

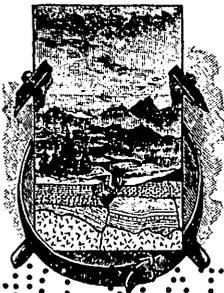
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

BULLETIN 555 - 89

RESULTS OF SPIRIT LEVELING IN INDIANA

1897 TO 1911, INCLUSIVE

R. B. MARSHALL, CHIEF GEOGRAPHER



OHIO STATE
UNIVERSITY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

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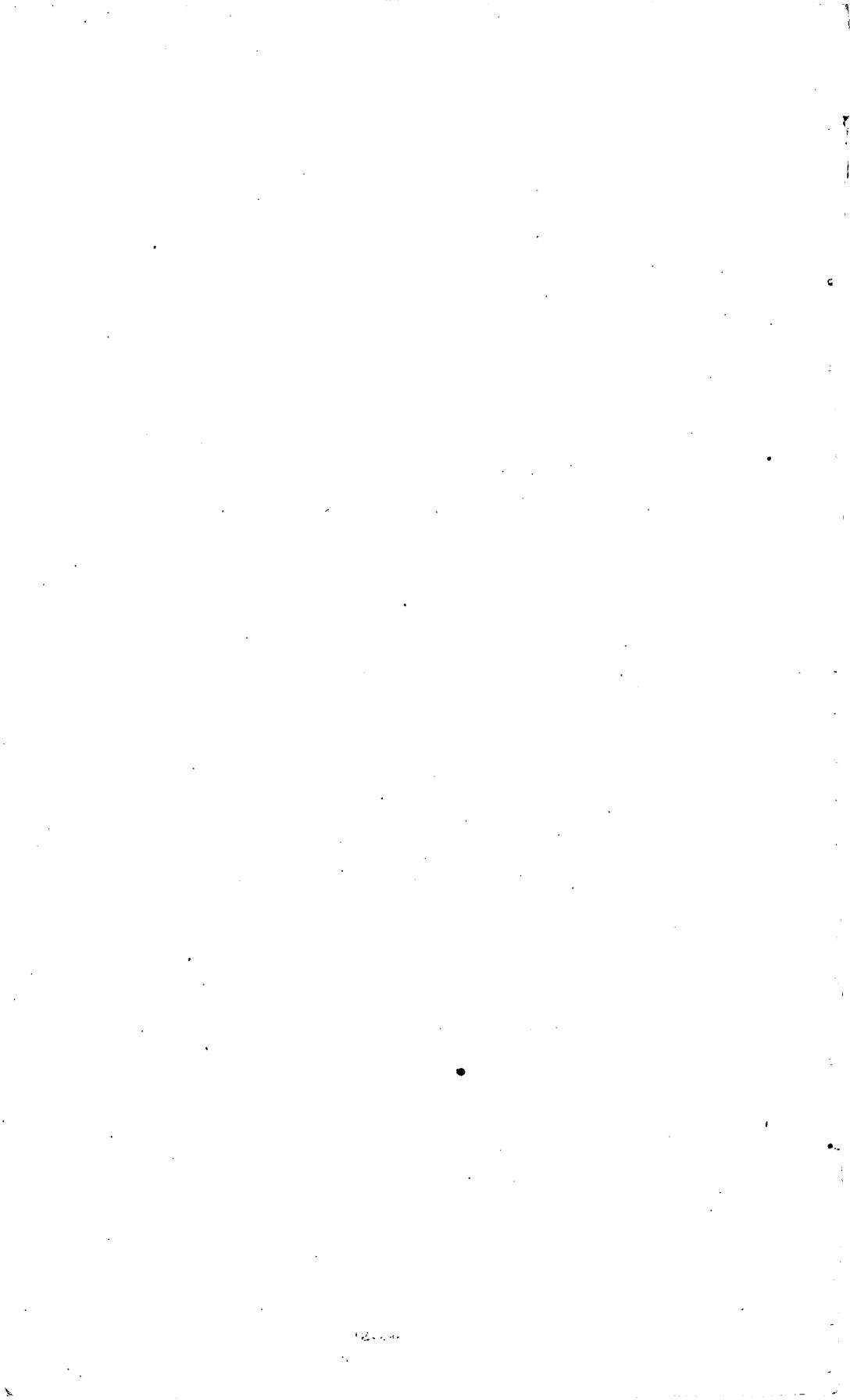
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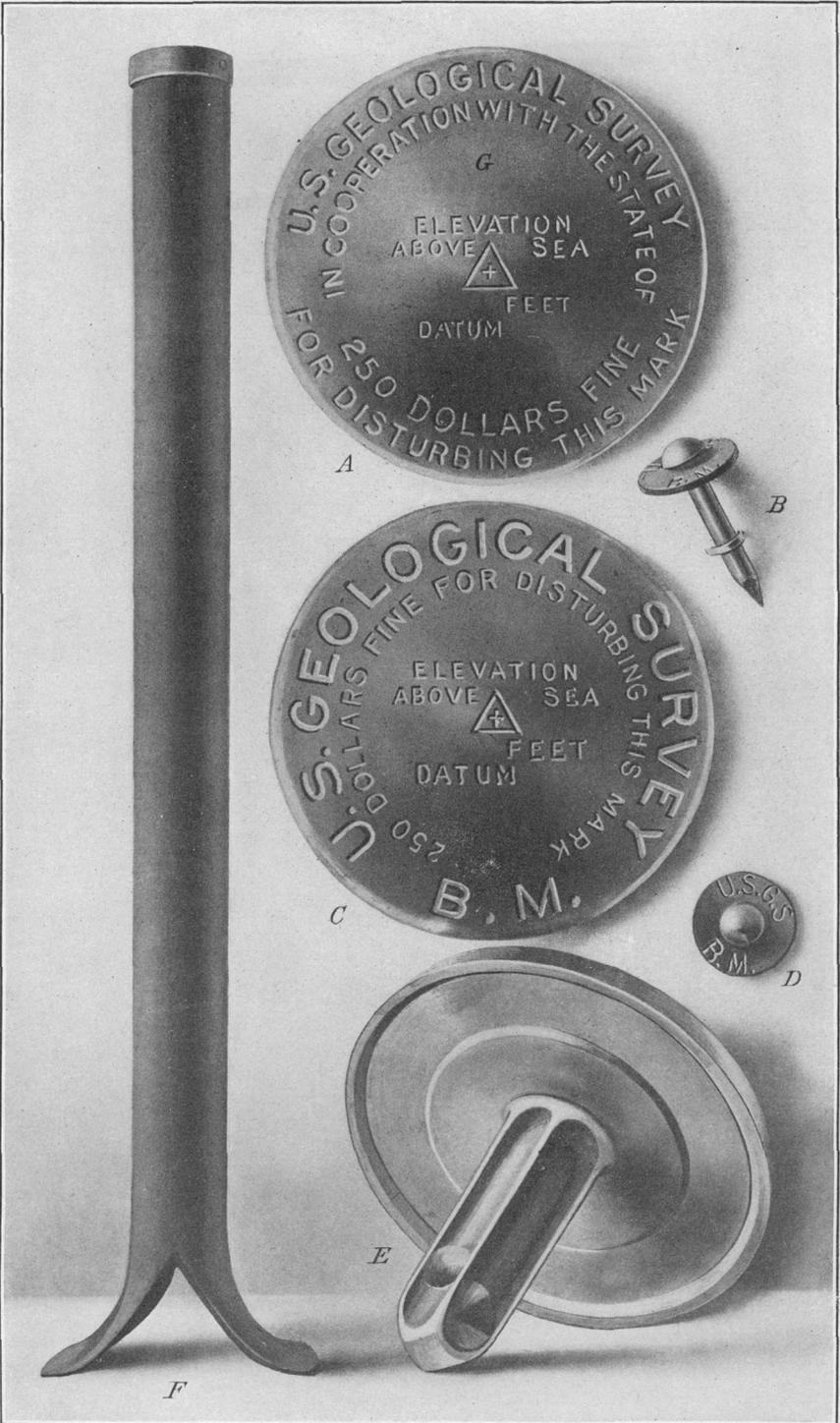
CONTENTS.

	Page.
Introduction.....	5
Scope of the work.....	5
Personnel.....	5
Classification.....	6
Bench marks.....	6
Datum.....	7
Topographic maps.....	7
Precise leveling.....	8
Bloomfield, Bloomington, Burns City, Clay City, Heltonville, Jasonville, Oolitic, Paoli, and Terre Haute quadrangles (Clay, Greene, Lawrence, Owen, and Vigo Counties).....	8
New Albany, Paoli, and Salem quadrangles (Clark, Floyd, Lawrence, Orange, and Washington Counties (Ind.) and Jefferson County (Ky.)....	11
Primary leveling.....	15
Boonville, Degonia Springs, Huntingsburg, Leopold, Owensboro, Peters- burg, St. Meinrad, Tell City, and Velpen quadrangles (Davies, Dubois, Gibson, Pike, Spencer, and Warrick Counties).....	15
Evansville, Hauptstadt, Newburg, New Harmony, Princeton, and Vin- cennes quadrangles (Gibson, Knox, Posey, and Vanderburg Counties)...	19
Kosmosdale, New Albany, and Prospect quadrangles (Clark, Floyd, and Harrison Counties).....	21
Bloomington quadrangle (Greene, Monroe, and Owen Counties).....	23
Clay City quadrangle (Clay, Owen, and Vigo Counties).....	25
Toleston quadrangle (Lake County).....	26
Danville quadrangle (Warren County).....	26
Appendix A: Elevations adjusted by the Coast and Geodetic Survey from pre- cise leveling.....	28
Appendix B: Primary leveling by the United States Corps of Engineers.....	38
Index.....	49

ILLUSTRATION.

	Page.
PLATE I. Geological Survey bench marks.....	5





GEOLOGICAL SURVEY BENCH MARKS.

A, Tablet used in cooperating States. The State name is inserted at G.
 B and D, Copper temporary bench mark, consisting of a nail and copper washer.
 A, C, and E, Tablets for stone or concrete structures.
 F, Iron post used where there is no rock.

RESULTS OF SPIRIT LEVELING IN INDIANA, 1897 TO 1911, INCLUSIVE.

R. B. MARSHALL, Chief Geographer

INTRODUCTION.

Scope of the work.—All results of spirit leveling in Indiana previously published by the United States Geological Survey and all results of later work in the State are included in this report, rearranged by quadrangles.

These results are in agreement with the 1907 adjustment of precise leveling by the Coast and Geodetic Survey, except as modified in the southern part of the State by an adjustment made in 1912 by that Survey of the precise-level lines from Lawrenceburg, Ind., to Olney, Ill., run by the Coast and Geodetic Survey; from Terre Haute, Ind., along Wabash River to Shawneetown, Ill., run by the United States Corps of Engineers; from Oakland, Ill., via Mitchell, Ind., and Louisville, Ky., to Georgetown, Ky., run by the United States Geological Survey; and from Lawrenceburg, Ind., along Ohio River to Cairo, Ill., run by the United States Corps of Engineers. These lines have been fitted to the precise-level net, the elevations at Georgetown, Ky., Lawrenceburg, Ind., Cairo, Olney, and Oakland, Ill., being held at the values given by the 1907 adjustment. The elevations of bench marks in the northwestern part of the State also remain as determined by the 1907 adjustment, and none of the bench-mark elevations in the State are likely to be changed materially by any future adjustment.

Personnel.—The field work during the years from 1897 to 1902, inclusive, was done under the direction of J. H. Renshawe, geographer; from 1903 to 1906, inclusive, under H. M. Wilson, geographer; and from 1907 to 1911, inclusive, under W. H. Herron, geographer. The work since January, 1908, was done under the general direction of R. B. Marshall, chief geographer. Credit is given to the different levelmen in the introduction to each list. The office work of computation, adjustment, and preparation of lists was done mainly by

S. S. Gannett, geographer, under the general direction of E. M. Douglas, geographer.

Classification.—The elevations are classified as precise or primary, according to the methods employed in their determination. For precise lines instruments and rods of the highest grade are used, each line is run in both forward and backward directions, and every precaution is taken to guard against error. The allowable divergence between the forward and the backward lines in feet is represented by the formula $0.017\sqrt{D}$, in which D is the distance in miles between bench marks. For primary lines standard Y levels are used; lines are run in circuits or are closed on precise lines, with an allowable closing error in feet represented by the formula $0.05\sqrt{D}$, in which D is the length of the circuit in miles, sufficient care being given the work to maintain this standard. For levels of both classes careful office adjustments are made, the small outstanding errors being distributed over the lines.

Bench marks.—The standard bench marks are of two forms. The first form is a circular bronze or aluminum tablet (C and E , Pl. I), $3\frac{1}{2}$ inches in diameter and one-fourth inch thick, having a 3-inch stem, which is cemented in a drill hole in solid rock, in the wall of some public building, in a bridge abutment, or in other substantial masonry structure. The second form (F , Pl. I), employed where masonry or rock is not accessible, consists of a hollow wrought-iron post $3\frac{1}{2}$ inches in outer diameter and 4 feet in length. It is split at the bottom and expanded to 10 inches in order to give a firm bearing on the earth and is set about 3 feet in the ground. A bronze or aluminum-bronze cap is riveted upon the top of the post. A third style of bench mark with abbreviated lettering (B and D , Pl. I) is used for unimportant points. This consists of a special copper nail $1\frac{1}{2}$ inches in length driven through a copper washer seven-eighths of an inch in diameter.

The tablets, as well as the caps on the iron posts, are appropriately lettered, and for cooperating States the fact of such cooperation is indicated by the addition of the State name (G , Pl. I). The numbers stamped on the bench marks described in the following pages represent the elevations to the nearest foot as determined by the levelman. These numbers are stamped with $\frac{3}{16}$ -inch steel dies on the tablets or post caps, to the left of the word "feet." The office adjustment of the notes and the reduction to mean sea-level datum may so change some of the figures that the original markings are 1 or 2 feet in error. It is assumed that engineers and others who have occasion to use the bench-mark elevations will apply to the Director of the United States Geological Survey, at Washington, D. C., for the adjusted values, and will use the markings as identification numbers only.

Datum.—All United States Geological Survey elevations are referred to mean sea level, which is the level that the sea would assume if the influence of winds and tides were eliminated. This level is not the elevation determined from the mean of the highest and the lowest tides, nor is it the half sum of the mean of all the high tides and of the mean of all the low tides, which is called half-tide level. *Mean sea level is the average height of the water, all stages of the tide being considered.* It is determined from observations made by means of tidal gages placed at stations where local conditions, such as long, narrow bays, rivers, and like features, will not affect the height of the water. To obtain even approximately correct results these observations must extend over at least one lunar month, and if great accuracy is desired they must extend over several years. At ocean stations half-tide level and mean sea level usually differ but little. It is assumed that there is no difference between the mean sea level as determined from observations in the Atlantic Ocean, the Gulf of Mexico, or the Pacific Ocean.

The connection with tidal stations for bench marks in certain areas that lie at some distance from the sea coast is still uncertain, and this fact is indicated by the addition of a letter or a word to the right of the word "Datum" on tablets or posts. For such areas corrections of published results will be made from time to time as the precise-level lines of the United States Geological Survey or other Government organizations are extended.

Topographic maps.—Maps of the following quadrangles wholly or partly in Indiana have been published by the United States Geological Survey up to June 1, 1913. They may be obtained for 10 cents each or \$3 for 50, on application to the Director of the Survey at Washington, D. C.

Bloomington.	New Harmony (Ind.-Ill.) ^b
Boonville. ^a	New Haven (Ill.-Ind.-Ky.) ^c
Calumet (Ill.-Ind.).	Owensboro (Ind.-Ky.)
Clay City.	Patoka (Ind.-Ill.) ^b
Danville (Ill.-Ind.).	Petersburg. ^a
Degonia Springs. ^a	Princeton (Ind.-Ill.) ^b
Ditney. ^a	St. Meinrad.
Haubstadt. ^b	Tell City (Ky.-Ind.)
Kosmosdale (Ky.-Ind.).	Toleston.
Mount Carmel (Ill.-Ind.) ^b	Velpen. ^a
Newburg (Ky.-Ind.)	

^a Boonville, Degonia Springs, Petersburg, and Velpen sheets, on scale of 1:62500, have been reduced and form Ditney sheet, on scale of 1:125000.

^b Haubstadt, Mount Carmel, New Harmony, and Princeton sheets, on scale of 1:62500, have been reduced and form Patoka sheet, on scale of 1:125000.

^c Shows wooded areas.

PRECISE LEVELING.

Bloomfield, Bloomington, Burns City, Clay City, Heltonville, Jasonville, Oolitic, Paoli, and Terre Haute quadrangles.

CLAY, GREENE, LAWRENCE, OWEN, AND VIGO COUNTIES.

The elevations in the following list are the results of a line of precise levels run from Mitchell, Ind., to the Illinois State line west of Terre Haute, based upon 1912 adjustment. An extension of this line into Illinois is given in bulletin 553. The total divergence between forward and backward lines by the main line was 0.228 foot in a distance of 101.23 miles to the State line, and for the spur to Cincinnati 0.037 foot in a distance of 6.53 miles.

The leveling from Redmon to Bloomfield was done in 1906 by T. A. Green, and the rest of the line was done by C. H. Semper—the part from Mitchell to Cincinnati in 1906 and that from Bloomfield, Ind., to Oakland, Ill., in 1907.

From Mitchell northwest along Chicago, Indianapolis & Louisville Ry. (Monon route) to Robison.

PAOLI QUADRANGLE.

[Latitude 38° 30'–38° 45'; longitude 86° 15'–86° 30'.]

Mitchell, in south face of M. N. Moore's store, window sill near west corner, cut thus: U. S. C. & G. S. B □ M X.....	Feet. 686.710
Mitchell, Bank of Mitchell, east face of, near northeast corner; aluminum tablet stamped "688".....	688.083
Mitchell, in front of Monon Route station; top of rail.....	679.9

HELTONVILLE QUADRANGLE.

[Latitude 38° 45'–39°; longitude 86° 15'–86° 30'.]

Yockey, near highway crossing at station, 80 feet east of track, 15 feet north of highway, in bed rock; aluminum tablet stamped "590".....	590.381
Yockey, in front of signboard; top of rail.....	593.2
Yockey, 1.68 miles north of, Monon Route bridge over White River, north abutment, west side, bridge seat; aluminum tablet stamped "508".....	508.120
Bedford, city hall, face of, near front entrance to building; aluminum tablet stamped "700".....	699.596
Bedford, Monon Route station, in front of; top of rail.....	689.3

OOLITIC QUADRANGLE.

[Latitude 38° 45'–39°; longitude 86° 30'–86° 45'.]

Dark Hollow, in front of station signboard; top of rail.....	512.9
Dark Hollow, 0.29 mile west of, Monon Route bridge over Salt Creek, south abutment, east side; aluminum tablet stamped "503".....	502.922
Reed, in front of station signboard; top of rail.....	510.6
Avoca, in front of station; top of rail.....	547.1
Avoca, in front of A. H. Bridwell's residence, in top of stone wall, 2 feet south of gate entrance; aluminum tablet stamped "557".....	556.774
Springville, in front of station; top of rail.....	639.4
Springville schoolhouse, northwest corner of foundation; aluminum tablet stamped "644".....	643.624

Springville, 1.58 miles west of, 15 feet east of private road crossing, about 400 feet southeast of small stone house, 4 feet south of track, in large rock; aluminum tablet stamped "575".....	Feet. 575.335
Armstrong, in front of station sign; top of rail.....	550.6
Armstrong, railroad water tank, in front face of stone foundation; aluminum tablet stamped "551".....	550.521
Armstrong, 2.13 miles west of, 100 feet east of railroad bridge over Indian Creek, 10 feet north of track, in top of limestone bowlder; aluminum tablet stamped "565".....	564.497
Owensburg, in front of station; top of rail.....	642.6
Owensburg, 343 feet west of station, on railroad overhead bridge, south side of track, in top of coping stone; aluminum tablet stamped "641".....	640.759

BURNS CITY QUADRANGLE.

[Latitude 38° 45'-39°; longitude 86° 45'-87°.]

Dresden, in front of station; top of rail.....	570.9
Robison, highway bridge on south side of railroad track, east abutment, in top of north wing wall; aluminum tablet stamped "543".....	542.548
Robison, in front of station; top of rail.....	540.7

From Robison northeast along highways to Cincinnati.

BURNS CITY QUADRANGLE.

Robison, 2.86 miles north of, near southwest corner of Latter Day Saints Church, in front face; aluminum tablet stamped "755".....	754.681
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BLOOMINGTON QUADRANGLE.

[Latitude 39°-39° 15'; longitude 86° 30'-86° 45'.]

Cincinnati, Ind., in front yard of J. H. Neals; iron post stamped "Prim. Trav. Sta. No. 7, 880".....	880.346
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From Robison northwest along Chicago, Indianapolis & Louisville Ry. to Elliston, thence northwest along Evansville & Indianapolis R. R. to Terre Haute, thence northwest along Vandalla R. R. to State line near Nelson, Ind.

BURNS CITY QUADRANGLE.

[Latitude 38° 45'-39°; longitude 86° 45'-87°.]

Koleen, in front of station; top of rail.....	521.8
Koleen, 378 feet north of station, 45 feet north of track, 45 feet northwest of milepost "C 26"; iron post stamped "519 1906".....	519.426
Rockwood, at road crossing; top of rail.....	517
Mineral City, 0.38 mile east of station, 125 feet west of road crossing, 20 feet south of track, in northwest corner of lot owned by Charles Hayward; iron post stamped "509 1906".....	509.081

BLOOMFIELD QUADRANGLE.

[Latitude 39°-39° 15'; longitude 86° 45'-87°.]

Mineral City, in front of station; top of rail.....	508.4
Mineral City, 2.55 miles northwest of, 15 feet north of track, 15 feet east of private road at foot of hill; iron post stamped "509 1906".....	508.537
Bloomfield, 120 feet north of Monon Route station, 50 feet west of wagon road, at southeast corner of Jones's planing mill, on south side; iron post stamped "534 1906".....	533.896
Bloomfield, near southwest corner of engine room of Fawcett Mfg. Co., on south side; aluminum tablet stamped "541 1906".....	540.792

	Feet.
Elliston, in front of Evansville & Indianapolis R. R. station; top of rail....	508.3
Elliston, 1.75 miles north of, west side of county bridge 75 feet west of railroad, in top of south abutment; aluminum tablet stamped "503".....	503.167
Elliston, 4.73 miles north of, at road crossing 780 feet north of milepost "T H 43," 30 feet east of railroad, on north end of road culvert; aluminum tablet stamped "507".....	506.594
Worthington, in front of Evansville & Indianapolis R. R. station; top of rail.	522.0
Worthington, southeast corner of Taylor Building, 338 feet south of Evansville & Indianapolis R. R. station; aluminum tablet stamped "526".....	526.206

JASONVILLE QUADRANGLE.

[Latitude 39°-39° 15'; longitude 87°-87° 15'.]

Worthington, 3.29 miles north of, 12 feet west of track, 0.10 mile south of milepost "T H 36," in boulder; aluminum tablet stamped "521".....	520.548
Hubbell, in front of station; top of rail.....	524.3
Worthington, 6.01 miles north of, 1,478 feet north of road crossing; 1,866 feet south of milepost "T H 33," 20 feet east of track, large rock, in side of cut; aluminum tablet stamped "562".....	561.594
Coal City, in front (southwest) wall of Red Men's Hall; aluminum tablet stamped "659".....	659.370
Coal City, in front of station; top of rail.....	651.9
Coal City, 2.40 miles north of, at Barrick's school house, 803 feet east of railroad, southwest corner of crossroads; aluminum tablet stamped "596".....	595.854

CLAY CITY QUADRANGLE.

[Latitude 39° 15'-39° 30'; longitude 87°-87° 15'.]

Clay City, northeast corner of "Clay City Roller Mill," 50 feet west of railroad track; aluminum tablet stamped "588".....	587.777
Clay City, in front of station; top of rail.....	579.6
Clay City, 3.41 miles north of, on south abutment of railroad bridge over Eel River, west side of track, in bridge seat; aluminum tablet stamped "558".....	558.289
Saline City, in front of station; top of rail.....	560.7
Saline City, 60 feet south of southwest corner of Brown Hotel, at road crossing, on south end of culvert under road; aluminum tablet stamped "569".....	569.308
Cory, in front of station; top of rail.....	628.4
Cory, southwest corner of I. O. O. F. building, front face; aluminum tablet stamped "634".....	633.653
Cory, 1.94 miles west of, on county-line road, 300 feet south of railroad, in brick chimney at rear of W. N. Brill's house; aluminum tablet stamped "608".....	607.519

TERRE HAUTE QUADRANGLE.

[Latitude 39° 15'-39° 30'; longitude 87° 15'-87° 30'.]

Riley, southeast corner of I. O. O. F. building, in south wall; aluminum tablet stamped "569".....	568.814
Riley, in front of station; top of rail.....	569.4
Riley, 4.63 miles north of, 2.6 miles south of Spring Hill, railroad culvert under Chicago, Terre Haute & Southeastern Ry., 60 feet north of highway, in top of stone; aluminum tablet stamped "524".....	523.722
Spring Hill, crossing of Chicago, Terre Haute & Southeastern Ry. and Chicago & Eastern Illinois R. R.; top of rail.....	515.6
Spring Hill, 1.04 miles north of, top of bridge seat of culvert under Chicago & Eastern Illinois R. R., 100 feet north of crossing of S. I. belt line; aluminum tablet stamped "493".....	492.601

Terre Haute, Union Station, in front face of, near southwest corner; aluminum tablet stamped "495".....	Feet. 494.743
Terre Haute, post office, northeast corner of; aluminum tablet stamped "513".....	512.660
Terre Haute, 0.9 mile west of, Vandalia R. R. bridge over Wabash River, east side of south abutment, on top of bridge seat; chiseled square (U. S. C. E. b. m.).....	482.177
West Terre Haute, Berry Block, near northwest corner of George L. Berry's drug store, in stone window sill; aluminum tablet stamped "477".....	476.413
Macksville, in front of station; top of rail.....	477.1
Liggett, in front of station; top of rail.....	515.1
Liggett, 1.32 miles west of, on west abutment of railroad bridge, in top of bridge seat; aluminum tablet stamped "508".....	507.495
Nelson, in front of signboard; top of rail.....	512.2
Farrington, Ill., 1.83 miles east of, 0.24 mile southwest of milepost "TH 10", east of track, in top of railroad culvert; aluminum tablet stamped "580".....	579.526

New Albany, Paoli, and Salem quadrangles.

CLARK, FLOYD, LAWRENCE, ORANGE, AND WASHINGTON COUNTIES, IND., AND JEFFERSON COUNTY, KY.

The elevations in the following lists are the results of a line of precise levels run from Mitchell, Ind., to Louisville, Ky., and accord with the 1912 adjustment. A prism level and yard rods, by the standard method, were used. The total divergence between forward and backward lines was 0.104 foot in a total distance of 65.25 miles.

The leveling was done in 1911 by E. L. McNair.

PAOLI QUADRANGLE.

[Latitude 38° 30'–38° 45'; longitude 86° 15'–86° 30'.]

From Mitchell, Ind., southeast along Chicago, Indianapolis & Louisville Ry. to Campbellsburg.

Mitchell, in south face of M. N. Moore's store, near southwest corner, cut on sill of window, thus: U. S. C. & G. S. B □ M X.....	Feet. 686.710
Mitchell, Bank of Mitchell, in east face, near northeast corner; aluminum tablet stamped "688".....	688.083
Mitchell, crossing of Baltimore & Ohio Southwestern and Chicago, Indianapolis & Louisville railroads, about 100 feet south of Monon Route station and 150 feet west of Baltimore & Ohio R. R. station; top of rail.....	680.4
Mitchell, 1.1 miles south of, railroad crossing, 30 feet east of track, 30 feet south of road crossing, 480 feet south of milepost 257; iron post stamped "707".....	707.106
Milepost 258, 50 feet north of, east side of track; railroad spike in telegraph pole, painted "U. S. B. M. 679.1".....	679.05
Milepost 259, 40 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 658.9".....	658.88
Milepost 260, 1,730 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 652.1".....	652.11
Orleans, 1,730 feet north of station, 27 feet west of track, 30 feet north of road, corner of Mr. Baker's yard fence; iron post stamped "636".....	636.177
Orleans, opposite semaphore at station; top of rail.....	640.6
Milepost 262, 2,050 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 650.1".....	650.14

Milepost 262, 2,900 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 664.4"	Feet. 664.35
Milepost 262, 2,450 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 690.9"	690.91
Leipsic, 5,400 feet west of station, in west end of concrete culvert 264.6, on north side of track; aluminum tablet stamped "709"	709.055
Leipsic, 600 feet west of station, on iron plate of log of water tank, east pier, nearest track; painted "U. S. B. M. 726.0"	725.93
Leipsic, in front of station; top of rail	724.8
Leipsic, 2,500 feet east of station, 30 feet north of track, on line with orchard fence; iron post stamped "735"	734.717
Milepost 267, 20 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 751.9"	751.85
Milepost 268, 190 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 766.5"	766.48
Saltillo, 1.4 miles west of, 10 feet north of track, in rock culvert 268.8; aluminum tablet stamped "774"	773.811
Milepost 270, 15 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 798.4"	798.38
Saltillo, in front of station; top of rail	801.4
Milepost 271, 10 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 814.7"	814.76
Campbellsburg, 450 feet west of station, north side of track; spike in telegraph pole, painted "U. S. B. M. 834.3"	834.38
Campbellsburg, 1,070 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 836.5"	836.46
Campbellsburg, 1,300 feet east of, 30 feet south of track, beside fence; iron post stamped "839"	838.577

SALEM QUADRANGLE.

[Latitude 38° 30'-38° 45'; longitude 86°-86° 15'.]

From Campbellsburg southeast along Chicago, Indianapolis & Louisville Ry. to Pekin.

Milepost 273, 1,000 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 848.5"	848.57
Milepost 273, 3,250 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 853.0"	853.06
Smedleys, 1,020 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 871.2"	871.20
Hitchcock, 1.7 miles west of, north side of track, 5 feet back from end of stone culvert "275.4," 10 feet below track; aluminum tablet stamped "886"	885.906
Milepost 276, 1,520 feet east of, on north side of track; spike in telegraph pole, painted "U. S. B. M. 886.9"	886.92
Hitchcock, 550 feet west of, 30 feet south of track, on line with orchard fence; iron post stamped "880"	880.213
Hitchcock, in front of station; top of rail	875.0
Milepost 278, 600 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 839.3"	839.22
Milepost 279, 215 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 784.0"	783.98
Salem, 2.1 miles west of, 15 feet north of track, on west end of stone culvert; aluminum tablet stamped "721"	721.071
Milepost 281, 220 feet west of, north side of track; spike in telegraph pole, painted "U. S. B. M. 709.2"	709.10

Milepost 282, 150 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 721.7".....	Feet. 721. 67
Salem, 480 feet west of station, south side of track, 6 inches from south face and 6 feet from east end of stone arch bridge 282.2; aluminum tablet stamped "728".....	727. 705
Salem, opposite semaphore at station; top of rail.....	729. 7
Salem, 0.8 mile southeast of, 25 feet south of track, 130 feet east of switch stand; iron post stamped "728".....	728. 198
Milepost 284, 580 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 741.3".....	741. 29
Salem, 2.6 miles east of, 6 feet south of track, in west abutment of bridge 284.9, 260 feet west of milepost 285; aluminum tablet stamped "760".....	759. 850
Milepost 286, 830 feet east of, north side of track; spike in telegraph pole, painted "U. S. B. M. 816.6".....	826. 72
Norris, in front of station; top of rail.....	872. 8
Milepost 287, 120 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 873.4".....	883. 35
Norris, 4,300 feet south of, 16 feet west of track, in top of south wall of stone culvert 287.7; aluminum tablet stamped "835".....	834. 950
Milepost 288, 1,700 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 786.7".....	786. 68
Milepost 289, 260 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 747.8".....	747. 78
Farabee, 150 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 764.9".....	764. 82
Farabee, road crossing at station; top of rail.....	766. 8
Farabee, 4,100 feet east of, 28 feet north of track, 150 feet west of milepost 291; iron post stamped "814".....	813. 731
Milepost 291, 1,620 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 838.1".....	838. 06
Milepost 292, 90 feet south of, east side of track; spike in telegraph pole; painted "U. S. B. M. 797.7".....	797. 64
Milepost 293, 120 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 741.5".....	741. 44
Milepost 294, 90 feet south of, west side of track; spike in telegraph pole, painted "U. S. B. M. 716.2".....	716. 14
Pekin, in front of station; top of rail.....	715. 4
Pekin, 1,100 feet south of, 26 feet west of track; iron post stamped "704"....	703. 820

NEW ALBANY QUADRANGLE (IND.-KY.)

[Latitude 38° 15'-38° 30'; longitude 85° 45'-86°.]

From Pekin southeast along Chicago, Indianapolis & Louisville Ry. to Louisville.

Milepost 295, 650 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 705.4".....	705. 22
Milepost 296, 450 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 688.6".....	688. 54
Milepost 297, 1,300 feet south of, west side of track; spike in railroad-crossing signboard, painted "U. S. B. M. 611.4".....	611. 28
Borden, 0.6 mile north of, 6 feet west of track, in north stone abutment of bridge 298.4; aluminum tablet stamped "577".....	576. 780
Borden, in front of station; spike in telegraph pole, painted "U. S. B. M. 564.1".....	564. 07
Borden, in front of station; top of rail.....	563. 8

Milepost 300, 200 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 546.9".....	Feet. 546. 78
Milepost 301, 280 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 530.1".....	530. 04
Milepost 301, 3,600 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 519.8".....	519. 74
Borden, 3 miles south of, 120 feet north of milepost 302, 10 feet east of track, in south side of stone culvert 301.9; aluminum tablet stamped "520".....	520. 370
Milepost 303, 80 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 512.6".....	512. 49
Bridgeport, 400 feet north of, 9 feet west of track, in south abutment of steel bridge 303.7; aluminum tablet stamped "504".....	503. 745
Bridgeport, at road crossing; top of rail.....	504. 7
Milepost 305, 1,300 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 490.7".....	490. 63
Wilson, at road crossing; top of rail.....	496. 9
Wilson, 370 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 493.3".....	493. 18
Milepost 307, 2,300 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 544.6".....	544. 54
Wilson, 0.9 mile south of, 9 feet west of track, in top of rock culvert 306.5; aluminum tablet stamped "545".....	545. 016
Milepost 308, 2,700 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 560.8".....	560. 74
Milepost 308, 1,550 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 570.8".....	570. 74
Milepost 309, 1,800 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 554.6".....	554. 50
St. Joseph, 800 feet south of, 10 feet east of track, in top of stone arch culvert 309.6; aluminum tablet stamped "547".....	546. 836
Smith, 1,200 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 566.8".....	566. 65
Milepost 312, 1,800 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 561.8".....	561. 72
New Albany, 4.8 miles north of, 11 feet west of track, in stone culvert 312.8; aluminum tablet stamped "536".....	535. 406
Milepost 313, 3,500 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 512.3".....	512. 23
Milepost 315, 1,350 feet north of, east side of track; spike in telegraph pole, painted "U. S. B. M. 484.9".....	484. 75
Silver station, at road crossing; top of rail.....	465. 1
Milepost 316, 160 feet south of, east side of track; spike in telegraph pole, painted "U. S. B. M. 466.8".....	466. 66
Vincennes station, at road crossing; top of rail.....	467. 0
New Albany, 1 mile north of Monon Route station, 12 feet south of track, in north side of wye, in east stone abutment of steel bridge; aluminum tablet stamped "456".....	455. 732
New Albany, at Baltimore & Ohio Southwestern R. R. and Monon Route crossing; top of rail.....	460. 8
New Albany, at Pennsylvania R. R. and Monon Route crossing; top of rail..	461. 0
New Albany, 125 feet south of Monon Route station, southeast corner of Main and Vincennes streets; iron post stamped "464 Ind".....	463. 780
Louisville, Ky., south end of old steel bridge between Louisville and New Albany, west side of track; top of bolt in guard rail, marked red.....	485. 86

Louisville, Ky., Twenty-seventh Street railroad bridge, north side of track; center of square cut in west concrete abutment.....	Feet. 447. 771
Louisville, Ky., Twenty-seventh Street Locks Bridge, 27 feet east of south end, 65 feet south of south wall of locks; 6 by 6 inch concrete monument with copper pin in center, marked "U. S. ⊙ B. M." (U. S. C. E. b. m.).	444. 607
Louisville, Ky., Twenty-seventh Street Locks, west side of approach to bridge, south side of canal, 14 feet south of engine house; iron bar (U. S. C. E. b. m.).....	430. 364
Louisville, Ky., southeast corner of Twenty-sixth Street and Portland Avenue, in stone; bronze tablet stamped "Prim. Trav. Sta. No. 13, 454" (Semper's b. m.).....	454. 028
Louisville, Ky., on Baltimore & Ohio R. R., 730 feet north of Fifteenth Street, west side of track; spike in telegraph pole, painted "448.3".....	448. 01
Louisville, Ky., northeast corner of Eleventh and Main streets, in stone; bronze tablet stamped "Prim. Trav. Sta. No. 86, 454" (Semper's b. m.)..	454. 333
Louisville, Ky., south side of canal, about 1 mile east of Twenty-seventh Street Locks, about midway of pocket in canal (12.3 feet from east X, 11 feet from west X, in canal wall), buried 3 feet (Eng. b. m. "603").....	415. 934

PRIMARY LEVELING.

Boonville, Degonia Springs, Huntingburg, Leopold, Owensboro, Petersburg, St. Meinrad, Tell City, and Velpen quadrangles.

DAVIESS, DUBOIS, GIBSON, PIKE, SPENCER, AND WARRICK COUNTIES.

The elevations in the following list are based on bench mark A-3 at Vincennes of the Coast and Geodetic Survey transcontinental line of precise levels, a cut on the stone ledge on the northwest front of the courthouse. The elevation of this is now accepted as 433.847 feet above mean sea level. A double line of levels was first carried south from bench mark Z at Washington, via Petersburg to center of T. 1 S.

The leveling in the Boonville and Petersburg quadrangles was done by L. E. Granke in 1899; that in the Owensboro and Tell City quadrangles by Dean Halford in 1900; and that in the Velpen, Huntingburg, Degonia Springs, and St. Meinrad quadrangles by C. E. Hewitt in 1900.

BOONVILLE QUADRANGLE.

[Latitude 38°-38° 15'; longitude 87° 15'-87° 30'.]

From Smith north along highway to Wheatonville, thence south to Stevenston, thence west to Smith.

T. 5 S., R. 10 W., at southwest corner of sec. 24, 3 feet south of southwest corner of schoolhouse; iron post stamped "390 Vin".....	Feet. 390. 494
T. 4 S., R. 10 W., at center of sec. 25, northwest corner of crossroads; iron post stamped "429 Vin".....	429. 204
T. 4 S., R. 9 W., northeast quarter of sec. 21, 27 feet north by 29.5 feet east of east end of bridge over canal; iron post stamped "392 Vin".....	392. 078
T. 5 S., R. 9 W., center of sec. 21, at southwest corner of crossroads, 13 feet south of fence corner; iron post stamped "411 Vin".....	411. 338
Stevenston, T. 6 S., R. 9 W., 2.5 feet south of southeast corner of schoolhouse, west side of road, 500 feet north of railroad; iron post stamped "389 Vin".....	389. 367

From Stevenston northeast to Boonville, thence north to Lynnville, thence west to Wheatonville.

T. 6 S., R. 8 W., 0.3 mile west of center of sec. 6, 4 feet north of fence at forks of road; iron post stamped "454 Vin".....	Feet. 453. 843
Boonville, 85 feet west by 95 feet north of amphitheater in fairground, in meridian stone; aluminum tablet stamped "395 Vin".....	395. 744
T. 4 S., R. 8 W., at center of sec. 27, 6.67 feet west by 2.25 feet south of fence corner, at northwest corner of crossroads at cemetery; iron post stamped "487 Vin".....	487. 701

At northeast corner of sec. 28, T. 3 S., R. 8 W.

T. 3 S., R. 8 W., northeast corner of sec. 28, 6.5 feet west by 2.83 feet north of fence corner, southwest corner of crossroads; iron post stamped "501 Vin" ..	501. 962
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At quarter corner south side of sec. 13, T. 3 S., R. 10 W.

T. 3 S., R. 10 W., quarter corner south side of sec. 13, 12.5 feet north by 1.75 feet west of fence corner, in eastern of two corners formed by intersection of road; iron post stamped "432 Vin".....	432. 962
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PETERSBURG QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 87° 15'-87° 30'.]

From center of sec. 21, T. 2 S., R. 8 W. to quarter corner south side of sec. 13, T. 3 S., R. 10 W.

T. 2 S., R. 8 W., center of sec. 21, 15.5 feet west by 28.5 feet north of fence corner, in western of two corners formed by intersection of roads; iron post stamped "458 Vin".....	457. 922
T. 1 S., R. 8 W., southwest corner of sec. 16, 8.25 feet east by 1 foot south of fence corner; iron post stamped "476 Vin".....	476. 378
T. 1 S., R. 9 W., northeast corner of sec. 21, at southwest corner of crossroads, 5.5 feet west by 8 feet south of fence corner; iron post stamped "489 Vin" ..	489. 321
T. 2 S., R. 9 W., 0.3 mile west of northeast corner of sec. 17, 3 feet south by 2 feet west of fence corner, at southeast corner of crossroads; iron post stamped "447 Vin".....	448. 032
T. 3 S., R. 9 W., center of sec. 16, 22.5 feet east by 2 feet north of fence corner, in southern of two corners formed by intersection of crossroads; iron post stamped "439 Vin".....	439. 366

DEGONIA SPRINGS QUADRANGLE.

[Latitude 38°-38° 15'; longitude 87°-87° 15'.]

From Degonia Springs to Pigeon Creek.

Degonia Springs, in stone post in front of Ash Iron Springs Hotel; aluminum tablet stamped "401 Vin".....	401. 725
Degonia Springs, about 0.3 mile south of northwest corner of sec. 27, T. 5 S., R. 7 W., at railroad crossing; iron post stamped "401 Vin".....	401. 461
Pigeon Creek, at north end of west abutment of bridge, in top of pier; aluminum tablet stamped "383 Vin".....	383. 689

From Degonia Springs southeast to Chrisney, thence north to Lincoln City, thence west to Degonia Springs.

T. 6 S., R. 7 W., near southwest corner of sec. 11, at southeast corner of lot of Hale schoolhouse; iron post stamped "401 Vin".....	401. 230
Chrisney, in NW. $\frac{1}{4}$ sec. 11, T. 6 S., R. 6 W., in southwest corner of hotel lot; iron post stamped "464 Vin".....	464. 187
Gentryville, T. 5 S., R. 6 W., sec. 1, at crossroads, 150 feet north of railroad track; iron post stamped "403 Vin".....	403. 704

At Hellman.

Hellman, 0.25 mile south of northeast corner of sec. 20, T. 4 S., R. 6 W., at northeast corner of crossroads; iron post stamped "484 Vin" 484. 900

From Dale west to Folsomville, thence south to Degonia Springs.

Folsomville, 0.25 mile south of northeast corner of sec. 34, T. 4 S., R. 7 W., at northeast corner of Odd Fellows Hall; iron post stamped "464 Vin" ... 464. 448

OWENSBORO QUADRANGLE.

[Latitude 37° 45'-38°; longitude 87°-87° 15'.]

From Lake to Rock Hill.

Lake (Richland), in cornerstone of I. O. O. F. building; aluminum tablet stamped "393 Vin" 393. 750
 Richland, 8 miles south of, in foundation at northeast corner of Mr. Cramer's storehouse; aluminum tablet stamped "381 Vin" 381. 744
 Africa, at east entrance of Africa schoolhouse, in stone step; aluminum tablet stamped "388 Vin" 388. 719
 Rockport, in stone foundation of courthouse; on east wall, 6.5 feet south of north wall; aluminum tablet stamped "454 Vin" 454. 927
 Rock Hill, 330 feet north of station, 14 feet west of Southern Ry. track, in face of rock; aluminum tablet stamped "393 Vin" 393. 860

TELL CITY QUADRANGLE.**From Chrisney east along highway via Troy and Cannelton to Hawesville, Ky.**

[Latitude 37° 45'-38°; longitude 86° 45'-87°.]

Grand View, secs. 4 and 5, T. 7 S., R. 5 W., on main street, 270 rods north of Ohio River, in west face of culvert; aluminum tablet stamped "391 Vin" 391. 620
 Crooked Creek, east end of north abutment of bridge, in top tier; aluminum tablet stamped "386 Vin" 386. 713
 Tell City, 300 feet west of Southern Ry. (side track), on Tell Street, Acme Distillery, in northeast corner of top tier of foundation; aluminum tablet stamped "395 Vin" 395. 190

At Troy.

Troy, sec. 13, T. 6 S., R. 4 W., northeast corner of Washington and Water streets, at southwest corner of Nester Hotel lot, in stone; iron post stamped "391 Vin" 391. 955

HUNTINGBURG QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 86° 45'-87°.]

At Huntingburg.

Huntingburg, in grounds of Southern Ry.; iron post stamped "472 Vin" .. 472. 007

ST. MEINRAD QUADRANGLE.

[Latitude 38°-38° 15'; longitude 86° 45'-87°.]

From Lincoln City southeast to Troy.

Buffaloville, sec. 9, T. 5 S., R. 5 W., at northeast corner of station grounds; iron post stamped "427 Vin" 427. 063
 Lamar, 0.25 mile south of northwest corner of sec. 19, T. 5 S., R. 4 W., on east side of street, at southwest corner of store lot; iron post stamped "411 Vin" 411. 510
 Evanston, sec. 34, T. 5 S., R. 4 W., at southeast corner of store west of north-south road, 200 feet north of railroad crossing; iron post stamped "413 Vin" 413. 264

At Newtonville.

Newtonville, southeast corner of sec. 11, T. 6 S., R. 5 W., at northeast corner of crossroads; iron post stamped "438 Vin"..... 438. 463

Near Troy.

Troy, 3.5 miles east of, at fork of Tell City and Troy roads; iron post stamped "550 Vin"..... 550. 730

At St. Meinrad.

St. Meinrad, 0.25 mile south of northeast corner of sec. 14, T. 4 S., R. 4 W., at northeast corner of post-office building at southwest corner of Main Street and street south to Abbey; iron post stamped "456 Vin"..... 456. 798

At Dale.

Dale, sec. 17, T. 4 S., R. 5 W., 6 feet west of northwest corner of Heickelbech's store, at southeast corner of street crossing; iron post stamped "463 Vin"..... 463. 390

From St. Meinrad northwest to Ferdinand.

Ferdinand, SW. $\frac{1}{4}$ sec. 27, T. 2 S., R. 4 W., at northeast corner of lot 235 belonging to August Barth, at southwest corner of street crossing; iron post stamped "525 Vin"..... 525. 101
 Jonesburg (Ferdinand station), north side of sec. 34, T. 2 S., R. 5 W., south of road and east of railroad, at northeast corner of Peter Schnell's store; iron post stamped "486 Vin"..... 486. 385

LEOPOLD QUADRANGLE.

[Latitude 38°-38° 15'; longitude 86° 30'-86° 45'.]

Near Bristow.

T. 4 S., R. 3 W., near south side of sec. 4, on north side of east-west road, opposite road south; iron post stamped "398 Vin"..... 398. 480
 Bristow, 0.25 mile northwest of, at northwest corner of intersection of road running west from road to Adyeville; iron post stamped "424 Vin"..... 424. 465

VELPEN QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 87°-87° 15'.]

From Folsomville north to Stendal, thence northeast to Duff, thence east to Huntingburg.

Stendal, near quarter corner east side of sec. 11, T. 3 S., R. 7 W., in front of Dr. Stork's office, at southwest corner of street crossing; iron post stamped "626 Vin"..... 626. 952
 T. 3 S., R. 6 W., near quarter corner east side of sec. 9, at northwest corner of school lot, on Dubois-Pike County line; iron post stamped "563 Vin"..... 563. 545

From Stendal north to Winslow, thence east to Duff.

Augusta, sec. 21, T. 2 S., R. 7 W., in northeast corner of hotel lot, at southwest corner of street crossing; iron post stamped "567 Vin"..... 567. 627
 Winslow, sec. 32, T. 1 S., R. 7 W., at southeast corner of street crossing, in stone window sill of brick store; aluminum tablet stamped "463 Vin"..... 463. 027
 Velpen, sec. 8, T. 2 S., R. 6 W., 200 feet east of station, 200 feet north of railroad, at southeast corner of G. W. Cockrel's clothing store; iron post stamped "490 Vin"..... 490. 238

From Huntingburg northwest to Otwell, thence south to Velpen.

Ireland, near east line of sec. 19, T. 1 S., R. 5 W., northwest corner of street crossing, at southeast corner of post office; iron post stamped "479 Vin" . . . 479. 034
 Otwell, 0.25 mile north of southeast corner of sec. 5, T. 1 S., R. 6 W., at southwest corner of crossroads, at northeast corner of William McCormick's brick store; iron post stamped "496 Vin" 496. 944

From Otwell west to Petersburg.

T. 1 N., R. 6 W., sec. 30, at northeast corner of junction of road north with road between Otwell and Algiers, at southwest corner of school lot; iron post stamped "502 Vin" 502. 421
 Algiers, sec. 27, T. 1 N., R. 7 W., at northeast corner of street crossing, at southwest corner of Dr. Harris's office; iron post stamped "527 Vin" 527. 409

Evansville, Haubstadt, Newburg, New Harmony, Princeton, and Vincennes quadrangles.

GIBSON, KNOX, POSEY, AND VANDERBURG COUNTIES.

The elevations in the following list are based upon bench mark A-3 at Vincennes of the Coast and Geodetic Survey transcontinental line of precise levels, which is a cut on a stone ledge on the northwest front of the courthouse. The elevation of this bench mark is now accepted as 433.847 feet above mean sea level by the 1912 adjustment. A double line of levels was carried south from this bench mark to Princeton, and a similar line was previously run from bench mark Z at Washington to Petersburg. The work here listed combines with previous work on the east, which is published in another list, page 39, and both have been given a mean value from the two sources.

The leveling was done in 1901 by D. D. Doty, except the line to Yankeetown, which was run in 1903 by F. M. Goodhue.

EVANSVILLE QUADRANGLE.

[Latitude 37° 45'-38°; longitude 87° 30'-87° 45'.]

From Belt Line and Illinois Central R. R. junction south to Evansville

Evansville, in southwest corner of Willard Library yard; iron post (meridian mark) stamped "386 Vin" 386. 710
 Evansville, at east entrance to customhouse, on floor; bronze tablet stamped "394 Vin" 394. 207
 Evansville, surface of water in Ohio River, June 10, 1901 351. 1
 Evansville, zero of water gage in Ohio River 329. 09

From Evansville east along railroad to Smith and return.

Evansville, corner of Main and Water streets; iron projection on iron doorsill of brick building, 48.84 feet above zero of gage 377. 936
 Evansville, at Evansville & Terre Haute R. R. station; top of rail 382. 8
 T. 6 S., R. 10 W., southeast corner of sec. 14, at intersection of roads, 4 feet west by 3 feet 7 inches north of fence corner; iron post stamped "387 Vin" . . 386. 959

VINCENNES QUADRANGLE.

[Latitude 38° 30'-38° 45'; longitude 87° 30'-87° 45'.]

At Decker.

Decker, on White River; zero of gage 386. 39

PRINCETON QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 87° 30'-87° 45'.]

At Hazleton.

Hazleton, second telegraph pole south of station, 6 feet north of; iron post stamped "422 Vin"	Feet. 422. 970
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From Princeton west along Southern Ry. to Mount Carmel, Ill. (double-rodged line).

Beck, crossing at station; top of rail	403
T. 1 S., R. 12 W., southeast corner of sec. 36, 48 feet south of track, at southwest corner of crossing; iron post stamped "397.6 Vin"	397. 792

At Port Gibson.

Port Gibson, at old Wabash and Erie Canal, 10 feet southwest of southeast corner of bridge over Pidgeon Creek; iron post stamped "427 Vin"	427. 567
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At Princeton.

Princeton, south side of courthouse, at east entrance to basement; bronze tablet stamped "500 Vin"	501. 143
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At Owensville.

Owensville, 40 feet north of 6th splice west of station, on main track; iron post stamped "506 Vin"	507. 061
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Near East Mount Carmel.

East Mount Carmel, 4.5 miles south of, iron bridge over Blair Ditch, 90 feet north of northwest corner of, at northwest corner of crossroads, inside fence; iron post stamped "391 Vin"	391. 642
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HAUBSTADT QUADRANGLE.

[Latitude 38°-38° 15'; longitude 87° 30'-87° 45'.]

From Fort Branch to St. James.

Fort Branch, 20 feet southeast of southeast corner of station; iron post stamped "454 Vin"	455. 049
Haubstadt, 10.8 feet west of southeast corner of station; iron post stamped "473 Vin"	473. 425
St. James, 20 feet south of station, 22 feet west of track; iron post stamped "477 Vin"	477. 422

From Smith station to Inglefield.

T. 6 S., R. 10 W., in northwest quarter of sec. 9, at junction of railroads, about 15 feet east of first joint north of north end of frog; iron post stamped "385 Vin"	385. 383
Inglefield, northwest corner of sec. 8, T. 5 S., R. 10 W., at southwest corner of crossing; iron post stamped "470 Vin"	470. 438

From southwest corner of T. 6 S., R. 10 W., west 1 mile, thence northwest along Illinois Central R. R. via Armstrong to Martin, thence east along highway to Inglefield.

T. 6 S., R. 11 W., northeast corner of sec. 2, at Hillside switch; iron post stamped "393 Vin"	393. 552
Armstrong, center of sec. 9, T. 5 S., R. 11 W., 20 feet south of crossing; iron post stamped "469 Vin"	469. 271
Martin, 3 feet from southeast corner of station; iron post stamped "431 Vin" ..	431. 490
T. 4 S., R. 11 W., quarter corner east side of sec. 34, highest corner of post. . . .	469. 81

NEW HARMONY QUADRANGLE,

[Latitude 38°-38° 15'; longitude 87° 45'-88°.]

At Poseyville.

Poseyville, 15 feet south of southeast corner of station; iron post stamped "434 Vin"..... 434. 625

From Poseyville south and southwest along Evansville & Terre Haute R. R. via Wadesville and Oliver to Solitude. (Mean of two direct lines.)

Wadesville, 1 foot north of north side of station; iron post stamped "467 Vin"..... 467. 205
 Oliver, between rails of main line and switch; iron post stamped "409 Vin"..... 409. 466
 Solitude, at southeast corner of cinder platform; iron post stamped "377 Vin"..... 377. 232

From Poseyville west along Illinois Central R. R. via Stewartsville to Grayville.

Stewartsville, 5th telegraph pole west of station, 20 feet west of, at junction of tracks; iron post stamped "469 Vin"..... 469. 526
 Griffin, 70 feet east of station, 20 feet north of track; iron post stamped "385 Vin"..... 384. 960

From Stewartsville southwest along branch railroad to New Harmony.

New Harmony, New Harmony Banking Co.'s building, center of north window sill; bronze tablet stamped "384 Vin"..... 384. 399
 New Harmony, Murphy Library, north side of entrance, at west end of top step; bronze tablet stamped "387 Vin"..... 386. 930
 New Harmony, in northwestern part, Wabash River at ferry; surface of water July 29, 1901..... 354. 8

NEWBURG QUADRANGLE.

[Latitude 37° 45'-38°; longitude 87° 15'-87° 30'.]

From Gilbert Grove (5 miles east of Evansville) east along Evansville Suburban & Newburgh Ry. via Newburg to Yankeetown. (Single spur line.)

Newburg, left side of main entrance to Citizens Bank, in center of marble base stone, 2 feet from ground; bronze tablet stamped "400 Louisville"..... 399. 948
 Yankeetown, 0.4 mile from Yankeetown corner, east side of Main Street, in brick foundation of bay window of Wesley Johnson's house, in northwest face; aluminum tablet stamped "515 Louisville"..... 515. 140

***From Henderson, Ky., across Ohio River bridge, thence along river road to Evansville. (Mean of two lines.)**

Henderson, Louisville & Nashville R. R. bridge over Ohio River, southeast corner of third abutment pier (Indiana side), in second stone above ground; chiseled cross..... 365. 41

Kosmosdale, New Albany, and Prospect quadrangles.

CLARK, FLOYD, AND HARRISON COUNTIES.

The elevations in the following list are based on the U. S. Corps of Engineers bench mark at Louisville and the U. S. Geological Survey bench mark at West Point, Ky.

The leveling was done in 1910 by E. C. Bibbee.

PROSPECT QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 85° 30'-85° 45'.]

From Jeffersonville along highways to Howard Park station.

Jeffersonville, 250 feet west of penitentiary, on north abutment west side of bridge 96 over Court Avenue (Pennsylvania R. R.); chiseled square painted "461.2".....	Feet. 461.30
Howard Park station, north side of railroad, at crossing of Interurban Ry. and Pittsburgh, Cincinnati, Chicago & St. Louis Ry.; spike in base of telegraph anchor post, marked "450.7".....	450.81

NEW ALBANY QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 85° 45'-86°.]

From Howard Park station southwest along highways to point 4 miles southwest of New Albany.

New Albany, 1.11 miles east of, 30 feet west of public road at railroad crossing; rail spike in base of telegraph pole, painted "440.9".....	440.88
New Albany, on north end of Monon Route and Pennsylvania R. R. passenger station platform; chiseled square, painted "459.2".....	459.15
New Albany, at southwest corner of Main and Vincennes streets, opposite Monon Route and Pennsylvania R. R. passenger station; iron post stamped "464".....	463.780
New Albany, on approach to State Street Pennsylvania R. R. station; chiseled square on west end of second step from bottom, painted "439.2".....	439.18
New Albany, crossing of Elizabeth pike and Southern Ry., on east side of pike, 20 feet south of railroad, in base of telephone pole; rail spike painted "445.8".....	445.79
New Albany, 3.25 miles west of, on southwest side of road at Y road; iron post stamped "502".....	501.577
New Albany, 3.89 miles west of, on northwest corner of abutment of small iron bridge; chiseled square, painted "481.6".....	481.59
New Albany, 4.2 miles west of, on south side of road, on limestone ledge; chiseled square, painted "670.7".....	670.65

KOSMOSDALE QUADRANGLE.

[Latitude 38°-38° 15'; longitude 85° 45'-86°.]

From point 4 miles southwest of New Albany southwest and south along highways via Lanesville, Elizabeth, and Evans Landing to West Point, Ky.

New Albany, 6.4 miles west of, northwest corner at T road, 1,000 feet east of H. Hitchcock's residence; iron post stamped "467".....	467.468
New Albany, 7.4 miles west of, on north side of road, on sandstone ledge; chiseled square, painted "729.2".....	729.19
Lanesville, 3.6 miles east of, on Elizabeth pike, at T road west, in front yard of W. M. Brown's residence; iron post stamped "931".....	930.595
Lanesville, 2.2 miles east of, at private road north, on west abutment north side of small bridge over creek; chiseled square, painted "772.4".....	772.43
Lanesville, 1.5 miles east of, on north side of Cardon pike, in front of residence of Joseph Stilger, on ledge of rocks; chiseled square, painted "788.5".....	788.50
Lanesville, northwest corner of schoolhouse yard; iron post stamped "731".....	730.988
Lanesville, on southwest corner of Main Street and alley leading to Elizabeth pike, in front of Jacob Tachinger's store; top of fire plug painted "703.167".....	703.16
Lanesville, 1 mile southeast of, at Y road, on limestone ledge; chiseled square, painted "772.4".....	772.37

Lanesville, 2.4 miles south of, 100 feet south of T road east, on large stone in center of road; chiseled square, painted "859.8".....	Feet. 859.81
Lanesville, 4.68 miles south of, 15 feet northeast of northeast corner of No. 7 schoolhouse; iron post stamped "874".....	874.076
Lanesville, 4.6 miles south of, east side of road, at terminus of mail route from Georgetown, said to be on Franklin-Posey township line; paint spot on top of white oak stump, painted "777.7".....	777.71
Lanesville, 6.27 miles south of, northeast corner at T road east, on limestone rock; chiseled square, painted "693.6".....	693.52
Lanesville, 6.96 miles south of, at T road north, in southwest corner of schoolhouse yard; iron post stamped "861".....	860.972
Elizabeth, 1.9 miles north of, on north side of road; chiseled square on rock, painted "793.8".....	793.70
Elizabeth, 1.6 miles north of, in front of Seven Springs schoolhouse (No. 4), on limestone ledge; chiseled square, painted "711.5".....	711.40
Elizabeth, 0.6 mile north of, in northwest corner at T road north; chiseled square on stone, painted "813.4".....	813.29
Elizabeth schoolhouse ("old"), at southwest corner of, iron post stamped "Trav. Sta. No. 6, 744".....	743.474
Elizabeth, 2.7 miles south of, on east side of road at T road west; paint spot on rock, painted "773.2".....	773.12
Buena Vista, center of, on northwest corner of street crossing, 700 feet southwest of Catholic church; iron post stamped "646".....	645.977
Buena Vista, 1.4 miles south of, on east side of road, in front of residence of John Cutchlow; chiseled square, painted "742.6".....	742.51
Buena Vista, 2.96 miles south of, on east abutment of small culvert under road; chiseled square, painted "721.2".....	721.10
Evans Landing, 60 feet east of Presbyterian church, in corner of field owned by R. N. Davis; iron post stamped "456".....	455.964
Evans Landing, surface of water in Ohio River at 2.30 p. m., October 25, 1910.....	370.3
West Point, Ky., Indiana Bank building; aluminum tablet stamped "441".....	441.204

Bloomington quadrangle.

GREENE, MONROE, AND OWEN COUNTIES.

The elevations in the following list are based upon an elevation at Cincinnati, Ind., brought by an adjusted line of precise leveling from Mitchell, Ind., based upon the 1912 adjustment.

The leveling was done in 1906 by C. H. Semper, using prism level and yard rods.

BLOOMINGTON QUADRANGLE.

[Latitude 39°-39° 15'; longitude 86° 30'-86° 45'.]

From Cincinnati east along highways to Harrodsburg, thence north along Chicago, Indianapolis & Louisville R. R. to Clear Creek.

Cincinnati, in front yard of J. H. Neals; iron post stamped "Prim. Trav. Sta. No. 7, 880".....	Feet. 880.346
Cincinnati, 3.92 miles east of, southeast corner of schoolhouse, in front face of foundation stone; aluminum tablet stamped "815".....	814.976
Cincinnati, 6.51 miles east of, at angle of road, 100 feet north of Gilmore's scale house, primary traverse station No. 8; iron post stamped "802".....	801.527
Harrodsburg, brick schoolhouse, west wing, south face; aluminum tablet stamped "627".....	627.062

	Feet.
Harrodsburg, in front of station; top of rail.....	520. 7
Smithville, 2.41 miles south of, railroad bridge over creek, east side of south abutment, in top of retaining wall; aluminum tablet stamped "530".....	532. 922.
Smithville, in front of station; top of rail.....	710. 8
Saunders, 0.29 mile south of, 100 feet south of James Craig's house, 15 feet west of track, in top of boulder; aluminum tablet stamped "737".....	739. 947
Saunders, in front of station; top of rail.....	749. 0
Johnstons, in front of station; top of rail.....	730. 8
Acme, in front of station; top of rail.....	692. 6
Clear Creek, in front of station; top of rail.....	659. 6
Clear Creek, 0.32 mile north of, railroad bridge over creek, south abutment, west side of top; aluminum tablet stamped "659".....	662. 464

From Cincinnati north along highway, thence east to Clear Creek

Cincinnati, 2.72 miles north of, west side of road, 584 feet north of O. N. Burge's barn, in outcrop of rock; aluminum tablet stamped "853".....	855. 970
Cincinnati, 6.03 miles north of, Green County Chapel, in northwest corner of foundation; aluminum tablet stamped "848".....	851. 381
Green County Chapel, 5.24 miles east of, 0.16 mile west of Bloomington pike, north side of road, southwest corner of William Hemphill's house, in foundation; aluminum tablet stamped "843".....	846. 218
Green County Chapel, 7.05 miles east of, at junction of road to Bloomington pike, southwest corner of Omer May's blacksmith shop; aluminum tablet stamped "833".....	835. 549

From Clear Creek north along railroad to Bloomington.

Bloomington, in front of station; top of rail.....	756. 6
Bloomington, Indiana University, south entrance to Student Building, in top of east buttress; aluminum tablet stamped "785".....	784. 599
Bloomington, Indiana University, east entrance to Library Hall; top of stone buttress (old elevation 792.89).....	792. 54
Bloomington, Indiana University, Owen Hall, on top of west stone buttress (old elevation 798.47).....	798. 16

From Bloomington northwest along highway to Hensonburg, thence west to Freeman, thence south toward Cincinnati. (Three-foot adjustment is thrown at end of this line.)

Hensonburg, railroad crossing with Vernal pike; top of rail.....	795. 5
Hensonburg, small highway bridge over Stout Creek, south side of west abutment, in top of; aluminum tablet stamped "787".....	786. 549
Hensonburg, 3.45 miles west of, north side of road, J. Reed's gate entrance, in front face of large stone gatepost; aluminum tablet stamped "741".....	741. 062
Hensonburg, 6.3 miles west of, north side of road, 515 feet east of Horton farm house, in north abutment of stone culvert; aluminum tablet stamped "740".....	739. 971
Hensonburg, 9.01 miles west of, at angle in road to west and north, on east margin of road, in top of outcrop; aluminum tablet stamped "716".....	716. 039
Freeman, 60 feet north of post office, west side of road, in top of outcrop of rock; aluminum tablet stamped "599".....	602. 109
Hendricksville, 660 feet north of, west side of road, at Cove Springs, 20 feet north of spring, in top of outcrop of rock; aluminum tablet stamped "636".....	638. 870
Cincinnati, 7.46 miles north of, railroad overhead bridge, southeast corner; spike in floor plank.....	859. 61

Clay City quadrangle.

CLAY, OWEN, AND VIGO COUNTIES.

The elevations in the following list are based on an adjusted precise-level line from Mitchell, which traverses this section, based upon the 1912 adjustment value at that point.

The leveling was done in 1908 by L. P. Jerrard.

CLAY CITY QUADRANGLE.

[Latitude 39° 15'-39° 30'; longitude 87°-87° 15.]

From Clay City west to point about 3 miles northeast of Lewis, thence north to point about 2 miles west of Cory.

	Feet.
T. 10 N., R. 7 W., middle of east line of sec. 27, 30 feet northwest of road crossing; iron post stamped "535"	535. 198
T. 10 N., R. 7 W., middle of north line of sec. 20, 30 feet southwest of road intersection; iron post stamped "547"	547. 140
T. 10 N., R. 8 W., southwest corner of sec. 1, 20 feet northwest of road intersection; iron post stamped "541"	541. 338
T. 11 N., R. 7 W., southwest corner of sec. 30, northeast of road crossing, on northeast abutment of bridge; chiseled cross in concrete, marked "563.7" ..	563. 719
T. 11 N., R. 7 W., southwest corner of sec. 19, 30 feet northeast of road crossing; iron post stamped "Prim. Trav. Sta. No. 13, 609"	609. 203
Cory, southwest corner of I. O. O. F. building, in front face; aluminum tablet stamped "634"	633. 653

From Saline City northeast to Center Point, thence north to Asherville, thence west to Staunton, thence south to point about 2 miles west of Carey.

Saline City, at road crossing, 60 feet south of southwest corner of Brown Hotel, in south end of culvert; aluminum tablet stamped "569"	569. 308
Ashboro, in front of station; top of rail	570. 4
T. 11 N., R. 6 W., middle of north line of sec. 8, west of intersection of road and railroad track, on southeast abutment of bridge; chiseled cross in concrete, marked "573.7"	573. 65
Center Point, in front of station; top of rail	647. 4
T. 11 N., R. 6 W., middle of north line of sec. 3, 30 feet southeast of intersection of road and railroad track; iron post stamped "671"	671. 216
Asherville, in front of station; top of rail	662. 0
T. 12 N., R. 6 W., southeast corner of sec. 16, 30 feet northwest of road crossing; iron post stamped "660"	660. 034
T. 12 N., R. 6 W., northwest corner of sec. 19, southeast of road crossing, in capstone of culvert; aluminum tablet stamped "626"	625. 857
T. 12 N., R. 7 W., southwest corner of sec. 15, 30 feet northeast of road intersection; iron post stamped "680"	680. 214
T. 12 N., R. 7 W., middle of south line of sec. 19, 40 feet northwest of road intersection; iron post stamped "629"	628. 688
T. 11 N., R. 8 W., southeast corner of sec. 1, 30 feet northwest of road crossing; iron post stamped "610"	610. 427

From Clay City to point about 2 miles northeast of Denmark, thence north via Bowling Green to point just northeast of Center Point.

T. 10 N., R. 6 W., middle of east line of sec. 21, 30 feet southwest of road crossing; iron post stamped "603"	603. 105
T. 10 N., R. 5 W., middle of south line of NW. $\frac{1}{4}$ sec. 18, 30 feet northwest of road intersection; iron post stamped "635"	635. 379

T. 10 N., R. 5 W., middle of north line of NW. $\frac{1}{4}$ sec. 6, 50 feet southeast of road intersection; iron post stamped "644"	Feet. 643.788
T. 11 N., R. 5 W., middle of south line of sec. 31, northwest of road intersection; cross on stone culvert, marked "602.9"	602.83
T. 11 N., R. 5 W., center of sec. 19, southeast of village of Bowling Green, east of road corner; iron post stamped "Prim. Trav. Sta. No. 17, 665"	664.734
Bowling Green, northwest corner of, northwest of road crossing; cross on stone culvert, marked "650.9"	650.786
T. 11 N., R. 6 W., 0.1 mile south of middle of north line of sec. 13, 75 feet northwest of road intersection; iron post stamped "609"	609.108

Danville quadrangle.

WARREN COUNTY, IND., AND VERMILION COUNTY, ILL.

The following elevation was determined by primary leveling connected at Catlin, Ill., by a spur line of the precise-level net. The work was done in 1897 by John L. McCalman.

DANVILLE QUADRANGLE.

[Latitude $40^{\circ}-40^{\circ} 15'$; longitude $87^{\circ} 30'-87^{\circ} 45'$.]

State Line, quarter corner at east side of sec. 18, T. 20 N., R. 10 W.; iron post stamped "Dnvl. 720"	Feet. 718.917
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Toleston quadrangle.

LAKE COUNTY.

The elevations in the following list are based upon a bronze tablet in the northeast corner of Todd Opera House Block, East Chicago, Ind., stamped "588 Chgo," the elevation of which is now accepted as 589.104 feet above mean sea level. The leveling was extended from a city bench mark in South Chicago, Ill., and the elevation now used is that obtained by adding 579.938 feet to the elevations given upon the Chicago city datum, which is the zero of the lake gage and low water of 1847.

The leveling was done in 1897 by E. S. Smith.

TOLESTON QUADRANGLE.

Latitude $41^{\circ} 30'-41^{\circ} 45'$; longitude $87^{\circ} 15'-87^{\circ} 30'$.

From South Chicago, Ill., southeast via East Chicago, Ind., to Hessville.

East Chicago, southwest corner of Chicago Avenue and Forsyth Street, northeast corner of Todd Opera House Block, in stone water table; bronze tablet stamped "588 Chgo"	Feet. 589.104
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From Hessville southeast to Griffith, thence east to Hobart, thence northwest to Toleston, thence west to Hessville.

Highlands, T. 36 N., R. 9 W., sec. 21, southwest corner of front projection of public-school building, south side of top course of stone foundation; bronze tablet stamped "618 Chgo"	618.819
Griffith, T. 35 N., R. 9 W., sec. 2, at south edge of town, northeast corner of frame schoolhouse, in brick foundation; bronze tablet stamped "630 Chgo"	630.856

T. 35 N., R. 8 W., near center of sec. 4, in front face of large stone church, at northwest corner, 20 inches from ground; bronze tablet stamped "640 Chgo".....	Feet. 640. 870
Hobart, T. 36 N., R. 7 W., sec. 32, wagon bridge over Deep River, southwest corner of west abutment, in top of stone; copper bolt stamped "607 Chgo".	607. 574
T. 35 N., R. 7 W., NW. $\frac{1}{4}$ sec. 5, at south entrance of brick schoolhouse, in top course of stone foundation; bronze tablet stamped "633 Chgo" ^a	633. 721
Toleston, T. 36 N., R. 8 W., sec. 8, northwest corner of frame schoolhouse, in top course of stone foundation; bronze tablet stamped "600 Chgo".....	600. 575
Clark, T. 36 N., R. 8 W., sec. 31, water tank of Pennsylvania R. R., 300 feet southeast of station, in masonry foundation at northwest corner; copper bolt stamped "591 Chgo" ^b	591. 81

^a On a single spur line from Hobart.

^b On a single spur line from Toleston.

APPENDIX A.

ELEVATIONS ADJUSTED BY THE COAST AND GEODETIC SURVEY FROM PRECISE LEVELING.

Birds, Carmi, Lawrenceburg, Marshall, Merom, Mount Carmel, New Harmony, New Haven, Paoli, Terre Haute, Shoals, Vincennes, and Washington quadrangles.

GIBSON, KNOX, LAWRENCE, MARTIN, SULLIVAN, VIGO, AND WASHINGTON COUNTIES.

The following descriptions and elevations are taken from reports of the Coast and Geodetic Survey and from manuscript furnished by the Chief of Engineers, United States Army, and are published by permission of the Superintendent of the Coast and Geodetic Survey and of the Chief of Engineers. The bench marks were established by the Coast and Geodetic Survey and by the Corps of Engineers, United States Army, from precise leveling and were included in the 1912 adjustment by the Coast and Geodetic Survey. The elevations are likely to be changed only slightly by any future adjustment.

The elevations of bench marks along Wabash River were determined from a line of precise levels run by the U. S. Corps of Engineers in 1911 from Terre Haute, Ind., to the mouth of the river, thence down Ohio River via Blackburn, Ky., to Shawneetown, Ill. Connections were made with precise-level bench marks of the United States Geological Survey at Terre Haute, Ind., Blackburn, Ky., and Shawneetown, Ill., and with the precise-level bench mark of the Coast and Geodetic Survey at Vincennes, Ind.; also with bench marks of the Ohio River Survey near the mouth of Wabash River.

The instruments used were Kern precise levels belonging to the Mississippi River Commission. The methods adopted for this work were the same as those in use by that commission.

The standard permanent bench mark established by the Wabash River Survey is a concrete slab surmounted by an iron pipe. The slab measures 16 inches by 16 inches by 4 inches and is set about 3 feet under ground. Elevations were taken on a copper bolt embedded in the concrete at the center of the slab. The iron pipe is 4 inches in diameter and 4 feet long, and a cap is bolted on its top. Elevations were taken on the center of the cap, which is directly above the bolt in the slab.

The bench marks established during previous surveys and connected with in 1911 are 3-inch iron pipes, 5 feet long, and set about 4.5 feet in the ground. Elevations on these were taken on the knobs on their caps.

The abbreviations R. B. and L. B. refer to the right and left banks, respectively, of Wabash River going downstream.

LAWRENCEBURG QUADRANGLE.

[Latitude 39°-39° 15'; longitude 84° 45'-85°.

At Lawrenceburg.

Lawrenceburg, front of courthouse, under center of second window from east corner, on water table; cut, marked "1879 U. S. C. & G. S. B □ M U" .. 485.942

PAOLI QUADRANGLE.

[Latitude 38° 30'-38° 45'; longitude 86° 15'-86° 30'.]

At Mitchell.

Mitchell, near southwest corner of M. N. Moore's store, in south face; cut on sill of window, marked "U. S. C. & G. S. B □ M X"..... 686.710

SHOALS QUADRANGLE.

[Latitude 38° 30'-38° 45'; longitude 86° 45'-87°.]

At West Shoals.

West Shoals, northwest side of courthouse, on stone cap of basement window; cut on face, marked "B+M" (C. & G. S. b. m. Y)..... 521.967

WASHINGTON QUADRANGLE.

[Latitude 38° 30'-38° 45'; longitude 87°-87° 15'.]

At Washington.

Washington, at southeast corner of courthouse, on sill of basement window; cut, marked "1879 U. S. C. & G. S. B □ M Z"..... 509.195

TERRE HAUTE QUADRANGLE.

[Latitude 39° 15'-39° 30'; longitude 87° 15'-87° 30'.]

Along Wabash River.

Terre Haute, at northeast corner of post office building; aluminum tablet stamped "513" (U. S. G. S. b. m.=Wabash River Survey p. b. m. "Post Office")..... 512.660

Terre Haute, in front face at southwest corner of Union Station; aluminum tablet stamped "495" (U. S. G. S. b. m.=Wabash River Survey p. b. m. "Union")..... 494.743

Terre Haute, east side of Chicago & Eastern Illinois R. R., north of Fort Harrison pike crossing, 26.6 feet east of east rail of track; S. 19° 15' E. 43 feet to blazed elm tree; iron post stamped "Prim. Trav. Sta. No. 22, 1906" (Wabash River Survey p. b. m. "Traverse"=U. S. G. S. primary traverse station mark)..... 496.413

Terre Haute, about 1 mile west of Union Station, on east side of Vandalia R. R. bridge across Wabash River; on top of bridge seat on south abutment; cross in center of chiseled square (U. S. G. S. b. m.=U. S. C. E. b. m. 1903 Survey=Wabash River Survey p. b. m. "Vandalia No. 1")... 482.177

	Feet.
Terre Haute, on west pier of Vandalia R. R. bridge, about 1,200 feet across bridge from p. b. m. "Vandalia No. 1," on southwest corner of bridge seat; square cut within a square, marked "U. S. B. M." (Wabash River Survey p. b. m. "Vandalia No. 2").....	482. 122
Taylorville, on R. B. opposite Terre Haute, on property of Louis Heyden, about 400 feet north of west end of Wabash Avenue highway bridge, 16 feet west of top of made high bank; bolt in slab.....	471. 163
Cap on pipe (Wabash River Survey p. b. m. 1).....	475. 217
Terre Haute, north abutment of highway bridge over Wabash River at Wabash Avenue, in east end of concrete approach, 6 feet from end post and 4 inches outside of guard wall; cross in center of 2-inch chiseled square, marked "B. M." (Wabash River Survey p. b. m. "Wabash").....	486. 807
Terre Haute, corner of First and Wilson streets, on north end of lower step of building of Peoples Brewing Co.; square cut (Wabash River Survey p. b. m. "Brewery").....	497. 774
Terre Haute, in lower part of, in front yard of cottage at 613 Prairieton Avenue, cottage is on west side of avenue and is first house south of Commercial Distilling Co.'s building, 3 feet south of north yard fence, 10 feet west of east yard fence, 6 feet west of 15-inch blazed oak tree; bolt in slab.....	488. 853
Cap on pipe (Wabash River Survey p. b. m. 2).....	492. 903
Terre Haute, about 7 miles below, about 325 feet east of river bank on the Theodore Hullman farm (George Cramer, tenant, 1911), about 245 feet west from dwelling, in fence corner about 3 feet east of north-south road fence and about 5 feet south of east-west barnyard fence; bolt in slab.....	483. 381
Cap on pipe (Wabash River Survey p. b. m. 3).....	487. 446

MARSHALL QUADRANGLE.

[Latitude 39° 15'-39° 30'; longitude 87° 30'-87° 45'.]

Along Wabash River.

Prairieton, 1.25 miles below, about 1 mile back from river, on north side of road leading west from Prairieton through Blue Hole (local name) to river, on west side of road from above described road south to river, at southeast corner of cultivated field owned by John Rotz, about 100 feet north of small dwelling occupied by George McCoy in 1911, 3 feet inside of east fence and 4 feet inside of south fence; bolt in slab.....	467. 471
Cap on pipe (Wabash River Survey p. b. m. 4).....	471. 517
Strains Ripple, 0.25 mile below lower end of, on farm of S. A. Paddock, about 325 feet east of The White School House (local name), about 100 feet north of northeast corner of dwelling house on said farm, about 16 feet south of center line of road, 3 feet south of yard and road fence and immediately at junction of yard and garden fences, 40 feet south of base of east-west levee on top of river bank; bolt in slab.....	450. 989
Cap on pipe (Wabash River Survey p. b. m. 5).....	455. 027
Aurora Bend, 600 feet above upper end of, 50 feet east of road near outside of levee leading to Darwin, Ill., in front yard of house of Fred Maurer, 12 feet west of northwest corner of house; bolt in slab.....	450. 742
Cap on pipe (Wabash River Survey p. b. m. 6).....	454. 810
Darwin, opposite, about 25 feet east of center of road at point where it turns down high bank to Darwin Ferry; four blazed cottonwood trees are distant SW. 33 feet, SE. 30 feet, NW. 37 feet, and NE. 31 feet; bolt in slab..	446. 696
Cap on pipe (Wabash River Survey p. b. m. 7).....	450. 681

MEROM QUADRANGLE.

[Latitude 39°-39' 15'; longitude 87° 30'-87° 45'.]

Along Wabash River.

Riverton, on L. B., in top of concrete abutment at east end of Illinois Central R. R. bridge over Wabash River, on south end of bridge seat, 2 feet from face of retaining wall and 3 feet below center line of downstream chord of bridge; center of 2-inch chiseled square, marked "U. S. □ B. M." (Wabash River Survey p. b. m. "Riverton")..... Feet. 442. 722

BIRDS QUADRANGLE.

[Latitude 38° 45'-39°; longitude 87° 30'-87° 45'.]

Along Wabash River.

Greers Ripple, 1.25 miles below, on L. B., 400 feet back from river bank, at point where north-south road turns east, in northwest corner of yard and about 35 feet in front of cabin occupied by Judd Smith and owned by W. H. Jones, 225 feet northwest to small iron pipe established by base-line party (1911); bolt in slab..... 441. 472

Cap on pipe (Wabash River Survey p. b. m. 15)..... 445. 508

Hites Ferry, 1.25 miles above point formerly known by this name, on L. B., at inside base of levee, about 25 feet above point where east-west section line road turns up river, 20 feet above well-defined path over levee, 150 feet below angle in levee, 400 feet above upper one of two pile hurdles in river which are about 300 feet apart, a fisherman's shack stands just outside of levee opposite bench mark; bolt in slab..... 428. 901

Cap on pipe (Wabash River Survey p. b. m. 16)..... 432. 956

Shaws Landing, 0.8 mile above, on L. B., 200 feet back from caving river bank, at upper end of growth of timber along bank, on west side of river road, in southwest corner of garden owned by Ross Lynch, whose house stands 180 feet north and barn stands 20 feet south; bolt in slab 425. 333

Cap on pipe (Wabash River Survey p. b. m. 17)..... 429. 389

Longtown Landing, opposite, on L. B., 0.25 mile north and 0.8 mile west to river bank, on west side of farm road, on north side of second farm road, in southeast corner of apple orchard, 3 feet inside of fences, 500 feet south of barn; house near barn is occupied by Exin Higgins and owned by A. Black; bolt in slab..... 422. 661

Cap on pipe (Wabash River Survey p. b. m. 18)..... 426. 683

Longtown Landing, 5.5 miles below, on L. B., 0.5 mile back from caving river bank (opposite bank at this point is a willow bar), on north fence line of east-west gravel road leading out to river, 650 feet east of wooden high bridge over ditch crossing road; bridge is second one out from river, 0.15 mile west of north-south road at point where farm road turns south and runs down to house occupied by E. E. Brown, large cultivated field on north side of gravel road, 10 feet west to 24-inch blazed elm tree; bolt in slab..... 417. 510

Cap on pipe (Wabash River Survey p. b. m. 19)..... 421. 501

VINCENNES QUADRANGLE.

[Latitude 38° 30'-38° 45'; longitude 87° 30'-87° 45'.]

Along Wabash River.

Vincennes, on Baltimore & Ohio R. R. bridge over Wabash River, on top of downstream end of south abutment, center of chiseled square, marked "U. S. E. □ B. M." (Wabash River Survey p. b. m. "B. & O. No. 2." = B. M. No. 1, 1903 Survey)..... 420. 532

	Feet.
Vincennes, in grounds of courthouse, easternmost stone pier of Coast and Geodetic Survey astronomical station, center of top surface. (Wabash River Survey p. b. m. 1 = C. & G. S. b. m.).....	429. 928
Vincennes, on Seventh Street side of courthouse; square cut in water table, marked "B. M. □ U. S. C. & G. S." (Wabash River Survey p. b. m. = C. & G. S. b. m. A 3).....	433. 847
Vincennes, 3.25 miles below Baltimore & Ohio R. R. bridge, on L. B., in front of house of Earl Meskemon, on river side, near top and nearly flush with slope of levee, blazed 48-inch sycamore tree northeast 21 feet; knob on cap (Wabash River Survey p. b. m. 2, set by 1903 Survey).....	419. 051
Homer Henderson's place, on L. B., in northwest corner of orchard, 260 feet north of northeast corner of Henderson's house, 100 feet back from top of river bank, 3 feet east of hedge fence and 3 feet north of wire fence, 15 feet east of center of road running along near base of levee; bolt in slab.....	411. 497
Cap on pipe (Wabash River Survey p. b. m. 23).....	415. 545
Vincennes, 6.4 miles below Baltimore & Ohio R. R. bridge, on L. B., 0.8 mile above mouth of Embarrass River, at lower end of small field outside of levee, 250 paces above small cabin on outside of levee, 300 paces above barn on inside of levee, on river side of levee near top; knob on cap (Wabash River Survey p. b. m. 3, set by 1903 Survey).....	420. 275
W. H. Brevoort Estate (No. 7), on farm of, on L. B., in northwest corner of barn lot, just inside of road fence, 12 feet east of center line of road running along near base of levee, 60 feet south of southwest corner of two-story red house on said farm; a small cultivated field lies just outside of levee in front of this house; bolt in slab.....	405. 958
Cap on pipe (Wabash River Survey p. b. m. 24).....	409. 959
St. Francisville, about 3.5 miles above, in top of downstream end of second pier from L. B. end of Big Four Route bridge over Wabash River; chiseled 1 inch square on stone, marked "U. S. □ B. M." (Wabash River Survey p. b. m. "Big Four" = b. m. 5 of 1903 Survey).....	416. 544
St. Francisville, 1.5 miles above, on L. B., on top of narrow sand ridge which shows clearly on contour of shore line, 250 feet southeast of center of road at point where it crosses ridge, 20 feet west of triple-bodied blazed elm tree standing in swale; bolt in slab.....	409. 674
Cap on pipe (Wabash River Survey p. b. m. 25).....	413. 711
St. Francisville, 3 miles below, on L. B., 35 feet northeast of northeast corner of two-story white frame house of John Rainey standing in angle of road, 15 feet south of center of east-west road and immediately inside of yard fence; bolt in slab.....	401. 706
Cap on pipe (Wabash River Survey p. b. m. 26).....	405. 759
Little Rock, 2.8 miles above, on L. B., 40 feet from top of bank, in northwest corner of garden plot of caretaker's house on property of Wabash Fishing Club, 2 feet east of east end of heavy wrought-iron fence in front of said property, 30 feet east of 18-inch blazed hickory tree; bolt in slab.....	400. 682
Cap on pipe (Wabash River Survey p. b. m. 27).....	404. 719
Little Rock, on L. B., in lane where road leaves river, 20 paces east of public scales, at west end of corn crib, 40 feet east of Edw. Self's mail box; iron pipe and cap (Wabash River Survey p. b. m. 10, set by 1903 Survey).....	403. 165
Little Rock, 2.5 miles below, on L. B., 25 feet from top of river bank, in northeast corner of yard of Perry Cunningham's residence (a 1½-story white house standing about 65 feet south of river bank), in southwest corner of road (south and east-west), just inside of yard fence, 45 feet northeast of northeast corner of house, 25 feet west of center line of south road at junction, 10 feet south of east-west road at its nearest point; bolt in slab..	401. 075
Cap on pipe (Wabash River Survey p. b. m. 28).....	405. 128

Mount Carmel, 4 miles above, 1.8 miles above Grand Rapids locks, on L. B., on land of James Carson (Reuben Reed, tenant), in front of and directly in line with south side of a small subtenant house which stands on a high mound about 0.25 mile below bridge over a main drainage ditch, 650 feet below a smaller ditch, 15 feet west of southwest corner of house, 15 feet east of center of road running along top bank of river, 6.5 feet northeast of blazed walnut tree (old bench mark, probably of a levee or Geological Survey, shows on east root of blazed walnut tree); bolt in slab.....	Feet. 401. 120
Cap on pipe (Wabash River Survey p. b. m. 29)	405. 153
Grand Rapids lock and dam, 1.5 miles above, on L. B., 0.5 mile below point opposite Hanging Rock, nearly opposite lower end of small island, exactly on fence line, 90 paces below bridge over ditch, 15 feet northeast of center of road, halfway between two drainage ditches, 30 feet northeast of blazed 24-inch black-oak tree; iron pipe and cap, knob on pipe (Wabash River Survey p. b. m. 12, set by 1903 Survey).....	397. 354

MOUNT CARMEL QUADRANGLE.

[Latitude 38° 15'-38° 30'; longitude 87° 45'-88°.]

Along Wabash River.

Southern R. R. bridge across Wabash River, 525 feet below, on L. B., 500 feet back from river bank, 25 feet from upstream river corner of house occupied by C. G. Patry (Geo. Combs, owner), on outside of river road leading downstream from ferry; bolt in slab.....	391. 147
Cap on pipe (Wabash River Survey p. b. m. 30).....	395. 180
Patoka Island, 0.5 mile below foot of, 0.25 mile above cable ferry, 30 paces below front gate of Anton Beuligman's yard, on river side of fence, close to same; iron pipe and cap, knob on pipe (Wabash River Survey p. b. m. 15, set by 1903 Survey).....	391. 965
Mount Carmel, 4.25 miles below, on L. B., 150 feet from river bank, on outside of river road, in front of small house occupied by Andrew Walden (Charles Kenton, owner), 1 foot inside of fence line, barn on high mound stands 200 feet above house; bolt in slab.....	386. 470
Cap on pipe (Wabash River Survey p. b. m. 31).....	390. 496
Rochester, opposite, on L. B., at anchor of ferry cable and on river side of fence; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 17, set by 1903 survey).....	390. 045
Rochester, 3 miles below cable ferry, on L. B., 1 mile above Crowleyville, in northwest corner of yard of house occupied by Jordan Garrett, 250 feet below barn with red tin roof, 3 feet inside of fences, 30 feet from hickory tree (top broken out) standing at top of river bank, 150 feet above p. b. m. 18 (1903 Survey); bolt in slab.....	385. 666
Cap on pipe.....	389. 738
Crowleyville, 1 mile above, 0.25 mile above church house, on river side of fence, at intersection of road fence and fence on lower side of garden, 30 feet below residence of Jordan Garrett, 150 feet below p. b. m. 32; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 18, set by 1903 Survey).....	388. 592
Jimtown, 1 mile below, on L. B., 125 feet back from top of bank, 0.5 mile below ruins of old sorghum mill, in southeast corner of garden plot, 3 feet inside of fences, 40 feet in front of house occupied by Allan Collins, house and all outbuildings painted white and show prominently from river; bolt in slab.....	383. 461
Cap on pipe (Wabash River Survey p. b. m. 33).....	387. 444

McCrearys Bluff, 1 mile below, on L. B., on river side of road, 0.25 mile above large white house standing back of open bluff bank, 50 paces below small house; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 20, set by 1903 Survey).....	Feet. 386. 370
McCrearys Bluff, 1.8 miles below, on L. B., 400 feet from river bank, on south side of east-west road, 600 feet west of schoolhouse on north side of road, 600 feet above small red house which shows prominently from river, 20 feet from northwest corner of small red house occupied by Millard Hagler, at northwest corner of yard, 3 feet inside of fences; bolt in slab.....	381. 538
Cap on pipe (Wabash River Survey p. b. m. 34).....	385. 562
Siegerts Island, 2 miles above, on L. B., 800 feet from river, 100 feet south of farm road at top of high bank and running west past Sieget's place, 100 feet west of prominent red barn on high mound, 20 feet southeast of small house, at corner of yard, 3 feet inside of fences, 20 feet west of small iron pipe established by base-line party in 1911; bolt in slab.....	380. 112
Cap on pipe (Wabash River Survey p. b. m. 35).....	384. 150
Siegerts Island, 0.25 mile below foot of, on L. B., on top of river bank, between house and corncrib, 205 feet from house and 86 feet from crib; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 22, set by 1903 Survey).....	380. 199
Grayville, 4.5 miles above, on L. B., 650 feet below prominent gravel and sand bar, 60 feet from top of bank, on east side of river road, 50 feet southwest of abandoned cabin, in corner of yard, 100 feet above log corncrib, 40-inch blazed swell-butted oak about 40 feet west, two 30-inch maples and twin 30-inch sycamores stand within 100 feet of blazed tree and show prominently from river; bolt in slab.....	377. 961
Cap on pipe (Wabash River Survey p. b. m. 36).....	382. 016
Siegerts Island, 3 miles below, on L. B., just above clump of timber, 178 feet northeast of house, in northeast corner of garden, inside of fence, 4 feet from caving bank (1911); iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 23, set by 1903 Survey).....	381. 424
Grayville, opposite, on L. B., 500 feet from river bank above Grayville and 0.25 mile from river bank below Grayville, 60 feet back of levee, in cultivated field, at intersection of Y road leading along outside of levee and road leading down river to Griffin, third road leads to Grayville Ferry, 40 feet west to 12-inch blazed coffee-bean tree; bolt in slab.....	374. 911
Cap on pipe (Wabash River Survey p. b. m. 37).....	378. 954

NEW HARMONY QUADRANGLE.

[Latitude 38°-38° 15'; longitude 87° 45'-88°.]

Along Wabash River.

Grayville, 1.8 miles below, on downstream end of west left-bank pier of Illinois Central R. R. Bridge; center of chiseled square in masonry, marked "U. S. E. B. M." (Wabash River Survey p. b. m. 25 = b. m. of 1903 Survey = U. S. G. S. b. m. described in Bulletin 421 on page 58).....	389. 096
New Baltimore, 3.5 miles above, on L. B., about 0.25 mile back from river, 125 feet east of center of road along top of high bank (road runs to New Harmony), 30 feet northeast of small house, on land of R. Brooks, in northwest corner of garden plat, 15 feet north of small iron pipe established by base-line party of 1911; bolt in slab.....	376. 625
Cap on pipe (Wabash River Survey p. b. m. 38).....	380. 634
New Harmony, 4 miles above, on L. B., 300 feet back from river bank, 40 feet above right bank of Black River, 325 feet south of highway bridge across Black River, 100 feet north of small house owned and occupied by D. M. Ades, in northeast corner of back yard, 3 feet inside of fences; bolt in slab.....	379. 160
Cap on pipe (Wabash River Survey p. b. m. 39).....	383. 159

New Harmony, 3 miles above, on L. B., 30 feet from top of river bank, near large white house of Link Ford, on north side of fence, 75 feet from south end of house, 50 feet from fence corner; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 28 set by 1903 Survey).....	Feet. 378.505
New Harmony, New Harmony Banking Co.'s building, in center of north window sill; bronze tablet stamped "392 Vin" (Wabash River Survey p. b. m. "Bank" = U. S. G. S. b. m.).....	384.399
New Harmony, at north side of entrance of Murphy Library, in west end of top step; bronze tablet stamped "387 Vin" (Wabash River Survey p. b. m. "Library" = U. S. G. S. b. m.).....	386.930
New Harmony, lower edge of town, on L. B., on top of second high bank, 78 feet south of west end of Steam Mill Street, close to wire fence, on west side of alley, just back of house of Le Roy Cox, 6 feet north of Capt. Ribeyre's red barn, 50 feet above p. b. m. 40 and on opposite side of alley; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. "New Harmony")..	378.527
New Harmony, lower edge of town, on L. B., 0.25 mile back of river bank, 150 feet north of road leading to ferry at head of Ribeyres Island, 70 feet south of west end of Steam Mill Street, southwest corner of yard of house of Le Roy Cox (fronting on Arthur Street), on east side of alley, 20 feet east of Capt. Ribeyre's large red barn, 50 feet below p. b. m. "New Harmony" and on opposite side of alley; bolt in slab.....	377.120
Cap on pipe (Wabash River Survey p. b. m. 40).....	381.173
Turkey Island, 0.5 mile below head of, on L. B. (shore of Ribeyres Island), 160 feet from top of river bank, 12 feet west of north corner of barn, 2 feet north of fence running west from north corner of barn to river, 110 feet northeast of house where John Fisher lives, 20 feet south of fence corner, 50 feet east of corn crib; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. "△4", set by 1903 Survey).....	371.689
New Harmony, 4.25 miles below, on L. B. (shore of Ribeyres Island), 400 feet back from river, 0.25 mile below large corncribs on river bank, outside of road around island, just across road from white barn, in southwest corner of yard of two-story white house of William Hobbs (tenant), about 25 feet southwest of house; bolt in slab.....	369.162
Cap on pipe (Wabash River Survey p. b. m. 41).....	373.211
New Harmony, 5.8 miles below, on L. B. (shore of Ribeyres Island), 400 feet from river, 100 feet from house where Mr. Stewart lives, 15 feet south of barn, 8 feet west from pump house, 4 feet from fence; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. "△10", set by 1903 Survey)..	370.743
New Harmony, 7.25 miles below, on L. B. (shore of Ribeyres Island), 700 feet from river, on top of high bank, 600 feet above p. b. m. "△9" (1903 Survey), on outside of road leading around island, 45 feet southeast of small white house occupied by George Mitchell (tenant), in southeast corner of garden plot, 3 feet inside of fences; bolt in slab.....	365.826
Cap on pipe (Wabash River Survey p. b. m. 42).....	369.891
Ribeyres Island, shore of (L. B. of Wabash River), 40 feet from top of high bank, inside of road along top of bank, 30 feet from center line of road, 600 feet below p. b. m. 42, 100 feet below vacant house, in cultivated field, road turns into cornfield between house and p. b. m. △9; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. "△9," 1903 Survey)..	369.152

CARMi QUADRANGLE.

[Latitude 38°-38° 15'; longitude 88°-88° 15'.]

Along Wabash River.

Maunie, 0.5 mile above, on L. B., 600 feet from river, 8 feet north of northeast corner of big red barn on high mound on land of John Aldrich, 3 feet west of small iron pipe established by base-line party of 1911; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. "Aldrich").....	372.426
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Grand Chain, 0.8 mile above head of, on L. B., 40 feet from upstream river corner of large tenement house on river side of road, 25 feet from iron pump in back yard, near two pecan trees on line at right angles to river; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 31, set by 1903 survey).....	Feet. 359. 000
Maunie, 3 miles below, on L. B., on top of land pier of Louisville & Nashville R. R. bridge over Wabash River, 1.5 feet above iron base plat, 3 feet from upstream end and about 3.5 feet from sides of top course of masonry; center of depressed chiseled square, marked "U. S. □ B. M." (Wabash River Survey p. b. m. "L. & N.").....	373. 296
Maunie, 3 miles below, on L. B., at Louisville & Nashville R. R. bridge, 175 feet back from land pier, 15 feet below center of trestle; bolt in slab...	358. 070
Cap on pipe (Wabash River Survey p. b. m. 45).....	362. 093
Maunie, in middle of northwest face of foundation wall to Methodist Church, 2 feet above ground; aluminum tablet stamped "375 Illinois 1903" (Wabash River Survey p. b. m. "Illinois"=U. S. G. S. b. m.).....	375. 171

NEW HAVEN QUADRANGLE.

[Latitude 37° 45'-33"; longitude 88°-88° 15'.]

Along Wabash River.

New Harmony, 10.5 miles below, on L. B., 0.5 mile above head of Mink Island, just above Winkler's Ferry, at top of river bank, inside of ferry road, blazed 12-inch box elder tree S. 8 feet, blazed 24-inch sycamore tree W. 12 feet; bolt in slab.....	363. 529
Cap on pipe (Wabash River Survey p. b. m. 43).....	367. 572
Maunie, 3 miles above, on L. B., 200 feet above foot of Twin Sister Island No. 1, about 100 feet from top of river bank, 6 feet west of north-south wire fence separating cultivated fields; blazed 16-inch walnut tree S. 20 feet, blazed 6-inch thorn tree NW. 10 feet, blazed 10-inch thorn tree NW. 20 feet; bolt in slab.....	362. 375
Cap on pipe (Wabash River Survey p. b. m. 44).....	366. 449
Maunie, 7.5 miles below, on L. B., 100 feet from river bank, 100 feet above head of cut-off, 0.25 mile above Little Chain, 30 feet southwest of southwest corner of small red house occupied part of year by Herman Jeffries; bolt in slab.....	356. 554
Cap on pipe (Wabash River Survey p. b. m. 46).....	360. 568
Fretageot's Ferry Landing, 200 feet above, on L. B., 250 feet from river, on outside of road leading to Mount Vernon, Ind., about 400 feet below angle in road, 3 feet inside of fence line of wooded pasture, 400 feet above small iron pipe established by base-line party in 1911, 30 feet south of door in end of long shed, blazed white-oak tree W. 85 feet; bolt in slab.....	359. 370
Cap on pipe (Wabash River Survey p. b. m. 47).....	363. 397
Little Wabash River, 3.25 miles above mouth of, on L. B., 250 feet from river, on land side of road, on top of high bank, in northeast corner of yard, 3 feet inside of fences, 18 feet northeast of northeast corner of small white house occupied by R. D. Walling, which is in plain view of river, 200 feet above small iron pipe established by base-line party in 1911; bolt in slab..	362. 059
Cap on pipe (Wabash River Survey p. b. m. 48).....	366. 097
Little Wabash River, 1 mile below mouth of, on L. B., 800 feet from river, on top of high bank, 50 feet southwest of southwest corner of rail carncrib with high roof (crib is on high mound in plain view from river), 3 feet inside of wire fence, 90 feet south of small iron pipe established by base-line party in 1911, blazed 15-inch red-oak tree S. 10 feet, blazed 8-inch pig-hickory tree N. 12 feet; bolt in slab.....	359. 384
Cap on pipe (Wabash River Survey p. b. m. 49).....	363. 451

Wabash River, about 10 miles above mouth of, on L. B., 1 mile above Levi's Slough, 800 feet from river, in corner of yard, 35 feet west of northwest corner of house owned and occupied by Ferdinand Vollmer, 20 feet south of center of east-west section line road (two sheds and a barn are on opposite side of road, on high ground, and in plain view from river); bolt in slab.....	Feet. 356. 999
Cap on pipe (Wabash River Survey p. b. m. 50).....	361. 048
Bone Bank, 1.25 miles below, on L. B., 40 feet from river, between large white-locust tree and large hackberry tree at lower edge of small strip of large trees, opposite upper end of Mackeys Bar, which is above island of same name, on river side of wagon road, small mound and shack stand on outside of road near by; iron pipe and cap, knob on cap (Wabash River Survey p. b. m. 39, set by 1903 Survey).....	348. 721
Wabash River, 6.5 miles above mouth of, on L. B., about 0.5 mile below Mackeys Island, 150 feet from top of caving bank, on land of Mackey heirs, 40 feet south of southwest corner of small tenant house, 100 feet east of high mound, in northwest corner of barn lot, 3 feet inside of fences, blazed 48-inch pecan tree W. 20 feet, 60-inch elm tree N. 40 feet, 40-inch cottonwood northwest 40 feet; bolt in slab.....	343. 268
Cap on pipe (Wabash River Survey p. b. m. 51).....	347. 347
Wabash River, 0.8 mile above mouth of, on L. B., 900 feet from river bank, in cultivated land, at intersection of road across neck and road leading down to river, 0.8 mile above prominent corncrib on high concrete-faced mound, on property of Crumback, 1,000 feet north of shack near top of bank, 0.25 mile east of shack at turn in road, blazed 24-inch pecan tree SW. 10 feet, blazed 24-inch pecan tree W. 125 feet; bolt in slab.....	337. 299
Cap on pipe (Wabash River Survey p. b. m. 52).....	341. 360
Wabash Island, opposite mouth of Wabash River, on right shore of island, at open place used as fisherman's landing, 125 feet from low-water bank, 450 feet above road leading across island; bolt in slab.....	344. 789
Cap on pipe (Wabash River Survey p. b. m. 53).....	348. 824

APPENDIX B.

PRIMARY LEVELING BY THE UNITED STATES CORPS OF ENGINEERS.

**Birds, Carmi, Marshall, Merom, Mount Carmel, New Harmony, New Haven, Prince-
ton, Terre Haute, and Vincennes quadrangles.**

GIBSON, KNOX, POSEY, SULLIVAN, AND VIGO COUNTIES.

Most of the following bench marks from Terre Haute along Wabash River to its mouth, are situated near the river banks, the maximum distance of any therefrom being about 1 mile. They were established by the United States Corps of Engineers in 1911, and the results are published by permission of the Chief of Engineers, U. S. Army.

The latitudes and longitudes were determined by a careful traverse line, measured forward and backward with steel tape, the limit of closure being 1:15,000, and the azimuth, the mean of six angles, was frequently checked by star observations, for which a triangulation, 10-second transit was used. The line was adjusted between United States Geological Survey primary traverse station 22 at Terre Haute, Ind., and Coast and Geodetic Survey station Merom College at Merom, Ind., and between the latter station and the Coast and Geodetic Survey astronomical station at Vincennes, Ind. No adjustment was made below Vincennes, Ind.

Elevations were determined by careful duplicated ordinary-level connections with precise-level bench marks of this survey (1911) whose elevations are based on the 1912 adjustment value of the Coast and Geodetic Survey bench mark A 3 at Vincennes, Ind., 433.847 feet above sea level.

The bench mark is the top of an iron post 2 inches in diameter, unless otherwise described.

TERRE HAUTE 15' QUADRANGLE.

From Terre Haute southerly along Wabash River to point 3 miles below Eight Mile Island.

Terre Haute, 1 mile above Union Station, on south side of Sixth Avenue, 8 feet east of Chicago & Eastern Illinois R. R. track; iron pipe (U. S. C. E. b. m. 1). Latitude 39° 28' 58.67". Longitude 87° 23' 54.50".....	Feet. 492.33
Terre Haute, at southeast corner of reservoir at waterworks, 1.5 feet from corner post; iron pipe (U. S. C. E. b. m. 2). Latitude 39° 28' 35.80". Longitude 87° 25' 01.02".....	502.13
Terre Haute, northeast corner of Water and Swan streets, in southwest corner of yard of gas company, 1 foot from brick retaining wall; iron pipe (U. S. C. E. b. m. 3). Latitude 39° 27' 45.10". Longitude 87° 25' 04.47".....	496.51

Terre Haute, 1 mile below highway bridge, in driveway of distillery, 8 feet from corner of wire fence with concrete posts; iron pipe (U. S. C. E. b. m. 4). Latitude 39° 27' 13.27". Longitude 87° 25' 06.48".....	Feet. 498. 02
Terre Haute, 4 miles below, 1 mile below Merchants Distillery, on east side of Prairieton road, at corner of large woods, 7 feet from center of railroad track; iron pipe (U. S. C. E. b. m. 5). Latitude 39° 26' 12.25". Longitude 87° 25' 33.85".....	494. 87
Terre Haute, 5.25 miles below, on river side of road, 2 feet from wire fence about 100 feet below house owned by W. S. Perkins; iron pipe (U. S. C. E. b. m. 6). Latitude 39° 25' 26.35". Longitude 87° 26' 34.01".....	505. 91
Terre Haute, 7.25 miles below, on Theodore Hulman farm, George Cramer, tenant, at point where river bends in to less than about 100 meters from road, in fence corner, 1 meter east of north-south road fence, 1.5 meters south of east-west barnyard fence, 75 meters west of dwelling house, 100 meters east of river bank; iron pipe (U. S. C. E. p. b. m. 3). Latitude 39° 24' 32.88". Longitude 87° 27' 59.59".....	487. 446
Terre Haute, 10 miles below, 2 miles below Eight Mile Island, 800 feet back from river bank, on land of S. E. Keever, 250 feet northwest of his house, in private lane leading to river, 200 feet west of wagon road; iron pipe (U. S. C. E. b. m. 7). Latitude 39° 23' 20.42". Longitude 87° 29' 09.12".....	471. 68

MARSHALL 15' QUADRANGLE.

From point 3 miles below Eight Mile Island southerly along Wabash River to Bohn Ferry.

Eight Mile Island, 3 miles below, 50 feet from river bank, on land of Henry Hahn, 500 feet upstream from an abandoned house on left bank; iron pipe (U. S. C. E. b. m. 8). Latitude 39° 22' 55.61". Longitude 87° 30' 50.16".....	468. 08
Terre Haute, 12.8 miles below, 1.8 miles above line between Illinois and Indiana, 100 feet back from river bank, on top of levee, on land of Will Farmer, 30 feet above well inside of levee, directly back of camp grounds; iron pipe (U. S. C. E. b. m. 9). Latitude 39° 22' 20.11". Longitude 87° 31' 40.58".....	466. 39
Terre Haute, 14.5 miles below, 0.25 mile above intersection of Illinois State line with river, on top of levee, 300 feet back from river, on land of Harvey Bentley, 200 feet above house of J. P. Hunt, public road runs along inside of levee, 11 feet E. an 8-inch blazed elm tree, 15 feet S. a 12-inch blazed elm tree; iron pipe (U. S. C. E. b. m. 10). Latitude 39° 21' 02.04". Longitude 87° 31' 32.06".....	466. 15
Terre Haute, 16.3 miles below, on land of Mrs. J. W. Stout, on top of levee, on river road, about 1.5 miles below State line, 400 feet below abandoned log cabin, blazed 18-inch sycamore tree on levee at turn of road, distant 178 feet; iron pipe (U. S. C. E. b. m. 11).	
Terre Haute, 17.2 miles below, 2.6 miles below State line, at side of river road, on top of levee, 200 feet below white schoolhouse, on land of Carrie Mitchell, 24-inch sycamore tree on side of levee is 302° 41' distant 69 feet; iron pipe (U. S. C. E. b. m. 12). Latitude 39° 20' 20.71". Longitude 87° 33' 58.25".....	463. 97
Darwin Ferry, 4 miles above, on top of levee, at side of river road, 100 feet from river, on land of Henry Maurer, 100 feet from tenant house, 700 feet above residence of C. C. Little; iron pipe (U. S. C. E. b. m. 13). Latitude 39° 19' 17.08". Longitude 87° 35' 46.60".....	462. 62
Darwin Ferry, 3.5 miles above, on top of levee, on property owned by De Kalb Fortune, 50 feet west of road at point of turn from west to south, 90 feet northwest of Fortune's schoolhouse, 100 feet from river; iron pipe (U. S. C. E. b. m. 14). Latitude 39° 18' 49.18". Longitude 87° 36' 07.68".....	460. 37

Darwin Ferry, 0.25 mile below, 800 feet back from river bank, in dooryard of J. L. Figg, 60 feet west of house, 30 feet east of public road, 20 feet east of fence along road, granary and wagon shed across road from bench mark; iron pipe (U. S. C. E. b. m. 15). Latitude $39^{\circ} 16' 51.54''$. Longitude $87^{\circ} 36' 20.0''$ 450.48 Feet.

MEROM QUADRANGLE.**At Riverton.**

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. 32). Latitude $39^{\circ} 01' 07.99''$. Longitude $87^{\circ} 34' 04.55''$ 443.32

BIRDS QUADRANGLE.**From Riverton southerly along Wabash River to point 2.5 miles above Russellville.**

Riverton, 2.5 miles below, 33 feet back from river, on sand knoll, 35 feet northwest of Jim Jones's house, 250 feet east of shack dwelling of Nelson Anderson, renter, 350 feet northwest of residence of J. N. Smith, renter, 0.5 mile above schoolhouse; iron pipe (U. S. C. E. b. m. 33). Latitude $38^{\circ} 59' 44.238''$. Longitude $87^{\circ} 33' 39.90''$ 446.38

Palestine Landing, 2 miles below, 800 feet back from river, on sand ridge, 5 feet east of center line of public road, 75 feet north of angle in road, 65 feet southwest of house of George Land; barn directly west across road, fencercail corncrib 12 feet east; iron pipe (U. S. C. E. b. m. 34). Latitude $38^{\circ} 58' 51.42''$. Longitude $87^{\circ} 32' 34.25''$ 447.33

Hites Ferry, 1 mile above, on top of levee, on land of John Harlot, between mouths of two drainage ditches passing through levee, 2 pile hurdles extend into river from these mouths, 20 feet above stone header of ditch, about 1,600 feet below shack occupied by H. K. Wallace 100 feet back from river; iron pipe (U. S. C. E. b. m. 35). Latitude $38^{\circ} 58' 08.16''$. Longitude $87^{\circ} 31' 34.26''$ 441.45

Palestine Landing, 4.3 miles below, 300 feet below Hites Ferry, 200 feet back from river bank, on top of levee, on land belonging to Mr. Marks, 75 feet west of house of Will Shepherd, renter, 60 feet south of public road crossing levee; iron pipe (U. S. C. E. b. m. 36). Latitude $38^{\circ} 57' 27.71''$. Longitude $87^{\circ} 30' 45.59''$ 441.56

Hites Ferry, 2 miles below, 1.3 miles above Shaws Landing, 500 feet from river bank, on top of levee, 250 feet east from right angle in levee; iron pipe (U. S. C. E. b. m. 37). Latitude $38^{\circ} 56' 10.31''$. Longitude $87^{\circ} 30' 50.96''$. 437.83

Shaws Landing, 1 mile below, 1 mile above Longtown Landing, 400 feet from river, on sand knoll, on land of M. E. Praether, 200 feet southwest of barn of H. McCarty, renter, 3 feet north of east-west fence to river; iron pipe (U. S. C. E. b. m. 38). Latitude $38^{\circ} 54' 31.04''$. Longitude $87^{\circ} 30' 56.95''$ 431.24

Longtown Landing, 1 mile below, 0.25 mile back from river, on land of A. Black, halfway between house and barns of H. Black, renter, 3 feet west of north-south fence; iron pipe (U. S. C. E. b. m. 39). Latitude $38^{\circ} 53' 25.14''$. Longitude $87^{\circ} 31' 42.81''$ 428.03

Russellville, 4.8 miles above, 0.25 mile from top of river bank along east-west gravel road, 5 feet to center line of gravel road, at junction with side lane running north to gravel bar, on land of George Price, 800 feet from river bank; iron pipe (U. S. C. E. b. m. 40). Latitude $38^{\circ} 52' 02.43''$. Longitude $87^{\circ} 32' 18.01''$ 423.14

Russellville, 2.5 miles above, 400 feet from top of bank, on land of C. A. Beard, on knoll about 25 feet south of residence of E. E. Brown, renter; iron pipe (U. S. C. E. b. m. 41). Latitude 38° 51' 20.08''. Longitude 87° 31' 51.55''. 429.74

VINCENNES QUADRANGLE.

From point 0.5 mile below Vincennes southerly along Wabash River to point 0.8 mile above Little Rock.

Vincennes, 0.5 mile below, at side of road, on top of levee, 125 feet from river bank; iron pipe (U. S. C. E. b. m. 50). Latitude 38° 40' 37.71''. Longitude 87° 32' 27.79''. 424.36

Vincennes, 2.2 miles below, on top of levee, 200 feet from house of Mary E. Kinnahan; iron pipe (U. S. C. E. b. m. 51). Latitude 38° 40' 21.62''. Longitude 87° 34' 17.31''. 423.49

Vincennes, 3.7 miles below, 200 feet from river bank, on top of levee, 225 feet from house, on land belonging to Isaac Henderson; iron pipe (U. S. C. E. b. m. 52). Latitude 38° 38' 51.47''. Longitude 87° 35' 43.35''. 421.80

Vincennes, 5.2 miles below, 200 feet from river bank, on top of levee, at junction of two levees, on property of Ed. Anderson; iron pipe (U. S. C. E. b. m. 53). Latitude 38° 38' 34.15''. Longitude 87° 36' 16.63''. 420.17

Vincennes, 7 miles below, 2.5 miles above Big Four Route bridge, about 400 feet from river, on top of levee, at side of road, 20 feet from junction of two levees, 500 feet from red house, on land of William Brevoort; iron pipe (U. S. C. E. b. m. 54). Latitude 38° 37' 34.06''. Longitude 87° 36' 51.13''. 418.53

Vincennes, 11 miles below, 2 miles above St. Francisville, 1.6 miles below Big Four Route bridge, 500 feet from river, on gravel road, 800 feet from two-story white house, William Brevoort, owner, and Otto Bledsoe, renter; iron pipe (U. S. C. E. b. m. 55). Latitude 38° 35' 23.42''. Longitude 87° 36' 31.73''. 406.29

St. Francisville, across river from, on gravel road leading to ferry, 150 feet from ferry landing, 150 feet above white house; iron pipe (U. S. C. E. b. m. 56). Latitude 38° 35' 27.17''. Longitude 87° 38' 14.49''. 406.57

St. Francisville, 2 miles below, 0.5 mile from river bank, 50 feet from house, in garden of Charles Rose, renter, William Brevoort, owner, about 0.7 mile below Beal Church and school; iron pipe (U. S. C. E. b. m. 57). Latitude 38° 33' 54.44''. Longitude 87° 38' 27.71''. 407.11

St. Francisville, 3 miles below, 100 feet from river, at side and end of gravel road, in front of two-story white house, J. M. Newton, owner, W. T. Raney, renter; iron pipe (U. S. C. E. b. m. 58). Latitude 38° 33' 12.55''. Longitude 87° 39' 13.83''. 406.04

St. Francisville, 5 miles below, 800 feet from river, 100 feet from white house, in garden of William Carter, renter, Capt. C. L. Lewis, owner, 25 feet from private road to river; iron pipe (U. S. C. E. b. m. 59). Latitude 38° 32' 02.93''. Longitude 87° 39' 20.92''. 403.02

Little Rock, 3 miles above, opposite Catfish Bend, 1 mile back from river, on north-south gravel road, just below wagon bridge over pond, about 250 feet from oil well, 260 feet from house, Ward Fry, owner; iron pipe (U. S. C. E. b. m. 60). Latitude 38° 30' 04.92''. Longitude 87° 37' 48.56''.

PRINCETON QUADRANGLE.

From point 0.8 mile above Little Rock southerly along Wabash River to Mount Carmel.

Little Rock, 0.8 mile above, on sand ridge, at side of north-south wagon road, 700 feet from river, 600 feet from log house, 120 feet from house of David Warth, renter, Mary Valentine, owner; iron pipe (U. S. C. E. b. m. 61). Latitude 38° 29' 58.26''. Longitude 87° 40' 01.00''. 415.82

Little Rock, in turn in lane where road leaves river, 20 paces east of public scales, west end of corncrib, 12 meters east of mail box of Edwin Self standing at angle of road; iron pipe (U. S. C. E. b. m. 10, 1903 survey). Latitude $38^{\circ} 29' 40.74''$. Longitude $87^{\circ} 40' 43.78''$	Feet. 403. 165
Mount Carmel, 9.1 miles above, 2.1 miles above Buchanans Ferry, 500 feet from river, 80 feet from barn, 225 feet from two-story white house, on land of William Stickler; iron pipe (U. S. C. E. b. m. 62). Latitude $38^{\circ} 28' 51.95''$. Longitude $87^{\circ} 42' 04.86''$	404. 17
Buchanans Ferry, 1 mile above, 50 feet from river, at side of river road, 80 feet from two-story white house, on land of J. W. Price, 6 feet from 22-inch elm tree; iron pipe (U. S. C. E. b. m. 63). Latitude $38^{\circ} 28' 41.88''$. Longitude $87^{\circ} 43' 21.01''$	405. 47
Mount Carmel, 7 miles above, 650 feet from river, in barn lot, 25 feet from red barn, at end of road to Buchanans Ferry, 125 feet from corncrib with windmill on opposite side, Robert Mayhan, owner; iron pipe (U. S. C. E. b. m. 64). Latitude $38^{\circ} 28' 32.88''$. Longitude $87^{\circ} 44' 21.30''$	403. 12
Mount Carmel, 4 miles above, on land of James Carson, Reuben Reed, tenant, in front of and directly in line with south side of small subtenant house which stands on high ground, 15 feet west of southwest corner of house, 15 feet from center line of road which runs along river, 1.7 miles above Grand Rapids Lock; concrete slab and iron pipe (U. S. C. E. p. b. m. 29). Latitude $38^{\circ} 27' 19.48''$. Longitude $87^{\circ} 44' 09.04''$	405. 153
Grand Rapids Lock, 1 foot south and 1 foot east of northeast corner of wide part of lock wall and 15 feet east of inner side of wall of lock chamber, on top of lower end of land side of masonry; cross with letters "U. S. Eng. B. M. 65" (U. S. C. E. b. m. 65). Latitude $38^{\circ} 26' 05.03''$. Longitude $87^{\circ} 44' 24.00''$	396. 80
Mount Carmel, across river from, 700 feet below Fifth Street Ferry, on left bank of White River, 25 feet from same, at point where it empties into Wabash, at side of wagon road, 15 feet from 36-inch blazed elm tree, azimuth 32° ; iron pipe (U. S. C. E. b. m. 66). Latitude $38^{\circ} 24' 48.77''$. Longitude $87^{\circ} 44' 28.53''$	391. 87

MOUNT CARMEL QUADRANGLE.

From Mount Carmel southerly along Wabash River to point 1.3 miles below Johnson's Ferry.

Mount Carmel, 1,100 feet below Southern Ry. bridge at, 1.9 miles below mouth of White River, 1,000 feet from river on wagon road leading to river, at point opposite Patoka Island, on upstream side of land of Sylvester Greggs; iron pipe (U. S. C. E. b. m. 67). Latitude $38^{\circ} 23' 33.70''$. Longitude $87^{\circ} 45' 02.09''$	392. 65
Burnett School, 400 feet from, 0.3 mile from river on wagon road running to river, Charity Church is in grove on road about 150 feet from river, pecan grove to left of bench mark, Abner Depty, owner; iron pipe (U. S. C. E. b. m. 68). Latitude $38^{\circ} 22' 44.578''$. Longitude $87^{\circ} 45' 40.92''$	394. 58
Mount Carmel, 2.8 miles below, 0.4 mile above new Big Four Route bridge, 150 feet from river between house and barn, 125 feet from barn, Herbert Walden, owner, ditch between bench mark and house, 35 feet from top of bank; iron pipe (U. S. C. E. b. m. 69). Latitude $38^{\circ} 22' 03.55''$. Longitude $87^{\circ} 46' 48.82''$	393. 82
Mount Carmel, 3.2 miles below, on left end pier of bridge, 4 feet 6 inches from river edge of pier and 3 feet 1 inch from upstream edge of pier; center of 1 $\frac{1}{4}$ inch square (U. S. C. E. b. m. 70). Latitude $38^{\circ} 21' 56.45''$. Longitude $87^{\circ} 47' 14.24''$	401. 06

Mount Carmel, 4.8 miles below, 0.4 mile above Coffee Island, 200 feet from river at side of private road running below white house and to river, 75 feet from house, 125 feet from barn above house; iron pipe (U. S. C. E. b. m. 71). Latitude 38° 21' 21.74". Longitude 87° 48' 31.77".....	Feet. 391.77
Mount Carmel, 5.9 miles below, 400 feet above ferry, 100 feet from river at side of wagon road along river, opposite small town of Rochester, Ill., 300 feet above road leading away from river and about 500 feet from large granary; iron pipe (U. S. C. E. b. m. 72). Latitude 38° 20' 41.20". Longitude 87° 49' 17.33".....	392.65
Crowleyville, 3 miles above, 1.5 miles below Coffee Island, 800 feet from river at crossroads, 125 feet from house where Geo. McClellan lives, 60 feet from big red barn, and 40 feet from granary both on his farm, 500 feet from Burns schoolhouse on east-west road; iron pipe (U. S. C. E. b. m. 73). Latitude 38° 19' 46.34". Longitude 87° 49' 25.75".....	393.04
Crowleyville, 1.7 miles above, 2.7 miles below Coffee Island, 500 feet from river, on top of levee running parallel to river, between road and house, 50 feet from house, George Wilbern, owner, and John Howard, renter; iron pipe (U. S. C. E. b. m. 74). Latitude 38° 18' 41.69". Longitude 87° 49' 37.70".....	392.33
Crowleyville, 1 mile above, 3 miles below Rochester Ferry, 30 feet from 40-inch hickory tree on top of bank of river, 3 feet inside of fence at north west corner of yard of house where Jordan Garrett lives, on land of Wesley Harmon; concrete slab with copper bolt in it surmounted by iron pipe (U. S. C. E. p. b. m. 32.) Latitude 38° 17' 55.64". Longitude 87° 49' 45.18". Copper bolt.....	385.666
Cap on pipe.....	389.738
Crowleyville, 250 feet from river, in pasture of Jim Cunningham, 2 feet from fence, 200 feet from downstream side of large corncrib, 250 feet northeast of house where Alva Burget lives, 150 feet from river road; iron pipe (U. S. C. E. b. m. 75). Latitude 38° 16' 52.89". Longitude 87° 50' 11.32".....	389.76
Jimtown, 200 feet below, 200 feet from river, on river side of river road, 175 feet below shed with red tin roof, 175 feet below small house on river side of river road, in timbered slough, on land of Jim Cunningham, 9 feet from J. Blair's mail box, 49 feet above a blazed 36-inch cottonwood tree on river edge of road, azimuth 270°, an 18-inch locust tree is across road from cottonwood and 51 feet from bench mark; iron pipe (U. S. C. E. b. m. 76). Latitude 38° 16' 22.95". Longitude 87° 51' 16.86".....	389.05
Jimtown, 1 mile below, 600 feet from river, at junction of private road and road running west, 0.25 mile north of house, 800 feet below white house (both houses on river road), on east-west road which is dividing line between land of Aaron Robb on north and Preston Robb on south; iron pipe (U. S. C. E. b. m. 77). Latitude 38° 17' 03.36". Longitude 87° 52' 07.83".....	388.46
McCrearys Bluff, 2 miles below, 250 feet from river, in northeast corner of field of M. A. Kelley; at crossroads east-west and north-south, 900 feet west of Pfeiffer school, on north side of road, 200 feet west of red house, 500 feet northeast of another red house in same field; iron pipe (U. S. C. E. b. m. 78). Latitude 38° 17' 03.85". Longitude 87° 53' 14.67".....	384.58
McCrearys Bluff, 3 miles below, 3 miles above Peankashaw Bend, 250 feet from river, at side of river road, 250 feet from house where Compton lives on land of William Styles, at northeast corner of barn lot, in field about 90 feet from northeast corner of barn on mound, 2 feet from fence; iron pipe (U. S. C. E. b. m. 79). Latitude 38° 16' 15.06". Longitude 87° 54' 03.91".....	383.55
McCrearys Bluff, 4 miles below, 2 miles above Peankashaw Bend, 120 feet from river, on top of levee, 50 feet from southeast corner of barn, 150 feet south of house, Charles Freeman, owner; iron pipe (U. S. C. E. b. m. 80). Latitude 38° 16' 18.76". Longitude 87° 55' 10.15".....	389.28

McCrearys Bluff, 5 miles below, at Peankashaw Bend, 600 feet from river, 2 feet from barnyard fence, 75 feet from corner of big red barn on mound, 30 feet from house of C. L. Gilmore, renter, James Cooper, owner; iron pipe (U. S. C. E. b. m. 81). Latitude $38^{\circ} 17' 04.13''$. Longitude $87^{\circ} 55' 07.41''$.	Feet. 383. 91
Siegerts Island, 0.25 mile below, 6.5 miles above Grayville, 100 feet from river, in open field, on side of mound, about 15 feet from barn and 250 feet from house, William Majors, renter, Herman Siegert, owner; iron pipe (U. S. C. E. b. m. 82). Latitude $38^{\circ} 17' 05.62''$. Longitude $87^{\circ} 56' 07.08''$.	380. 95
Siegerts Island, 2.2 miles below, 4.6 miles above Grayville, 700 feet from river, 4 feet from fence running along downstream edge of large grove, 900 feet from vacant log house on land of Herman Siegert; iron pipe (U. S. C. E. b. m. 83). Latitude $38^{\circ} 16' 08.80''$. Longitude $87^{\circ} 56' 28.92''$.	381. 52
Grayville, 3.7 miles above, 0.5 mile above Johnsons Ferry, 200 feet from river, on Virgil Boseman estate, 60 feet from southeast corner of house with row of 20-inch maple trees in front, 8 feet from edge of concrete foundation of corncrib, 130 feet from barn, 400 feet below bench mark 23 of 1903 survey; iron pipe (U. S. C. E. b. m. 84). Latitude $38^{\circ} 15' 17.61''$. Longitude $87^{\circ} 56' 50.90''$.	383. 33

NEW HARMONY QUADRANGLE.

From point 1.3 miles below Johnsons Ferry southerly along Wabash River to point 9 miles below New Harmony.

Johnsons Ferry, 1.3 miles below, 0.3 mile below ditch with bridge crossing it, 30 feet from river, in field, 5 feet from southwest corner of garden, 10 feet from southwest corner of chicken house, about 150 feet from southwest corner of old red barn, 100 feet from house where Otto Burnett lives, river road running in front of house, on land of Cake & Gonoman, 0.5 mile above Kingdom Island and about 2 miles above Grayville; iron pipe (U. S. C. E. b. m. 85). Latitude $38^{\circ} 14' 14.00''$. Longitude $87^{\circ} 57' 52.41''$.	380. 20
Kingdom Island, opposite, 1 mile above Illinois Central R. R. bridge, 200 feet from river, at side of wagon road running to Grayville Ferry, 1 mile back on road from ferry, on land belonging to Harry Blood; 22 feet from 10-inch blazed locust tree, azimuth 276° ; iron pipe (U. S. C. E. b. m. 86). Latitude $38^{\circ} 14' 39.06''$. Longitude $87^{\circ} 58' 36.74''$.	378. 72
Grayville, 2 miles below, 200 feet below Illinois Central R. R. bridge, 900 feet from river at end of trestle, 200 feet from track on downstream side, 2 feet from fence at side of road, 90 feet from shed across road, 150 feet from red barn, 400 feet from house on land of H. P. Owens; iron pipe (U. S. C. E. b. m. 87). Latitude $38^{\circ} 13' 42.60''$. Longitude $87^{\circ} 58' 46.23''$.	378. 32
Grayville, 1.4 miles below Illinois Central R. R. bridge at, on river side of private farm road running along main high bank, 450 feet from river, 25 feet from vacant house, 35 feet from barn on land of Mr. Griffen; iron pipe (U. S. C. E. b. m. 88). Latitude $38^{\circ} 12' 43.80''$. Longitude $87^{\circ} 58' 48.27''$.	377. 39
Grayville, 4.2 miles below, 2.2 miles below Illinois Central R. R. Bridge, on land of Henry Mann, 25 feet from tenant house, in corner of garden, 350 feet from river, 30 feet from private farm road running along river bank and turning away from river at this point; iron pipe (U. S. C. E. b. m. 89). Latitude $38^{\circ} 12' 05.23''$. Longitude $87^{\circ} 58' 29.01''$.	376. 86
Grayville, 6.3 miles below, on land of John Whitehead, 0.4 mile from river, in corner of garden, 2 feet from fence, 10 feet from corner of chicken house, 30 feet from corner of house, R. Brooks, renter; road in front of house makes turn and follows river; iron pipe (U. S. C. E. b. m. 90). Latitude $38^{\circ} 11' 16.23''$. Longitude $87^{\circ} 57' 04.21''$.	380. 66

Grayville, 7 miles below, 2.8 miles above mouth of Black River, 1.4 miles above Bald Point, 7 miles above New Harmony, 200 feet from river side of north-south road, 300 feet from crossroads, 100 feet from white house across road where Levi Ryden lives, on land of Horace Owens, John Whitehead owns land on west side of road; iron pipe (U. S. C. E. b. m. 91). Latitude $38^{\circ} 10' 41.56''$. Longitude $87^{\circ} 56' 16.04''$	Feet. 377. 59
New Harmony, 4.2 miles above, in New Baltimore, 600 feet from river, in corner of field, 2 feet from corner of fence, 20 feet from center line of north-south road, 300 feet from house where William Schnarr lives, azimuth about 310° , 125 feet from house, azimuth 73° , 15 feet from 8-inch double elm tree on land of James Jones, John Whitehead owns land across north-south road; iron pipe (U. S. C. E. b. m. 92). Latitude $38^{\circ} 10' 18.54''$. Longitude $87^{\circ} 55' 41.80''$	382. 60
New Harmony, 2.7 miles above, 1.1 miles below mouth of Black River, 0.9 mile above Juno Island, 175 feet from river, on north side of orchard farm of Fred Caede, 250 feet above house and 2 feet from fence, 150 feet from river road which runs along top of bank, 100 feet from 18-inch gum tree in pasture, azimuth $142^{\circ} 50'$; iron pipe (U. S. C. E. b. m. 93). Latitude $38^{\circ} 09' 44.92''$. Longitude $87^{\circ} 54' 35.09''$	377. 08
New Harmony, 1.5 miles above, 300 feet from river, in northwest corner of field, 3 feet from fence, 20 feet from center line of north-south road, on top of second high bank, 600 feet above house, W. T. Boyce, renter, Lichtenberger Bros., owners, 400 feet below old house, 50 feet south of 10-inch locust tree on fence line; iron pipe (U. S. C. E. b. m. 94). Latitude $38^{\circ} 08' 43.28''$. Longitude $87^{\circ} 55' 41.57''$	375. 38
New Harmony, 600 feet from river, on edge of alley, 6.2 feet north of corner of Capt. Ribeyres red barn; iron pipe (U. S. C. E. "Triangle New Harmony, 1903"). Latitude $38^{\circ} 07' 41.00''$. Longitude $87^{\circ} 56' 21.86''$	378. 855
New Harmony, on top of first high hill below, 3 feet west of fence, 27 feet north of white-oak tree; the old dam is at foot of this hill and slightly upstream from triangulation station; iron pipe (U. S. C. E. "Triangle Mound Hill, 1903"). Latitude $38^{\circ} 07' 17.74''$. Longitude $87^{\circ} 56' 36.15''$.	
New Harmony, 3 miles below, 0.5 mile below head of Turkey Island, 160 feet from top of river bank, 12 feet west from corner of barn, 110 feet northeast of corner of house where John Fischer lives, 20 feet south of fence corner, 50 feet east of corncrib on Ribeyres Island; iron pipe (U. S. C. E. "Triangle 4, 1902"). Latitude $38^{\circ} 06' 37.14''$. Longitude $87^{\circ} 58' 25.33''$	371. 68
Ribeyres Island, 100 feet below vacant house, 40 feet from top of bank, 30 feet from center line of river road along top of bank, also road turning into cornfield between house and Triangle 9, Mr. Mitchell lives about 600 feet above on river road; iron pipe (U. S. C. E. "Triangle 9, 1902"). Latitude $38^{\circ} 05' 18.01''$. Longitude $87^{\circ} 59' 58.77''$	369. 152

CARMI QUADRANGLE.

From point below New Harmony southerly along Wabash River to point 4.7 miles below Maunie.

New Harmony, 5.8 miles below, on Ribeyre's Island, 400 feet from river, 4 feet from fence, 8 feet west of pump house, 15 feet south of barn, 100 feet from where Stewart lives; iron pipe (U. S. C. E. b. m. "Triangle 10, 1902"). Latitude $38^{\circ} 05' 45.40''$. Longitude $88^{\circ} 00' 43.78''$	370. 743
Maunie, 0.5 mile above, 600 feet from river, 8 feet north of northeast corner of big red barn on high mound, on land of John C. Aldrich; iron pipe (U. S. C. E. b. m. 102). Latitude $38^{\circ} 02' 45.32''$. Longitude $88^{\circ} 02' 03.49''$.	372. 54

Maunie, 0.3 mile below, 1.9 miles above Grand Chain, 2.7 miles above Louisville & Nashville R. R. bridge, 600 feet from river, on mound, 24 feet from small red house; Levi Churchill, renter; iron pipe (U. S. C. E. b. m. 103). Latitude 38° 02' 14.31". Longitude 88° 02' 00.13".....	Feet. 363.56
Maunie, 2.3 miles below, at head of Grand Chain, 0.8 mile above Louisville & Nashville R. R. bridge, 100 feet from river, at intersection of river road and road running east of river back to hills, 6 feet below fence running along road to hills, 300 feet above house; Jas. Thomas, renter; Enoch Allison, owner; iron pipe (U. S. C. E. b. m. 104). Latitude 38° 01' 32.32". Longitude 88° 00' 20.89".....	364.74
Maunie, 3.3 miles below, 0.3 mile below Louisville & Nashville R. R. bridge, 600 feet from river, 6 feet northeast of northwest corner of barn lot, 100 feet northwest of barn, 100 feet west of house, Wm. Good, renter, E. M. Spencer, owner; iron pipe (U. S. C. E. b. m. 105). Latitude 38° 00' 46.80". Longitude 88° 01' 10.71".....	368.57
Maunie, 4 miles below, 1 mile below Louisville & Nashville R. R. bridge, on north side of east-west road running from river, 400 feet from river, on land of Marion Oldridge, 500 feet below tenant house, 30 feet from double walnut tree; iron pipe (U. S. C. E. b. m. 106). Latitude 38° 00' 12.28". Longitude 88° 01' 13.18".....	365.06

NEW HAVEN QUADRANGLE.

From point 4.7 miles below Maunie southerly along Wabash River to mouth of river.	
Maunie, 4.7 miles below, 1.8 miles below Louisville & Nashville R. R. bridge, in line with upstream side of steel tower supporting telephone wires crossing river, 30 feet from base of tower toward river; iron pipe (U. S. C. E. b. m. 33, 1902). Latitude 37° 59' 45.65". Longitude 88° 01' 07.79".....	360.627
Rising Sun village, 0.3 mile southeast of, on west side of river; under center of steel telephone tower; iron post stamped "Prim. Trav. Sta. No. 27, Illinois, 1908" (U. S. G. S. primary traverse station mark). Latitude 37° 59' 45.20". Longitude 88° 01' 25.49". U. S. G. S. from Henderson, Ky., astronomic datum: Latitude 37° 59' 49.00"; longitude 88° 01' 21.90".....	370.32
Maunie, 6.2 miles below, 0.8 mile below Big Creek, 1.5 miles above Little Chain cut-off, 200 feet from river, at side of road leading away from river and to a two-story house below a barn, Mrs. Schultz, owner; iron pipe (U. S. C. E. b. m. 107). Latitude 37° 58' 35.77". Longitude 88° 00' 35.31".....	360.58
Maunie, 7.6 miles below, 2.4 miles below Big Creek, 700 feet above Little Chain cut-off, 130 feet from river, at downstream side of road running to river, 600 feet above tenant house on land of M. Grobert; iron pipe (U. S. C. E. b. m. 108). Latitude 37° 57' 32.10". Longitude 88° 01' 24.79".....	360.47
Maunie, 8.8 miles below, 0.25 mile below head of Little Chain cut-off, on island formed by cut-off and river, 800 feet from river, 1 mile below dike, 1.5 miles above foot of cut-off, 20 feet south and in line with east side of house, on land of Herman Stephan; iron pipe (U. S. C. E. b. m. 109). Latitude 37° 57' 09.65". Longitude 88° 01' 52.09".....	357.57
Little Chain cut-off, 2.3 miles below head of, 1.3 miles below Little Chain dike, 0.4 mile above foot of cut-off on island, 250 feet from river, 125 feet northeast of high mound with corncribs on it, 75 feet northwest of scales, at side of road, on land of Herman Stephan; iron pipe (U. S. C. E. b. m. 110). Latitude 37° 56' 03.23". Longitude 88° 01' 39.04".....	354.53

Little Chain cut-off, 1.3 miles below foot of, 400 feet from Mackey's Ferry on road leading away from ferry and downstream, about 33 feet from river, in corner of grove, 4 feet from fence, 20 feet from center line of road, 100 feet northwest of house, 10 feet from top of bank of ditch running at right angles to road, over a 24-inch tile drain running under road; iron pipe (U. S. C. E. b. m. 111). Latitude 37° 54' 52.01". Longitude 88° 01' 01.92".....	Feet. 362. 44
Little Chain cut-off, 2.8 miles below foot of, 1.7 miles below Mackey's Ferry, 5.3 miles above mouth of the Little Wabash, 500 feet from river, open high bank in open field and on downstream side of row of apple trees, on land of Henry Goss; iron pipe (U. S. C. E. b. m. 112). Latitude 37° 53' 27.66". Longitude 88° 01' 04.86".....	362. 62
Little Wabash River, 3.4 miles above mouth of, 3.6 miles below Mackey's ferry, 250 feet from river, 20 feet back from second high bank, river road between bench mark and second high bank, 3 feet west of northwest corner of barn lot, 75 feet northwest of barn, 50 feet northeast of corncrib, 200 feet from white house, R. D. Walling, renter, and Margaret Kimball, owner; iron pipe (U. S. C. E. b. m. 113). Latitude 37° 53' 22.95". Longitude 88° 03' 20.96".....	364. 46
Mackey's ferry, 4.7 miles below, 2.4 miles above mouth of the Little Wabash, 800 feet from river, on upstream side of road which runs to high mound with corncrib; mound is between river and bench mark, 600 feet south of mound, 700 feet north of red house, on land of Mary Sheidel; iron pipe (U. S. C. E. b. m. 114). Latitude 37° 53' 44.94". Longitude 88° 04' 36.34".....	354. 15
Little Wabash River, opposite mouth of, at upstream side of road, 10 feet from center line of road to river, 200 feet from river, at edge of high bank; iron pipe (U. S. C. E. b. m. 115). Latitude 37° 53' 35.60". Longitude 88° 05' 23.18".....	350. 58
Little Wabash River, 1.3 miles below mouth of, 1.2 miles above Ragland Island, 700 feet from river, on high mound with corncrib, at top of second high bank, 20 feet from fence, 70 feet from corner of corncrib; 110 feet north of blazed oak tree in azimuth 342° 45'; iron pipe (U. S. C. E. b. m. 116). Latitude 37° 52' 50.12". Longitude 88° 04' 25.31".....	361. 79
Little Wabash River, 2.5 miles below mouth of, 3.3 miles above Bone-bank, 500 feet from river, on high mound on which stands a corncrib, 30 feet north of north corner of crib, on upstream side of driveway, 70 feet from tenant house on land of Allan Gray; iron pipe (U. S. C. E. b. m. 117). Latitude 37° 51' 50.73". Longitude 88° 03' 58.89".....	360. 71
Little Wabash River, 4.5 miles below mouth of, 1.3 miles above Bone-bank, 600 feet from river, 5 feet from center line of road, 600 feet down road below vacant house, 20 feet from second high bank, on land of John Hinnekamp; iron pipe (U. S. C. E. b. m. 118). Latitude 37° 50' 56.16". Longitude 88° 02' 33.08".....	
Little Wabash River, 5.4 miles below mouth of, 0.4 mile above Bone-bank, 200 feet from river, at top of second high bank, a corncrib with driveway at each end is opposite bench mark on opposite bank; iron pipe (U. S. C. E. b. m. 119). Latitude 37° 50' 28.23". Longitude 88° 01' 36.19".....	365. 31
Bone-bank, 1.2 miles below, between large white-locust tree and large hackberry tree, at end of small strip of large trees, 40 feet from river, opposite upper end of Mackey's bar, which is above island of same name; iron pipe (U. S. C. E. b. m. 39, 1902). Latitude 37° 49' 12.30". Longitude 88° 02' 31.63".....	348. 721

Mackeys Island, 0.5 mile below, 6.8 miles above mouth of Wabash River, 500 feet from river, on downstream side of driveway to corncrib, driveway has concrete retaining wall on each side, at end of driveway, 75 feet from crib; iron pipe (U. S. C. E. b. m. 120). Latitude $37^{\circ} 49' 12.49''$. Longitude $88^{\circ} 03' 35.69''$	Feet. 350.29
Mackeys Island, 1 mile below, 2.5 miles above Skidmore's bar, 6.3 miles above mouth of Wabash River, 100 feet from river, 3 feet from barnyard fence, 15 feet north of northwest corner of barn, 50 feet southeast of tenant house; 70 feet from p. b. m. 51, azimuth $119^{\circ} 11' 30''$, 95 feet from 30-inch blazed pecan tree, azimuth $184^{\circ} 30'$, 103 feet from 30-inch blazed cottonwood tree, azimuth $142^{\circ} 30'$, on land of Edith Gheobald, 150 feet above high-water mound; iron pipe (U. S. C. E. b. m. 121). Latitude $37^{\circ} 49' 26.39''$. Longitude $88^{\circ} 04' 04.28''$	349.55
Skidmore's bar, 0.2 mile below head of, 3.6 miles above mouth of Wabash River, 50 feet from river, on side of mound on which house sets, river road on top of high bank, 60 feet from house, on land of Mary K. Mackey; iron pipe (U. S. C. E. b. m. 122). Latitude $37^{\circ} 48' 37.04''$. Longitude $88^{\circ} 04' 47.21''$	349.81
Wabash River, 3 miles above mouth of, at Skidmore's bar, 175 feet from river at downstream side of large corncrib raised 23 feet above ground on concrete foundation, 22 feet from crib on land of Peter Keck; iron pipe (U. S. C. E. b. m. 123). Latitude $37^{\circ} 48' 18.04''$. Longitude $88^{\circ} 04' 18.05''$	345.79
Wabash River, 1.7 miles above mouth of, 1.3 miles below Skidmore's bar, 800 feet from river, on upstream side of road running to river and turning upstream 800 feet from house on same road at edge of woods on land of Emery Bennett; Clay Mackey owns land on downstream side of road; iron pipe (U. S. C. E. b. m. 124). Latitude $37^{\circ} 48' 29.14''$. Longitude $88^{\circ} 03' 14.69''$.	
Wabash River, 0.6 mile above mouth of, 2.4 miles below Skidmore's bar, 200 feet from river, on river side of road which follows river along high bank to mouth, 100 feet above small house in small strip of pecan trees; iron pipe (U. S. C. E. b. m. 125). Latitude $37^{\circ} 48' 29.20''$. Longitude $88^{\circ} 01' 50.89''$	346.04
Wabash River, opposite mouth of, on Wabash Island, 900 feet from right fork of Ohio River, at northeast corner of crossroads, 75 feet from northeast corner of house, 30 feet east of 30-inch box elder tree, 40 feet northwest of 16-inch walnut tree, on land of A. Walter & Co.; Mason Doll owns land across road; tenant is Aaron Burleson; iron pipe (U. S. C. E. b. m. 126). Latitude $37^{\circ} 47' 32.35''$. Longitude $88^{\circ} 01' 28.84''$.	

INDEX.

	Page.		Page.
A.			
Acme.....	24	Decker.....	19
Africa.....	17	Deonia Springs.....	16
Algiers.....	19	quadrangle.....	16-17
Armstrong, Lawrence County.....	9	Doty, D. D., work of.....	19
Vanderberg County.....	20	Dresden.....	9
Ashboro.....	25	E.	
Asherville.....	25	East Chicago.....	26
Augusta.....	18	East Mount Carmel.....	20
Aurora Bend.....	30	Eight Mile Island.....	39
Avoca.....	8	Elizabeth.....	23
B.			
Beck.....	20	Elliston.....	10
Bedford.....	8	Evans Landing.....	23
Bench marks, description of.....	6	Evanston.....	17
plate showing.....	5	Evansville.....	19
Bibbee, E. C., work of.....	21	quadrangle.....	19
Birds quadrangle.....	31, 40-41	F.	
Bloomfield.....	9	Farabee.....	13
quadrangle.....	9-10	Farrington, Ill.....	11
Bloomington.....	24	Ferdinand.....	18
quadrangle.....	9, 23-24	Folsomville.....	17
Bone Bank.....	37, 47	Fort Branch.....	20
Boonville.....	16	Freeman.....	24
quadrangle.....	15-16	Fretageots Ferry.....	36
Borden.....	13, 14	G.	
Bowling Green.....	26	Gentryville.....	16
Bridgeport.....	14	Goodhue, F. M.....	19
Bristow.....	18	Grand Chain.....	36
Buchanans Ferry.....	42	Grand Rapids.....	33, 42
Buena Vista.....	23	Grand View.....	17
Buffaloville.....	17	Granke, L. E., work of.....	15
Burns City quadrangle.....	9	Grayville.....	34, 44
C.			
Campbellsburg.....	12	Green T. A., work of.....	8
Carmi quadrangle.....	35-36, 45-46	Greers Ripple.....	31
Center Point.....	25	Griffin.....	21
Chrisney.....	16	Griffith.....	26
Cincinnati.....	9, 23, 24	H.	
Clark.....	27	Halford, Dean, work of.....	15
Clay City.....	10	Harrodsburg.....	23, 24
quadrangle.....	10, 25-26	Haubstadt.....	20
Clear Creek.....	24	quadrangle.....	20
Coal City.....	10	Hazleton.....	20
Cory.....	10, 25	Heilman.....	17
Crooked Creek.....	17	Heltonville quadrangle.....	8
Crowleyville.....	33, 43	Henderson, Ky.....	21
D.			
Dale.....	18	Hendricksville.....	24
Danville quadrangle.....	26	Hensonburg.....	24
Dark Hollow.....	8	Hewitt, C. E., work of.....	15
Darwin, Ill.....	30	Highlands.....	26
Darwin Ferry.....	39, 40	Hitchcock.....	12
		Hites Ferry.....	31, 40
		Hobart.....	27

	Page.		Page.
Howard Park.....	22	New Harmony.....	21, 34, 35, 36, 45
Hubbell.....	10	quadrangle.....	21, 34-35, 44-45
Huntingburg.....	17	New Haven quadrangle.....	36-37, 46-48
quadrangle.....	17	Newtonville.....	13
		Norris.....	13
I.		O.	
Inglefield.....	20	Oliver.....	21
Ireland.....	19	Oolitic quadrangle.....	8-9
J.		Orleans.....	11
Jasonville quadrangle.....	10	Otwell.....	19
Jeffersonville.....	22	Owensboro quadrangle.....	17
Jerrard, L. P., work of.....	25	Owensburg.....	9
Jimtown.....	33, 43	Owensville.....	20
Johnsons Ferry.....	44	P.	
Johnstons.....	24	Palestine Landing.....	40
Jonesburg.....	18	Paoli quadrangle.....	8, 11-12, 29
		Patoka Island.....	33
K.		Pekin.....	13
Kingdom Island.....	44	Personnel.....	5-6
Koleen.....	9	Petersburg quadrangle.....	16
Kosmosdale quadrangle.....	22-23	Pigeon Creek.....	16
		Port Gibson.....	20
L.		Poseyville.....	21
Lake.....	17	Prairieton.....	30
Lamar.....	17	Princeton.....	20
Lanesville.....	22, 23	quadrangle.....	20, 41-42
Lawrenceburg.....	29	Prospect quadrangle.....	22
quadrangle.....	29	R.	
Leipsic.....	12	Reed.....	8
Leopold quadrangle.....	18	Ribeyres Island.....	35, 45
Leveling, precise, method of.....	6	Richland.....	17
precise, results of.....	6-15, 28-37	Riley.....	10
primary, method of.....	6	Rising Sun.....	46
results of.....	15-27, 38-48	Riverton.....	31, 40
Levis Slough.....	37	Robison.....	9
Liggett.....	11	Rochester, Ill.....	33
Little Chain cut-off.....	46, 47	Rock Hill.....	17
Little Rock.....	32, 41, 42	Rockport.....	17
Longtown Landing.....	31, 40	Rockwood.....	9
Louisville, Ky.....	14, 15	Russellville.....	40, 41
M.		S.	
McCalman, J. L., work of.....	26	St. Francisville, Ill.....	32, 41
McCrearys Bluff.....	34, 43, 44	St. James.....	20
Mackeys Ferry.....	47	St. Joseph.....	14
Mackeys Island.....	37, 48	St. Meinrad.....	18
Macksville.....	11	quadrangle.....	17-18
McNair, work of.....	11	Salem.....	12, 13
Maps of quadrangles, list of.....	7	quadrangle.....	12-13
Marshall quadrangle.....	30, 39-40	Saline City.....	10, 25
Martin.....	20	Saltillo.....	12
Maunie, Ill.....	35, 36, 45, 46	Saunders.....	24
Merom quadrangle.....	31, 40	Scope of the work.....	5
Mineral City.....	9	Sea level, mean, definition of.....	7
Mitchell.....	8, 11, 29	Semper, C. H., work of.....	8, 23
Mount Carmel, Ill.....	33, 42, 43	Shaws Landing.....	31, 40
quadrangle.....	33-34, 42-44	Shoals quadrangle.....	29
N.		Siegerts Island.....	34, 44
Nelson.....	11	Silver.....	14
New Albany.....	14, 22	Skidmores bar.....	48
quadrangle.....	13-15, 22	Smedleys.....	12
New Baltimore.....	34	Smith.....	14
Newburg.....	21	Smith, E. S., work of.....	26
quadrangle.....	21		

	Page.		Page.
Smithville.....	24	Velpen.....	18
Solitude.....	21	quadrangle.....	18-19
Spring Hill.....	10	Vincennes.....	14, 31, 32, 41
Springville.....	8, 9	quadrangle.....	19, 31-33, 41
Stendal.....	18		
Stevenston.....	15	W.	
Stewartsville.....	21	Wabash Island.....	37, 48
Strains Ripple.....	30	Wadesville.....	21
		Washington.....	29
T.		quadrangle.....	29
Taylorville.....	30	West Point, Ky.....	23
Tell City.....	17	West Shoals.....	29
quadrangle.....	17	West Terre Haute.....	11
Terre Haute.....	11, 29, 30, 38	Wilson.....	14
quadrangle.....	10-11, 29-30, 38-39	Winslow.....	18
Toleston.....	27	Worthington.....	10
quadrangle.....	26-27		
Troy.....	17, 18	Y.	
Turkey Island.....	35	Yankeetown.....	21
		Yockey.....	8

