W.; for southeast corner, 1° 20' E.

## SMYRNA QUADRANGLE.

North along public highway near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Ada, 3 miles north by 0.5 mile east of, 300 feet south of corner of secs. 10, 11, 14, and 15, T. 7 N., R. 10 W., at fork of road; iron post stamped "Prim. Trav. Sta. No. 14, Mich. 1911"	° ' "	° ' "	<i>Fect.</i>
T road west.....	43 00 01.4	85 28 18.3	.....
T. 7 N., R. 10 W., corner secs. 2 and 3, T road south; 200 feet east is T road north, corner secs. 34 and 35, T. 8 N., R. 10 W.....	43 00 56.5	85 28 27.6	5,621
T. 8 N., R. 10 W., corner secs. 26, 27, 34, and 35; crossroads.....	43 01 43.0	85 28 17.3	4,761
Cannonsburg, T road south.....	43 02 35.2	85 28 14.2	5,298
T. 8 N., R. 10 W., center sec. 2; cross roads.....	43 03 14.8	85 28 13.0	4,006
T. 8 N., R. 10 W., quarter corner between secs. 10 and 15; T road south.....	43 03 53.3	85 28 49.9	4,773
T. 8 N., R. 10 W., corner of secs. 10, 11, 14, and 15; T road north.....	43 05 11.4	85 28 50.1	7,909
T. 8 N., R. 10 W., corner secs. 2, 3, 10, and 11; crossroads at school-house.....	43 05 11.9	85 28 14.4	2,651
Rockford, 5 miles east of, 15 feet south of T road north and corner secs. 34 and 35, T. 9 N., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915"	43 06 04.1	85 28 14.5	5,280
T. 9 N., R. 10 W., corner secs. 26, 27, 34, and 35; T road west.....	43 07 04.3	85 28 16.6	6,098
T. 9 N., R. 10 W., corner secs. 22, 23, 26, and 27; fence line east and west.....	43 07 56.8	85 28 16.5	5,310
T. 9 N., R. 10 W., corner secs. 14, 15, 22, and 23; T road south.....	43 08 49.0	85 28 16.5	5,290
T. 9 N., R. 10 W., corner secs. 10, 11, 14, and 15; T road north.....	43 09 41.4	85 28 16.8	5,310
T. 9 N., R. 10 W., corner secs. 2, 3, 10, and 11; T road west.....	43 10 34.0	85 28 14.1	5,322
Tps. 9 and 10 N., R. 10 W., corner secs. 2, 3, 34, and 35; T road south.....	43 11 26.4	85 28 14.2	5,310
T. 10 N., R. 10 W., corner secs. 26, 27, 34, and 35; T road west.....	43 12 21.8	85 28 14.1	5,600
T. 10 N., R. 10 W., corner secs. 22, 23, 26, and 27; crossroads.....	43 13 13.9	85 28 17.4	5,286
Cedar Springs, 2 miles north and 4 miles east of, 19 feet west by 32 feet south of crossroads and corner secs. 14, 15, 22, and 23, T. 10 N., R. 10 W.; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915"	43 14 06.2	85 28 17.8	5,299
T. 10 N., R. 10 W., corner secs. 15, 16, 21, and 22; T road east.....	43 14 58.3	85 28 18.3	5,269
	43 14 58.6	85 29 29.5	5,269

Magnetic declination for west border of quadrangle, 0° 30' W.

Near east border of quadrangle.

T. 10 N., R. 8 W., corner of secs. 21, 22, 27, and 28, center of crossroads.....	° ' "	° ' "	<i>Fect.</i>
T. 10 N., R. 8 W., corner of secs. 27, 28, 33, and 34, fence line.....	43 14 08.2	85 15 09.1	.....
T. 10 N., R. 8 W., corner of secs. 33 and 34, 10 feet west, corner of secs. 3 and 4, T. 9 N., R. 8 W., center of T road west.....	43 13 15.8	85 15 09.8	5,310
Pere Marquette R. R. crossing.....	43 12 23.3	85 15 10.5	5,320
T. 9 N., R. 8 W., corner of secs. 3, 4, 9, and 10, center of T road east.....	43 12 13.3	85 15 11.4	1,010
T. 9 N., R. 8 W., corner of secs. 9, 10, 15, and 16, street crossing, Greenville.....	43 11 31.1	85 15 11.7	4,270
Greenville, intersection south Lafayette Street and Fairplain Street, quarter corner between secs. 15 and 16, T. 9 N., R. 8 W.....	43 10 39.0	85 15 12.1	5,280
T. 9 N., R. 8 W., corner of secs. 15, 16, 21, and 22, fence line.....	43 10 12.8	85 15 12.2	2,658
Crossroads.....	43 09 46.6	85 15 12.2	2,650
Belding, 2 miles west by 1.5 miles north of, 25 feet south by 31 feet east, is quarter corner of sec. 4, T. 8 N., R. 8 W., center of T road south, 25 feet south by 114 feet east, quarter corner of sec. 33, T. 9 N., R. 8 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 17, Mich. 1915"	43 08 54.1	85 15 47.7	5,927
Smyrna, west end of iron bridge over Flat River.....	43 07 09.4	85 15 46.4	10,602
Smyrna, center of crossroads, quarter corner between secs. 21 and 28, T. 8 N., R. 8 W.....	43 03 31.6	85 15 18.1	.....
T. 8 N., R. 8 W., center of secs. 21, center of T road west.....	43 03 33.5	85 15 47.2	2,173
T. 8 N., R. 8 W., quarter corner between secs. 9 and 16, center of crossroads.....	43 03 59.9	85 15 46.9	2,675
T. 8 N., R. 8 W., quarter corner between secs. 4 and 9, center of crossroads.....	43 05 18.3	85 15 46.0	7,939
T. 8 N., R. 8 W., center of sec. 4, center of crossroads.....	43 06 10.2	85 15 45.8	5,258
	42 06 36.4	85 15 46.3	2,684

Near south border of quadrangle.

Vergennes, 1 mile south and 2 miles west of, 27 feet north by 14 feet west is corner of secs. 8, 9, 16, and 17, T. 7 N., R. 9 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 25, Mich. 1915"			
T. 7 N., R. 9 W., corner of secs. 7, 8, 17, and 18, center of crossroads.....	43 00 06.8	85 23 29.5	.....
T. 7 N., R. 10 W., quarter corner between secs. 12 and 13, center of crossroads.....	43 00 06.1	85 24 40.1	5,246
	43 00 06.2	85 26 28.7	8,072

Magnetic declination near west border of quadrangle, 0° 30' W.; near east border, 0° 30' W.; near south border, 0° 30' W.

Clare, Edmore, Fenwick, Howard City, Ionia, Ithaca, Lowell, Mount Pleasant, Remus, Sears, and Vestaburg quadrangles.

BARRY, CLINTON, EATON, GRATIOT, IONIA, ISABELLA, KENT, AND MONTCALM COUNTIES.

The following geographic positions were determined by primary traverse in 1915, by Oscar Jones, and are based on primary traverse positions determined by J. R. Ellis in 1912, and J. H. Wilson in 1913, on approximate North American datum.

CLARE QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 16 N., R. 4 W., corner of secs. 19, 20, 29, and 30, center of T road west.....	° ' " 43 45 22.7	° ' " 84 49 39.3	<i>Fect.</i> .....
T. 16 N., Rs. 4 and 5 W., corner of secs. 19, 24, 25, and 30, center of crossroads.....	43 45 21.8	84 50 55.5	5,589
T. 16 N., R. 5 W., corner of secs. 23, 24, 25, and 26, center of T road south.....	43 45 20.7	84 52 06.0	5,179
Gilmore, 35 feet north by 27 feet east, of corner of secs. 22, 23, 26, and 27, T. 16 N., R. 5 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915.".....	43 45 20.6	84 53 17.5	5,248
T. 16 N., R. 5 W., corner of secs. 21, 22, 27, and 28, center of crossroads.....	43 45 20.3	84 54 29.9	5,317
T. 16 N., R. 5 W., corner of secs. 20, 21, 23, and 29, center of crossroads.....	43 45 20.2	84 55 41.7	5,270
T. 16 N., Rs. 5 and 6 W., corner of secs. 19, 24, 25, and 30, center of crossroads.....	43 45 19.8	84 58 06.1	10,598
T. 16 N., R. 6 W., corner of secs. 23, 24, 25, and 26, center of crossroads.....	43 45 19.7	84 59 18.0	5,280

Magnetic declination for south border of quadrangle, 1° 30' W.

EDMORE QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 10 N., R. 6 W., corner of secs. 8, 9, 16, and 17, center of crossroads.....	° ' " 43 15 50.6	° ' " 85 02 00.9	<i>Fect.</i> .....
T. 10 N., R. 6 W., corner of sec. 4, 5, 8, and 9, center of crossroads.....	43 16 42.7	85 02 01.1	5,278
T. 10 N., R. 6 W., corner of secs. 4 and 5, center of T road south.....	43 17 32.9	85 02 03.0	5,080
T. 11 N., R. 6 W., corner of secs. 33 and 34, center of T road north.....	43 17 32.8	85 01 29.7	2,460
T. 11 N., R. 6 W., corner of secs. 27, 28, 33, and 34, center of crossroads.....	43 18 24.9	85 01 28.5	5,270
T. 11 N., R. 6 W., corner of secs. 21, 22, 27, and 28, center of crossroads.....	43 19 16.7	85 01 28.3	5,250
T. 11 N., R. 6 W., corner of secs. 15, 16, 21, and 22, center of crossroads.....	43 20 08.8	85 01 28.0	5,270
T. 11 N., R. 6 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	43 21 01.0	85 01 27.8	5,290
T. 11 N., R. 6 W., corner of secs. 3, 4, 9, and 10, center of T road east.....	43 21 52.8	85 01 27.8	5,240
Edmore, 2 miles south by 1 mile east of, 31 feet south by 33 feet west of corner of secs. 3 and 4, T. 11 N., R. 6 W., 31 feet south by 49 feet west of corner of secs. 33 and 34, T. 12 N., R. 6 W., crossroads; iron post stamped "Prim. Trav. Sta. No. 12, Mich. 1915.".....	43 22 44.6	85 01 28.3	5,245
T. 12 N., R. 6 W., corner of secs. 34 and 35, center of T road north.....	43 22 44.9	85 00 16.5	.....
T. 12 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	43 23 36.9	85 00 16.4	5,278
T. 12 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	43 24 28.8	85 00 17.3	5,258
T. 12 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 25 20.8	85 00 18.1	5,260
T. 12 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of T road east.....	43 26 12.7	85 00 18.2	5,260
T. 12 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	43 27 04.7	85 00 18.7	5,260
T. 13 N., R. 6 W., corner of secs. 34 and 35, center of crossroads.....	43 27 57.7	85 00 18.2	5,370
T. 13 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of T road east.....	43 28 49.8	85 00 19.1	5,279
T. 13 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of T road east.....	43 29 42.0	85 00 20.0	5,280

**EDMORE QUADRANGLE—Continued.**

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 10 N., R. 7 W., corner of secs. 17, 18, 19, and 20, center of T road south.	43 15 00.3	85 10 26.1	.....
T. 10 N., Rs. 7 and 8 W., corner of secs. 13, 18, 19, and 24, center of T road north.	43 15 00.9	85 11 33.8	5,009
T. 10 N., R. 8 W., corner of secs. 13, 14, 23, and 24, center of T road north.	43 15 00.5	85 12 45.0	5,267

Magnetic declination for east border of quadrangle, 0° 45' W.; for south border, 0° 45' W.

**FENWICK QUADRANGLE.**

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 10 N., R. 6 W., corner of secs. 15, 16, 21, and 22, center of crossroads.	43 14 58.8	85 00 49.5	.....
T. 10 N., R. 6 W., corner of secs. 16, 17, 20, and 21, center of crossroads.	43 14 58.8	85 02 00.9	5,280
T. 10 N., R. 6 W., corner of secs. 17, 18, 19, and 20, center of crossroads.	43 14 58.8	85 03 12.4	5,290
T. 10 N., R. 7 W., corner of secs. 13 and 24, center of T road west.	43 14 59.5	85 04 25.5	5,407
T. 10 N., R. 7 W., corner of secs. 13, 14, 23, and 24, center of T road north.	43 14 59.9	85 05 37.5	5,329
Sidney, 1 mile east of, 28 feet south by 17 feet west, is corner of secs. 14, 15, 22, and 23, T. 10 N., R. 7 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 15, Mich. 1915".	43 14 59.9	85 06 49.5	5,324
Pere Marquette R. R. crossing.	43 15 00.0	85 07 36.6	3,489
Sidney, crossroads at corner of secs. 15, 16, 21, and 22, T. 10 N., R. 7 W.	43 15 00.0	85 08 00.4	1,760
T. 10 N., R. 7 W., corner of secs. 16, 17, 20, and 21, center of crossroads.	43 14 58.5	85 09 12.5	5,340
T. 10 N., R. 8 W., corner of secs. 14, 15, 22, and 23.	43 14 59.2	85 13 58.3	.....

Near west border of quadrangle.

Crossroads at schoolhouse.	43 01 50.5	85 14 54.0	.....
Crossroads.	43 02 16.5	85 14 54.0	2,636
Crossroads.	43 03 08.3	85 14 53.7	5,246

Near south border of quadrangle.

T. 7 N., R. 6 W., corner of secs. 9, 10, 15, and 16, center of road fork.	43 00 06.7	85 00 54.5	.....
T. 7 N., R. 6 W., corner of secs. 7, 8, 17, and 18, fence line.	43 00 07.2	85 03 16.9	.....
T. 7 N., R. 6 W., quarter corner between secs. 7 and 8, center of crossroads.	43 00 33.4	85 03 17.3	2,655
T. 7 N., R. 6 W., quarter corner west side of sec. 7, 25 feet south is quarter corner east side sec. 12, T. 7 N., R. 7 W., crossroads.	43 00 33.4	85 04 30.6	5,449
T. 7 N., R. 7 W., center of sec. 12, center of T road north.	43 00 33.2	85 05 05.9	2,618
T. 7 N., R. 7 W., center of sec. 12, center of T road north.	43 00 33.2	85 06 16.8	5,265
Ionia, 3 miles west and 2 miles north of, 18 feet south by 32 feet east is quarter corner between secs. 10 and 11, T. 7 N., R. 7 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 23, Mich. 1915".	43 00 32.7	85 06 51.8	2,603
T. 7 N., R. 7 W., quarter corner between secs. 9 and 10, center of crossroads.	43 00 33.5	85 08 03.6	5,332
T. 7 N., R. 7 W., corner of secs. 9, 10, 15, and 16, center of T road east.	43 00 07.5	85 08 03.7	2,630
T. 7 N., R. 7 W., quarter corner between secs. 7 and 18, center of T road north.	43 00 07.3	85 09 50.6	.....
T. 7 N., R. 7 W., corner of secs. 7, 8, 17, and 18, center of crossroads.	43 00 07.3	85 10 26.3	2,648
T. 7 N., R. 7 W., corner of secs. 7 and 18, 25 feet south is corner of secs. 12 and 13, T. 7 N., R. 8 W., fence line.	43 00 07.4	85 11 37.8	5,312
T. 7 N., R. 8 W., corner of secs. 11, 12, 13, and 14, center of T road east.	43 00 07.3	85 12 48.9	5,279
T. 7 N., R. 8 W., quarter corner between secs. 11 and 12, center of T road west.	43 00 33.5	85 12 48.7	2,650

**FENWICK QUADRANGLE—Continued.**

Near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 7 N., R. 8 W., center of sec. 11, center of T road north.....	43 00 33.7	85 13 24.4	2,648
T. 7 N., R. 8 W., quarter corner between secs. 10 and 11, center of T road south.....	43 00 33.8	85 13 59.6	2,612
T road east.....	43 00 39.2	85 14 53.5	4,044
Saranac, 5 miles north by 2 miles west of; 17 feet north by 22 feet west is center of T road north; iron post stamped "Prim. Trav. Sta. No. 24, Mich. 1915".....	43 00 07.0	85 14 53.4	3,263

**Through center of quadrangle.**

Crossroads.....	43 07 10.0	85 14 54.0	.....
East end of iron bridge over White River.....	43 07 11.0	85 13 28.3	6,506
T. 9 N., R. 8 W., corner of secs. 35 and 36, center of T road north....	43 07 11.1	85 12 48.6	2,785
Pere Marquette R. R. crossing.....	43 07 37.5	85 12 48.6	2,680
T. 9 N., R. 8 W., corner of secs. 25, 26, 35, and 36, center of T road east.....	43 08 03.2	85 12 48.7	2,600
T. 9 N., Rs. 7 and 8 W., corner of secs. 25, 30, 31, and 36, center of T road south.....	43 08 03.0	85 11 37.3	5,295
T. 9 N., R. 7 W., corner of secs. 29, 30, 31, and 32, center of T road east.....	43 08 02.4	85 10 24.5	5,393
T. 9 N., R. 7 W., corner of secs. 28, 29, 32, and 33, center of crossroads.....	43 08 03.0	85 09 13.9	5,231
T. 8 N., R. 7 W., corner of secs. 4 and 5, center of T road east.....	43 07 11.2	85 09 18.4	5,253
Tps. 8 and 9 N., R. 7 W., corner of secs. 3, 4, 33, and 34, center of crossroads.....	43 07 11.5	85 08 06.0	5,355
Shiloh, 2 miles west and 1 mile north of, T road south; iron post stamped "Prim. Trav. Sta. No. 18, Mich. 1915".....	43 07 11.7	85 07 19.5	3,449
T. 9 N., R. 7 W., quarter corner between secs. 34 and 35, center of T road north.....	43 07 39.2	85 06 52.6	3,422
T. 9 N., R. 7 W., quarter corner between secs. 35 and 36, center of crossroads.....	43 07 38.6	85 05 41.5	5,266
Pere Marquette R. R. crossing.....	43 07 38.7	85 05 19.4	1,640
Tps. 8 and 9 N., Rs. 6 and 7 W., corner of secs. 1, 6, 31, and 36, center of T road north.....	43 07 12.7	85 04 30.3	3,734
Tps. 8 and 9 N., R. 6 W., corner of secs. 5, 6, 31, and 32, fence line..	43 07 12.5	85 03 17.6	5,390
Tps. 8 and 9 N., R. 6 W., corner of secs. 4, 5, 32, and 33, center of T road west.....	43 07 11.9	85 02 06.5	5,270
T. 8 N., R. 6 W., quarter corner between secs. 3 and 4, center of crossroads.....	43 06 44.5	85 00 55.2	5,972

Magnetic declination near north border of quadrangle, 0° 45' W.; near west border, 0° 30' W.; near south border, 0° 30' W.; through center, 0° 30' W.

**HOWARD CITY QUADRANGLE.**

Near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Greenville, 5 miles north of, 25 feet north by 29 feet west of, corner of secs. 15, 16, 21, and 22, T. 10 N., R. 8 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 16, Mich. 1915".....	43 15 01.1	85 15 09.0	.....

**IONIA QUADRANGLE.**

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T road north.....	42 59 32.0	85 01 37.6	.....
T road north.....	42 59 07.3	85 01 48.9	2,637
T road south.....	42 58 58.4	85 02 48.5	4,523
T. 7 N., R. 6 W., quarter corner between secs. 17 and 18, center of T road east.....	42 59 40.9	85 03 16.8	4,785
Crossroads.....	42 59 54.2	85 08 57.2	.....

## IONIA QUADRANGLE—Continued.

## Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Fect.</i>
T. 7 N., R. 8 W., quarter corner between secs. 15 and 22, center of crossroads.....	42 59 14.8	85 14 35.1	-----
T. 7 N., R. 8 W., corner of secs. 14, 15, 22, and 23, center of T road west.....	42 59 14.9	85 14 00.0	2,610
T. 7 N., R. 8 W., quarter corner between secs. 22 and 23, center of crossroads.....	42 58 48.8	85 14 00.4	2,646
T. 7 N., R. 8 W., quarter corner between secs. 26 and 27, center of crossroads.....	42 57 56.8	85 13 59.7	5,260
T. 7 N., R. 8 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	42 57 30.6	85 13 59.7	2,645
T. 7 N., R. 8 W., corner of secs. 34 and 35, 30 feet west is corner of secs. 2 and 3, T. 6 N., R. 8 W., crossroads.....	42 56 38.7	85 13 59.3	5,250
T. 7 N., R. 8 W., corner of secs. 35 and 36, center of T road north.....	42 56 38.6	85 12 48.2	5,290
Crossroads.....	42 56 18.2	85 12 49.1	2,062
T. 6 N., R. 8 W., corner of secs. 1, 2, 11, and 12, street crossing Saranac.....	42 55 46.4	85 12 48.2	3,209
T. 6 N., R. 8 W., corner of secs. 10, 11, 14, and 15, center of road fork.....	42 54 54.8	85 13 58.9	7,412
T. 6 N., R. 8 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	42 54 02.5	85 13 59.0	5,295
T. 6 N., R. 8 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	42 53 10.3	85 13 59.0	5,282
T. 6 N., R. 8 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	42 52 18.0	85 13 59.0	5,290
T. 5 N., R. 8 W., corner of secs. 2 and 3, 25 feet west is corner of secs. 34 and 35, T. 6 N., R. 8 W., center of T road west.....	42 51 25.6	85 13 58.7	5,304
T. 5 N., R. 8 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	42 50 31.6	85 13 57.9	5,466
Pere Marquette R. R. crossing.....	42 49 51.9	85 13 57.0	4,007
T. 5 N., R. 8 W., corner of secs. 10, 11, 14, and 15.....	42 49 39.1	85 13 56.8	1,293
T. 5 N., R. 8 W., quarter corner between secs. 22 and 23, center of crossroads.....	42 48 20.8	85 13 55.9	7,924
T. 5 N., R. 8 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	42 47 02.6	85 13 55.6	7,915
T. 4 N., R. 8 W., corner of secs. 2 and 3, 30 feet west, corner of secs. 34 and 35, T. 5 N., R. 8 E., center of crossroads.....	42 46 10.7	85 13 54.9	5,256
T. 4 N., R. 8 W., corner of secs. 2, 3, 10, and 11, center of T road north.....	42 45 19.4	85 13 54.0	5,188

## Through center of quadrangle.

T. 6 N., R. 8 W., corner of secs. 25, 26, 35, and 36, center of crossroads.....	42 52 17.8	85 12 48.2	-----
T. 6 N., Rs. 7 and 8 W., corner of secs. 25, 30, 31, and 36, center of crossroads.....	42 52 18.0	85 11 37.0	5,296
T. 6 N., R. 7 W., corner of secs. 29, 30, 31, and 32, center of crossroads.....	42 52 17.9	85 10 25.6	5,316
T. 6 N., R. 7 W., corner of secs. 28, 29, 32, and 33, center of crossroads.....	42 52 17.8	85 09 14.1	5,319
Clarksville, 2 miles north and 5.5 miles east of, 25 feet south by 32 feet west, corner of secs. 27, 28, 33, and 34, T. 6 N., R. 7 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 28, Mich. 1915.".....	42 52 17.6	85 08 03.6	5,247
T. 6 N., R. 7 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	42 52 17.6	85 06 52.1	5,322
T. 6 N., R. 7 W., corner of secs. 25, 26, 35, and 36, center of crossroads.....	42 52 17.6	85 05 41.2	5,278
T. 6 N., Rs. 6 and 7 W., corner of secs. 25, 30, 31, and 36, center of crossroads.....	42 52 17.5	85 04 30.2	5,289
T. 6 N., R. 6 W., corner of secs. 29, 30, 31, and 32, center of crossroads.....	42 52 17.2	85 03 14.8	5,611
T. 6 N., R. 6 W., quarter corner between secs. 28 and 33, center of T road south.....	42 52 17.0	85 01 28.6	7,902
T. 6 N., R. 6 W., corner of secs. 27, 28, 33, and 34, center of crossroads.....	42 52 17.0	85 00 53.1	2,640

## Near east border of quadrangle.

T. 7 N., R. 6 W., corner of secs. 27, 28, 33, and 34, fence line.....	42 57 29.8	85 00 54.6	-----
T. 7 N., R. 6 W., quarter corner between secs. 28 and 33, center of T road south.....	42 57 29.9	85 01 30.0	2,630
T. 7 N., R. 6 W., corner of secs. 28, 29, 32, and 33, center of T road north.....	42 57 30.0	85 02 05.3	2,627
T. 7 N., R. 6 W., quarter corner between secs. 29 and 32, center of T road east.....	42 57 30.2	85 02 40.7	2,633
Crossroads.....	42 58 19.7	85 02 48.3	5,044

Magnetic declination near north border of quadrangle, 0° 30' W.; near west border 0° 30' W.; near east border, 0° 30' W.; through center, 0° 30' W.

## ITHACA QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 11 N., R. 4 W., corner of secs. 23, 24, 25, and 26, center of T road north.....	° ' " 43 19 15.8	° ' " 84 44 46.5	Feet. ....
T. 11 N., R. 4 W., corner of secs. 25, 26, 35, and 36, center of T road north.....	43 18 23.6	84 44 46.6	5,283
T. 10 N., R. 4 W., corner of secs. 1 and 2, center of T road south.....	43 17 31.4	84 44 15.9	5,752
Crossroads.....	43 16 51.4	84 44 16.1	4,050
T. 10 N., R. 4 W., corner of secs. 11, 12, 13, and 14, center of crossroads.....	43 15 46.0	84 44 16.2	6,620

Magnetic declination for west border of quadrangle, 1° 15' W.

## LOWELL QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 7 N., R. 8 W., quarter corner between secs. 21 and 22, fence line.....	° ' " 42 58 48.7	° ' " 85 15 11.3	Feet. ....
T. 7 N., R. 8 W., quarter corner between secs. 20 and 21, center of crossroads.....	42 58 49.2	85 16 21.7	5,232
T. 7 N., R. 8 W., quarter corner between secs. 19 and 20, center of crossroads.....	42 58 49.4	85 17 33.3	5,318
T road north.....	42 59 01.3	85 18 44.2	5,403
Flat River, east end of covered bridge over.....	42 58 50.2	85 19 36.2	4,030
T road east.....	42 58 36.0	85 20 57.8	6,231
T. 7 N., R. 9 W., quarter corner between secs. 22 and 23, center of crossroads.....	42 58 49.2	85 21 06.8	1,494
T. 7 N., R. 9 W., corner of secs. 14, 15, 22, and 23, center of T road west.....	42 59 15.2	85 21 06.6	2,626
T. 7 N., R. 9 W., quarter corner between secs. 14 and 15, center of T road west.....	42 59 41.5	85 21 06.8	2,665
Pere Marquette R. R. crossing.....	42 59 41.3	85 21 33.6	1,990
T. 7 N., R. 9 W., quarter corner between secs. 15 and 16, center of crossroads.....	42 59 41.1	85 22 18.1	3,310

Through center of quadrangle.

Whitneyville, crossing Pere Marquette R. ....	42 52 14.1	85 27 28.8	.....
T. 6 N., R. 10 W., corner of secs. 25, 26, 35, and 36, center of T road north.....	42 52 14.5	85 26 57.4	2,330
T. 6 N., Rs. 9 and 10 W., corner of secs. 25, 30, 31, and 36, center of crossroads.....	42 52 15.2	85 25 46.6	5,270
T. 6 N., R. 9 W., corner of secs. 29, 30, 31, and 32, center of crossroads.....	42 52 15.5	85 24 37.4	5,153
T. 6 N., R. 9 W., corner of secs. 28, 29, 32, and 33, center of crossroads.....	42 52 15.7	85 23 26.7	5,265
Alto, 1 mile north, by 0.5 mile east of, 41 feet west is corner of secs. 27, 28, 33, and 34, T. 6 N., R. 9 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 26, Mich. 1915".....	42 52 15.7	85 22 16.4	5,233
Crossroads.....	42 52 16.5	85 20 46.8	6,669
T. 6 N., R. 9 W., corner of secs. 25, 26, 35, and 36, center of T road south.....	42 52 16.8	85 19 53.7	3,952
T. 6 N., R. 9 W., corner of secs. 25 and 36, center of T road north.....	42 52 17.3	85 18 42.1	5,325
T. 6 N., R. 8 W., corner of secs. 29, 30, 31, and 32, center of crossroads.....	42 52 17.0	85 17 31.9	5,227
T. 6 N., R. 8 W., corner of secs. 28, 29, 32, and 33, center of crossroads.....	42 52 17.5	85 16 21.3	5,254
T. 6 N., R. 8 W., quarter corner between secs. 28 and 33, center of T road south.....	42 52 17.7	85 15 45.9	2,636
Clarksville, 2 miles north and 0.5 mile west of, 24 feet south by 20 feet west is corner of secs. 27, 28, 33, and 34, T. 6 N., R. 8 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 27, Mich. 1915".....	42 52 17.6	85 15 10.6	2,624

Magnetic declination near north border of quadrangle, 0° 15' W.; through center, 0° 15' W.

## MOUNT PLEASANT QUADRANGLE.

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Mount Pleasant, 6 miles south of, 22 feet south by 20 feet west of corner of secs. 14, 15, 22, and 23, T. 13 N., R. 4 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, Mich. 1915".....	° ' " 43 31 26.2	° ' " 84 46 02.5	<i>Fect.</i> .....
T. 13 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	43 32 18.4	84 46 03.1	5,280
T. 13 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads.....	43 33 12.0	84 46 02.1	5,428
T. 14 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of T road west.....	43 34 04.6	84 46 02.2	5,330
Depuy station, Ann Arbor R. R. crossing.....	43 34 11.0	84 46 02.3	640
T. 14 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	43 34 57.0	84 46 02.7	4,660
T. 14 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 35 49.5	84 46 03.1	5,320
Mount Pleasant, intersection of Main Street and State road.....	43 36 15.8	84 46 03.4	2,659
T. 14 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	43 36 42.1	84 46 03.7	2,660
Mount Pleasant, 1 mile north of, crossing Pere Marquette R. R.....	43 37 10.1	84 46 04.4	2,840
Mount Pleasant, 1.5 miles north of, 1,100 feet north of bridge over Chippewa River; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915".....	43 37 39.0	84 46 08.5	2,943
Tps. 14 and 15 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads.....	43 38 25.7	84 46 05.0	4,728
T. 15 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	43 39 16.8	84 46 04.8	5,180
T. 15 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	43 40 08.8	84 46 04.0	5,260
T. 15 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 41 00.6	84 46 03.4	5,250
Rosebush, at corner of secs. 10, 11, 14, and 15, T. 15 N., R. 4 W., center of crossroads.....	43 41 54.1	84 46 04.1	5,410
T. 15 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	43 42 45.3	84 46 03.6	5,190
Tps. 15 and 16 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads.....	43 43 40.0	84 46 03.8	5,540
Mount Pleasant, 9 miles north of, 22 feet south by 20 feet east of corner secs. 26, 27, 34, and 35, T. 16 N., R. 4 W., center of T road east; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915".....	43 44 31.9	84 46 02.1	5,254

## Near north border of quadrangle.

T. 16 N., R. 4 W., quarter corner between secs. 26 and 27, center of T road west.....	43 44 58.3	84 46 02.9	.....
Doherty station, Ann Arbor R. R. crossing.....	43 44 57.8	84 46 38.7	2,630
T. 16 N., R. 4 W., quarter corner between secs. 27 and 28, center of crossroads.....	43 44 57.3	84 47 14.9	2,660
T. 16 N., R. 4 W., quarter corner between secs. 28 and 29, center of T road south.....	43 44 56.9	84 48 26.3	5,240
T. 16 N., R. 4 W., quarter corner between secs. 29 and 30, center of T road east.....	43 44 56.6	84 49 37.7	5,240

## Near west border of quadrangle.

T. 15 N., R. 6 W., center of sec. 13, center of T road south.....	43 41 24.7	84 58 40.9	7,871
T. 15 N., R. 6 W., quarter corner between secs. 13 and 24, center of crossroads.....	43 40 58.5	84 58 40.4	2,650
Pere Marquette R. R. crossing.....	43 40 05.7	84 58 39.8	5,350
T. 15 N., R. 6 W., center of sec. 25, T road west.....	43 39 40.6	84 58 39.9	2,540
T. 15 N., R. 6 W., quarter corner between secs. 25 and 26, center of T road south.....	43 39 40.6	84 59 15.3	2,610
T. 15 N., R. 6 W., corner of secs. 25, 26, 35, and 36, center of T road east.....	43 39 14.7	84 59 15.2	2,620
T. 15 N., R. 6 W., corner of secs. 35 and 36, 20 feet west is corner secs. 1 and 2, T. 14 N., R. 6 W., center of crossroads.....	43 38 22.7	84 59 15.2	5,270
Caldwell, 2 miles west of, 31 feet south by 24 feet east of corner of secs. 1, 2, 11, and 12, T. 14 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915".....	43 37 30.1	84 59 14.6	5,322
T. 14 N., R. 6 W., corner of secs. 11, 12, 13 and 14, center of crossroads.....	43 36 38.5	84 59 14.3	5,230



**MOUNT PLEASANT QUADRANGLE—Continued.**

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 13 N., R. 6 W., corner of secs. 13, 14, 23, and 24, center of T road north.....	° ' " 43 30 34.5	° ' " 84 59 09.2	Feet.....
T. 13 N., R. 6 W., corner of secs. 13 and 24, 30 feet north is corner of secs. 18 and 19, T. 13 N., R. 5 W., center of crossroads.....	43 30 34.3	84 57 56.8	5,340
T. 13 N., R. 5 W., corner of secs. 17, 18, 19, and 20, center of crossroads.....	43 30 37.0	84 56 46.3	5,193
T. 13 N., R. 5 W., corner of secs. 16, 17, 20, and 21, center of crossroads.....	43 30 37.3	84 55 32.9	5,410
T. 13 N., R. 5 W., corner of secs. 8, 9, 16, and 17, center of crossroads.....	43 31 30.2	84 55 33.7	5,360
T. 13 N., R. 5 W., quarter corner between secs. 9 and 16, center of crossroads.....	43 31 30.4	84 54 57.6	2,660
T. 13 N., R. 5 W., quarter corner between secs. 10 and 15, center of T road south.....	43 31 30.5	84 53 45.2	5,341
Winn, 1 mile south of, 32 feet north by 28 feet west, of corner of secs. 15 and 22, T. 13 N., R. 5 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 9, Mich. 1915.".....	43 30 37.7	84 53 45.0	5,348
T. 13 N., R. 5 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 30 37.6	84 53 08.6	2,678
T. 13 N., R. 5 W., corner of secs. 13, 14, 23, and 24, center of crossroads.....	43 30 37.6	84 51 55.8	5,370
T. 13 N., Rs. 4 and 5 W., corner of secs. 13, 18, 19, and 24, center of crossroads.....	43 30 33.9	84 50 48.7	4,955
T. 13 N., R. 4 W., corner of secs. 17, 18, 19, and 20, center of crossroads.....	43 30 33.9	84 49 37.5	5,250
T. 13 N., R. 4 W., corner of secs. 16, 17, 20, and 21, center of crossroads.....	43 30 33.4	84 48 26.0	5,269
T. 13 N., R. 4 W., corner of secs. 15, 16, 21, and 22, center of crossroads.....	43 30 33.9	84 47 14.0	5,310

Through center of quadrangle.

T. 14 N., Rs. 5 and 6 W., corner of secs. 1, 6, 7, and 12, center of T road south.....	43 37 30.3	84 58 02.8	.....
T. 14 N., R. 5 W., corner of secs. 5, 6, 7, and 8, center of crossroads.....	43 37 30.3	84 56 53.0	5,137
Crossroad.....	43 37 35.8	84 55 41.0	5,326
Crossroad.....	43 37 36.0	84 54 28.7	5,320
Caldwell, 3 miles east of, 20 feet south by 25 feet west of, center of crossroad; iron post stamped "Prim. Trav. Sta. No. 7, Mich. 1915".....	43 37 36.4	84 53 17.2	5,258
T. 14 N., R. 5 W., corner of secs. 1, 2, 11, and 12, center of T road south.....	43 37 31.7	84 52 03.1	5,469
T. 14 N., Rs. 4 and 5 W., corner of secs. 1, 6, 7, and 12, center of crossroads.....	43 37 31.8	84 50 54.0	5,090
T. 14 N., R. 4 W., corner of secs. 5, 6, 7, and 8, center of crossroads.....	43 37 32.8	84 49 40.9	5,375
T. 14 N., R. 4 W., corner of secs. 4, 5, 8, and 9, center of crossroads.....	43 37 33.2	84 48 28.5	5,329
T. 14 N., R. 4 W., corner of secs. 3, 4, 9, and 10, center of crossroads.....	43 37 34.0	84 47 16.6	5,289

Magnetic declination for east border of quadrangle, 1° 30' W.; for north border, 1° 30' W.; for west border, 1° 30' W.; for south border, 1° 00' W.; through center, 1° 15' W.

**REMUS QUADRANGLE.**

Near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 16 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	° ' " 43 44 27.5	° ' " 85 00 24.2	Feet.....
Tps. 15 and 16 N., R. 6 W., corner of secs. 2, 3, 34, and 35, center of crossroads.....	43 43 35.4	85 00 28.1	5,280
T. 15 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	43 41 50.9	85 00 28.5	10,574
T. 15 N., R. 6 W., quarter corner between secs. 14 and 15, center of crossroads.....	43 41 24.9	85 00 28.0	2,639
T. 14 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	43 36 38.2	85 00 25.0	.....
T. 14 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 35 46.4	85 00 24.2	5,239

## REMUS QUADRANGLE—Continued.

Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T. 14 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	° ' " 43 34 54.4	° ' " 85 00 23.5	Feet. 5,270
T. 14 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	43 34 02.2	85 00 22.8	5,280
Tps. 13 and 14 N., R. 6 W., corner of secs. 2, 3, 34, and 35, center of T road north.....	43 33 10.1	85 00 22.1	5,278
T. 13 N., R. 6 W., corner of secs. 3 and 4, center of T road south.....	43 33 09.8	85 01 35.0	5,370
T. 13 N., R. 6 W., corner of secs. 3, 4, 9 and 10, center of crossroads.....	43 32 17.1	85 01 33.9	5,330
T. 13 N., R. 6 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	43 31 25.5	85 01 32.8	5,230
Blanchard, 3 miles east of, 32 feet south by 26 feet west of corner of secs. 15, 16, 21, and 22, T. 13 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 8, Mich. 1915".....	43 30 33.4	85 01 32.4	5,273
T. 13 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of T road west.....	43 30 33.9	85 00 20.9	5,266

Magnetic declination for east border of quadrangle, 1° 30' W.

## SEARS QUADRANGLE.

Near southeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Brinton, 1 mile south of, 26 feet south by 26 feet east of corner of secs. 22, 23, 26, and 27, T. 16 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915".....	° ' " 43 45 19.3	° ' " 85 00 29.6	Feet. ....

## VESTABURG QUADRANGLE.

Near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 10 N., R. 5 W., quarter corner, east side sec. 13, 25 feet north is quarter corner, west side of sec. 18.....	° ' " 43 15 23.1	° ' " 84 50 08.3	Feet. ....
T. 10 N., R. 5 W., center of sec. 13, center of T road south.....	43 15 23.0	84 50 44.2	2,650
T. 10 N., R. 5 W., quarter corner between secs. 13 and 14, center of crossroads.....	43 15 23.1	84 51 20.0	2,650
Crystal, 2 miles east of, 17 feet north by 30 feet east of quarter corner between secs. 14 and 15, center of T road south; iron post stamped "Prim. Trav. Sta. No. 13, Mich. 1915".....	43 15 23.5	84 52 31.5	5,290
T. 10 N., R. 5 W., quarter corner between secs. 15 and 16, center of crossroads.....	43 15 24.2	84 53 42.7	5,270
T. 10 N., R. 5 W., quarter corner between secs. 16 and 17, center of crossroads.....	43 15 24.6	84 54 54.2	5,290
Crystal, center of crossroads at.....	43 15 47.3	84 54 53.9	2,300
T. 10 N., R. 5 W., corner of secs. 7 and 18, center of T road east.....	43 15 51.1	84 57 17.3	10,615
T. 10 N., R. 6 W., corner of secs. 12, 13, 14, and 15, center of crossroads.....	43 15 51.6	84 58 28.0	5,231

Near east border of quadrangle.

T. 13 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of T road west.....	43 29 42.1	84 46 01.9	.....
T. 13 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of T road west.....	43 28 50.4	84 46 01.5	5,236
T. 13 N., R. 4 W., corner of secs. 34 and 35, 30 feet east is corner secs. 2 and 3, T. 12 N., R. 4 W., center of crossroads.....	43 27 58.2	84 46 00.3	5,290
T. 12 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	43 27 06.1	84 45 59.6	5,278
T. 12 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	43 26 13.8	84 45 59.7	5,290

## VESTABURG QUADRANGLE—Continued.

## Near east border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T. 12 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	° ' " 43 25 21.6	° ' " 84 46 00.0	<i>Feet.</i> 5,280
T. 12 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	43 24 29.4	84 45 59.9	5,290
T. 12 N., R. 4 W., corner of secs. 26, 27, 34, and 35.....	43 23 37.1	84 45 59.6	5,290
Pere Marquette R. R. crossing.....	43 23 11.0	84 45 59.5	2,650
Elwell, 1 mile west of, 27 feet north by 25 feet east of corner of secs. 34 and 35, 27 feet north by 15 feet east of corner of secs. 2 and 3, T. 11 N., R. 4 W., crossroads; iron post stamped "Prim. Trav. Sta. No. 10, Mich. 1915".....	43 22 45.2	84 45 59.0	2,610
T. 11 N., R. 4 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	43 21 52.2	84 45 59.0	5,370
T. 11 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	43 21 00.0	84 45 58.8	5,280
T. 11 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 20 08.0	84 45 58.7	5,270
T. 11 N., R. 4 W., corner of secs. 22, 23, 26, and 27, center of T road north.....	43 19 15.7	84 45 58.8	5,290

## Through center of quadrangle.

T. 11 N., R. 4 W., corner of secs. 3 and 4, 30 feet west, corner of secs. 33 and 34, T. 12 N., R. 4 W., crossroads.....	43 22 45.0	84 47 10.5	.....
T. 11 N., R. 4 W., corner of secs. 4 and 5, 20 feet west, corner of secs. 32 and 33, T. 12 N., R. 4 W., crossroads.....	43 22 44.9	84 48 22.2	5,300
T. 12 N., R. 4 W., corner of secs. 31 and 32, center of T road north.....	43 22 44.8	84 49 34.3	5,320
Riverdale, 0.5 mile south of; center of crossroads.....	43 22 44.7	84 50 09.1	2,570
Tps. 11 and 12 N., Rs. 4 and 5 W., corner of secs. 1, 6, 31, and 36, center of road south.....	43 22 44.7	84 50 42.1	2,440
T. 11 N., R. 5 W., corner of secs. 1 and 2, center of T road south.....	43 22 44.5	84 51 57.4	5,560
Vestaburg, 1 mile south by 1 mile west of, 25 feet south by 26 feet east of corner of secs. 2 and 3, T. 11 N., R. 5 W., center of T road south; iron post stamped "Prim. Trav. Sta. No. 11, Mich. 1915".....	43 22 44.2	84 53 09.3	5,315
T. 12 N., R. 5 W., corner of secs. 33 and 34, center of T road north.....	43 22 44.6	84 54 17.3	5,016
T. 11 N., R. 5 W., corner of secs. 3 and 4, center of T road south.....	43 22 44.6	84 54 21.6	320
T. 12 N., R. 5 W., quarter corner, south side of sec. 33, center of T road north.....	43 22 44.6	84 54 53.1	2,330
T. 11 N., R. 5 W., quarter corner, north side of sec. 4, center of T road south.....	43 22 44.6	84 54 56.8	270
T. 11 N., R. 5 W., corner of secs. 5 and 6, center of T road south.....	43 22 44.9	84 56 43.6	7,890
Tps. 11 and 12 N., Rs. 5 and 6 W., corner of secs. 1, 6, 31, and 36, center of T road north.....	43 22 45.0	84 57 53.4	5,150
T. 11 N., R. 6 W., corner of secs. 1 and 2, center of T road south.....	43 22 45.0	84 59 06.3	5,390

Magnetic declination for south border of quadrangle, 1° 00' W.; for east border, 1° 15' W.; through center, 1° 15' W.

Bay City, Burt, Carson City, Chesaning, Corunna, De Witt, Durand, Elsie, Fowlerville, Freland, Laingsburg, Merrill, Muir, Perrinton, St. Charles, Saginaw, and Vassar quadrangles.

CLINTON, EATON, GRATIOT, LIVINGSTON, MIDLAND, SAGINAW, AND SHIAWASSEE COUNTIES.

The following geographic positions were determined by primary traverse in 1913 and 1915 by J. H. Wilson, and are based on traverse positions determined in 1908 and 1909, described in Bulletins 440 and 496, on approximate North American datum.

Additional control for Muir, Bay City, Saginaw, and Vassar quadrangles was done by Oscar Jones in 1915.

## BAY CITY QUADRANGLE.

Along highways near southwest corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Saginaw, 4.5 miles north of, 20 feet north by 20 feet east of corner of secs. 22, 23, 26, and 27, T. 13 N., R. 4 E., in northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 12 Michigan 1913"	° ' "	° ' "	<i>Fect.</i>
T. 13 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads.....	43 30 31.8 43 30 30.4	83 58 24.3 83 59 40.1	..... 5,590

Magnetic declination near southwest corner of quadrangle, 1° 54' W.

Near south border of quadrangle.

T. 13 N., R. 4 E., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 31 23.8	83 58 29.4	.....
T. 13 N., R. 4 E., corner of secs. 13, 14, 23, and 24, center of crossroads.....	43 31 22.8	83 57 21.2	5,030
T. 13 N., Rs. 4 and 5 E., corner of secs. 13, 18, 19, and 24, center of roads.....	43 31 21.8	83 56 06.6	5,490

North through center of quadrangle west of Saginaw River.

T. 13 N., Rs. 4 and 5 E., corner of secs. 7, 12, 13, and 18, center of T road west.....	43 32 11.1	83 56 06.0	4,990
T. 13 N., Rs. 4 and 5 E., corner of secs. 1, 6, 7, and 12, center of T road west.....	43 33 04.8	83 56 04.8	5,440
Road fork at brick church.....	43 33 48.1	83 56 35.3	4,929
Tps. 13 and 14 N., Rs. 4 and 5 E., corner of secs. 1, 6, 31, and 36, center of T road north.....	43 33 57.6	83 56 02.9	2,563
Tps. 13 and 14 N., R. 5 E., corner of secs. 31 and 32, center of crossroads.....	43 33 57.0	83 54 59.4	4,680
T. 14 N., R. 5 E., corner of secs. 29, 30, 31, and 32, center of crossroads.....	43 34 49.1	83 54 58.0	5,280
T. 14 N., R. 5 E., corner of secs. 19, 20, 25, and 30, center of crossroads.....	43 35 41.2	83 54 56.8	5,280
Bay City, west side, intersection of West Midland Street and South Euclid Avenue.....	43 36 07.1	83 54 56.0	2,624
Bay City, west side, intersection, southwest curb line of South Walnut and East Midland streets.....	43 36 06.5	83 53 55.2	4,472
Bay City, west side, railroad crossing corner of State and Hart streets.....	43 36 45.8	83 53 43.1	4,086
Puddy's corners, center of crossroads.....	43 37 26.9	83 53 59.3	4,330
Crossroads.....	43 38 17.6	83 53 56.0	5,141
T road west.....	43 39 09.2	83 53 53.2	5,233
Tps. 14 and 15 N., R. 5 E., corner of secs. 5, 6, 31, and 32, center of crossroads.....	43 39 09.8	83 54 47.0	3,955
Tps. 14 and 15 N., Rs. 4 and 5 E., corner of secs. 1, 6, 31, and 36, center of crossroads.....	43 39 10.3	83 55 45.4	4,295
Michigan Central R. R. crossing.....	43 39 55.9	83 56 54.7	6,870
Do.....	43 40 55.3	83 57 04.0	6,058
Do.....	43 41 45.3	83 57 11.8	5,089
Do.....	43 42 35.3	83 57 19.6	5,100
Do.....	43 43 26.8	83 57 27.7	5,250
Linwood, Michigan Central R. R. crossing, 420 feet north of station.....	43 44 18.8	83 57 35.7	5,293
Tps. 15 and 16 N., R. 4 E., corner of secs. 2, 3, 34, and 35, center of T road north.....	43 44 19.1	83 58 07.7	2,349
Crossroads.....	43 44 19.3	83 58 37.1	2,160

Near west border of quadrangle.

Linwood, 2 miles west of, 27 feet south by 26 feet east of corner of secs. 3, 4, 33, and 34, T. 15 N., R. 4 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 20, Mich. 1915"	43 44 19.3	83 59 18.4	3,029
T. 15 N., R. 4 E., corner of secs. 3, 4, 9, and 10, center of crossroads.....	43 43 27.9	83 59 18.8	5,200
T. 15 N., R. 4 E., corner of secs. 9, 10, 15, and 16, center of crossroads.....	43 42 36.5	83 59 19.6	5,210
T. 15 N., R. 4 E., corner of secs. 15, 16, 21, and 22, center of T road west.....	43 41 45.2	83 59 21.0	5,190
T. 15 N., R. 4 E., corner of secs. 21, 22, 27, and 28, center of crossroads.....	43 40 53.9	83 59 22.0	5,195
T. 15 N., R. 4 E., corner of secs. 27, 28, 33, and 34, center of crossroads.....	43 40 02.3	83 59 23.1	5,230

## BAY CITY QUADRANGLE—Continued.

## Near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Fect.
T. 15 N., R. 4 E., corner of secs. 33 and 34, center of T road north....	43 39 11.2	83 59 24.4	5,170
T. 14 N., R. 4 E., corner of secs. 3, 4, 9, and 10, center of crossroads..	43 38 19.6	83 59 28.6	5,231
Kawkawlin, 2 miles south and 2 miles west of, 20 feet south by 23 feet west of corner of secs. 9, 10, 15, and 16, T. 14 N., R. 4 E., center of T road west; iron post stamped "Prim. Trav. Sta. No. 21, Mich. 1915"	43 37 27.6	83 59 30.2	5,275
T. 14 N., R. 4 E., corner of secs. 15, 16, 21, and 22, center of T road west.....	43 36 36.6	83 59 31.9	5,168
T. 14 N., R. 4 E., quarter corner between secs. 21 and 22, center of crossroads.....	43 36 10.3	83 59 33.0	2,660
T. 14 N., R. 4 E., corner of secs. 27, 28, 33, and 34, center of crossroads.....	43 34 52.5	83 59 36.0	7,880
Tps. 13 and 14 N., R. 4 E., corner of secs. 3, 4, 33, and 34, center of T road north.....	43 34 00.5	83 59 38.8	5,268
T. 13 N., R. 4 E., corner of secs. 3, 4, 9, and 10, center of cross- roads.....	43 33 08.3	83 59 41.8	5,296
T. 13 N., R. 4 E., corner of secs. 9, 10, 15, and 16, center of cross- roads.....	43 32 15.5	83 59 42.9	5,340
T. 13 N., R. 4 E., corner of secs. 15, 16, 21, and 22, center of cross- roads.....	43 31 23.8	83 59 41.7	5,240
T. 13 N., R. 4 E., corner of secs. 21, 22, 27, and 28, center of cross- roads.....	43 30 30.6	83 59 40.2	5,390

## North through center of quadrangle east of Saginaw River.

T. 13 N., R. 5 E., corner of secs. 23, 24, 25, and 26, center of cross- roads.....	43 30 28.1	83 50 10.8	.....
T. 13 N., R. 5 E., corner of secs. 13, 14, 23, and 24, center of cross- roads.....	43 31 19.9	83 50 12.4	5,250
T. 13 N., R. 5 E., corner of secs. 14, 15, 22, and 23, center of T road east.....	43 31 20.4	83 51 26.1	5,430
T. 13 N., R. 5 E., corner of secs. 10, 11, 14, and 15, center of cross- roads.....	43 32 12.2	83 51 26.3	5,237
Michigan Ry. Co. electric line crossing.....	43 32 13.4	83 52 19.5	3,918
T. 13 N., R. 5 E., corner of secs. 9, 10, 15, and 16, center of T road east.....	43 32 13.4	83 52 36.1	1,220
T. 13 N., R. 5 E., corner of secs. 3, 4, 9, and 10, center of crossroads....	43 33 05.3	83 52 34.4	5,260
T. 14 N., R. 5 E., corner of secs. 33 and 34, center of crossroads....	43 33 56.5	83 52 35.8	5,182
Bay City, T. 14 N., R. 5 E., corner of secs. 27, 28, 33, and 34, corner of Lincoln street and Kosciuszka Avenue.....	43 34 48.3	83 52 37.2	5,240
Bay City, southwest corner, curb line, Third and North Lincoln streets.....	43 36 00.1	83 52 33.7	7,276
Bay City, southeast corner, curb line, Third and Washington streets, U. S. post office.....	43 36 03.4	83 53 15.6	3,094

## Near north border of quadrangle.

Bay City, northeast corner, curb line, Central and Park avenues..	43 35 45.8	83 51 45.6	.....
Hotel Holland, crossroad at.....	43 35 41.0	83 50 51.5	4,008
T. 14 N., R. 5 E., quarter corner between secs. 14 and 23, center of crossroads.....	43 36 12.7	83 50 31.6	3,530
T. 14 N., R. 5 E., corner of secs. 14, 15, 23, and 24, center of cross- roads.....	43 36 31.0	83 50 15.1	2,212
Essexville, quarter corner between secs. 14 and 15, T. 14 N., R. 5 E., center of crossroads.....	43 36 57.1	83 50 14.8	2,640
T. 14 N., Rs. 5 and 6 E., quarter corner between secs. 15 and 18, center of crossroads.....	43 36 56.2	83 49 01.0	5,429
T. 14 N., R. 6 E., quarter corner between secs. 17 and 18, center of crossroads.....	43 36 56.9	83 48 00.0	4,489
T. 14 N., R. 6 E., quarter corner between secs. 16 and 17, center of crossroads.....	43 36 56.9	83 46 48.6	5,250
Essexville, 4 miles east of, 29 feet north by 11 feet east of quarter corner between secs. 15 and 16, T. 14 N., R. 6 E., center of cross- roads; iron post stamped "Prim. Trav. Sta. No. 22, Mich. 1915"....	43 36 57.8	83 45 36.9	5,270

## Near east border of quadrangle.

T. 14 N., R. 6 E., corner of secs. 15, 16, 21, and 22, center of cross- roads.....	43 36 31.5	83 45 36.8	2,670
Farleigh station, railroad crossing.....	43 35 26.3	83 45 35.9	6,600
T. 14 N., R. 6 E., corner of secs. 27, 28, 33, and 34, center of cross- roads.....	43 34 47.3	83 45 35.5	3,950
T. 14 N., R. 6 E., corner of secs. 33 and 34, center of T road north..	43 33 55.0	83 45 35.2	5,300

**BAY CITY QUADRANGLE—Continued.**  
**Near east border of quadrangle—Continued.**

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 13 N., R. 6 E., corner of secs. 3, 4, 9, and 10, center of crossroads.	43 33 03.0	83 45 33.2	5,259
T. 13 N., R. 6 E., corner of secs. 9, 10, 15, and 16, center of crossroads.	43 32 11.0	83 45 33.1	5,270
T. 13 N., R. 6 E., corner of secs. 15, 16, 21, and 22, center of crossroads.	43 31 18.8	83 45 32.3	5,280
T. 13 N., R. 6 E., corner of secs. 21, 22, 27, and 28, center of crossroads.	43 30 27.0	83 45 32.3	5,250

Magnetic declination near south border of quadrangle, 2° 00' W.; through center (west side of Saginaw River), 2° 00' W.; through center (east side of Saginaw River), 2° 00' W.; near north border, 2° 00' W.; near west border, 2° 15' W.; near east border, 2° 15' W.

**BURT QUADRANGLE.**  
**Along highways near west border of quadrangle.**

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 10 N., R. 4 E., 1 mile east of corner of secs. 28, 29, 32, and 33; west end of bridge over creek.	43 14 04.3	83 59 32.1	
T. 10 N., R. 4 E., corner of secs. 26, 27, 34, and 35; crossroads at District No. 2 schoolhouse.	43 14 04.6	83 58 18.2	5,472
T. 10 N., R. 4 E., 35 feet south by 25 feet east of corner of secs. 22, 23, 26, and 27, in southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 10 Michigan 1913"	43 14 56.4	83 58 18.2	5,244
T. 9 N., R. 4 E., north corner of secs. 3 and 4; just west of bridge.	43 13 11.9	83 59 27.7	
T. 9 N., R. 4 E., corner of secs. 3, 4, 9, and 10; stone in crossroads at schoolhouse.	43 12 16.2	83 59 24.4	5,641
T. 9 N., R. 4 E., corner of secs. 9, 10, 15, and 16; crossroads.	43 11 24.3	83 59 22.6	5,259
T. 9 N., R. 4 E., corner of secs. 15, 16, 21, and 22; crossroads at Layton Corners.	43 10 32.2	83 59 21.2	5,270
T. 9 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads at St. Michaels Church and school.	43 09 40.1	83 59 20.3	5,280
T. 9 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads at schoolhouse.	43 08 48.0	83 59 18.6	5,270
T. 9 N., R. 4 E., south corner of secs. 33 and 34; stone, 10 feet west of center of crossroads (30 feet east of above position is T. 8 N., R. 4 E., north corner of secs. 3 and 4, Saginaw-Shiawassee county line.)	43 07 55.9	83 59 17.8	5,280
New Lothrop, 1 mile west of, 30 feet south by 25 feet west of corner of secs. 3, 4, 9, and 10, T. 8 N., R. 4 E., at schoolhouse in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 17 Michigan 1913"	43 06 59.9	83 59 17.4	5,669
T. 8 N., R. 4 E., stone at corner of secs. 9, 10, 15, and 16; crossroads.	43 06 07.6	83 59 15.9	5,295
T. 8 N., R. 4 E., corner of secs. 15, 16, 21, and 22; crossroads at schoolhouse.	43 05 15.5	83 59 16.4	5,280
T. 8 N., R. 4 E., corner of secs. 21, 22, 27, and 28; center of crossroads.	43 04 23.2	83 59 15.9	5,290
T. 8 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads at Judville.	43 03 31.1	83 59 15.6	5,280
Tps. 7 and 8 N., R. 4 E., corner of secs. 3, 4, 33, and 34; T road west.	43 02 39.0	83 59 14.8	5,270
T. 7 N., R. 4 E., corner of secs. 3, 4, 9, and 10; T road east of District No. 8 schoolhouse.	43 01 41.8	83 59 14.3	5,790
T. 7 N., R. 4 E., corner of secs. 9, 10, 15, and 16; T road east.	43 00 50.2	83 59 14.2	5,230

**Along highways near north border of quadrangle.**

T. 10 N., R. 4 E., corner of secs. 23, 24, 25, and 26; crossroads.	43 14 56.8	83 57 09.3	5,104
T. 10 N., R. 4 E., east corner of secs. 24 and 25; T road west. (450 feet north of above corner is west corner of secs. 19 and 30, T road east.)	43 14 56.8	83 55 57.3	5,322
T. 10 N., R. 5 E., corner of secs. 20, 21, 28, and 29; crossroads.	43 14 58.9	83 53 40.0	
T. 10 N., R. 5 E., stone at corner of secs. 21, 22, 27, and 28; T road west.	43 14 59.2	83 52 28.5	5,295
T. 10 N., R. 5 E., 20 feet south and 25 feet west of corner of secs. 22, 23, 26, and 27; iron post set at southwest corner of crossroads, stamped "Prim. Trav. Sta. No. 11, 1915, Mich."	43 14 59.7	83 51 16.3	5,346
T. 10 N., R. 6 E., corner of secs. 19, 20, 29, and 30, just west of railroad crossing at Birch Run; T road south.	43 15 00.1	83 47 40.1	

Magnetic declination for north border of quadrangle, 2° 10' W.; for west border, 2° 14' W.

## CARSON CITY QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Fect.
T. 8 N., R. 4 W., corner of secs. 22, 23, 26, and 27; crossroads.....	43 03 41.0	84 45 33.7	.....
T. 8 N., R. 4 W., corner of secs. 14, 15, 22, and 23; stone.....	43 04 33.4	84 45 33.3	5,300
Maple River, south end of bridge over, T. 8 N., R. 4 W., 470 feet southwest of corner of secs. 10, 11, 14, and 15.....	43 05 21.5	84 45 35.1	4,868
T. 8 N., R. 4 W., corner of secs. 10, 11, 14, and 15.....	43 05 25.7	84 45 32.3	479

Magnetic declination near east border of quadrangle, 0° 54' W.

## Near north border of quadrangle.

T. 10 N., R. 4 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	43 14 54.5	84 45 27.7	.....
T. 10 N., R. 4 W., corner of secs. 15, 16, 21, and 22, center of crossroads.....	43 14 55.1	84 46 39.3	5,300
T. 10 N., R. 4 W., corner of secs. 16, 17, 20, and 21, center of crossroads.....	43 14 55.9	84 47 50.1	5,240
T. 10 N., R. 4 W., corner of secs. 17, 18, 19, and 20, center of crossroads.....	43 14 56.2	84 49 01.2	5,260
T. 10 N., R. 4 W., corner of secs. 18 and 19, center of T road east.....	43 14 57.5	84 50 08.6	4,989
T. 10 N., R. 6 W., corner of secs. 13, 14, 23, and 24, center of T road north.....	43 14 59.5	84 58 28.3	.....
Crystal, 3.5 miles west by 1 mile south of, 16 feet south by 21 feet west of quarter corner between secs. 14 and 23, T. 10 N., R. 6 W., center of crossroad; iron post stamped "Prim. Trav. Sta. No. 14, Mich. 1915.".....	43 14 59.0	84 59 04.0	2,644

## Near west border of quadrangle.

T. 7 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	43 00 59.0	84 59 43.5	.....
T. 7 N., R. 6 W., corner of secs. 2 and 3, 100 feet west is corner of secs. 34 and 35, T. 8 N., R. 6 W., center of crossroads.....	43 01 57.4	84 59 43.5	5,917
T. 8 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	43 03 41.8	84 59 44.5	10,570
Crossroads.....	43 04 44.9	84 59 43.7	6,382
T. 8 N., R. 6 W., quarter corner between secs. 11 and 14, center of T road west.....	43 05 26.5	84 59 07.6	4,995
Tps. 8 and 9 N., R. 6 W., quarter corner between secs. 2 and 35, center of T road west.....	43 07 11.3	84 59 08.0	.....
T road east.....	43 07 50.3	84 59 07.9	3,950
T. 9 N., R. 6 W., quarter corner between secs. 26 and 35, center of T road west.....	43 08 03.3	84 59 08.0	1,320
T road south.....	43 08 54.7	84 59 08.9	5,207
T. 9 N., R. 6 W., quarter corner between secs. 24 and 25, center of crossroads.....	43 08 55.5	84 57 57.9	5,266
T. 9 N., R. 6 W., quarter corner between secs. 13 and 24, center of crossroads.....	43 09 47.5	84 57 57.5	5,270
T. 9 N., R. 6 W., quarter corner between secs. 12 and 13.....	43 10 39.5	84 57 56.0	5,259
Vickeryville crossing Grand Trunk R. R.....	43 11 05.5	84 57 55.7	2,634
T. 9 N., R. 6 W., quarter corner between secs. 1 and 2.....	43 11 31.5	84 57 55.3	2,636
T. 9 N., R. 6 W., corner of secs. 1, 2, 11, and 12, center of T road north.....	43 11 31.4	84 58 31.3	2,660
T. 9 N., R. 6 W., center of sec. 2, center of T road west.....	43 11 57.1	84 59 07.1	3,710
Tps. 9 and 10 N., R. 6 W., quarter corner between secs. 2 and 35, center of crossroads.....	43 12 22.8	84 59 06.6	2,610
T. 10 N., R. 6 W., quarter corner between secs. 26 and 35, center of T road west.....	43 13 14.8	84 59 04.8	5,264
T. 10 N., R. 6 W., quarter corner between secs. 23 and 26, center of crossroads.....	43 14 07.4	84 59 04.0	5,321

## Near south border of quadrangle.

T. 7 N., R. 4 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	43 00 06.4	84 45 34.1	.....
T. 7 N., R. 4 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	43 00 06.7	84 46 45.3	5,290
T. 7 N., R. 4 W., corner of secs. 8, 9, 16, and 17, center of crossroads.....	43 00 06.8	84 47 56.6	5,300
T. 7 N., R. 4 W., corner of secs. 7, 8, 17, and 18, center of crossroads.....	43 00 06.8	84 49 07.7	5,280
T. 7 N., R. 4 W., corner of secs. 7 and 18.....	43 00 05.7	84 50 15.0	5,000
Pewamo, crossroads at.....	43 00 04.1	84 50 50.6	2,645
T. 7 N., R. 5 W., corner of secs. 11, 12, 13, and 14, center of crossroads.....	43 00 06.2	84 51 26.2	2,650

## CARSON CITY QUADRANGLE—Continued.

## Near south border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
Pewamo, 1 mile west of, 27 feet north by 22 feet west of quarter corner between secs. 11 and 14, T. 7 N., R. 5 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 21, Mich. 1915".....	° ' "	° ' "	<i>Feet.</i>
T. 7 N., R. 5 W., corner of secs. 10, 11, 14, and 15, fence line.....	43 00 06.7	84 52 01.9	2,652
Grand Trunk R. R. crossing.....	43 00 06.5	84 52 37.0	2,608
T. 7 N., R. 5 W., corner of secs. 7 and 13, 90 feet north is corner of of secs. 12 and 13, T. 7 N., R. 6 W., center of T road west.....	43 00 01.6	84 53 50.5	5,480
T. 7 N., R. 6 W., corner of secs. 11, 12, 13, and 14, center of crossroads.....	43 00 05.6	84 57 22.5	15,758
Ionia, 3 miles east by 1 mile north of, 30 feet south by 32 feet east of corner of secs. 10, 11, 14, and 15, T. 7 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 22, Mich. 1915".....	43 00 06.4	84 58 32.8	5,221
	43 00 06.3	84 59 43.1	5,221

## Through center of quadrangle.

Palo, 25 feet north by 32 feet east, center of sec. 2, T. 8 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trva. Sta. No. 19, Mich. 1915".....	43 06 44.9	84 59 07.1	.....
T. 8 N., R. 6 W., center of sec. 1, center of T road north.....	43 06 44.6	84 57 56.5	5,238
Tps. 8 and 9 N., Rs. 5 and 6 W., corner of secs. 1, 6, 31, and 36, center of T road east.....	43 07 10.5	84 57 20.8	3,724
T. 9 N., R. 5 W., corner of secs. 31 and 32, 50 feet east, corner of secs. 5 and 6, T. 8 N., R. 5 W., center of crossroads.....	43 07 10.0	84 56 09.1	5,320
T. 9 N., R. 5 W., corner of secs. 32 and 33, center of T road north.....	43 07 09.6	84 54 57.9	5,280
T. 9 N., R. 5 W., corner of secs. 33 and 34, center of crossroads.....	43 07 09.1	84 53 46.7	5,280
Hubbardston, 2 miles north by 2 miles east of, 25 feet south, is corner of secs. 34 and 35, T. 9 N., R. 5 W., center of T road west, 25 feet south by 40 feet west, is corner of secs. 2 and 3, T. 8 N., R. 5 W.; iron post stamped "Prim. Trav. Sta. No. 20, Mich. 1915".....	43 07 08.5	84 52 35.5	5,276
Tps. 8 and 9 N., Rs. 4 and 5 W., corner of secs. 1, 6, 31, and 36, center of crossroads.....	43 07 07.7	84 50 13.0	10,565
T. 9 N., R. 4 W., corner of secs. 31 and 32, center of T road north.....	43 07 07.3	84 49 06.4	4,940
T. 9 N., R. 4 W., corner of secs. 32 and 33, center of T road north.....	43 07 06.8	84 47 54.9	5,300
T. 8 N., R. 4 W., corner of secs. 3 and 4, center of T road south.....	43 07 06.4	84 46 44.5	5,220
T. 9 N., R. 4 W., corner of secs. 33 and 34, center of T road north.....	43 07 06.4	84 46 43.5	70
Tps. 8 and 9 N., R. 4 W., corner of secs. 2, 3, 34, and 35, center of crossroads.....	43 07 06.0	84 45 32.2	5,290

Magnetic declination near north border of quadrangle, 1° 00' W.; near west border, 0° 30' W.; near south border, 0° 30' W.; through center, 0° 15' W.; near east border, 0° 54' W.

## CHESANING QUADRANGLE.

## Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Brant, 1 mile south by 1 mile west of, 100 feet north by 30 feet west of bridge over Bad River, in northwest corner of road forks; iron post stamped "Prim. Trav. Sta. No. 8 Michigan, 1913".....	° ' "	° ' "	<i>Feet.</i>
T. 10 N., R. 2 E., corner of secs. 20, 21, 28, and 29.....	43 14 42.5	84 14 56.3	.....
Brant, 1 mile south of, corner of secs. 21, 22, 27, and 28, T. 10 N., R. 2 E.; crossroads at schoolhouse.....	43 14 39.6	84 14 55.9	302
T. 10 N., R. 2 E., corner of secs. 22, 23, 26, and 27; crossroads.....	43 14 40.3	84 13 44.8	5,262
T. 10 N., R. 2 E., corner of secs. 23, 24, 25, and 26.....	43 14 40.7	84 12 34.0	5,240
T. 10 N., R. 2 E., east corner of secs. 24 and 25; T road west.....	43 14 39.3	84 11 23.0	5,260
(110 feet north of above position is T. 10 N., R. 3 E., west corner of secs. 19 and 30; T road east.)	43 14 39.0	84 10 10.5	5,365
T. 10 N., R. 3 E., corner of secs. 19, 20, 29, and 30; T road south.....	43 14 47.0	84 08 56.8	5,519
Fergus, 0.5 mile south of, 150 feet west of railroad crossing, 20 feet south by 15 feet east of corner of secs. 20, 21, 28, and 29, T. 10 N., R. 3 W., at southeast corner of T road south; iron post stamped "Prim. Trav. Sta. No. 9, Michigan, 1913".....	43 14 48.1	84 07 46.0	5,241
T. 10 N., R. 3 E., corner of secs. 28, 29, 32, and 33; crossroads.....	43 13 52.8	84 07 44.8	5,600
Chesaning, 2 miles north of, at District No. 4 schoolhouse; T road east.....	43 13 02.2	84 06 56.9	6,227
T. 9 N., R. 3 E., north corner of secs. 3 and 4.....	43 13 02.9	84 06 37.6	1,429
(140 feet east of above position is south corner of secs. 33 and 34, T road north.)			



## CHESANING QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Fect.
Shiawassee River, west end of bridge over.....	43 13 03.5	84 06 19.1	1,370
T. 10 N., R. 3 E., south corner of secs. 34 and 35; T road north..... (75 feet west of above position is north corner of secs. 2 and 3, T. 9 N., R. 3 E.; T road south.)	43 13 05.4	84 05 25.7	3,900
T. 10 N., R. 3 E., corner of secs. 26, 27, 34, and 35.....	43 13 59.0	84 05 27.4	5,430
T. 10 N., R. 3 E., corner of secs. 23, 26, 35, and 36; crossroads at schoolhouse.....	43 14 02.5	84 04 13.1	5,511
T. 10 N., R. 3 E., east corner of secs. 25 and 36; T road west at Luce post-office..... (60 feet north is west corner of secs. 30 and 31, T road east.)	43 14 02.0	84 03 04.1	5,110
T. 10 N., R. 4 E., corner of secs. 29, 30, 31, and 32; crossroads....	43 14 02.7	84 01 52.3	5,319
T. 10 N., R. 4 E., corner of secs. 28, 29, 32, and 33; T road south....	43 14 03.3	84 00 40.9	5,280
T. 10 N., R. 2 E., corner of secs. 23, 29, 32, and 33; crossroads....	43 13 47.6	84 14 55.2	.....

Along highways near west border of quadrangle.

T. 7 N., R. 2 E., corner of secs. 9, 10, 15, and 16; crossroads.....	43 00 44.5	84 13 33.1	.....
T. 7 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads.....	43 00 50.8	84 14 41.6	5,124
T. 7 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 01 43.2	84 14 41.9	5,305
T. 7 N., R. 2 E., north corner of secs. 4 and 5.....	43 02 32.9	84 14 41.5	5,030
(180 feet west of above corner is south corner of secs. 32 and 33 T. 8 N., R. 2 E., T road north)			
T. 8 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads.....	43 03 24.9	84 14 46.1	5,280
T. 8 N., R. 2 E., corner of secs. 20, 21, 28, and 29; crossroads.....	43 04 17.7	84 14 45.4	5,340
T. 8 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads.....	43 05 10.1	84 14 44.8	5,310
T. 8 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads.....	43 06 03.0	84 14 44.4	5,360
T. 8 N., R. 2 E., 25 feet south and 15 feet west of corner of secs. 4, 5, 8, and 9, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. 8, 1915, Mich.".....	43 06 55.2	84 14 45.5	5,284
T. 8 N., R. 2 E., north corner of secs. 4 and 5, T road south, on Saginaw-Shiawassee county line.....	43 07 43.5	84 14 46.3	4,890
(150 feet west of above corner is south corner of secs. 32 and 33, T. 9 N., R. 2 E., T road north.)			
T. 9 N., R. 2 E., corner of secs. 28, 29, 32, and 33; T road east.....	43 08 35.8	84 14 48.9	5,297
T. 9 N., R. 2 E., corner of secs. 20, 21, 28, and 29; crossroads.....	43 09 28.0	84 14 50.5	5,291
T. 9 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads.....	43 10 17.5	84 14 51.3	5,010
T. 9 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads.....	43 11 12.6	84 14 52.0	5,580
T. 9 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 12 04.9	84 14 52.8	5,300
T. 9 N., R. 2 E., north corner of secs. 4 and 5.....	43 12 54.3	84 14 53.6	4,998
(40 feet west of above corner is south corner of secs. 32 and 33, T. 10 N., R. 2 E., crossroads)			
T. 10 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads.....	43 13 47.6	84 14 55.2	5,400
Brant, 1 mile south and 1 mile west of, 100 feet north and 30 feet west of bridge over Bad River, in northwest corner of road forks; iron post stamped "Prim. Trav. Sta. No. 8, 1913, Mich.".....	43 14 42.50	84 14 56.30	5,558

Along highways through center of quadrangle.

T. 9 N., R. 2 E., south corner of secs. 33 and 34; T road north..... (120 feet east of above corner is north corner of secs. 3 and 4, T. 8 N., R. 2 E., T road south on Saginaw-Shiawassee county line.)	43 07 43.2	84 13 37.8	.....
T. 9 N., R. 2 E., south corner of secs. 34 and 35; T road north..... (140 feet east of above corner is north corner of secs. 2 and 3, T. 8 N., R. 2 E., at T road south.)	43 07 42.9	84 12 27.2	5,220
T. 8 N., R. 2 E., north corner of secs. 1 and 2; T road south..... (210 feet east of above corner is south corner of secs. 35 and 36, T. 9 N., R. 2 E., T road north.)	43 07 42.9	84 11 19.3	5,040
Oakley, 1 mile south of, corner of Tps. 8 and 9 N., Rs. 2 and 3 E., crossroads.....	43 07 42.7	84 10 05.7	5,460
T. 8 N., R. 3 E., stone at corner of secs. 5 and 6; T road south..... (150 feet east of above corner is south corner of secs. 31 and 32, T road north.)	43 07 44.5	84 08 55.4	5,211
T. 9 N., R. 3 E., south corner of secs. 32 and 33; center of east-west road.....	43 07 46.2	84 07 44.6	5,261
T. 8 N., R. 3 E., 15 feet south and 25 feet east of north corner of secs. 3 and 4, 15 feet south and 230 feet east of south corner of secs. 33 and 34, T. 9 N., R. 3 E., at southeast corner of T road south; iron post stamped "Prim. Trav. Sta. No. 10, 1915, Mich." Is on the Saginaw-Shiawassee county line road.....	43 07 48.0	84 06 30.8	5,470
T. 8 N., R. 3 E., north corner of secs. 2 and 3..... (110 feet west of above corner is south corner of secs. 34 and 35, T. 9 N., R. 3 E., T road north at Saginaw-Shiawassee county line.)	43 07 49.9	84 05 21.7	5,130

## CHESANING QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 8 N., R. 3 E., quarter corner between secs. 2 and 3; crossroads....	43 07 22.1	84 05 21.5	2,820
T. 8 N., R. 3 E., corner of secs. 2, 3, 10, and 11, 690 feet north of crossroads.....	43 06 56.1	84 05 18.9	2,640
T. 8 N., R. 3 E., 310 feet south of apparent corner of secs. 1, 2, 11, and 12; crossroads.....	43 06 53.7	84 04 09.2	5,169
T. 8 N., Rs. 3 and 4 E., between secs. 7 and 12; T road north.....	43 06 51.1	84 03 01.7	5,020
T. 8 N., R. 4 E., corner of secs. 5, 6, 7, and 8, crossroads at schoolhouse.....	43 06 59.3	84 01 39.9	6,125
T. 8 N., R. 4 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 06 59.5	84 00 27.5	5,370

Magnetic declination for north border of quadrangle, 1° 22' W.; for south border, 1° 55' W.; for east border, 2° 14' W.; for west border, 2° 05' W.; through center, 2° 15' W.

## CORUNNA QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Bancroft, 3 miles east of, in T. 6 N., R. 4 E., 30 feet south by 25 feet west of corner of secs. 28, 29, 32, and 33, in southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 19 Michigan 1913.....	42 52 52.8	84 00 24.8	.....
T. 6 N., R. 4 E., south corner of secs. 32 and 33, T road north..... (35 feet east of above position is north corner of secs. 4 and 5, T. 5 N., R. 4 E.)	42 52 00.7	84 00 23.0	5,270
T. 6 N., R. 4 E., south corner of secs. 32 and 33, 0.8 mile west of; T road east.....	42 52 00.0	84 01 16.4	3,981
Shiawassee River, north end of bridge over.....	42 50 57.9	84 01 25.8	6,318
Shiawassee River bridge, 0.8 mile southeast of; on quarter section line; T road south.....	42 50 28.0	84 00 50.7	4,009
Union Plains District No. 7 schoolhouse; T road north.....	42 49 47.3	84 00 48.9	4,120
T. 5 N., R. 4 E., corner of secs. 17, 18, 19, and 20; crossroads.....	42 49 20.6	84 01 23.2	3,722
T. 5 N., R. 4 E., corner of secs. 19, 20, 29, and 30; crossroads at schoolhouse.....	42 48 28.2	84 01 21.0	5,300
T. 5 N., R. 4 E., corner of secs. 29, 30, 31, and 32; crossroads.....	42 47 35.8	84 01 18.8	5,311
T. 5 N., R. 4 E., south corner of secs. 31 and 32; T road north (Shiawassee-Livingston county line)..... (265 feet east of above corner is north corner of secs. 5 and 6, T. 4 N., R. 4 E., T road south.)	42 46 43.5	84 01 16.9	5,301
Tps. 4 and 5 N., Rs. 3 and 4 E., corner of; T road south, county line.....	42 46 42.4	84 02 22.8	4,911
T. 4 N., R. 4 E., west corner of secs. 6 and 7.....	42 45 28.3	84 02 19.2	7,500

Magnetic declination near east border of quadrangle, 1° 58' W.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 7 N., R. 2 E., 20 feet north and 10 feet west of corner of secs. 16, 17, 20, and 21, on north side of east and west road at T road south; iron post stamped "Prim. Trav. Sta. No. 6, 1915, Mich.".....	42 59 58.6	84 14 42.0	.....
Five Corners, T. 7 N., R. 2 E., corner of secs. 15, 16, 21, and 22; at schoolhouse.....	42 59 51.8	84 13 33.1	5,163
T. 7 N., R. 2 E., corner of secs. 14, 15, 22, and 23; crossroads at schoolhouse.....	42 59 51.2	84 12 23.2	5,194
Owosso, T. 7 N., R. 2 E., corner of secs. 13, 14, 23, and 24, intersection of Chipman and Main streets.....	42 59 51.7	84 11 11.7	5,320
Owosso, intersection of Main and North Hickory streets, at corner of secs. 13, 24, 18, and 19, T. 7 N., Rs. 2 and 3 W.....	42 59 50.8	84 10 01.3	5,230
T. 7 N., R. 3 E., corner of secs. 17, 18, 19, and 20; T road north.....	42 59 51.7	84 08 53.4	5,050
T. 7 N., R. 3 E., corner of secs. 16, 17, 20, and 21; center of east and west road.....	42 59 53.3	84 07 44.6	5,120
T. 7 N., R. 3 E., 20 feet north and 45 feet east of quarter corner between secs. 16 and 21, at northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 7, 1915, Mich.".....	42 59 54.5	84 07 08.0	2,720
T. 7 N., R. 3 E., corner of secs. 15, 16, 21, and 22; center of east and west road.....	42 59 55.1	84 06 33.2	2,590

## CORUNNA QUADRANGLE—Continued.

Along highways near north border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T. 7 N., R. 3 E., corner of secs. 14, 15, 22, and 23; center of east and west road.....	° ' " 42 59 55.8	° ' " 84 05 22.8	<i>Feet.</i> 5,230
T. 7 N., R. 3 E., corner of secs. 13, 14, 23, and 24; crossroads at schoolhouse.....	42 59 57.4	84 04 09.9	5,421
T lane (unimproved) west, north and south township line.....	42 59 45.1	84 03 00.4	5,318
T. 7 N., R. 4 E., corner of secs. 17, 18, 19, and 20; crossroads just east of Venice school.....	42 59 57.2	84 01 37.5	6,279
T. 7 N., R. 4 E., corner of secs. 16, 17, 20, and 21; crossroads.....	42 59 56.9	84 00 25.4	5,360

Magnetic declination for north border of quadrangle, 1° 55' W.; near east border, 1° 58' W.

## DE WITT QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 5 N., R. 4 W., corner of secs. 25, 26, 35, and 36; T road west....	° ' " 42 47 04.9	° ' " 84 44 22.2	<i>Feet.</i> .....
T. 5 N., R. 4 W., corner of secs. 23, 24, 25, and 26; 510 feet north of crossroads.....	42 47 57.2	84 44 21.6	5,290
T. 5 N., R. 4 W., corner of secs. 13, 14, 23, and 24; crossroads.....	42 48 49.4	84 44 21.5	5,290
Lookingglass River, north end of bridge over.....	42 49 15.0	84 44 22.0	5,295
T. 5 N., R. 4 W., corner of secs. 11, 12, 13, and 14; crossroads.....	42 49 41.8	84 44 22.3	2,705
T. 5 N., R. 4 W., corner of secs. 1, 2, 11, and 12; stone in crossroads..	42 50 34.2	84 44 22.5	5,310
T. 5 N., R. 4 W., north corner of secs. 1 and 2; T road south.....	42 51 25.2	84 44 22.8	5,160
(50 feet east of above corner is south corner of secs. 35 and 36, T. 6 N., R. 4 W., T road north.)			
Westphalia District No. 3 schoolhouse, 35 feet south by 20 feet west of corner of secs. 25, 26, 35, and 36, T. 6 N., R. 4 W., in south-west corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, 1913, Mich.".....	42 52 17.0	84 44 22.5	5,242
Westphalia schoolhouse, about 1 mile north of; crossroads.....	42 53 06.4	84 44 22.7	4,999
T. 6 N., R. 4 W., corner of secs. 13, 14, 23, and 24, stone in crossroads.	42 54 01.7	84 44 22.7	5,605
T. 6 N., R. 4 W., corner of secs. 11, 12, 13, and 14; crossroads.....	42 54 53.9	84 44 22.8	5,285
T. 6 N., R. 4 W., corner of secs. 1, 2, 11, and 12, at Westphalia schoolhouse (District No. 1); crossroads.....	42 55 46.1	84 44 23.0	5,280
Tps. 6 and 7 N., R. 4 W., corner of secs. 1, 2, 35, and 36; crossroads..	42 56 37.7	84 44 23.1	5,225
T. 7 N., R. 4 W., corner of secs. 25, 26, 35, and 36; T road west at schoolhouse.....	42 57 28.6	84 44 22.4	5,160
Stony Creek, north end of bridge over.....	42 57 47.9	84 44 22.6	1,945
T. 7 N., R. 4 W., corner of secs. 23, 24, 25, and 26; stone in crossroads.	42 58 21.3	84 44 22.3	3,380
T. 7 N., R. 4 W., corner of secs. 13, 14, 23, and 24; crossroads.....	42 59 14.0	84 44 22.6	5,340

Magnetic declination near west border of quadrangle, 0° 50' W.

## DURAND QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
T. 7 N., R. 4 E., 15 feet south by 30 feet west of corner of secs. 15, 16, 21, and 22, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 18, Michigan 1913".....	° ' " 42 59 58.0	° ' " 83 59 13.2	<i>Feet.</i> .....
T. 7 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads.....	42 59 06.0	83 59 12.8	5,260
T. 7 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads.....	42 58 14.0	83 59 12.9	5,270
T. 7 N., R. 4 E., south corner of secs. 33 and 34.....	42 57 20.4	83 59 14.4	5,420
T. 6 N., R. 4 E., north corner of secs. 3 and 4.....	42 57 20.3	83 59 21.4	5,520
T. 6 N., R. 4 E., corner of secs. 3, 4, 9, and 10; crossroads.....	42 56 22.9	83 59 19.7	5,810
Durand, intersection of Main and Oak streets; corner of secs. 15, 16, 21, and 22; T. 6 N., R. 4 E.....	42 54 38.6	83 59 16.2	10,570
T. 6 N., R. 4 E., corner of secs. 21, 22, 27, and 28; crossroads.....	42 53 46.3	83 59 14.8	5,291
T. 6 N., R. 4 E., corner of secs. 27, 28, 33, and 34; crossroads at schoolhouse.....	42 52 54.2	83 59 13.2	5,280

Magnetic declination near west border of quadrangle, 1° 58' W.

## ELSIE QUADRANGLE.

## Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
North Star, 3 miles east of, 30 feet north by 30 feet east of west corner of secs. 18 and 19, T. 10 N., R. 1 W., 30 feet E. by 180 feet north of east corner of secs. 13 and 24, T. 10 N., R. 2 W., in northeast corner of T road east; iron post stamped "Prim. Trav. Sta. No. 6 Michigan 1913".....	43 14 54.8	84 29 01.8	<i>Fect.</i> .....
T. 10 N., R. 1 W., corner of secs. 17, 18, 19, and 20; crossroads.....	43 14 54.6	84 28 07.5	4,020
T. 10 N., R. 1 W., corner of secs. 16, 17, 20, and 21; crossroads.....	43 14 53.9	84 26 55.6	5,320
T. 10 N., R. 1 W., corner of secs. 15, 16, 21, and 22; crossroads.....	43 14 54.3	84 25 43.7	5,320
T. 10 N., R. 1 W., corner of secs. 14, 15, 22, and 23; crossroads.....	43 14 54.7	84 24 32.6	5,280
T. 10 N., R. 1 W., 10 feet east of east corner of secs. 13 and 24, 10 feet east of center of T road west, on county line road; iron post stamped "Prim. Trav. Sta. No. 7 Michigan 1913".....	43 14 54.6	84 22 08.5	10,671
T. 10 N., R. 1 E., west corner of secs. 20 and 29; Gratiot-Saginaw county line; T road east.....	43 14 37.5	84 22 08.4	1,730
T. 10 N., R. 1 E., corner of secs. 21, 22, 27, and 28; crossroads.....	43 14 37.7	84 20 52.4	5,630
Marion Springs, corner of secs. 22, 23, 26, and 27, T. 10 N., R. 1 E.; crossroads.....	43 14 38.0	84 19 40.8	5,300
T. 10 N., R. 1 E., corner of secs. 23, 24, 25, and 26; crossroads.....	43 14 38.2	84 18 29.2	5,300
T. 10 N., R. 1 E., east corner of secs. 24 and 25.....	43 14 37.6	84 17 17.8	5,280
(90 feet north of the above position is west corner of secs. 30 and 19, T. 10 N., R. 2 E.)			
T. 10 N., R. 2 E., corner of secs. 19, 20, 29, and 30; crossroads.....	43 14 39.1	84 16 06.9	5,255

## Along highways near west border of quadrangle.

T. 8 N., R. 2 W., quarter corner between secs. 25 and 36, at T road north.....	43 02 43.2	84 29 38.7	.....
T. 8 N., R. 2 W., quarter corner between secs. 24 and 25, at crossroads.....	43 03 35.1	84 29 38.4	5,260
T. 8 N., R. 2 W., quarter corner in center of sec. 24, at crossroads.....	43 04 01.3	84 29 38.3	2,650
T. 8 N., R. 2 W., quarter corner in center of sec. 13, at T road south.....	43 04 53.6	84 29 38.4	5,300

## Along highways near south border of quadrangle.

T. 7 N., R. 2 W., east corner of secs. 12 and 13, at T road west.....	43 00 03.3	84 29 02.5	.....
(95 feet south of above corner is west corner of secs. 7 and 18, T. 7 N., R. 1 W., at T road east.)			
T. 7 N., R. 1 W., corner of secs. 7, 8, 17, and 18, at crossroads.....	43 00 02.5	84 27 53.0	5,166
T. 7 N., R. 1 W., corner of secs. 8, 9, 16, and 17, at T road.....	43 00 02.5	84 26 42.4	5,245
T. 7 N., R. 1 W., corner of secs. 9, 10, 15, and 16, at T road.....	43 00 03.5	84 25 32.4	5,203
T. 7 N., R. 1 W., corner of secs. 10, 11, 14, and 15.....	43 00 04.0	84 24 20.8	5,320
Ovid, 0.75 mile west of and 0.25 mile south of, on east side of north and south road at T road west, 5 feet south and 25 feet east of corner of secs. 11, 12, 13, and 14, T. 7 N., R. 1 W.; iron post stamped "Prim. Trav. Sta. No. 5, 1915, Mich.".....	43 00 04.7	84 23 10.7	5,214
vid, crossing of Main and Front streets.....	43 00 18.9	84 22 18.2	4,153
vid, 180 feet east of intersection of Elm and Oak streets; center of Elm Street at crossing of principal meridian.....	43 00 10.1	84 22 00.1	1,620
Ovid, about 0.15 mile east of; center of road at crossing of line between sec. 16 and fractional sec. 17, T. 7 N., R. 1 E.....	43 00 08.3	84 21 50.1	767

## Along highways through center of quadrangle.

T. 8 N., R. 2 E., corner of secs. 5, 6, 7, and 8; crossroads at school-house.....	43 06 53.3	84 15 56.8	.....
T. 8 N., R. 2 E., west corner of secs. 6 and 7.....	43 06 52.6	84 17 07.1	5,216
(45 feet south of above at crossroads is east corner of secs. 1 and 12, T. 8 N., R. 1 E.)			
T. 8 N., R. 1 E., corner of secs. 1, 2, 11, and 12; crossroads.....	43 06 52.8	84 18 18.5	5,295
T. 8 N., R. 1 E., corner of secs. 2, 3, 10, and 11; crossroads.....	43 06 52.6	84 19 31.0	5,380
T. 8 N., R. 1 E., corner of secs. 3, 4, 9, and 10; T road south.....	43 06 51.4	84 20 40.1	5,130
T. 8 N., R. 1 E., corner of secs. 4, 5, 8, and 9; center of east and west road.....	43 06 50.5	84 21 52.5	5,370
T. 8 N., R. 1 E., west corner of fractional secs. 8 and 9; T road east on Shiawassee-Gratiot county line.....	43 06 50.4	84 22 04.2	870
Clinton-Gratiot County line, about 0.5 mile north of, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 9, 1915, Mich.".....	43 07 28.2	84 22 05.2	3,827

## ELSIE QUADRANGLE—Continued.

## Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Fect.</i>
T. 8 N., R. 1 W., north corner of secs. 1 and 2..... (10 feet east of above corner is south corner of secs. 35 and 36; T. 9 N., R. 1 W.; crossroads on Clinton-Gratiot county line.)	43 07 04.0	84 23 15.7	5,776
Tps. 8 and 9 N., R. 1 W., corner of secs. 2, 3, 34, and 35; crossroads..	43 07 03.8	84 24 27.2	5,300
T. 8 N., R. 1 W., north corner of secs. 3 and 4; T road south..... (75 feet west of above corner is south corner of secs. 33 and 34, T. 9 N., R. 1 W., at T road north.)	43 07 03.6	84 25 37.4	5,210
T. 8 N., R. 1 W., north corner of secs. 4 and 5; T road south..... (75 feet west of above is south corner of secs. 32 and 33. T. 9 N., R. 1 W., T road north.)	43 07 03.4	84 26 48.6	5,280
T. 8 N., R. 1 W., north corner of secs. 5 and 6; T road south..... (70 feet west of above corner is south corner of secs. 31 and 32, T. 9 N., R. 1 W., T road north.)	43 07 03.2	84 28 00.2	5,310
Tps. 8 and 9 N., Rs. 1 and 2 W., crossroads at corner of .....	43 07 03.2	84 29 01.7	4,560

Magnetic declination for north border of quadrangle, 1° 39' W.; for south border, 1° 33' W.; for east border, 2° 05' W.; for west border, 1° 20' W.; through center, 1° 32' W.

## FOWLerville QUADRANGLE.

## Along highways near northeast corner of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Fect.</i>
T. 4 N., R. 4 E., west corner of secs. 7 and 18; T road east.....	42 44 36.2	84 02 16.8	.....
T. 4 N., R. 3 E., quarter corner between secs. 13 and 14; iron post stamped "Prim. Trav. Sta. No. 1, Mich., 1908" .....	42 44 09.9	84 03 26.9	5,870

## FREELAND QUADRANGLE.

## Along highways near south border of quadrangle.

T. 13 N., R. 4 E., corner of secs. 20, 21, 28, and 29; stone in crossroads.	43 30 33.5	84 00 52.7	.....
T. 13 N., R. 4 E., corner of secs. 19, 20, 29, and 30; stone in crossroads.	43 30 34.4	84 02 04.0	5,261
T. 13 N., R. 4 E., west corner of secs. 19 and 30; T road east..... (80 feet south of above position is east corner of secs. 24 and 25, T. 13 N., R. 3 E., T road west.)	43 30 35.0	84 03 05.8	4,556
T. 13 N., R. 3 E., corner of secs. 23, 24, 25, and 26; crossroads.....	43 30 35.5	84 04 17.2	5,259
T. 13 N., R. 3 E., corner of secs. 22, 23, 26, and 27, 720 feet west of railroad crossing and 520 feet north of another railroad crossing; crossroads .....	43 30 36.1	84 05 28.6	5,270
T. 13 N., R. 3 E., corner of secs. 14, 15, 22, and 23; crossroads.....	43 31 28.3	84 05 27.6	5,290
Freeland, east edge of town, 30 feet north by 25 feet west of corner of secs. 15, 16, 21, and 22, at northwest corner of T road north; iron post stamped "Prim. Trav. Sta. No. 13 Mich., 1913." .....	43 31 29.0	84 06 38.6	5,231
Freeland, east end of bridge over Tittabawassee River .....	43 31 29.5	84 07 30.7	3,844
T. 13 N., R. 3 E., corner of secs. 16, 17, 20, and 21.....	43 31 29.7	84 07 49.0	1,350
T. 13 N., R. 3 E., quarter corner between secs. 20 and 29; crossroads (this quarter corner computes 2,720 feet west of above corner; topographer should look for 100-foot error) .....	43 30 37.7	84 08 25.9	5,923
T. 13 N., R. 3 E., corner of secs. 19, 20, 29, and 30; crossroads.....	43 30 38.0	84 09 01.7	2,640
T. 13 N., Rs. 2 and 3 E., corner of secs. 19, 30, 24, and 25; crossroads (Midland-Saginaw county line) .....	43 30 38.7	84 10 12.6	5,230
T. 13 N., R. 2 E., corner of secs. 23, 24, 25, and 26; crossroads.....	43 30 38.8	84 11 24.2	5,280
T. 13 N., R. 2 E., corner of secs. 22, 23, 26, and 27; crossroads.....	43 30 38.2	84 12 35.8	5,280
T. 13 N., R. 2 E., corner of secs. 21, 22, 27, and 28; crossroads.....	43 30 38.0	84 13 47.6	5,290
T. 13 N., R. 2 E., 20 feet north by 20 feet west of corner of secs. 20, 21, 28, and 29, in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 14, Mich., 1913." .....	43 30 37.8	84 14 59.1	5,275

Magnetic declination for south border of quadrangle, 1° 31' W.

## LAINGSBURG QUADRANGLE.

Along highways near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 7 N., R. 1 E., corner of secs. 15, 16, 21, and 22; T road north.....	42 59 55.8	84 20 39.4	.....
T road west.....	42 59 46.1	84 19 10.4	6,687
T. 7 N., R. 1 E., corner of secs. 13, 14, 23, and 24; T road north.....	42 59 57.2	84 18 17.4	4,096
T. 7 N., R. 1 E., east corner of secs. 13 and 24.....	42 59 57.1	84 17 04.7	5,400
(140 feet north of above corner is west corner of secs. 18 and 19, T. 7 N., R. 2 E.)			
Center of road at north and south section line crossing.....	42 59 39.2	84 15 55.6	5,446

Magnetic declination for north border of quadrangle, 1° 33' W.

## MERRILL QUADRANGLE.

Along highways near east border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 13 N., R. 2 E., south corner of secs. 32 and 33; crossroads (Midland-Saginaw county line).....	43 28 53.4	84 15 00.6	.....
(30 feet east of above position is north corner of secs. 4 and 5, T. 12 N., R. 2 E.)			
T. 12 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 27 51.1	84 15 00.5	6,310

Magnetic declination for east border of quadrangle, 1° 48' W.

## MUIR QUADRANGLE.

Along highways near south border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Grand Ledge, 3 miles west of, at northeast corner of church, 25 feet north by 25 feet east to stone at corner of secs. 5, 6, 7, and 8, T. 4 N., R. 4 W., at crossroads; iron post stamped "Prim. Trav. Sta. No. 2 Michigan 1909".....	42 45 19.4	84 49 06.0	.....
T. 4 N., R. 4 W., north corner of secs. 5 and 6.....	42 46 13.1	84 49 05.6	5,437
(15 feet east of above position is south corner of secs. 31 and 32, T. 5 N., R. 4 W., crossroads.)			
T. 5 N., R. 4 W., corner of secs. 29, 30, 31, and 32; crossroads.....	42 47 05.4	84 49 05.4	5,290
Grand River, near east end of bridge over, T. 5 N., R. 4 W.; corner of secs. 28, 29, 32, and 33.....	42 47 05.3	84 47 56.8	5,115
T. 5 N., R. 4 W., corner of secs. 27, 28, 33, and 34; T road north.....	42 47 04.9	84 46 43.4	5,475
T. 5 N., R. 4 W., corner of secs. 26, 27, 34, and 35; crossroads.....	42 47 05.0	84 45 32.6	5,275

Near west border of quadrangle.

Sunfield, Père Marquette R. R. crossing.....	42 45 46.7	84 59 42.3	.....
T. 5 N., R. 6 W., corner of secs. 34 and 35, 15 feet west of corner of secs. 2 and 3, T. 4 N., R. 6 W., crossroads.....	42 46 13.9	84 59 42.3	2,757
T. 5 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of crossroads.....	42 47 06.0	84 59 42.2	5,272
T. 5 N., R. 6 W., corner of secs. 22, 23, 26, and 27, center of crossroads.....	42 47 58.1	84 59 42.1	5,271
T. 5 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	42 48 50.1	84 59 42.2	5,262
T. 5 N., R. 6 W., corner of secs. 10, 11, 14, and 15, fence line.....	42 49 42.1	84 59 22.5	5,265
T. 5 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	42 50 34.3	84 59 42.6	5,280
Tps. 5 and 6 N., R. 6 W., corner of secs. 2, 3, 34, and 35, center of T road east.....	42 51 24.9	84 59 42.7	5,118
T. 6 N., R. 6 W., corner of secs. 22, 23, 26, and 27.....	42 53 08.9	84 59 42.3	.....
T. 6 N., R. 6 W., corner of secs. 14, 15, 22, and 23, center of crossroads.....	42 54 01.0	84 59 42.6	5,267

## MUIR QUADRANGLE—Continued.

Near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T. 6 N., R. 6 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	° ' " 42 54 53.2	° ' " 84 59 43.0	<i>Feet.</i> 5,280
T. 6 N., R. 6 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	42 55 45.2	84 59 42.9	5,267
T. 6 N., R. 6 W., corner of secs. 2 and 3, 30 feet west, corner of secs. 34 and 35, T. 7 N., R. 6 W., T road east.....	42 56 37.4	84 59 43.5	5,281
T. 7 N., R. 6 W., corner of secs. 26, 27, 34, and 35, center of T road south.....	42 57 29.8	84 59 43.8	5,300

## Through center of quadrangle.

Portland, 4.5 miles west of, 27 feet south by 23 feet east is corner of secs. 26, 27, 34, and 35, T. 6 N., R. 6 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 29, Mich. 1915".....	42 52 16.5	84 59 42.3	.....
T. 6 N., Rs. 5 and 6 W., corner of secs. 25, 30, 31, and 36, center of crossroads.....	42 52 17.0	84 57 21.7	10,469
T. 6 N., R. 5 W., quarter corner between secs. 30 and 31, center of T road north.....	42 52 17.1	84 56 44.5	2,770
T. 6 N., R. 5 W., corner of secs. 28, 29, 32, and 33, fence line.....	42 52 17.3	84 54 53.1	7,915
Portland, west abutment, lower iron bridge over Grand River.....	42 52 15.0	84 54 12.1	3,433
Portland, 2.5 miles east of, 39 feet north by 18 feet east is corner of secs. 25, 26, 35, and 36, T. 6 N., R. 5 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 30, Mich. 1915".....	42 52 18.2	84 51 24.9	12,455
T. 6 N., Rs. 4 and 5 W., corner of secs. 25, 30, 31, and 36, center of crossroads.....	42 52 17.5	84 50 14.1	5,264
T. 6 N., R. 4 W., corner of secs. 29, 30, 31, and 32, center of crossroads.....	42 52 17.3	84 49 05.2	5,134
T. 6 N., R. 4 W., corner of secs. 28, 29, 32, and 33, center of T road west.....	42 52 17.4	84 47 54.6	5,254
Tps. 5 and 6 N., R. 4 W., corner of secs. 4, 5, 32, and 33, center of crossroads.....	42 51 25.4	84 47 54.6	5,270
T. 5 N., R. 4 W., corner of secs. 3 and 4, center of T road south, 42 feet east is corner of secs. 33 and 34, T. 6 N., R. 4 W., center of T road north.....	42 51 25.2	84 46 44.3	5,230
T. 6 N., R. 4 W., corner of secs. 34 and 35, 25 feet west, corner of secs. 2 and 3, T. 5 N., R. 4 W., crossroads.....	42 51 25.3	84 45 33.0	5,310
T. 6 N., R. 4 W., corner of secs. 26, 27, 34, and 35, center of T road east.....	42 52 17.3	84 45 32.6	5,270

Magnetic declination near west border of quadrangle, 0° 30' W.; near east border, 0° 50' W.; through center, 0° 30' W.

## PERRINTON QUADRANGLE.

Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Fowler, cross streets in, 1 block south of railroad, at corner of secs. 11, 12, 13, and 14, T. 7 N., R. 4 W.....	° ' " 43 00 06.4	° ' " 84 44 22.8	<i>Feet.</i> .....
Fowler, at southwest corner of first cross street north of railroad; iron post stamped "Prim. Trav. Sta. No. 2, Michigan, 1913".....	43 00 12.1	84 44 23.3	572
T. 7 N., R. 4 W., corner of secs. 1, 2, 11, and 12; crossroads at schoolhouse.....	43 00 58.8	84 44 22.7	4,726
T. 7 N., R. 4 W., north corner of secs. 1 and 2; stone in crossroads..... (30 feet east of above corner is south corner of secs. 35 and 36, T. 8 N., R. 4 W., crossroads.)	43 01 56.0	84 44 22.7	5,790
T. 8 N., R. 4 W., corner of secs. 25, 26, 35, and 36; crossroads at Lebanon schoolhouse.....	43 02 48.4	84 44 22.0	5,305
T. 8 N., R. 4 W., corner of secs. 23, 24, 25, and 26; T road west.....	43 03 40.6	84 44 21.8	5,290
T. 8 N., R. 4 W., corner of secs. 1, 2, 11, and 12; stone at schoolhouse.....	43 06 17.4	84 44 20.8	.....
Tps. 8 and 9 N., 30 feet south by 25 feet east of corner of secs. 1, 2, 35, and 36, at southeast corner of crossroads, on Clinton-Gratiot county line; iron post stamped "Prim. Trav. Sta. No. 3, 1913, Mich.".....	43 07 05.2	84 44 20.9	4,842
North Shade schoolhouse, T. 9 N., R. 4 W., corner of secs. 25, 26, 35, and 36; crossroads at.....	43 07 57.6	84 44 20.9	5,300
T. 9 N., R. 4 W., corner of secs. 23, 24, 25, and 26, at U. B. Church; stone in crossroads.....	43 08 49.8	84 44 20.4	5,280
North Shade, T. 9 N., R. 4 W., corner of secs. 13, 14, 23, and 24, at District No. 3 schoolhouse; stone in crossroads.....	43 09 42.0	84 44 19.9	5,290

## PERRINTON QUADRANGLE—Continued.

## Along highways near west border of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 9 N., R. 4 W., corner of secs. 11, 12, 13, and 14; crossroads.....	43 10 34.1	84 44 19.4	5,270
North Shade District No. 6 schoolhouse, T. 9 N., R. 4 W., corner of secs. 1, 2, 11, and 12; crossroads.....	43 11 26.3	84 44 19.0	5,290
T. 9 N., R. 4 W., north corner of secs. 1 and 2, stone at T road south. (40 feet east of above corner is south corner of secs. 35 and 36, T. 10 N., R. 4 W., stone in T road north.)	43 12 17.4	84 44 18.5	5,169
New Haven District No. 8 schoolhouse, T. 10 N., R. 4 W., corner of secs. 25, 26, 35, and 36; crossroads.....	43 13 09.5	84 44 17.3	5,280
T. 10 N., R. 4 W., corner of secs. 23, 24, 25, and 26; crossroads.....	43 14 01.7	84 44 16.8	5,280
New Haven District No. 3 schoolhouse, T. 10 N., R. 4 W., 25 feet south by 25 feet east of corner of secs. 13, 14, 23, and 24, southeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1913"	43 14 53.7	84 44 16.4	5,268
T. 10 N., R. 4 W., east corner of secs. 13 and 24; stone. (75 feet north of preceding position is west corner of secs. 18 and 19, T. 10 N., R. 3 W.)	43 14 53.5	84 43 05.6	5,239
T. 10 N., R. 3 W., corner of secs. 17, 18, 19, and 20.....	43 14 54.0	84 41 59.0	4,929
T. 10 N., R. 3 W., corner of secs. 16, 17, 20, and 21; stone.....	43 14 53.8	84 40 48.1	5,250
T. 10 N., R. 3 W., corner of secs. 15, 16, 21, and 22; crossroads.....	43 14 53.6	84 39 36.6	5,290
T. 10 N., R. 3 W., corner of secs. 14, 15, 22, and 23; crossroads.....	43 14 53.1	84 38 25.7	5,250
T. 10 N., R. 3 W., corner of secs. 13, 14, 23, and 24; crossroads.....	43 14 53.0	84 37 14.9	5,240
T. 10 N., R. 3 W., 10 feet south by 30 feet east of east corner of secs. 13 and 24, 30 feet south by 30 feet east of west corner of secs. 18 and 19, T. 10 N., R. 2 W., at south corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 5 Michigan 1913"	43 14 52.8	84 36 02.6	5,347
North Star District No. 4 schoolhouse, T. 10 N., R. 2 W., corner of secs. 17, 18, 19, and 20; crossroads.....	43 14 52.9	84 34 59.0	4,710
T. 10 N., R. 2 W., corner of secs. 16, 17, 20, and 21; crossroads.....	43 14 52.9	84 33 47.3	5,305
North Star, corner of secs. 15, 16, 21, and 22, T. 10 N., R. 2 W.; crossroads.....	43 14 52.8	84 32 36.5	5,245
T. 10 N., R. 2 W., corner of secs. 14, 15, 22, and 23; crossroads.....	43 14 53.0	84 31 25.0	5,290
T. 10 N., R. 2 W., corner of secs. 13, 14, 23, and 24; crossroads at schoolhouse.....	43 14 52.9	84 30 14.3	5,230

## Along highways near south border of quadrangle.

T. 7 N., R. 4 W., east corner of secs. 12 and 13..... (50 feet south of above corner is west corner of secs. 7 and 18, T. 7 N., R. 3 W.)	43 00 06.6	84 43 11.2	.....
T. 7 N., R. 3 W., corner of secs. 7, 8, 17, and 18, at crossroads.....	43 00 05.9	84 41 59.7	5,318
T. 7 N., R. 3 W., corner of secs. 8, 9, 16, and 17, at T road north.....	43 00 06.1	84 40 48.5	5,290
T. 7 N., R. 4 W., corner of secs. 9, 10, 15, and 16, at crossroads.....	43 00 05.5	84 39 37.7	5,260
T. 7 N., R. 4 W., 20 feet south and 30 feet west of corner of secs. 10, 11, 14, and 15, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 1, 1915"	43 00 05.4	84 38 27.6	5,216
T. 7 N., Rs. 2 and 3 W., corner of secs. 12, 13, 7, and 18, at crossroads.....	43 00 04.9	84 36 05.7	10,540
T. 7 N., R. 2 W., corner of secs. 7, 8, 17, and 18, at crossroads.....	43 00 05.1	84 34 56.4	5,150
T. 7 N., R. 2 W., corner of secs. 8, 9, 16, and 17, at cross streets in St. John.....	43 00 05.3	84 33 45.3	5,290
T. 7 N., R. 2 W., corner of secs. 9, 10, 15, and 16, at T road east..... (85 feet south of above corner is T road west.)	43 00 04.8	84 32 33.8	5,308
T. 7 N., R. 2 W., corner of secs. 10, 11, 14, and 15.....	43 00 04.8	84 31 23.5	5,226
T. 7 N., R. 2 W., 15 feet north and 20 feet east of corner of secs. 11, 12, 13, and 14, in northeast corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, 1915"	43 00 04.6	84 30 12.7	5,267

## Along highways near east border of quadrangle.

T. 7 N., R. 2 W., corner of secs. 1, 2, 11, and 12, at crossroads near schoolhouse.....	43 00 57.1	84 30 13.2	5,319
T. 7 N., R. 2 W., north corner of secs. 1 and 2..... (80 feet west of above corner is south corner of secs. 35 and 36, T. 8 N., R. 2 W.)	43 01 51.0	84 30 13.6	5,460
T. 8 N., R. 2 W., corner of secs. 25, 26, 35, and 36, at T road south.....	43 02 43.3	84 30 14.4	5,295
T. 8 N., R. 2 W., quarter corner between secs. 13 and 14, at T road north.....	43 04 53.8	84 30 14.1	.....
T. 8 N., R. 2 W., quarter corner between secs. 11 and 12, at crossroads near schoolhouse.....	43 05 46.3	84 30 13.7	5,320
T. 8 N., R. 2 W., corner of secs. 1, 2, 11, and 12, at crossroads.....	43 06 12.4	84 30 13.6	2,640
Tps. 8 and 9 N., R. 2 W., 15 feet south and 20 feet west of corner of secs. 1, 2, 35, and 36, in southwest corner of crossroads on Clinton-Gratiot county line; iron post stamped "Prim. Trav. Sta. No. 3, 1915"	43 07 03.1	84 30 13.3	5,136
T. 9 N., R. 2 W., corner of secs. 25, 26, 35, and 36, at crossroads.....	43 07 55.8	84 30 12.8	5,340
T. 9 N., R. 2 W., corner of secs. 23, 24, 25, and 26, 400 feet north of bridge over Maple River.....	43 08 47.6	84 30 13.2	5,240



**PERRINTON QUADRANGLE—Continued.****Along highways near east border of quadrangle—Continued.**

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 9 N., R. 2 W., corner of secs. 13, 14, 23, and 24, at crossroads....	43 09 40.0	84 30 13.0	5,310
T. 9 N., R. 2 W., corner of secs. 11, 12, 13, and 14, at crossroads....	43 10 32.6	84 30 13.1	5,320
T. 9 N., R. 2 W., corner of secs. 1, 2, 11, and 12, at crossroads....	43 11 25.0	84 30 13.1	5,310
Tps. 9 and 10 N., R. 2 W., corner of secs. 1, 2, 35, and 36, at crossroads.....	43 12 16.2	84 30 13.4	5,190
T. 10 N., R. 2 W., corner of secs. 25, 26, 35, and 36, at crossroads near schoolhouse.....	43 13 08.5	84 30 13.7	5,290
T. 10 N., R. 2 W., corner of secs. 23, 24, 25, and 26, at crossroads....	43 14 00.6	84 30 14.1	5,280
T. 10 N., R. 2 W., corner of secs. 13, 14, 23, and 24, at crossroads near schoolhouse.....	43 14 52.9	84 30 14.3	5,285

**Along highways through middle of quadrangle.**

Tps. 8 and 9 N., R. 2 W., corner of secs. 2, 3, 34, and 35, at crossroads on county line.....	43 07 03.4	84 31 24.5	.....
Tps. 8 and 9 N., R. 2 W., corner of secs. 3, 4, 33, and 34, at crossroads on county line.....	43 07 03.5	84 32 35.7	5,290
Tps. 8 and 9 N., R. 2 W., corner of secs. 4, 5, 32, and 33, at crossroads on county line near church.....	43 07 03.4	84 33 47.0	5,290
Tps. 8 and 9 N., R. 2 W., corner of secs. 5, 6, 31, and 32.....	43 07 03.5	84 34 58.2	5,280
Tps. 8 and 9 N., Rs. 2 and 3 W., corner of secs. 1, 6, 31, and 36.....	43 07 03.5	84 36 02.3	4,760
T. 8 N., R. 3 W., 20 feet south and 40 feet west of corner of secs. 1 and 2, at southwest corner of T road south; iron post stamped "Prim. Trav. Sta. No. 4, 1915".....	43 07 03.6	84 37 14.0	5,317
Tps. 8 and 9 N., R. 3 W., corner of secs. 2, 3, 34, and 35.....	43 07 03.8	84 38 24.9	5,260
T. 8 N., R. 3 W., corner of secs. 2, 3, 10, and 11, at crossroads.....	43 06 15.1	84 38 25.0	4,929
T. 8 N., R. 3 W., corner of secs. 3, 4, 9, and 10, at T road south.....	43 06 15.7	84 39 36.4	5,300
T. 8 N., R. 3 W., corner of secs. 4, 5, 8, and 9, near speed limit sign.....	43 06 16.4	84 40 47.7	5,290
Maple Rapids, 0.5 mile southwest of T road south, on section line.....	43 06 10.2	84 41 59.0	5,334
Maple River, south end of bridge over.....	43 06 33.9	84 42 43.3	4,070
Iron post No. 31, 1913.....	43 07 05.2	84 44 20.9	7,905

Magnetic declination for north border of quadrangle, 1° 18' W.; for south border, 0° 50' W.; for east border, 1° 20' W.; for west border, 0° 54' W.; through center, 0° 54' W.

**SAGINAW QUADRANGLE.****Near east border of quadrangle.**

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 11 N., R. 6 E., corner of secs. 3 and 4, center of T road south....	43 23 33.6	83 45 32.2	.....
T. 12 N., R. 6 E., corner of secs. 27, 28, 33, and 34, center of crossroads.....	43 24 25.6	83 45 28.9	5,275
T. 12 N., R. 6 E., corner of secs. 21, 22, 27, and 28, Pere Marquette R. R. crossing.....	43 25 17.4	83 45 29.1	5,240
T. 12 N., R. 6 E., corner of secs. 15, 16, 21, and 22, center of T road south.....	43 26 09.7	83 45 29.5	5,290
Crossroads.....	43 27 01.7	83 45 18.3	.....
Crossroads.....	43 27 53.8	83 45 42.5	5,571

**Near north border of quadrangle.**

Arn, 1 mile west of, 23 feet north, 21 feet west, corner of secs. 27, 28, 33, and 34, T. 13 N., R. 6 E., center of T road north; iron post stamped "Prim. Trav. Sta. No. 23, Mich. 1915".....	43 29 35.1	83 45 32.3	.....
T. 13 N., R. 6 E., corner of secs. 28, 29, 32, and 33, center of T road north.....	43 29 34.9	83 46 42.7	5,189
T. 13 N., R. 6 E., corner of secs. 29, 30, 31, and 32, center of crossroads.....	43 29 35.7	83 47 53.6	5,230
T. 13 N., Rs. 5 and 6 E., corner of secs. 31 and 36, center of T road south.....	43 29 34.9	83 49 04.7	5,235
South Bay City, 3 miles south and 2 miles east of, 15 feet north by 23 feet east, corner of secs. 25, 26, 35, and 36, T. 13 N., R. 5 E., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 24, Mich. 1915".....	43 29 36.5	83 50 14.0	5,130

Magnetic declination near east border of quadrangle, 1° 45' W.; near north border, 1° 45' W.

## SAGINAW QUADRANGLE—Continued.

## Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 10 N., R. 4 E., corner of secs. 14, 15, 22, and 23; crossroads.....	43 15 48.8	83 58 19.0	.....
T. 10 N., R. 4 E., corner of secs. 13, 14, 23, and 24; crossroads.....	43 15 49.0	83 57 10.4	5,080
T. 10 N., R. 4 E., corner of secs. 11, 12, 13, and 14; crossroads.....	43 16 40.8	83 57 10.8	5,240
T. 10 N., R. 4 E., corner of secs. 1, 2, 11, and 12; crossroads.....	43 17 33.5	83 57 11.1	5,340
T. 10 N., R. 4 E., north corner of secs. 1 and 2.....	43 18 27.8	83 57 11.9	5,489
(60 feet west of above position and 190 feet south of south end of bridge over Flint River is south corner of secs. 35 and 36, T. 11 N., R. 4 E.)			
T. 11 N., R. 4 E., corner of secs. 25, 26, 35, and 36; crossroads.....	43 19 19.5	83 57 14.1	5,240
T. 11 N., R. 4 E., corner of secs. 23, 24, 25, and 26; crossroads.....	43 20 11.2	83 57 14.8	5,230
Youngs Corners, corner of secs. 13, 14, 23, and 24, T. 11 N., R. 4 E.; crossroads.....	43 21 03.2	83 57 17.0	5,271
Youngs Corners, 0.9 mile north of; south end of bridge over Cass River.....	43 21 52.4	83 57 18.5	4,980
T. 11 N., R. 4 E., corner of secs. 1, 2, 11, and 12.....	43 22 46.4	83 57 20.0	5,461
Saginaw, intersection of East and Youman streets (probably north corner of secs. 1 and 2, T. 11 N., R. 4 E.).....	43 23 39.9	83 57 21.1	5,420
Saginaw, intersection of Center Street and Fordney Avenue.....	43 24 08.8	83 57 35.6	3,112
Saginaw, east end of Mackinaw Street bridge over Saginaw River.....	43 24 43.7	83 57 49.0	3,670
Saginaw, east side of north basement steps on east side of county courthouse, in top of stone facing; bronze tablet stamped "Prim. Trav. Sta. No. 11 Michigan 1913".....	43 25 03.4	83 57 55.2	2,046
Saginaw, intersection of Court, Bay, and Alexander streets; water trough.....	43 25 33.2	83 58 32.6	4,085
Saginaw, intersection of Bay and State streets, corner of secs. 14, 15, 22, and 23, T. 12 N., R. 4 E.....	43 26 11.8	83 58 32.5	3,910
T. 12 N., R. 4 E., corner of secs. 10, 11, 14, and 13; crossroads at schoolhouse.....	43 27 03.5	83 58 33.3	5,240
T. 12 N., R. 4 E., corner of secs. 2, 3, 10, and 11; crossroads.....	43 27 55.3	83 58 33.3	5,250
Eisenhauer Corners, corner of secs. 2, 3, 34, and 35, Tps. 12 and 13 N., R. 4 E.; crossroads.....	43 28 48.1	83 58 33.1	5,340
Deutsche B. M. Kirche, corner of secs. 26, 27, 34, and 35, T. 13 N., R. 4 E.; crossroads.....	43 29 39.8	83 58 25.8	5,269
Saginaw, intersection of Michigan Avenue and Wheeler Street.....	43 24 02.6	83 59 30.3	.....
Saginaw, 50 feet southwest of intersection of Florence Street and Michigan Avenue; intersection of railroad and street-car line.....	43 24 17.8	83 58 48.2	3,477

## Along highways near south border of quadrangle.

T. 10 N., R. 5 E., corner of secs. 19, 20, 29, and 30; crossroads.....	43 15 01.6	83 54 51.2	.....
T. 10 N., R. 5 E., corner of secs. 23, 24, 25, and 26; crossroads.....	43 15 02.9	83 50 05.1	.....
T. 10 N., Rs. 5 and 6 E., corner of secs. 24, 25, 19, and 30; crossroads.....	43 15 00.4	83 48 53.4	5,320
Birch Run, 1.3 miles east of; crossroads.....	43 15 00.5	83 46 10.3	.....
T. 10 N., R. 6 E., 25 feet north and 25 feet west of corner of secs. 21, 22, 27, and 28, at northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 12, 1915, Mich.".....	43 15 00.4	83 45 17.7	3,889
T. 10 N., R. 6 E., corner of secs. 15, 16, 21, and 22; crossroads at Town Hall.....	43 15 51.9	83 45 17.9	5,210
T. 10 N., R. 6 E., corner of secs. 9, 10, 15, and 16; T road east.....	43 16 43.5	83 45 19.4	5,230
T. 10 N., R. 6 E., corner of secs. 3, 4, 9, and 10; crossroads.....	43 17 36.0	83 45 17.6	5,312
Tps. 10 and 11 N., R. 6 E., corner of secs. 3, 4, 33, and 34; crossroads.....	43 18 25.2	83 45 17.3	4,980
T. 11 N., R. 6 E., corner of secs. 27, 28, 33, and 34; T road south.....	43 19 18.3	83 45 18.1	5,380
Frankenmuth, at extreme west edge of; crossroads, probably corner of secs. 21, 22, 27, and 28, T. 11 N., R. 6 E.....	43 20 09.0	83 45 31.7	5,230
T. 11 N., R. 6 E., corner of secs. 15, 16, 21, and 22; crossroads.....	43 21 01.0	83 45 31.5	5,270
T. 11 N., R. 6 E., corner of secs. 9, 10, 15, and 16; crossroads.....	43 21 53.2	83 45 32.5	5,281
T. 11 N., R. 6 E., 30 feet south and 20 feet west of corner of secs. 3, 4, 9, and 10, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 13, 1915, Mich.".....	43 22 45.8	83 45 32.4	5,326

NOTE.—Post is set 1.5 feet north of above position.

## Along highways through middle of quadrangle.

T. 11 N., R. 6 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 22 45.9	83 46 44.6	5,330
T. 11 N., R. 6 E., corner of secs. 5, 6, 7, and 8; crossroads.....	43 22 46.1	83 47 56.9	5,240
T. 11 N., R. 6 E., west corner of secs. 6 and 7; T road east.....	43 22 46.4	83 49 03.9	4,950
T. 11 N., R. 5 E., east corner of secs. 1 and 12; T road west.....	43 22 40.4	83 49 03.8	600
T. 11 N., R. 5 E., corner of secs. 1, 2, 11, and 12; crossroads at church.....	43 22 44.5	83 50 15.0	5,278
T. 11 N., R. 5 E., corner of secs. 2, 3, 10, and 11; crossroads.....	43 22 44.4	83 51 25.7	5,219
T. 11 N., R. 5 E., 30 feet south and 25 feet west of corner of secs. 3, 4, 9, and 10; iron post set at southwest corner of T road south stamped "Prim. Trav. Sta. No. 14, 1915, Mich.".....	43 22 44.8	83 52 36.2	5,210

## SAGINAW QUADRANGLE—Continued.

## Along highways through middle of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T. 11 N., R. 5 E., apparent corner of secs. 4, 5, 8, and 9; center of east and west road.....	° ' " 43 22 45.5	° ' " 83 53 45.9	Feet. 5,149
T. 11 N., R. 5 E., corner of secs. 5, 6, 7, and 8; right angle turn in road just north of crossroad.....	43 22 45.7	83 54 58.0	5,320
T. 11 N., R. 5 E., corner of secs. 7, 8, 17, and 18; T road west.....	43 21 53.7	83 54 56.9	5,271
T. 11 N., R. 5 E., west corner of secs. 7 and 18; T road east..... (120 feet north of above corner is apparently the east corner of secs. 12 and 13, T. 11 N., R. 4 E.)	43 21 54.2	83 56 06.8	5,165
T. 11 N., R. 4 E., east corner of secs. 13 and 24; T road west..... (20 feet south of above corner is west corner of secs. 18 and 19, T. 11 N., R. 5 E.)	43 21 03.7	83 56 05.5	5,120
Youngs Corners, T. 11 N., R. 4 E., corner of secs. 13, 14, 23, and 24; crossroads.....	43 21 03.20	83 57 17.0	5,284

Magnetic declination for south border of quadrangle, 2° 10' W.; for east border of south half, 1° 38' W.; for west border, 2° 09' W.; through center, 2° 15' W.; near east border, 1° 45' W.; near north border, 1° 45' W.

## ST. CHARLES QUADRANGLE.

## Along highways near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 13 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads.....	43 29 45.7	84 14 59.7	.....
T. 12 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads.....	43 26 59.1	84 14 59.9	.....
T. 12 N., R. 2 E., corner of secs. 16, 17, 20, and 21; stone at T road east.....	43 26 07.1	84 14 59.5	5,270
T. 12 N., R. 2 E., corner of secs. 20, 21, 28, and 29; stone at T road west.....	43 25 15.1	84 14 58.9	5,260
Hamlock, 1 mile west of, quarter corner between secs. 28 and 29, T. 12 N., R. 2 E.; crossroads.....	43 24 49.1	84 14 58.5	2,637
T. 12 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads.....	43 24 23.1	84 14 58.2	2,630
T. 12 N., R. 2 E., south corner of secs. 32 and 33; T road north..... (130 feet west of preceding position is north corner of secs. 4 and 5, T. 11 N., R. 2 E., T road south.)	43 23 30.9	84 14 57.2	5,280
T. 11 N., R. 2 E., 20 feet north by 20 feet west of corner of secs. 4, 5, 8, and 9, in northwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 15, Mich. 1913".....	43 22 36.6	84 14 57.6	5,495
T. 11 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads.....	43 21 44.4	84 14 56.0	5,290
T. 11 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads.....	43 20 52.4	84 14 56.0	5,270
T. 11 N., R. 2 E., corner of secs. 20, 21, 28, and 29; crossroads at church and schoolhouse.....	43 20 00.3	84 14 56.0	5,280
T. 11 N., R. 2 E., corner of secs. 28, 29, 32, and 33; crossroads.....	43 19 08.1	84 14 56.1	5,280
T. 11 N., R. 2 E., south corner of secs. 32 and 33; T road north..... (285 feet west of preceding position is north corner of secs. 4 and 5, T. 10 N., R. 2 E., T road south.)	43 18 14.4	84 14 54.2	5,441
Bad River bridge, just south of; cross roads.....	43 17 39.7	84 14 58.0	3,526
T. 10 N., R. 2 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 17 16.1	84 14 57.8	2,390
T. 10 N., R. 2 E., corner of secs. 8, 9, 16, and 17; crossroads.....	43 16 24.0	84 14 57.2	5,280
T. 10 N., R. 2 E., corner of secs. 16, 17, 20, and 21; crossroads.....	43 15 31.8	84 14 56.6	5,280

## Along highways through center of quadrangle.

T. 11 N., R. 2 E., corner of secs. 3, 4, 9, and 10; crossroads at schoolhouse.....	43 22 38.6	84 13 47.1	.....
T. 11 N., R. 2 E., corner of secs. 2, 3, 10, and 11; T road south.....	43 22 38.7	84 12 38.7	5,050
T. 11 N., R. 2 E., corner of secs. 1, 2, 11, and 12; stone in crossroads.....	43 22 40.4	84 11 25.4	5,420
T. 11 N., Rs. 2 and 3, corner of secs. 1, 12, 6, and 7; stone at crossroads.....	43 22 47.2	84 10 14.3	5,291
T. 11 N., R. 3 E., corner of secs. 5, 6, 7, and 8; crossroads.....	43 22 46.8	84 09 03.3	5,249
T. 11 N., R. 3 E., corner of secs. 4, 5, 8, and 9; crossroads.....	43 22 46.9	84 07 52.2	5,250
Swan Creek, 1 mile west of, 30 feet north by 25 feet west of corner of secs. 3, 4, 9, and 10, T. 11 N., R. 3 E.; iron post stamped "Prim. Trav. Sta. No. 16 Michigan 1913".....	43 22 47.1	84 06 41.5	5,218
Swan Creek, south end of wagon bridge over.....	43 22 43.6	84 05 57.3	3,286
Swan Creek, east-west road at railroad crossing, just southwest of station.....	43 22 46.2	84 05 38.4	1,427
Swan Creek, corner of secs. 2, 3, 10, and 11, T. 11 N., R. 3 E.; crossroads.....	43 22 46.1	84 05 30.4	590

## ST. CHARLES QUADRANGLE—Continued.

Along highways through center of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 11 N., R. 3 E., corner of secs. 1, 2, 11, and 12; crossroads.....	43 22 45.7	84 04 19.7	5,220
T. 11 N., R. 3 E., east corner of secs. 1 and 12; T road west.....	43 22 44.6	84 03 08.0	5,300
T. 11 N., R. 4 E., west corner of secs. 6 and 7; T road east.....	43 22 47.4	84 03 08.0	290
T. 11 N., R. 4 E., corner of secs. 5, 6, 7, and 8; at District No. 1 schoolhouse; crossroads.....	43 22 47.1	84 02 04.3	4,700
District No. 1 schoolhouse; 0.5 mile east of; center of east-west road at railroad crossing.....	43 22 46.6	84 01 28.6	2,640
Lincoln Corners, T. 11 N., R. 4 E., corner of secs. 4, 5, 8, and 9.....	43 22 46.2	84 00 53.6	2,580
Lincoln Corners, 0.8 mile north of, on north-south section line; T road south.....	43 23 25.1	84 00 54.4	3,940
Lincoln Corners, 1 mile northeast of, 0.6 mile south of Vogt Corners, 0.6 mile southwest of extreme south end of bridge over Titta- bawassee River.....	43 23 34.1	84 00 39.5	1,432
Vogt Corners; T road south.....	43 24 03.0	84 00 39.5	2,930

Magnetic declination for north border of quadrangle, 1° 31' W.; for south border, 1° 22' W.; for east border, 2° 09' W.; for west border, 1° 48' W.; for center, 1° 59' W.

## VASSAR QUADRANGLE.

Near west border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Crossroads.....	43 26 19.4	83 44 58.5	.....
T. 12 N., R. 6 E., center of sec. 3, center of T road north.....	43 28 20.0	83 44 54.8	.....
Tps. 12 and 13 N., R. 6 E., quarter corner between secs. 3 and 34, center of crossroads.....	43 28 43.2	83 44 54.9	2,340
T. 13 N., R. 6 E., center of sec. 34, center of T road south.....	43 29 09.2	83 44 55.4	2,640
T. 13 N., R. 6 E., quarter corner between secs. 34 and 35, center of crossroads.....	43 29 09.4	83 44 19.8	2,630
T. 13 N., R. 6 E., corner of secs. 26, 27, 34, and 35, center of T road north, 100 feet west is Michigan Central R. R. crossing at Arn station.....	43 29 35.4	83 44 19.9	2,629

Magnetic declination near west border of quadrangle, 1° 30' W.

Benzonia, Elk Rapids, Empire, Kingsley, Maple City, Thompsonville, and Traverse City quadrangles.

ANTRIM, BENZIE, GRAND TRAVERSE, KALKASKA, AND LEELANAU COUNTIES.

The following geographic positions were determined by primary traverse in 1915 by Oscar Jones, on North American datum, and are based on Sleeping Bear and Pyramid triangulation stations of the United States Lake Survey.

## BENZONIA QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Empire, 4 miles south of, 25 feet south by 20 feet west from quarter corner between secs. 7 and 18, center of T road east; is iron post stamped "Prim. Trav. Sta. No. 9, Mich. 1915".....	44 44 51.0	86 02 57.1	.....
T. 27 N., R. 14 W., corner of secs. 7, 8, 17, and 18, center of cross- roads.....	44 44 51.3	86 02 20.2	2,662
T. 27 N., R. 14 W., corner of secs. 8, 9, 16, and 17, center of cross- roads.....	44 44 51.1	86 01 06.8	5,300

Magnetic declination for north border of quadrangle, 2° 00' W.

## ELK RAPIDS QUADRANGLE.

Along east shore of east arm of Grand Traverse Bay.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Crossroads.....	44 47 14.0	85 29 23.7	.....
Crossroads, section line east and west.....	44 48 07.5	85 28 53.2	5,846
Yuba, road forks at.....	44 49 23.9	85 27 31.7	9,719
Road forks.....	44 50 45.3	85 26 10.6	10,170
T road east, Grand Traverse-Antrim county line.....	44 51 35.1	85 25 42.7	5,428
Pere Marquette R. R. crossing.....	44 53 17.0	85 25 19.8	10,450
Elk Rapids, west end of Ottawa Street; iron post stamped "Prim. Trav. Sta. No. 14, Mich. 1915".....	44 53 40.0	85 25 40.2	2,333
Elk Rapids, corner of Ottawa and Bridge streets.....	44 53 47.5	85 24 41.4	2,890
T road east.....	44 54 25.8	85 23 19.2	7,075
Kewadin Junction, west Michigan Pike and Kalkaska Road.....	44 55 46.2	85 21 57.3	10,054
Tps. 29 and 30 N., R. 9 W., corner of secs. 1, 2, 35, and 36, center of crossroads.....	44 56 46.5	85 21 09.8	6,994
T. 30 N., R. 9 W., corner of secs. 25, 26, 35, and 36, center of cross- roads.....	44 57 39.3	85 21 11.0	5,350
T road west.....	44 58 32.4	85 21 20.2	5,417
T road east.....	44 58 58.8	85 21 18.4	2,680
Kewadin, 4 miles north by 1 mile east of; 25 feet south by 25 feet east of corner of secs. 13, 14, 23, and 24, center of crossroad; is iron post stamped "Prim. Trav. Sta. No. 15, Mich., 1915".....	44 59 25.0	85 21 10.4	2,703

## Through center of quadrangle from west to east.

T road east.....	44 55 29.4	85 21 17.3	.....
T road east.....	44 54 24.2	85 21 00.1	6,725
T. 29 N., R. 9 W., corner of secs. 23, 24, 25, and 26, center of T road west.....	44 53 18.8	85 21 09.8	6,664
T. 29 N., R. 9 W., corner of secs. 25, 26, 35, and 36, center of cross- roads.....	44 52 26.5	85 21 10.4	5,290
Tps. 28 and 29 N., R. 9 W., corner of secs. 1, 2, 35, and 36, center of crossroads.....	44 51 34.5	85 21 10.6	5,270
T road east.....	44 51 34.4	85 20 22.6	3,460
Pearsons Harbor, road fork 470 feet west of drawbridge.....	44 51 00.8	85 19 45.7	4,327
Road fork.....	44 51 07.5	85 18 59.0	3,434
Alden, 1 mile south of Pere Marquette R. R. crossing.....	44 51 34.3	85 17 02.6	8,814

## Near east border of quadrangle.

Alden, center of track opposite station, Pere Marquette R. R.....	44 52 42.8	85 16 37.9	7,165
Pere Marquette R. R. crossing.....	44 53 18.5	85 16 26.0	3,711
Pere Marquette R. R. crossing.....	44 55 09.0	85 17 10.7	11,644
Pere Marquette R. R. crossing, section line east and west.....	44 55 55.6	85 17 12.7	4,720
Clam River, south end of iron bridge over.....	44 56 32.3	85 17 01.0	3,817
Road fork, section line east and west.....	44 56 47.2	85 16 46.4	1,838
T. 30 N., R. 8 W., quarter corner between secs. 33 and 34, center of T road north.....	44 57 13.4	85 16 18.9	3,308
T. 30 N., R. 8 W., corner of secs. 27, 28, 33, and 34, center of T road west.....	44 57 39.7	85 16 18.7	2,665
Bellairo, 3 miles west by 1 mile north of; 35 feet north by 25 feet west of corner of secs. 21, 22, 27, and 28, T. 30 N., R. 8 W., center of crossroads; is iron post stamped "Prim. Trav. Sta. No. 16, Mich. 1915".....	44 58 32.8	85 16 18.8	5,374
T road south.....	44 55 59.4	85 16 19.1	.....
T. 29 N., R. 8 W., corner of secs. 9, 10, 15, and 16, center of cross- roads.....	44 55 03.4	85 16 19.5	5,670
T. 29 N., R. 8 W., corner of secs. 10, 11, 14, and 15, center of cross- roads.....	44 55 03.3	85 15 05.9	5,300
T. 29 N., R. 8 W., corner of secs. 14, 15, 22, and 23, center of cross- roads.....	44 54 10.9	85 15 06.4	5,306
T. 29 N., R. 8 W., corner of secs. 22, 23, 26, and 27, center of cross- roads.....	44 53 18.4	85 15 06.3	5,314
Alden, 1 mile east of; 25 feet east by 25 feet south of quarter corner between secs. 26 and 27, T. 29 N., R. 8 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 17, Mich. 1915".....	44 52 52.0	85 15 06.1	2,677
Pere Marquette R. R. crossing.....	44 50 42.6	85 17 04.8	.....
Rapid City, center of track opposite station Pere Marquette R. R. T. 28 N., R. 8 W., quarter corner between secs. 9 and 16, center of T road east.....	44 50 01.2	85 17 04.6	4,230
T road east.....	44 49 50.4	85 16 58.1	1,192
T road east.....	44 49 24.1	85 16 58.2	2,656
T. 28 N., R. 8 W., quarter corner between secs. 16 and 21, center of crossroads.....	44 48 58.0	85 16 58.1	2,670
T. 28 N., R. 8 W., center of secs. 21, center of T road east.....	44 48 32.0	85 16 58.1	2,630

**ELK RAPIDS QUADRANGLE—Continued.****Near east border of quadrangle—Continued.**

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
T. 28 N., R. 8 W., corner of secs. 21, 22, 27, and 28, fence line.....	44 48 05.7	85 16 21.3	3,756
T road west.....	44 47 24.8	85 16 39.9	4,359
Rapid City, 4 miles south by 0.5 mile east of, 15 feet south by 20 feet west of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 18, Mich. 1915".....	44 46 50.9	85 16 22.6	3,647

**Near south border of quadrangle.**

Barker Creek, Pere Marquette R. R. crossing, 480 feet south of station.....	46 46 47.9	85 18 55.4	-----
T. 28 N., Rs. 8 and 9 W., quarter corner between secs. 31 and 36; center of crossroads.....	44 46 47.7	85 19 57.6	4,484
T. 28 N., R. 9 W., quarter corner between secs. 35 and 36, center of T road east.....	44 46 47.2	85 21 10.2	5,236
T. 28 N., R. 9 W., corner of secs. 1, 2, 35, and 36, center of T road north.....	44 46 22.1	85 21 10.8	2,540
Pere Marquette R. R. road crossing.....	44 46 22.2	85 22 30.0	5,712
Williamsburg, 1 mile east of, 35 feet east by 25 feet north of, quarter corner between secs. 3 and 34, Tps. 27 and 28 N., R. 9 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 19, Mich. 1915".....	44 46 22.7	85 23 00.3	2,182
Tps. 27 and 28 N., R. 9 W., quarter corner between secs. 4 and 33, center of crossroads.....	44 46 22.5	85 24 13.6	5,284
Williamsburg, Pere Marquette R. R. road crossing, 300 feet west of station.....	44 46 22.4	85 24 36.5	1,656
Tps. 27 and 28 N., R. 9 W., corner of secs. 4, 5, 32, and 33, center of T road south.....	44 46 22.3	85 24 50.0	967
Tps. 27 and 28 N., R. 9 W., corner of secs. 5, 6, 31, and 32, center of crossroads.....	44 46 22.0	85 26 03.3	5,292
Tps. 27 and 28 N., R. 10 W., corner of secs. 1, 2, 35, and 36, center of crossroads.....	44 46 21.5	85 28 31.9	10,719
Tps. 27 and 28 N., R. 10 W., corner of secs. 2, 3, 34, and 35, center of T road north.....	44 46 24.5	85 29 57.4	6,174

Magnetic declination along east shore of east arm of Grand Traverse Bay, 1° 45' W.; through center of quadrangle, 2° 00' W.; near east border, 1° 45' W.; near south border, 2° 00' W.

**EMPIRE QUADRANGLE.****Near east border of quadrangle.**

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	<i>Feet.</i>
Road fork.....	44 52 39.6	86 02 22.8	7,676
Road fork.....	44 51 39.2	86 02 01.8	6,297
T road north junction West Michigan Pike with Maple City road..	44 50 05.9	86 02 02.4	9,454
Empire, crossroads at high school.....	44 48 40.3	86 03 29.7	10,715
T. 27 N., R. 14 W., quarter corner between secs. 30 and 31, center of crossroads.....	44 47 35.1	86 02 58.6	6,975
T. 27 N., R. 14 W., quarter corner between secs. 6 and 31, center of crossroads.....	44 46 42.7	86 02 57.3	5,305
T. 27 N., R. 14 W., quarter corner between secs. 6 and 7, center of crossroads.....	44 45 43.6	86 02 56.8	5,985
Bennett Corners, 0.5 mile south of Glen Haven, 33 feet east, center of T road east; iron post stamped "Prim. Trav. Sta. No. 8, Mich. 1915".....	44 53 53.0	86 01 46.0	-----
T road west.....	44 53 25.8	86 02 00.9	2,962
Sleeping Bear triangulation station, situated on the highest point of the hill, about 3 miles south and about 2 miles west of Glen Haven (signal found but no mark, 1915).....	44 52 23.0	86 04 06.8	11,069

Magnetic declination near east border of quadrangle, 2° 0' W.

## KINGSLEY QUADRANGLE.

Near north border of quadrangle

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T road south.....	44 44 56.4	85 33 28.0	.....
Pere Marquette R. R. road crossing.....	44 44 47.2	85 31 33.4	8,321
T road west.....	44 44 48.0	85 31 21.0	900

Magnetic declination near north border of quadrangle, 2° 00' W.

## MAPLE CITY QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T road south, north-south line between secs. 21 and 22, T. 3 N., R. 12 W.....	44 59 40.2	85 45 15.9	.....
Leland, 2 miles south of; junction West Michigan Pike and Provenant road; iron post stamped "Prim. Trav. Sta. No. 6, Mich. 1915".....	44 59 40.9	85 46 09.8	3,874
Road fork.....	44 58 48.0	85 46 35.7	5,673
Road fork.....	44 57 02.7	85 47 59.0	12,231
Crossroads.....	44 56 38.7	85 48 08.2	2,514
Road fork, road south on line between secs. 7 and 12, T. 29 N., Rs. 12 and 13 W.....	44 56 13.8	85 48 40.5	3,433
Road fork.....	44 55 23.5	85 49 12.9	5,604
Shetland schoolhouse, crossroads at.....	44 55 00.7	85 49 51.6	3,617
T road south, on line between secs. 14 and 15, T. 29 N., R. 13 W.....	44 54 58.0	85 51 08.5	5,540
T. 29 N., R. 13 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	44 55 19.3	85 52 22.0	5,711
Bass Lake, 1 mile north of, 200 feet south of school, south side of road; iron post stamped "Prim. Trav. Sta. No. 7, Mich. 1915".....	44 55 59.3	85 54 28.3	9,945
Road fork.....	44 56 07.9	85 55 14.8	3,459
T. 29 N., Rs. 13 and 14 W., corner of secs. 1, 6, 7, and 12, center of crossroads.....	44 56 16.7	85 56 11.4	4,167
Road fork.....	44 57 17.8	85 56 27.0	6,286
Pyramid triangulation station, situated on Pyramid Point near the lake shore on the highest point of the hill (remains of signal, no mark, 1915).....	44 58 04.7	85 55 26.9	6,426
Road fork.....	44 54 42.7	85 57 27.3	.....
Road fork.....	44 54 23.6	85 58 20.4	4,284
Glenn Arbor, crossroads at.....	44 53 52.3	85 59 19.2	5,289

Near south border of quadrangle.

T. 27 N., R. 13 W., quarter corner between secs. 3 and 10, center of T road east.....	44 45 41.6	85 51 57.9	.....
T. 27 N., R. 13 W., corner of secs. 2, 3, 10, and 11, center of crossroads.....	44 45 41.5	85 51 20.9	2,665
T. 27 N., Rs. 12 and 13 W., corner of secs. 1, 2, 7, and 12, center of crossroads.....	44 45 41.6	85 50 07.1	5,329
Cedar Run crossing Manistee & Northeastern R. R., 200 feet south of station.....	44 45 46.8	85 48 52.0	5,444
T. 27 N., R. 12 W., corner of secs. 5, 6, 7, and 8, center of T road south.....	44 45 40.6	85 47 46.0	4,798
T. 27 N., R. 12 W., corner of secs. 4, 5, 8, and 9, center of T road north.....	44 45 39.1	85 46 32.9	5,280
Cedar Run, 3.5 miles east of, 35 feet north by 35 feet west from corner of secs. 3, 4, 9, and 10, T. 27 N., R. 12 W.; iron post stamped "Prim. Trav. Sta. No. 11, Mich. 1915".....	44 45 38.4	85 45 20.3	5,238
T road south.....	44 46 27.5	85 45 18.0	4,980

Near east border of quadrangle.

T. 28 N., R. 12 W., corner of secs. 27, 28, 33, and 34, center of T road west.....	44 47 21.6	85 45 18.9	.....
T. 28 N., R. 12 W., corner of secs. 21, 22, 27, and 28, center of T road south.....	44 48 14.5	85 45 19.0	5,364

## MAPLE CITY QUADRANGLE—Continued.

Along Manistee &amp; Northeastern R. R.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Solon, road crossing at.....	44 48 35.8	85 45 38.2	2,561
Cedar City, 100 feet south of station, west side of railroad; iron post stamped "Prim. Trav. Sta. No. 12, Mich. 1915".....	44 50 51.0	85 47 34.0	16,030
Road crossing.....	44 52 01.1	85 47 49.0	7,189
Isadore, road crossing at.....	44 52 39.1	85 47 36.9	3,946
Bodus, road crossing at.....	44 54 24.2	85 46 58.9	10,996
Road crossing section line north and south.....	44 55 08.0	85 46 31.9	4,834
Schomberg, road crossing at.....	44 55 16.6	85 46 23.5	1,069
Road crossing.....	44 56 08.6	85 45 33.1	6,395
Road crossing.....	44 57 02.8	85 45 17.6	5,598
Road crossing.....	44 57 58.0	85 45 16.2	5,591

Magnetic declination near north border of quadrangle, 0° 45' W.; near south border, 0° 15' W.; near east border, 0° 30' W.

## THOMPSONVILLE QUADRANGLE.

Near north border of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T. 27 N., R. 14 W., corner of secs. 10, 11, 14, and 15, center of crossroads.....	44 44 51.1	85 59 53.7	.....
Empire & Southeastern R. R. road crossing.....	44 44 45.2	85 58 53.5	4,379
Crossroads.....	44 44 49.7	85 55 29.2	14,756
T road south.....	44 44 49.9	85 53 48.8	7,244
Almira Corners, corner of secs. 9, 10, 15, and 16, T. 27 N., R. 13 W., center of crossroads.....	44 44 49.8	85 52 35.8	5,270
Almira Corners, 1 mile east of, 30 feet south of quarter corner between secs. 10 and 15, T. 27 N., R. 13 W., center of T road north; iron post stamped "Prim. Trav. Sta. No. 10, Mich. 1915".....	44 44 49.3	85 51 59.2	2,642

Magnetic declination near north border of quadrangle, 1° 00' W.

## TRAVERSE CITY QUADRANGLE.

East and west sides of the peninsula.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
T road east.....	44 47 45.4	85 35 06.4	.....
T road east.....	44 48 55.4	85 34 40.7	7,323
T road east.....	44 49 36.0	85 33 57.8	5,107
T road east.....	44 50 11.0	85 33 41.9	3,750
T road east.....	44 51 42.4	85 32 57.0	9,798
Bowers Harbor, 1 mile south of, 10 feet west of center of T road east; iron post stamped "Prim. Trav. Sta. No. 1 Mich. 1915".....	44 52 09.0	85 32 12.7	4,179
Bowers Harbor, road fork at.....	44 53 40.0	85 31 29.3	9,740
Road fork.....	44 53 54.8	85 30 54.5	2,916
T. 29 N., R. 10 W., corner of secs. 9, 10, 15, and 16, center of crossroads.....	44 55 15.9	85 30 55.3	8,120
T. 29 N., R. 10 W., corner of secs. 3, 4, 9, and 10, center of crossroads.....	44 56 08.5	85 30 55.3	5,424
T. 29 N., R. 10 W., corner of secs. 3, 4, 33, and 34, center of crossroads.....	44 57 01.6	85 30 55.2	5,373
T. 29 N., R. 10 W., corner of secs. 27, 28, 33, and 34, center of crossroads.....	44 57 54.5	85 30 54.8	5,363
Old mission, 1 mile west of, 35 feet south by 29 feet east of quarter corner between secs. 27 and 34, T. 29 N., R. 10 W., center of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, Mich. 1915".....	44 57 54.4	85 30 16.3	2,769
T. 29 N., R. 10 W., quarter corner between secs. 3 and 10, center of T road west.....	44 56 08.8	85 30 17.3	10,695



## TRAVERSE CITY QUADRANGLE—Continued.

East and west sides of the peninsula—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
T 29 N., R. 10 W., quarter corner between secs. 10 and 15, center of T road west.....	44 55 14.9	85 30 17.6	5,460
T road west.....	44 54 41.6	85 30 12.5	3,384
Mapleton, road fork at.....	44 53 32.5	85 30 30.8	7,120
Road fork at school.....	44 51 16.1	85 31 38.7	.....
Road fork.....	40 50 16.5	85 32 10.0	6,443
Road fork.....	44 49 11.1	85 33 18.0	8,223
McKinley School, road fork at.....	44 47 47.1	85 34 29.3	9,941
Road fork.....	44 46 26.9	85 35 27.5	9,142
Traverse City, east side of road fork Old Mission and Elk Rapids..	44 45 51.5	85 35 04.5	4,133

## Near south border of quadrangle.

Traverse City, center of south Maple and west Front streets.....	44 45 50.8	85 37 57.8	.....
Traverse City, center State and Park streets at Park Place Hotel..	44 45 46.9	85 37 04.8	3,843
Crossroads.....	44 45 51.4	85 35 17.0	4,421
T road south.....	44 45 53.7	85 30 24.2	.....
Acme, 31 feet north by 5 feet east of center of T road east; iron post stamped "Prim. Trav. Sta. No. 13, Mich. 1915".....	44 46 24.9	85 30 01.5	3,556
Elwood School, center of crossroads at.....	44 46 32.0	85 41 38.9	.....
Road forks.....	44 46 27.2	85 39 35.4	8,919
Traverse City, 36 feet north of center of West Michigan Pike and Empire Road; iron post stamped "Prim. Trav. Sta. No. 3, Mich. 1915".....	44 46 31.4	85 38.30.2	4,725

## Along west shore of west arm of Grand Traverse Bay.

T road west.....	44 47 36.7	85 38 11.7	.....
T road west.....	44 50 12.5	85 30 04.0	16,222
T road west.....	44 51 35.0	85 38 58.1	8,367
Traverse City, 9 miles north of, 30 feet east of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 4, Mich. 1915".....	44 52 58.1	85 38 53.6	8,418
T road south.....	44 53 32.6	85 38 30.6	3,864
T road west at school.....	44 54 24.8	85 37 53.5	5,925
Road fork.....	44 55 20.0	85 37 29.5	5,854
T 29 N., R. 11 W., corner of secs. 3, 4, 9, and 10, fence line.....	44 56 09.1	85 38 00.3	5,444
T road east line between Tps. 29 and 30 N., R. 11 W.....	44 57 09.1	85 37 51.4	6,115
T road south, road south on section line.....	44 57 58.5	85 38 00.4	5,036
Sutton Bay, 39 feet north by 16 feet west of center of road fork; iron post stamped "Prim. Trav. Sta. No. 5, Mich. 1915".....	44 58 50.6	85 38 49.2	6,336

## Near north border of quadrangle.

T road north.....	44 59 21.6	85 39 52.2	5,511
Road fork.....	44 59 51.9	85 40 31.0	4,154
Road fork.....	44 59 20.2	85 41 37.7	5,773
Provemont, east side of, center of crossroads.....	44 59 00.0	85 42 30.3	4,297
Provemont, 1 mile west of, crossing Manistee & Northeastern R. R.....	44 58 55.4	85 44 01.7	6,591
Manistee & Northeastern R. R. road crossing.....	44 58 18.3	85 44 41.8	.....

Magnetic declination east and west sides of the peninsula, 0° 45' W.; near south border of quadrangle, 1° 30' W.; along west shore of west arm of Grand Traverse Bay, 1° 00' W.; near north border of quadrangle, 1° 00' W.

