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UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, DIRECTOR

BULLETIN 569

JANCELLED.

RESULTS OF SPIRIT LEVELING
IN IOWA

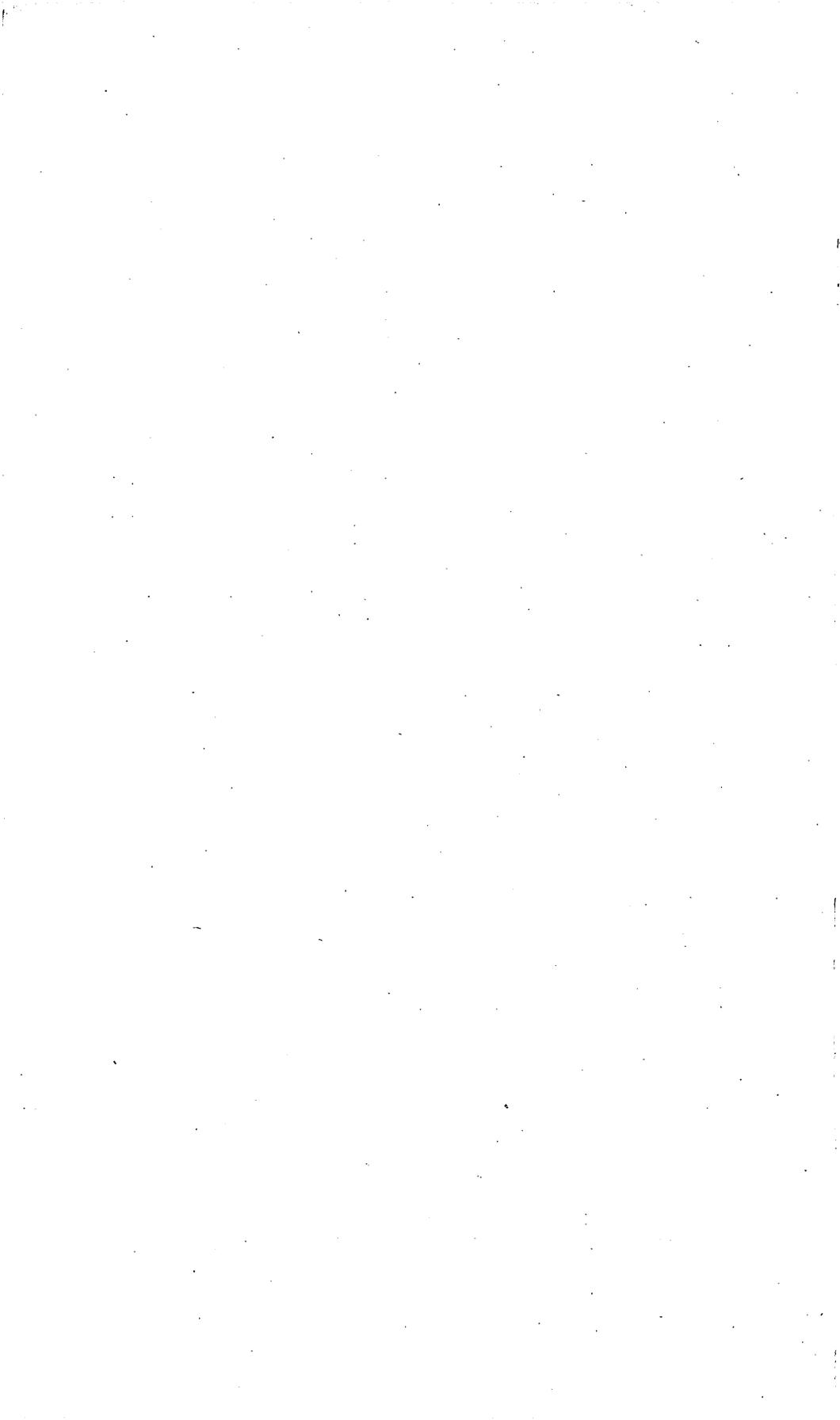
1896 TO 1913, INCLUSIVE

R. B. MARSHALL, CHIEF GEOGRAPHER

WORK DONE IN COOPERATION WITH THE STATE OF IOWA
FROM 1907 TO 1913, INCLUSIVE



WASHINGTON
GOVERNMENT PRINTING OFFICE
1915



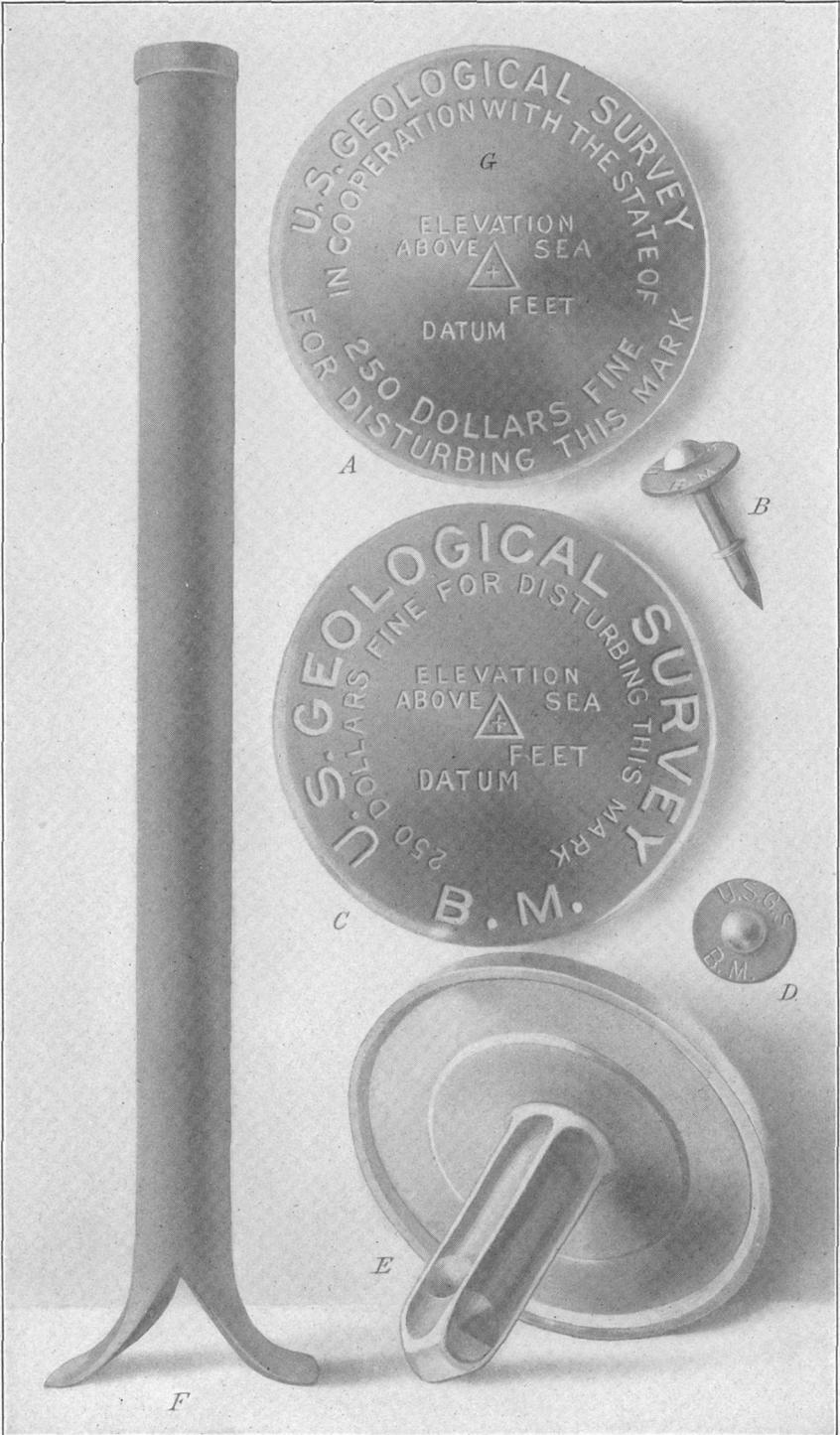
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GEOLOGICAL SURVEY BENCH MARKS.

- 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 IOWA, 1896 TO 1913, INCLUSIVE.

R. B. MARSHALL, Chief Geographer.

INTRODUCTION.

Cooperation.—The State of Iowa contributed financially to the work from 1907 to 1913, inclusive, through the Iowa Geological Survey, of which Samuel Calvin was director from 1907 to 1910, inclusive, and George F. Kay was director from 1911 to 1913, inclusive.

Previous publication.—All results of spirit leveling in the State of Iowa from 1896 to 1909, published by the United States Geological Survey in Bulletin 460 and based on the 1907 adjustment by the Coast and Geodetic Survey of the precise-level net, have been corrected to agree with the 1912 adjustment of that bureau and are republished in this bulletin together with the results of spirit leveling since 1909. The precise-level lines which lie within or along the borders of Iowa comprise the line of the Mississippi River Commission along the eastern border of the State from Keokuk to New Albin, the line of the Missouri River Commission along the western border of the State from Hamburg to a point near Sioux Falls, S. Dak., and the line of the Coast and Geodetic Survey in the northwestern part of this State.

Personnel.—The field work previous to 1903 was done under the general direction of J. H. Renshawe, geographer; that for 1903 to 1906, inclusive, under H. M. Wilson, geographer; and the later work under W. H. Herron, geographer, under the general direction of R. B. Marshall, chief geographer. The names of the various levelmen are given in the introduction to each list. The office work of computation, adjustment, and preparation of lists was done mainly by S. S. Gannett, geographer, and since 1907 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-level 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 $0.05\sqrt{D}$, in which D is the length of the circuit in miles, sufficient care being given to 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. Orthometric corrections have been applied in determining the following elevations.

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, a bridge abutment, or other substantial masonry structure. The second form (F , Pl. I), used where masonry or rock is not available, consists of a hollow wrought-iron post $3\frac{1}{2}$ inches in outer diameter and 4 feet in length, which is set about 3 feet in the ground. It is split at the bottom and expanded to a width of 10 inches in order to give a firm bearing on the earth. 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 State 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 tides and winds 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 the

mean of all the low tides, which is called the 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 accuracy is desired they must extend over several years. At ocean stations the half-tide level and the mean sea level usually differ but little. It is assumed that there is no difference between the mean sea levels determined from observations in the Atlantic Ocean, the Gulf of Mexico, and the Pacific Ocean.

The connection with tidal stations for bench marks in certain areas that lie at some distance from the seacoast is still uncertain, and this fact is indicated by the addition of a letter or 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 Iowa have been published by the United States Geological Survey up to April 25, 1915. They may be obtained, except as noted, for 10 cents each, or \$3 for 50, on application to the Director of the Survey at Washington, D. C.

Amana.	Mechanicsville.
Anamosa.	Milan (Ill.-Iowa).
Baldwin.	Milo.
Canton (S. Dak.-Iowa).	Monticello.
Cedar Rapids.	Nebraska City (Nebr.-Iowa-Mo.).
Clinton (Iowa-Ill.).	Oelwein.
Cordova (Iowa-Ill.).	Omaha and vicinity (Nebr.-Iowa) (20 cents).
Davenport (Iowa-Ill.).	Oxford.
Decorah.	Pella.
Des Moines.	Peosta (Iowa-Ill.).
Dewitt.	Rock Island (Iowa-Ill.).
Durant.	Savanna (Iowa-Ill.).
Elk Point (S. Dak.-Nebr.-Iowa).	Shellsburg.
Elkader (Iowa-Wis.).	Slater.
Fairfax.	Stanwood.
Farley.	Tipton.
Goose Lake (Iowa-Ill.).	Waukee.
Iowa City.	Waukon (Iowa-Wis.).
Kahoka (Mo.-Iowa-Ill.).	West Liberty.
Knoxville.	Wheatland.
Lancaster (Wis.-Iowa-Ill.).	Wilton Junction.
Leclaire (Iowa-Ill.).	Winthrop.
Maquoketa.	
Marion.	

PRECISE LEVELING.

Adel, Avoca, Casey, Des Moines, Fontanelle, Harlan, Marne, Neola, Panora, Waukee, and Wiota quadrangles, and Omaha and vicinity.

ADAIR, CASS, DALLAS, GUTHRIE, POLK, POTTAWATTAMIE, AND SHELBY COUNTIES.

The elevations in the following list are the results of a line of precise levels run in 1905 from the United States Army engineers' bench mark 348 at Council Bluffs eastward along the Chicago, Rock Island & Pacific Railway to Des Moines by R. L. Libby.

OMAHA AND VICINITY.¹

[Latitude 41°-41° 23'; longitude 95° 45'-96° 05'.]

Council Bluffs, in southwest corner of courthouse yard, 3 feet from west fence and 3 feet from south fence; p. b. m. 348, same as 121-2, top of cap.	Feet. 994. 355
Council Bluffs, in stone doorsill of Chicago, Milwaukee & St. Paul Ry. roundhouse, 0.3 foot from east side of door frame and same distance from front face of sill, 8 feet from southwest corner of building; p. b. m. 343, top of copper bolt leaded vertically in stone.....	981. 002
Council Bluffs, in front of station; top of rail.....	981. 9
Council Bluffs, in south wall of post office, near southwest corner; aluminum tablet.....	1, 000. 654
Council Bluffs, 2.5 miles east of, in west pier of Chicago Great Western Ry. bridge crossing Chicago, Rock Island & Pacific Ry. and Chicago, Milwaukee & St. Paul Ry. tracks, 5 feet from ground; aluminum tablet....	994. 520
Council Bluffs, 6 miles east of, halfway between Chicago, Rock Island & Pacific Ry. and Chicago, Milwaukee & St. Paul Ry. tracks, 6 feet north of wagon road at crossing southeast of John Slightam's house; iron post..	1, 019. 720
Weston, 3 miles west of, 0.25 mile south of milepost 491, in concrete culvert on east side of track; aluminum tablet.....	1, 021. 296

NEOLA QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 95° 30'-95° 45'.]

From Weston northeast along Chicago, Rock Island & Pacific Ry. to point 0.25 mile east of Minden.

Weston, in front of station; top of rail.....	1, 036. 4
Weston, 100 feet north of Chicago, Rock Island & Pacific Ry. station, 15 feet west of track; iron post.....	1, 037. 399
Underwood, 50 feet west of track, 15 feet south of first road crossing track south of station, 50 feet southwest of telegraph pole 483-21; iron post....	1, 073. 973
Underwood, in first concrete culvert south of station, 20 feet east of Chicago, Rock Island & Pacific Ry. track, near telegraph pole 483-24 "G"; aluminum tablet.....	1, 072. 536
Underwood, in front of station; top of rail.....	1, 077. 4
Neola, in first concrete bridge abutment west of town (Chicago, Rock Island & Pacific Ry. bridge 483), on southeast side, 5 feet below level of track; aluminum tablet.....	1, 088. 890
Neola, at Main Street crossing of Chicago, Milwaukee & St. Paul Ry., 20 feet west of street, 10 feet south of track; iron post.....	1, 095. 820
Neola, in front of station; top of rail.....	1, 098. 7

¹ For other elevations in this quadrangle see Bulletin 572.

Minden, 100 feet south of Chicago, Rock Island & Pacific Ry. track, opposite a point 120 feet west of station, 6 feet south of wagon road; iron post.	1, 187. 345
Minden, in front of station; top of rail.....	1, 196. 8
Minden, 0.25 mile east of, in southwest concrete abutment of Chicago, Rock Island & Pacific Ry. bridge crossing the Chicago Great Western Ry. track, 2 feet from outer corner of abutment; aluminum tablet.....	1, 201. 385

HARLAN QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 95° 15'-95° 30'.]

From point 0.25 mile east of Minden, east along Chicago, Rock Island & Pacific Ry. to Avoca.

Shelby, 3 miles west of, in northeast stone abutment of Chicago, Rock Island & Pacific Ry. bridge 475; aluminum tablet.....	1, 289. 328
Shelby, in front of station; top of rail.....	1, 296
Shelby, 160 feet west of Chicago, Rock Island & Pacific Ry. track, opposite a point 150 feet north of station, near corner of park; iron post.....	1, 294. 654
Avoca, 3 miles northwest of, in southeast wing wall of stone culvert, third step from top; aluminum tablet.....	1, 192. 860

AVOCA QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 95° 15'-95° 30'.]

From Avoca east along Chicago, Rock Island & Pacific Ry. to Walnut.

Avoca, in stone water table of Avoca bank, on south side, 10 feet from southwest corner; aluminum tablet.....	1, 158. 769
Avoca, near southwest corner of Avoca Hotel, between building and sidewalk; iron post.....	1, 155. 38
Avoca, in southwest corner of city hall lot, town bench mark, a 6-inch iron pipe open at top and filled with concrete, in which is embedded a ¾-inch brass pipe.....	1, 165. 147
Avoca, 2 miles east of, in northwest abutment of bridge 459; aluminum tablet.....	1, 171. 039

MARNE QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 95°-95° 15'.]

From Walnut east along Chicago, Rock Island & Pacific Ry. to Atlantic.

Walnut, 300 feet south of track opposite point on track 300 feet west of station, 5 feet southwest of second telegraph pole south of track; iron post.....	1, 285. 285
Walnut, in front of station; top of rail.....	1, 294. 8
Walnut, 2.5 miles east of, in northwest abutment of bridge 449; aluminum tablet.....	1, 286. 181
Marne, 75 feet south of track, opposite a point 100 feet west of station, 10 feet south of corner post of P. C. Meredith's yard; iron post.....	1, 184. 096
Marne, in front of station; top of rail.....	1, 193. 3
Marne, 3 miles east of, in northwest stone abutment of bridge 444; aluminum tablet (reset in 1906 by railroad engineer).....	1, 211. 1
Marne, 3 miles east of, on northeast corner of east abutment; chiseled cross..	1, 210. 18

WIOTA QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 94° 45'-95°.]

From Atlantic east along Chicago, Rock Island & Pacific Ry. to Anita.

Atlantic, in grass plat of Chicago, Rock Island & Pacific Ry. station, 200 feet east of station, 20 feet west of standpipe, 30 feet south of main track; iron post.....	Feet. 1, 159. 311
Atlantic, on east side of south wing of county courthouse, 4 feet above ground; aluminum tablet.....	1, 215. 088
Atlantic, 0.5 mile east of, in southwest abutment of bridge 440, 375 feet east of road crossing; aluminum tablet.....	1, 154. 720
Wiota, 50 feet north of track, opposite point on track about 700 feet west of station; iron post.....	1, 199. 238
Wiota, in front of station; top of rail.....	1, 203. 5
Anita, 3 miles west of, in north abutment of concrete culvert, 50 feet south of wagon road near telegraph pole 428-14; aluminum tablet.....	1, 232. 213
Anita, 1 mile west of, in northeast corner of concrete culvert A2; aluminum tablet.....	1, 243. 318
Anita, in front of station; top of rail.....	1, 256. 9
Anita, 20 feet west of entrance to Keystone Park, 150 feet south of track, opposite point 300 feet west of station; iron post.....	1, 252. 360

FONTANELLE QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 94° 30'-94° 45'.]

From Anita northeast along Chicago, Rock Island & Pacific Ry. to Adair.

Adair, 2.5 miles west of, in northwest abutment of bridge, near telegraph pole 420-1; aluminum tablet.....	1, 320. 798
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CASEY QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 94° 30'-94° 45'.]

From Adair east along Chicago, Rock Island & Pacific Ry. to Casey.

Adair, 150 feet south of track, opposite point 375 feet east of station 300 feet southwest of Davenport Elevator Co.'s elevator; iron post.....	1, 399. 355
Adair, in front of station; top of rail.....	1, 404. 2
Adair, 3 miles east of, in southwest abutment of bridge 402; aluminum tablet.....	1, 273. 002
Casey, 2.8 miles west of, in southwest stone abutment of bridge 397; aluminum tablet.....	1, 253. 485
Casey, in front of station; top of rail.....	1, 228. 9
Casey, in stone foundation of T. J. Burns's store, in south wall, halfway between Main Street and alley; aluminum tablet.....	1, 248. 979
Casey, 100 feet south of track, opposite point 300 feet east of station, 200 feet northwest of Lutheran Church, 3 feet east of sidewalk leading to station; iron post.....	1, 223. 927

PANORA QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 94° 15'-94° 30'.]

From Casey east along Chicago, Rock Island & Pacific Ry. to Stuart.

Menlo, 1.5 miles west of, in northwest abutment of bridge 385 (bridge over wagon road); aluminum tablet.....	1, 279. 018
Menlo, in front of station; top of rail.....	1, 265. 2

Menlo, 30 feet south of track, opposite point 300 feet east of station, 75 feet east of road crossing; iron post.....	Feet. 1, 263. 893
Stuart, in northwest corner of station grass plat, 300 feet west of station, 60 feet north of track, 1 foot east of sidewalk; iron post.....	1, 210. 150
Stuart, in front of station; top of rail.....	1, 208. 0
Stuart, in stone water table of high school, about 6 feet east of entrance; aluminum tablet.....	1, 206. 045

ADEL QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 94°-94° 15'.]

From Stuart east along Chicago, Rock Island & Pacific Ry. to De Soto.

Dexter, in front of station; top of rail.....	1, 148. 3
Dexter, in stone water table of National Bank of Dexter, on north side of building, 1 foot from northwest corner; aluminum tablet.....	1, 152. 335
Dexter, 150 feet south of track, opposite point 300 feet east of station, 50 feet north of wagon road, opposite S. C. Patton & Co.'s elevator; iron post.....	1, 144. 048
Earlham, 100 feet south of track, opposite point 560 feet east of station, 150 feet south of derailing switch, 2 feet north of fence; iron post.....	1, 104. 188
Earlham, in front of station; top of rail.....	1, 106. 1
Earlham, 1.5 miles east of, in south side of a concrete culvert, near telegraph pole 485-30; aluminum tablet.....	1, 065. 576
De Soto, 1.5 miles southwest of, in southwest stone abutment of bridge 368; aluminum tablet.....	920. 595

WAUKEE QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 93° 45'-94°.]

From De Soto east along Chicago, Rock Island & Pacific Ry. to Commerce.

De Soto, 150 feet south of track, opposite west end of station, 2 feet north of wire fence; iron post.....	888. 266
De Soto, in front of station; top of rail.....	891. 8
Van Meter, 60 feet north of track opposite west end of station, in grass plat, opposite a point about halfway between station and water tank, 20 feet north of road, near Main Street crossing; iron post.....	872. 406
Van Meter, in front of station; top of rail.....	873. 5
Van Meter, 1.25 miles east of, in southwest abutment of bridge 358; aluminum tablet.....	861. 901
Booneville, 50 feet south of track, in northwest corner of field, opposite point 450 feet west of station; iron post stamped "Prim. Trav. Sta. No. 9".....	857. 618
Booneville, in front of station; top of rail.....	856. 3
Booneville, 2 miles east of, in southwest abutment of bridge 353; aluminum tablet.....	845. 155
Commerce, 2.5 miles west of, in northwest corner of concrete culvert; aluminum tablet.....	834. 843
Commerce, 50 feet south of track, 75 feet southwest of first stone culvert west of station, 2 feet west of gate, in right of way fence, near section tool house; iron post.....	836. 074
Commerce, in front of station; top of rail.....	836. 5

DES MOINES QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 93° 30'-93° 45'.]

From Commerce northeast along Chicago, Rock Island & Pacific Ry. to Des Moines.

Valley Junction, 150 feet north of track, opposite point 180 feet east of station, in fence corner; iron post.....	Feet. 811. 271
Valley Junction, in front of station; top of rail.....	812. 9
Valley Junction, 1 mile east of, 70 feet south of track, 100 feet west of right-of-way gate; iron post.....	805. 924
Des Moines, 1 mile west of station, in southeast corner of park adjoining pumping station of Des Moines Water Works Co., 100 feet north of Chicago, Milwaukee & St. Paul Ry. tracks; iron post stamped "797".....	795. 560
Des Moines, in foundation stone 1 foot east of southwest corner of post office; aluminum tablet stamped "809".....	807. 351
Des Moines, in northeast corner of yard adjoining city hall, 60 feet north of Locust Street; iron post stamped "804".....	802. 510
Des Moines, in front of Chicago, Rock Island & Pacific Ry. station; top of rail.....	799. 2

PRIMARY LEVELING.

Decorah, Elkader, Lancaster, Oelwein, and Waukon quadrangles.

ALLAMAKEE, BUCHANAN, CLAYTON, DELAWARE, DUBUQUE, FAYETTE, AND WINNESHIEK COUNTIES.

The elevations in the following list are based on various bench marks of the Mississippi River Commission between Dubuque and New Albin. The elevation of the reference bench mark "279" at Dubuque is accepted as 644.838 feet above mean sea level.

The leveling in the Lancaster quadrangle was done in 1897 by C. E. Hewitt, that in the Elkader quadrangle in 1898 by G. W. Zorn and F. C. French, that in the Oelwein and Waukon quadrangles in 1899 and 1900, respectively, by Tim Burns, and that in the Decorah quadrangle was done partly in 1901-2 by John Wilson and completed in 1903 by M. A. Steele.

LANCASTER QUADRANGLE.

[Latitude 42° 30'-43°; longitude 90° 30'-91°.]

From Bankston southeast along highways to Lattners, thence northeast along Chicago Great Western Ry. to Sageville, thence northwest and west along highways to Holy Cross.

T. 89 N., R. 1 E., near southeast corner of sec. 16, east end of south abutment of wagon bridge over south fork of Maquoketa River; bronze tablet stamped "732 DBQ".....	Feet. 733. 564
T. 89 N., R. 1 W., NE. $\frac{1}{4}$ sec. 16, 0.8 mile south of Bankston, southwest corner of O'Connor's orchard; iron post stamped "1193 DBQ".....	1, 194. 293
T. 90 N., R. 1 W., north line of sec. 17, southeast corner of O. W. Burns's field; iron post stamped "1159 DBQ".....	1, 159. 854
T. 90 N., R. 1 E., south side of sec. 4, in ledge of rock; bronze tablet stamped "1049 DBQ".....	1, 049. 855
Sageville, T. 90 N., R. 2 E., sec. 34, on west end of north abutment of bridge over Maquoketa River, in stone; bronze tablet stamped "621 DBQ".....	622. 600

T. 91 N., R. 1 W., north side of sec. 32, junction of John Richmond's road with main wagon road; iron post stamped "1181 DBQ".....	Feet. 1, 181. 159
T. 91 N., R. 1 E., in fraction of Jefferson Township, near northeast corner of sec. 2, in field; iron post.....	897. 778

ELKADER QUADRANGLE.

[Latitude 42° 30'-43°; longitude 91°-91° 30'.]

From Guttenberg northwest along highway to National, thence northeast to McGregor.

Guttenberg, northeast corner of Herder and First streets, T. 92 N., R. 2 W.; aluminum tablet stamped "630 DBQ".....	631. 603
T. 93 N., R. 2 W., near north line of sec. 31, in school grounds; iron post stamped "681 DBQ".....	682. 054
Garnaville, SE. $\frac{1}{4}$ sec. 18, T. 93 N., R. 3 W., southeast corner of park; iron post stamped "1065 DBQ".....	1, 066. 760
T. 94 N., R. 3 W., SW. $\frac{1}{4}$ sec. 8, northwest corner of schoolhouse yard; iron post stamped "699 DBQ".....	700. 235
T. 95 N., R. 3 W., SE. $\frac{1}{4}$ sec. 33, southwest corner of schoolhouse; iron post stamped "1103 DBQ".....	1, 104. 674

From National west along highway to point near Wagner, thence south to Mederville, thence east to Guttenberg.

National, SE. $\frac{1}{4}$ sec. 15, T. 94 N., R. 4 W., in southwest corner of schoolhouse yard; iron post stamped "1110 DBQ".....	1, 111. 436
Farmersburg, crossing south of station; top of rail.....	905. 4
T. 94 N., R. 5 W., southwest corner of sec. 15, southwest corner of schoolhouse yard; iron post stamped "1077 DBQ".....	1, 078. 516
Elkader, in front of station; top of rail.....	724. 5
Elkader, sec. 23, T. 93 N., R. 5 W., northeast corner of courthouse yard; iron post stamped "759 DBQ".....	760. 020
Mederville, SW. $\frac{1}{4}$ sec. 22, T. 92 N., R. 5 W., southwest corner of schoolhouse yard; iron post stamped "767 DBQ".....	768. 000
T. 92 N., R. 4 W., SW. $\frac{1}{4}$ sec. 16, in southeast corner of schoolhouse yard; iron post stamped "929 DBQ".....	930. 628
T. 92 N., R. 3 W., SW. $\frac{1}{4}$ sec. 9, in schoolhouse grounds; iron post stamped "959 DBQ".....	960. 200

From Mederville south along highway to Manchester.

T. 91 N., R. 5 S., quarter corner south side of sec. 16; iron post stamped "1240 DBQ".....	1, 241. 790
T. 90 N., R. 5 W., southwest corner of sec. 21; iron post stamped "1016 DBQ".....	1, 017. 270

From T. 90 N., R. 5 W., sec. 21, east along highway to Luxemburg, thence north to Turkey River.

Greeley, sec. 20, T. 90 N., R. 4 W.; iron post stamped "1142 DBQ".....	1, 143. 753
T. 90 N., R. 3 W., quarter corner east side of sec. 28, southeast corner of schoolhouse yard; iron post stamped "1090 DBQ".....	1, 091. 140
Luxemburg, sec. 21, T. 90 N., R. 2 W., in Catholic churchyard; iron post stamped "1179 DBQ".....	1, 180. 636

From Garnaville east to Clayton Center (double-spur line).

Clayton Center, sec. 9, T. 93 N., R. 4 W., southeast corner of school yard; iron post stamped "1038 DBQ".....	1, 038. 838
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From Turkey River west along highway to sec. 16, T. 92 N., R. 4 W.

Millville, northwest corner of sec. 15, T. 91 N., R. 2 W.; iron post stamped "638"	Feet. 639. 310
T. 91 N., R. 3 W., near center of sec. 13, 100 feet east of junction of roads; iron post stamped "897"	898. 170
T. 91 N., R. 4 W., northwest corner of sec. 22, at northwest corner of school-house; iron post stamped "1168"	1,168. 870

OELWEIN QUADRANGLE.

[Latitude 42° 30'-43°; longitude 91° 30'-92°.]

From Mederville west along highway to Westgate, thence north 6 miles, thence east to Randalia.

Osborne, at crossing; top of rail.....	753. 0
Volga, at crossing; top of rail.....	789. 9
Volga, in southeast corner of school yard; iron post stamped "794 DBQ" ..	795. 143
Arlington, northeast corner of sec. 28, T. 92 N., R. 7 W.; iron post stamped "1080 DBQ"	1,081. 171
T. 92 N., R. 8 W., northeast corner of sec. 21; in school yard; iron post stamped "1168"	1,168. 916
Maynard, northeast corner of sec. 21, T. 92 N., R. 9 W.; iron post stamped "1164 DBQ"	1,165. 162
Maynard, 120 feet south of station, at crossing; top of rail.....	1,102. 0
Randalia, southeast corner of sec. 16, T. 93 N., R. 9 W.; iron post stamped "1128 DBQ"	1,129. 082

From Maynard north to Randalia, thence east along highway and Chicago, Milwaukee & St. Paul Ry. to Volga.

Randalia, in front of station; top of rail.....	1,103. 6
Albany, sec. 14, T. 93 N., R. 8 W., 1,100 feet north of school building; iron post stamped "930 DBQ"	931. 737
Wadena, in front of station; top of rail.....	873. 9
Wadena, in front of station; iron post stamped "874 DBQ"	874. 485

From Volga north into Marion Township, thence west via Elgin and West Union to R. 10 W., thence south 6 miles to point 5 miles west of Randalia.

T. 93 N., R. 6 W., NE. $\frac{1}{4}$ sec. 21, southeast corner of school yard; iron post stamped "1147 DBQ"	1,148. 733
T. 94 N., R. 6 W., NE. $\frac{1}{4}$ sec. 33, northeast corner of school yard; iron post stamped "876 DBQ"	877. 585
Elgin, in front of station; top of rail.....	835. 1
T. 94 N., R. 7 W., SE. $\frac{1}{4}$ sec. 16, in school yard; iron post stamped "989 DBQ"	989. 926
Clermont, in front of station; top of rail (on spur line).....	854. 6
West Union, south meridian stone in county-fair grounds; aluminum tablet stamped "1111 DBQ"	1,112. 163
West Union, corner of Main and Walnut streets, south wall of building of public school, in coping stone; aluminum tablet stamped "1186 DBQ" ..	1,187. 570
West Union, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	1,104. 6
West Union, at junction of Chicago, Milwaukee & St. Paul Ry. with Chicago, Rock Island & Pacific Ry.....	1,106. 7
West Union, in front of Chicago, Rock Island & Pacific Ry. station; top of rail.....	1,105. 9

T. 94 N., R. 9 W., NE. $\frac{1}{4}$ sec. 16, at road crossing; iron post stamped "1194 DBQ".....	Feet. 1, 195. 442
Hawkeye (on spur line), in front of station of Chicago, Milwaukee & St. Paul Ry.; top of rail.....	1, 176. 5

From Volga south via Strawberry Point and Dundee to Manchester.

T. 91 N., R. 6 W., quarter corner north side of sec. 21; iron post stamped "1221 DBQ".....	1, 222. 344
Strawberry Point, in front of station; top of rail.....	1, 217. 2
Dundee, at railroad station; iron post stamped "997 DBQ".....	997. 847
Dundee, in front of station; top of rail.....	998. 0
Manchester, in front of station; top of rail.....	941. 9

From Strawberry Point west along highway to Oelwein, thence south to Hazelton, thence east to Dundee.

T. 91 N., R. 7 W., NE. $\frac{1}{4}$ sec. 21, in school yard; iron post stamped "114 DBQ".....	1, 114. 811
T. 91 N., R. 8 W., NE. $\frac{1}{4}$ sec. 21, at crossroads; iron post stamped "1143 DBQ".....	1, 144. 385
Oelwein, north wall of post office, in coping stone; aluminum tablet stamped "1044 DBQ".....	1, 045. 347
Hazelton, at railroad station; iron post stamped "995 DBQ".....	996. 674
T. 90 N., R. 8 W., NE. $\frac{1}{4}$ sec. 21, at side of wagon road; iron post stamped "1063 DBQ".....	1, 063. 969
T. 90 N., R. 7 W., NE. $\frac{1}{4}$ sec. 21, at road crossing; iron post stamped "1061 DBQ".....	1, 061. 951
Lamont, in front of station; top of rail.....	1, 045. 6

WAUKON QUADRANGLE.

[Latitude 43°-43° 30'; longitude 91°-91° 30'.]

From North McGregor west along highway to Monona, thence northeast to point near Reesville, thence southeast to Waukon Junction.

North McGregor, 2 miles west of, at top of Hatch Hill, on south side of road, in northwest corner of yard at residence of J. K. Gray; iron post stamped "1096 DBQ".....	1, 096. 904
Watson, 0.2 mile northwest of corner of sec. 4, T. 95 N., R. 4 W., 13 feet north of corner fence post at intersection of roads; iron post stamped "1179 DBQ".....	1, 179. 987
Monona, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	1, 215. 6
T. 95 N., R. 5 W., 0.2 mile north of center of sec. 10, 60 feet north of railroad track, southeast of Walsh's house; iron post stamped "1184 DBQ".....	1, 185. 584
T. 96 N., R. 5 W., 700 feet east of quarter corner west side of sec. 23, north side of Hickory Creek, 80 feet southwest of northwest corner of bridge 16, south side of road; iron post stamped "787 DBQ".....	787. 791
T. 96 N., R. 4 W., south of quarter corner west side of sec. 8, on summit of hill north of Yellow River; iron post stamped "1099 DBQ".....	1, 100. 680
T. 96 N., R. 4 W., 1,000 feet west of southeast corner of sec. 2, in northeast corner of schoolhouse No. 1; iron post stamped "1137 DBQ".....	1, 137. 865

From Harpers Ferry northwest along highway to Dalby, thence west to Waukon, thence 3 miles north to iron mines, thence east to Village Creek.

T. 97 N., R. 3 W., quarter mile south of center of sec. 16, northeast of junction of roads; iron post stamped "1061 D".....	1, 061. 974
T. 93 N., R. 3 W., at quarter corner east side of sec. 31, near northwest corner of fence post of cemetery; iron post stamped "1148 DBQ".....	1, 149. 940

Elon, 2,500 feet east of, quarter mile east of center of sec. 33, T. 98 N., R. 4 W., northeast of fence post northeast of schoolhouse; iron post stamped "1238 DBQ".....	Feet. 1, 238. 726
T. 97 N., R. 5 W., quarter corner west side of sec. 16, just off the highway, northeast corner of crossroads; iron post stamped "1218 DBQ" (on spur line).....	1, 219. 328
T. 98 N. R. 5 W., 1,300 feet northeast of center of sec. 17, 15 feet south-east of northwest corner post of north fence line; iron post stamped "1320 DBQ".....	1, 321. 049
T. 98 N., R. 4 W., sec. 19, 200 feet east of bridge over small tributary of Village Creek, on north side of road and south side of fence; iron post stamped "834 DBQ".....	835. 510
Village Creek post office, near northwest corner of schoolhouse; iron post stamped "646 DBQ".....	647. 072

From Lansing west along highway to T. 99 N., R. 5 W., thence north to point near Dorchester, thence east to New Albin.

Lansing, northeast of intersection of Main and Second streets, near south-west corner of implement warehouse of Nielande & Co.; aluminum tablet stamped "653 DBQ".....	654. 493
T. 99 N., R. 4 W., on east side of sec. 20, 12 feet west of northeast corner post of cemetery; iron post stamped "1216 DUBQ".....	1, 217. 533
T. 99 N., R. 5 W., near quarter corner on north side of sec. 21, northwest of schoolhouse, 25 feet south of fence-corner post; iron post stamped "1060 DUBQ".....	1, 060. 838
New Albin schoolhouse, 22 feet northeast of northeast corner of; iron post stamped "652 DUBQ".....	652. 977
T. 100 N., R. 5 W., north of quarter corner east side of sec. 16, 60 feet south of southeast corner of schoolhouse, north side of road; iron post stamped "842 DUBQ".....	843. 468

DECORAH QUADRANGLE.

[Latitude 43°-43° 30'; longitude 91° 30'-92°.]

From Monona west along highway to Postville, thence north to Union Prairie, thence east to iron mines.

T. 95 N., R. 6 W., NE. $\frac{1}{4}$ sec. 16, in southeast corner of school yard; iron post stamped "1075 DBQ".....	1, 075. 526
Postville, in front face of Commercial House; aluminum tablet stamped "1195 DBQ".....	1, 194. 516
Postville, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	1, 197. 3
Lybrand, T. 96 N., R. 6 W., southwest corner of schoolhouse yard; iron post stamped "1186 DBQ".....	1, 185. 654
T. 97 N., R. 6 W., center, 20 feet west of road intersection on north side of, at Center schoolhouse; iron post stamped "1169 DBQ".....	1, 168. 880

From Union Prairie north to Dorchester, thence west to sec. 19, T. 100 N., R. 9 W., thence south to Bluffton, thence east to Springwater, thence north to Hespera.

T. 98 N., R. 6 W., southeast corner of sec. 9, in southwest corner of West Ridge school yard; iron post stamped "1254 DBQ".....	1, 253. 487
T. 99 N., R. 6 W., about 0.2 mile north of southeast corner of sec. 9, in northwest corner of school yard; iron post stamped "731 DBQ".....	729. 578
T. 100 N., R. 6 W., NW. $\frac{1}{4}$ sec. 23, 1 mile west of Dorchester, northwest of road intersection by cemetery; iron post stamped "1087 DBQ".....	1, 086. 825

	Feet.
T. 100 N., R. 7 W., southeast corner of sec. 16, 2 miles north of Highlandville, northwest corner of road crossing; iron post stamped "1136 DBQ".	1, 135. 833
T. 100 N., R. 8 W., southeast corner of sec. 16, 10 feet north of northwest corner of road crossing; iron post stamped "1264 DBQ".....	1, 263. 835
T. 100 N., R. 9 W., quarter corner on east side of sec. 21, in southwest corner of Ward schoolhouse yard; iron post stamped "1213 DBQ".....	1, 212. 773
T. 99 N., R. 9 W., southeast corner of sec. 16, in northeast corner of school yard; iron post stamped "1139 DBQ".....	1, 139. 16
T. 99 N., R. 8 W., 0.25 mile east of southwest corner of sec. 21, northwest of road intersection; iron post stamped "1148 DBQ".....	1, 148. 355

From Springwater east 6 miles, thence north via Highlandville to center of T. 100 N., R. 7 W.

T. 99 N., R. 7 W., sec. 15, 1 rod east of northeast corner of intersection of Locust and Sattre roads; iron post stamped "1159 DBQ".....	1, 158. 943
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From center of T. 98 N., R. 6 W., to center of T. 98 N., R. 8 W., thence south to Nordness, T. 97 N., R. 8 W., thence east to Ludlow.

T. 98 N., R. 7 W., 0.4 mile west of southeast corner of sec. 16, 2 rods north of northwest corner of road intersection; iron post stamped "845 DBQ".	844. 805
T. 97 N., R. 8 W., NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 15, 0.5 mile south of Nordness, 3 rods north of crossing and road intersection, 2 feet east of right of way of Chicago, Rock Island & Pacific Ry.; iron post stamped "1059 DBQ"....	1, 058. 982
T. 97 N., R. 7 W., near center of sec. 15, northwest of road junction, in southeast corner of McKay school yard; iron post stamped "1144 DBQ".	1, 144. 127

From center of T. 98 N., R. 8 W., west 5 miles, thence north to sec. 25, T. 99 N., R. 7 W.

Decorah, in front of Chicago, Rock Island & Pacific Ry. station; top of rail.....	861. 2
Decorah, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	863. 1
Decorah, SE. $\frac{1}{4}$ sec. 16, T. 98 N., R. 8 W., in foundation of jail at northeast corner, 3 feet above ground; bronze tablet stamped "904 DBQ".....	904. 152

From line continued west from Decorah to sec. 8, T. 98 N., R. 9 W., thence south to sec. 18, T. 97 N., R. 9 W., near Spillville; thence east to Nordness.

McIntosh schoolhouse, 1.25 miles west of, 1.25 miles east of Madison Church, east of entrance to cemetery; iron post stamped "1194 DBQ".....	1, 193. 625
Conover, in front of station; top of rail.....	1, 235. 2
Conover, sec. 15, T. 97 N., R. 9 W., north of front entrance to village hall; iron post stamped "1233 DBQ".....	1, 233. 449

From McKay schoolhouse, sec. 15, T. 97 N., R. 7 W., south to Castolia, thence west to R. 10 W., thence south to sec. 13, T. 95 N., R. 10 W., thence east to Postville.

Castolia, in southwest corner of school yard; iron post stamped "1251 DBQ".....	1, 251. 144
Ossian, sec. 11, T. 96 N., R. 8 W., at Catholic Church, east side of north-south road, north side of east-west road; iron post stamped "1263 DBQ"..	1, 263. 219
Fort Atkinson, sec. 7, T. 96 N., R. 9 W., west side of town, in northwest corner of church yard; iron post stamped "1019 DBQ".....	1, 019. 721
T. 95 N., R. 9 W., 0.4 mile north by 0.1 mile west of southeast corner of sec. 22, opposite road intersection by east-west road, east side; iron post stamped "1151 DBQ".....	1, 152. 424

T. 95 N., R. 8 W., 0.5 mile north of center of sec. 21, in school yard; iron post stamped "983 DBQ".....	Feet. 983. 688
Clermont, in sec. 34, T. 95 N., R. 7 W., in northeast corner of school yard; iron post stamped "861 DBQ".....	861. 831

Farley and Peosta quadrangles.

DELAWARE, DUBUQUE, JONES, AND LINN COUNTIES.

The elevations in the following list are based on bench mark 279 of the Mississippi River Commission, in the northeast corner of the customhouse at Dubuque, a copper bolt marked "U. S. P. B. M.," the elevation of which is now accepted as 644.838 feet above mean sea level. The elevations published for these bench marks in the appendix to the Eighteenth Annual Report of the United States Geological Survey are unreliable. Many large errors have been corrected in connection with the later leveling in the Elkader quadrangle, and the following list results from a new adjustment.

The leveling was done by G. W. Newell in 1896.

The elevations given for the points marked with an asterisk (*) are not reliable but are included in order to complete the list.

PEOSTA QUADRANGLE.

[Latitude 42°-42° 30'; longitude 90° 30'-91°.]

From Dubuque southwest to Fillmore.

Dubuque, northeast corner of Grandview and Dodge streets; iron post stamped "875".....	Feet. 874. 486
T. 88 N., R. 2 E., SW. $\frac{1}{4}$ sec. 15, south side of road, 60 feet from center of porch; iron post stamped "1071".....	1,070. 924
T. 87 N., R. 1 E., SE. $\frac{1}{4}$ sec. 11, northeast corner of frame building formerly used for saloon at junction of roads going south (formerly Melleray post office, commonly called the "Corners"); iron post stamped "1065"....	1,065. 583
T. 87 N., R. 1 W., at quarter-section line of sec. 25, Whitewater Township, road crossing Chicago, Milwaukee & St. Paul Ry., near north end of second tie from east cattle guard; iron post stamped "889".....	879. 594

From Fillmore east to Lamotte, thence north to Dubuque.

*Butler Township, sec. 1, T. 86 N., R. 1 E., south side of road crossing, north line of Chicago, Milwaukee & St. Paul Ry., fence corner near William Cannon's gate, 20 feet southeast of cattle guard; iron post stamped "868".....	858. 444
*Otter Creek Township, sec. 2, T. 86 N., R. 2 E., road crossing Chicago, Milwaukee & St. Paul Ry., near west section line, 10 feet south of track; iron post stamped "921".....	912. 386
*Zwingle station, sec. 35, T. 87 N., R. 2 E., Chicago, Milwaukee & St. Paul Ry., west end of platform; iron post stamped "902".....	893. 977
*Lamotte, sec. 4, T. 86 N., R. 3 E., corner Market and Water streets, 40 feet northeast of railroad; iron post stamped "923".....	914. 661
*Bellevue Township, Jackson County, T. 86 N., R. 4 E., SW. $\frac{1}{4}$ sec. 6, junction of wagon roads near Anton Ernest's house; iron post stamped "708".....	700. 149

*T. 87 N., R. 3 E., sec. 22, southeast corner Nat Mandor's shed, west side of road, 200 feet southwest of bridge over Tete des Morts River, on half-section line; iron post stamped "718".....	Feet. 709. 829
*St. Donatus post office, near center of sec. 7, T. 87 N., R. 4 E., iron post stamped "674".....	666. 028
*T. 88 N., R. 3 E., near center of NE. $\frac{1}{4}$ sec. 27, St. Katherine's Church, northwest corner of yard of priest's house; iron post stamped "1123"....	1, 114. 552

From Farley east along Illinois Central R. R. to Dubuque.

*Peosta station (Illinois Central R. R.), 25 feet northwest of station, sec. 9, T. 88 N., R. 1 E., 50 feet north of main track, beside wagon road; iron post stamped "1051".....	1, 041. 585
*T. 89 N., R. 1 E., sec. 36, east-west road crossing Illinois Central R. R. near railroad fence, north side of wagon road, 50 feet west of railroad track; iron post stamped "869".....	860. 048

FARLEY QUADRANGLE.

[Latitude 42°-42° 30'; longitude 91°-91° 30'.]

From Fillmore west to Sand Springs, thence northeast along railroad to Farley.

T. 86 N., R. 1 W., NW. $\frac{1}{4}$ sec. 7, junction of road going south; iron post stamped "961".....	951. 797
T. 86 N., R. 2 W., NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 1, on line between secs. 1 and 2, at junction of roads going north and west; iron post stamped "957".....	947. 900
T. 87 N., R. 2 W., center of sec. 16, at southeast corner of junction of wagon roads; iron post stamped "886".....	877. 897
T. 87 N., R. 3 W., corner of secs. 10, 11, 14, and 15; iron post stamped "952".....	943. 004
T. 88 N., R. 3 W., near center of NE. $\frac{1}{4}$ sec. 36, 50 feet southeast of highway bridge over Maquoketa River; iron post stamped "908".....	896. 874
Worthington, near north line of sec. 31, T. 88 N., R. 2 W., southwest corner of A Street and Fourth Avenue; iron post stamped "931".....	921. 206
Farley, SW. $\frac{1}{4}$ sec. 13, T. 88 N., R. 1 W., west side of Wood Street, where street crosses Illinois Central R. R.; iron post stamped "1117".....	1, 108. 148

From Sand Springs southwest along Chicago, Milwaukee & St. Paul Ry., thence northwest along same railroad to Delaware.

T. 86 N., R. 3 W., NW. $\frac{1}{4}$ sec. 9, between railroad tracks, 500 feet north of switch; iron post stamped "849".....	840. 097
Hopkinton, SW. $\frac{1}{4}$ sec. 13, T. 87 N., R. 4 W., northwest corner of Main and Locust streets, near Central drug store; iron post stamped "872".....	862. 706
Delhi, near north line of sec. 20, T. 88 N., R. 4 W., on east side of road, about 100 feet east of Chicago, Milwaukee & St. Paul Ry. station; iron post stamped "1016".....	1, 007. 208

From Farley north to Luxemburg.

T. 88 N., R. 1 W., quarter corner north line of sec. 6, at road junction; iron post stamped "1139".....	1, 130. 066
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From Farley west along Illinois Central R. R. to Manchester.

Dyersville, about 100 feet north of east end of station of Illinois Central R. R.; iron post stamped "952".....	942. 308
T. 89 N., R. 3 W., NW. $\frac{1}{4}$ sec. 33, near north line of, where highway goes south from Illinois Central R. R.; iron post stamped "1022".....	1, 011. 966
Delaware, SW. $\frac{1}{4}$ sec. 32, T. 88 N., R. 4 W., northwest corner of street opposite post office and Knowles Hotel; iron post stamped "1089".....	1, 079. 668

	Feet.
Delaware, in front of Illinois Central R. R. station; top of rail.....	1,065.4
Manchester, 150 feet south of stock yards, on west side of Illinois Central R. R. track, south side of street; iron post stamped "949".....	939.802
From Manchester south along highway to T. 86 N., thence east to Monticello, thence along Illinois Central R. R. to Junction.	
Golden, on quarter-section line of sec. 31, T. 88 N., R. 5 W., highway cross- ing 150 feet west of Illinois Central R. R., north side of road and south of station; iron post stamped "1055".....	1,046.158
Ryan, west side of sec. 18, T. 87 N., R. 5 W., east side of road crossing Illinois Central R. R., about 50 feet north of railroad; iron post stamped "1020".....	1,000.789
T. 86 N., R. 5 W., northwest corner of sec. 10, opposite side of road from Stromburg's residence; iron post stamped "1013".....	1,004.245
Argand post office, south line of section, SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 4, T. 86 N., R. 4 W., corner of yard at schoolhouse; iron post stamped "977".....	967.778

Kahoka quadrangle.

[Latitude 40°-40° 30'; longitude 91° 30'-92°.]

LEE COUNTY.

The following elevation at Vincennes was determined by a single spur line from a checked elevation at St. Francisville, Mo., based upon United States Corps of Engineers bench mark at Alexandria, Mo., the elevation of which is accepted as 493.605 feet above mean sea level.

The leveling was done in 1900 by H. V. Rees.

At Vincennes.

Vincennes, SW. $\frac{1}{4}$ sec. 22, T. 66 N., R. 6 W., in northwest corner of founda- tion of house of R. Sargent; aluminum tablet stamped "555 A".....	Feet. 555.847
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Des Moines quadrangle.**POLK COUNTY.**

The elevations in the following list are based on that of an aluminum tablet 1 foot east of the southwest corner of the post office at Des Moines, which was established by precise levels run in 1905 from Council Bluffs, the accepted elevation being 807.351 feet above mean sea level.

The leveling was done in 1905 by F. W. Hughes.

DES MOINES QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 93° 30'-93° 45'.]

**From Des Moines west over Chicago, Rock Island & Pacific Ry. to Valley Junction,
thence north along highways to Corydon Bridge.**

Des Moines post office, 1 foot east of southwest corner; aluminum tablet stamped "809 Adj 1903".....	Feet. 807.351
Des Moines, Twenty-eighth Street crossing of Chicago, Rock Island & Pacific Ry., 100 feet north of race track, SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 8, T. 78 N., R. 24 W., 30 feet north of cottonwood tree; iron post stamped "804 Adj 1903".....	802.978

Valley Junction, in foundation of public school, 1 foot west of entrance door; aluminum tablet stamped "821 Adj 1903".....	Feet. 819.615
Motts schoolhouse, 1.1 miles north of, 20 feet north of center of forks of roads, 400 feet west of road north, 400 feet west of southeast corner of sec. 26, T. 79 N., R. 25 W.; iron post stamped "869 Adj 1903".....	868.097
Kimball Corner, southeast corner of sec. 19, T. 79 N., R. 24 W., 50 feet northwest of center of crossroads, 2 miles north of University Avenue; iron post stamped "935 Adj 1903".....	933.983
Beaver Creek, 1.6 miles north of, NE. $\frac{1}{4}$ sec. 7, T. 79 N., R. 24 W., northeast corner Lawson schoolhouse; iron post stamped "833 Adj 1903".....	831.943
Ridgedale schoolhouse, near center sec. 36, T. 80 N., R. 25 W., southeast corner of school yard, opposite road south; iron post stamped "959 Adj 1903".....	957.965
Corydon Bridge, 1 mile west of, about center of sec. 14, T. 80 N., R. 25 W., 40 feet west of center of road, in A. L. Frazer's yard; iron post stamped "950 Adj 1903".....	948.972
From Des Moines southeast over Chicago, Rock Island & Pacific Ry. to Levey, thence north and west along highway via Berwick and Ankeny to Corydon Bridge.	
Des Moines, railroad bridge over Des Moines River, north face of coping, 2 feet west of east end of pier on south bank, southwest corner of sec. 6, T. 78 N., R. 24 W.; aluminum tablet stamped "797 Adj 1903".....	795.206
Levey, 15 feet west of road, 175 feet northwest of E. S. Irwin's house; iron post stamped "Prim. Trav. Sta. No. 7, 782 Adj 1903".....	780.515
Youngstown, center of south side of sec. 5, T. 78 N., R. 23 W., railroad bridge over Four Mile Creek, west face of coping stone above east pier; aluminum tablet stamped "796 Adj 1903".....	794.172
Bowsher station, 0.8 mile south of, bridge over Four Mile Creek, in south side of east abutment; aluminum tablet stamped "821 Adj 1903".....	819.296
Berwick, 200 feet north of station, east of road, 20 feet north of elm; iron post stamped "841 Adj 1903".....	839.931
Berwick, 1.6 miles north of, 150 feet southwest of brick house, 100 feet northeast of fork of road; iron post stamped "942 Adj 1903".....	940.889
T. 80 N., R. 23 W., southeast corner of sec. 19, 2.5 miles west by 1 mile south of, 40 feet northwest of center of crossroads; iron post stamped "938 Adj 1903".....	936.837
Ankeny, Methodist Episcopal Church, in foundation stone facing east and 2 feet south of north main-entrance door; aluminum tablet stamped "997 Adj 1903".....	995.799
Ankeny, 1 mile north by 1.5 miles west of, 100 feet west of southeast corner of field, in southeast corner sec. 9; iron post stamped "Prim. Trav. Sta. No. 4".....	962.546
T. 80 N., R. 24 W., NE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 18, 150 feet west of road fork, Corydon Bridge; iron post stamped "850 Adj 1903".....	848.913

Waukee quadrangle.

DALLAS AND POLK COUNTIES.

The elevations in the following list are based upon an iron bench-mark post 60 feet north of the Chicago, Rock Island & Pacific Railway track, near the Main Street crossing, at Van Meter, and an iron bench-mark post 50 feet south of track, 75 feet southwest of the first stone culvert west of the station, at Commerce. The

accepted elevations of these bench marks are, respectively, 872.406 and 836.074 feet above mean sea level, as determined by a line of precise levels from Council Bluffs to Des Moines.

The leveling was done in 1906 by W. A. Gelbach and F. H. West.

WAUKEE QUADRANGLE.

[Latitude 41° 30'–41° 45'; longitude 93° 45'–94°.]

From Van Meter north to Ortonville, thence east to Campbell, thence south to Commerce.

T. 78 N., R. 27 W., northwest corner of sec. 10, 20 feet west of, 4 feet north of corner fence post by roadside; iron post stamped "983".....	Feet. 881. 357
Ortonville, 30 feet southeast of quarter corner north side of sec. 35, T. 79 N., R. 27 W., 4 feet south of corner fence post; iron post stamped "1037".....	1, 035. 985
Waukee, 35 feet southeast of northwest corner of sec. 33, T. 79 N., R. 26 W., 4 feet south of corner fence post; iron post stamped "1035".....	1, 033. 817
Pleasant View schoolhouse, T. 79 N., R. 26 W., 35 feet northeast of northwest corner of sec. 36, 8 feet east of corner fence post, in school yard; iron post stamped "1032".....	1, 030. 227
T. 78 N., R. 25 W., 40 feet northwest of northwest corner of sec. 8, in corner of school yard; iron post stamped "950".....	948. 675

From Ortonville to Adel (double-rodged line).

Adel, in southeast corner of courthouse yard, 2 feet from either side of angle formed by sidewalks; iron post (Prim. Trav. Sta. No. 11)..... 891. 391

From Ortonville north to sec. 23, T. 80 N., R. 27 W., thence northeast to sec. 12, T. 80 N., R. 26 W., thence southeast to Campbell.

T. 79 N., R. 27 W., northeast corner of NW. $\frac{1}{4}$ sec. 14, in corner of lot at southwest corner of junction of crossroads, 10 feet from either road; iron post stamped "1049".....	1, 047. 306
Dallas Center, T. 79 N., R. 27 W., sec. 2, in east face of Citizen's Bank, 27 feet from south edge; aluminum tablet stamped "1073".....	1, 071. 985
T. 80 N., R. 27 W., northwest corner of SW. $\frac{1}{4}$ sec. 23, in corner of field at southeast corner of crossroads, 15 feet from either road and 3 feet from side of fence around field; iron post stamped "1024".....	1, 022. 376
T. 80 N., R. 26 W., southeast corner of NE. $\frac{1}{4}$ sec. 19, in corner of field at northwest corner of T road, 10 feet from either road, 3 feet from either side of fence around field; iron post stamped "1029".....	1, 027. 995
T. 80 N., R. 26 W., northeast corner of NE. $\frac{1}{4}$ sec. 16, in corner of lot at southwest corner of crossroads; iron post stamped "970".....	968. 443
T. 80 N., R. 26 W., southeast corner of SE. $\frac{1}{4}$ sec. 12, in corner of field, Dallas County, 2.5 feet from county line, on C. E. Waters's place, 200 yards east of house; iron post stamped "867".....	866. 142
T. 80 N., R. 25 W., southwest corner of NE. $\frac{1}{4}$ sec. 20, northeast corner of schoolhouse yard; iron post stamped "881".....	879. 221
T. 80 N., R. 25 W., northwest corner of NW. $\frac{1}{4}$ sec. 34, in field opposite junction of T roads; iron post stamped "885".....	883. 280
T. 79 N., R. 25 W., southeast part of SE. $\frac{1}{4}$ sec. 4, in brick foundation on west side of schoolhouse, 150 yards west of intersection of section lines secs. 3, 4, 9, and 10; aluminum tablet stamped "976".....	974. 226
T. 79 N., R. 25 W., southeast corner of SE. $\frac{1}{4}$ sec. 21, 20 feet west of junction with T road south, in field, 20 feet from large tree at corner; iron post stamped "956 Prim. Trav. Sta. No. 2".....	954. 389

Chariton, Indianola, and Milo quadrangles.

MARION AND WARREN COUNTIES.

The elevations in the following list are based on various bench marks in this locality.

The leveling was done in 1907 by W. A. Gelbach and in 1913 by R. G. Clinite.

MILO QUADRANGLE.

[Latitude 41° 15' - 41° 30'; longitude 93° 15' - 93° 30'.]

From point near Milo southwest to northeast corner of sec. 3, T. 74 N., R. 23 W.

T. 75 N., R. 23 W., west of center of sec. 23, 1.75 miles west of Milo, at southwest corner of crossroads, 10 feet south of corner post, in limestone rock, 6 by 8 by 30 inches, set 29 inches in ground; aluminum tablet stamped "896 Adj"	Feet. 894. 377
T. 75 N., R. 23 W., about 0.25 mile east of the northwest corner of sec. 26, opposite T road west, 2 feet south of telephone pole, in top of wooden peg; copper nail.....	921. 55
T. 75 N., R. 23 W., about 0.25 mile east of the southwest corner of sec. 26, at northwest corner of crossroads, 12 feet north of corner post, in root of 12-inch locust tree; copper nail.....	908. 92

From Levey southeast along Chicago, Burlington & Quincy R. R. to Carlisle, thence south along roads to northwest corner of sec. 3, T. 74 N., R. 23 W.

Carlisle, in front of station; top of rail.....	784. 2
Carlisle station, at side of road 200 feet east of tracks, limestone rock 8 by 8 by 30 inches, set 28 inches in ground; aluminum tablet stamped "782 Adj".....	781. 564
T. 77 N., R. 23 W., sec. 23, southwest corner of, at northeast corner of crossing, limestone rock 8 by 9 by 32 inches, set 30 inches in ground; aluminum tablet stamped "914 Adj".....	912. 891
T. 76 N., R. 23 W., center of NE. ¼ sec. 10, west side of road, opposite T road to east, limestone rock 5 by 8 by 28 inches, set 27 inches in the ground; aluminum tablet stamped "931 Adj".....	930. 189
Ackworth, 0.75 mile west of, at southeast angle of forks of road, limestone rock 8 by 8 by 30 inches, set 29 inches in ground; aluminum tablet stamped "943 Adj".....	941. 264
T. 75 N., R. 23 W., sec. 10, 0.25 mile west of northeast corner of, 4 feet west of corner post, at southwest angle of road forks, limestone rock 8 by 9 by 32 inches; aluminum tablet stamped "958 Adj".....	957. 178
T. 75 N., R. 23 W., sec. 23, west of center of, 1.75 miles west of Milo at southwest corner of crossroads, 10 feet south of corner post; in limestone rock 6 by 8 by 30 inches, set 29 inches in ground; aluminum tablet stamped "896 Adj".....	894. 377

From St. Mary's Catholic Church north via Sandyville to Ford station, thence northwest to Levey.

T. 75 N., R. 22 W., northeast corner of sec. 26, 2 miles west of Caloma, in southwest angle of crossroads, 50 feet west by 30 feet south of corner; in limestone rock 6 by 10 by 30 inches, set 28 inches in ground; aluminum tablet stamped "966 Adj".....	965. 179
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T. 35 N., R. 22 W., southeast corner of sec. 3, 1 mile west of Motor, northwest angle of crossroads, sandstone rock 8 by 10 by 24 inches, set 23 inches in ground; aluminum tablet stamped "943 Adj".....	Feet. 941. 926
Sandyville, 300 feet south of main crossroads, west side of road at fence behind hitching rack, limestone rock 8 by 8 by 32 inches, set 30 inches in ground; aluminum tablet stamped "941 Adj".....	940. 721
T. 76 N., R. 22 W., center of SW. $\frac{1}{4}$ sec. 4, west of road opposite T road east, limestone rock 6 by 8 by 33 inches, set 32 inches in ground; aluminum tablet stamped "773 Adj".....	772. 575
Hartford, at south edge of town, southeast angle of T road east, sandstone rock 8 by 10 by 20 inches, set 19 inches in ground; aluminum tablet stamped "888".....	887. 171
From northeast corner sec. 26, T. 75 N., R. 22 W., east to Caloma, thence northeast along road to Pleasantville, thence northwest along Chicago, Burlington & Quincy R. R. to Ford station.	
T. 75 N., R. 21 W., northwest corner of sec. 20, 1 mile north of Caloma, at southeast angle of crossroads, limestone rock 8 by 10 by 24 inches, set 22 inches in ground; aluminum tablet stamped "936 Adj".....	934. 698
T. 75 N., R. 21 W., west of southeast corner of sec. 5, northwest angle of crossroads, in limestone rock 6 by 8 by 28 inches, set 27 inches in ground; aluminum tablet stamped "869 Adj".....	867. 704
T. 76 N., R. 21 W., northeast corner of sec. 33, 2.5 miles south of Pleasantville, in southwest angle of crossroads, at northeast corner of schoolhouse, sandstone rock 8 by 10 by 22 inches, set 21 inches in ground; aluminum tablet stamped "894 Adj".....	893. 119
Pleasantville, 0.75 mile southeast of, 230 feet northwest of road crossing, in top of east end of railroad culvert; Prim. Trav. Sta. No. 3; aluminum tablet stamped "882 Adj".....	880. 347
Pleasantville, in front of station; top of rail.....	926. 4
Wheeling, 0.75 mile east of, north side of road, 120 feet west of track at road crossing; iron post stamped "910 Adj".....	908. 872
Swan station, 100 feet south of, 55 feet west of track, 5 feet south of sidewalk, in corner of grass plot; iron post stamped "772 Adj".....	771. 050
Swan station, in front of; top of rail.....	763. 3
Ford, 0.75 mile northeast of, in top of southeast pier of south span of highway bridge over Des Moines River; aluminum tablet stamped "Prim. Trav. Sta. No. 1, 763 Adj".....	761. 635
From Swan northeast along road to highway bridge over Des Moines River and return (spur line).	
Percy, 1.5 miles west of, 100 feet west of road, in south part of W. C. Wilson's yard, 1 foot north of Wabash R. R. fence at crossing south to highway bridge over Des Moines River, sandstone rock 5 by 20 by 26 inches; set 22 inches in ground; aluminum tablet stamped "774 Adj".....	772. 828

INDIANOLA QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 93° 30'-93° 45'.]

SW. $\frac{1}{4}$ sec. 16, T. 76 N., R. 23 W.

T. 76 N., R. 23 W., southwest corner of sec. 16, northeast angle of crossroads, limestone rock; aluminum tablet stamped "948 Adj".....	946. 812
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CHARITON QUADRANGLE.

[Latitude 41°-41° 15'; longitude 93° 15'-93° 30'.

From northwest corner of sec. 3, T. 74 N., R. 23 W., east by road to St. Mary's Catholic Church.

T. 74 N., R. 23 W., northwest corner of sec. 3, 30 feet south by 60 feet east of crossroads, in limestone rock; aluminum tablet stamped "Prim. Trav. Sta. No. 6, 937 Adj".....	Feet. 935. 347
T. 74 N., R. 23 W., northeast corner of sec. 1, southwest angle of crossroads; in limestone rock 8 by 8 by 33 inches, set 32 inches in ground; aluminum tablet stamped "977 Adj".....	976. 674
T. 75 N., R. 22 W., southwest corner of sec. 35, at St. Mary's Catholic Church, 6 feet east of cottonwood tree at northeast angle of crossroads, in limestone rock; aluminum tablet stamped "Prim. Trav. Sta. No. 5, 926 Adj".....	924. 701

From point southwest of Milo along highways east and north to southwest corner of sec. 35, T. 75 N., R. 22 W.

T. 74 N., R. 23 W., at northeast corner of sec. 3, in southwest corner of T road south, in top of west end of plank culvert; copper nail.....	935. 80
T. 74 N., R. 23 W., at southeast corner of sec. 3, in northwest corner of crossroads, 2 feet west of corner post; iron post stamped "Iowa 934, 1913".....	933. 865
T. 74 N., R. 23 W., at southwest corner of sec. 1, in northeast corner of crossroads, at Greenplain School, west side of concrete walk, top of south end, date 1911; mark on raised part of upper loop of figure "9".....	990. 90
T. 74 N., Rs. 22 and 23 W., at corner of secs. 6, 7, -1, and 12, in center of crossroads, 3.5 miles south of Milo, in section stone; highest point of square cut.....	948. 83
T. 74 N., R. 22 W., at southeast corner of sec. 6, in northwest corner of crossroads, 3 feet east of corner post; iron post stamped "Iowa 880, 1913".....	880. 465
T. 74 N., R. 22 W., at northwest corner of sec. 9, in southeast corner of crossroads, at south end of tile drain, on 4 by 2 by 2.5 foot boulder; highest point of chiseled circle.....	901. 37
T. 74 N., R. 22 W., at southwest corner of sec. 3, in northeast corner of crossroads, at southwest corner of school yard; iron post stamped "Iowa, 865, 1913".....	864. 605
T. 74 N., R. 22 W., at southeast corner of sec. 3, at crossroads, center of jog in east-west road, at southwest corner of wooden bridge over Wolf Creek, in bridge floor; copper nail.....	813. 85
High-water mark June 24, 1913, wooden bridge over Wolf Creek, west side of bridge, on east side of center rail post; pencil mark "815.8".....	815. 8
T. 75 N., R. 22 W., at southwest corner of sec. 35, at St. Mary's Catholic Church, 6 feet east of stump of cottonwood tree, at northeast angle of crossroads, in sandstone post; aluminum tablet stamped "Prim. Trav. Sta. No. 5, 926." (An old tablet reset in new stone same location but 0.265 foot lower. Old stone had split).....	924. 436

From southeast corner of sec. 3, T. 74 N., R. 22 W., east along highways to Dallas.

T. 74 N., R. 22 W., at southwest corner of sec. 1, at northeast corner of crossroads, 25 feet east of corner post, in root of 10-inch elm tree; copper nail.....	885. 27
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T. 74 N., R. 22 W., sec. 12, at northeast corner of, at southwest corner of private T road south; 10 feet west of fence corner; iron post stamped "Iowa, 909, 1913".....	Feet. 909. 171
T. 74 N., R. 21 W., at southeast corner of sec. 6, at northwest corner of T road west, on top of north end of corrugated iron drain; painted square..	850. 22
T. 74 N., R. 21 W., near southwest corner of sec. 8, 200 feet northwest of road forks, at west end of steel highway bridge over Whitebreast Creek, top course, north end of sandstone abutment; bottom of chiseled square..	801. 43
Whitebreast Creek, surface of water, July 1, 1913.....	781. 8
T. 74 N., R. 21 W., at northwest corner of sec. 16, opposite T road west, 20 feet east by 2 feet south of section corner stone; iron post stamped "Iowa, 947, 1913".....	946. 588
T. 74 N., R. 21 W., at quarter corner on west side of sec. 9, at center of T road east, on east side in root of 36-inch cottonwood tree; copper nail....	894. 00
T. 74 N., R. 21 W., at quarter corner on east side of sec. 9, at summit of hill, 25 feet northwest of quarter corner stone, 2 feet west of fence corner, in top of wooden peg; copper nail.....	918. 99
T. 74 N., R. 21 W., about 0.25 mile east of southwest corner of sec. 3, 35 feet northwest of road intersection, 1.3 miles west of Dallas, in peg at foot of 20-inch oak tree; copper nail.....	921. 28
From northwest corner of sec. 16, T. 74 N., R. 21 W., by a devious route along highways south to Renfrow School, thence southeast to sec. 22, T. 73 N., R. 21 W.	
T. 74 N., R. 21 W., at northwest corner of sec. 16, opposite T road west, 20 feet east by 2 feet south of stone marking corner of secs. 8, 9, 16, and 17; iron post stamped "Iowa, 947, 1913".....	946. 588
T. 74 N., R. 21 W., near quarter corner on east side of sec. 17, at northwest corner of T road north, in crotch near base of corner post; copper nail..	956. 95
T. 74 N., R. 21 W., near quarter corner on east side of sec. 16, in southwest corner of T road south, 15 feet west of center of triangular grass plat, 10 feet northwest of mail box, in top of wooden peg; copper nail.....	852. 77
T. 74 N., R. 21 W., about 0.25 mile south of quarter corner on west side of sec. 22, at angle in road to west, in top of wooden peg, at southwest corner of yard; copper nail.....	985. 13
T. 74 N., R. 21 W., northwest of center of sec. 28, at north side of road forks, 50 feet north of mile board "Knoxville 19 miles;" iron post stamped "Iowa, 936, 1913".....	936. 423
T. 74 N., R. 21 W., about 0.25 mile north of quarter corner on west side of sec. 33, at angle to south in road east, 16 feet north of telephone pole, in top of wooden peg; copper nail.....	936. 73
T. 73 N., R. 21 W., at northeast corner of sec. 5, at southwest corner of crossroads, 2 feet east of corner post, in top of osage stump; copper nail..	1,007. 58
T. 74 N., R. 21 W., about 250 feet east of the southwest corner of sec. 34, opposite T road south, 80 feet northeast of bridge over Long Branch Creek; iron post stamped "Iowa 904, 1913".....	904. 215
T. 73 N., R. 21 W., at southwest corner of sec. 3, in northeast angle of crossroads, 28 feet north by 24 feet east of corner of secs. 3, 4, 9, and 10, in southwest corner of churchyard, in sandstone rock; bottom of chiseled square.....	999. 22
T. 73 N., R. 21 W., at corner of secs. 9, 10, 15, and 16, in center of crossroads, on section stone; chiseled circle.....	1,009. 65
T. 73 N., R. 21 W., at southeast corner of sec. 16, in northwest angle of T road west, in southeast corner of school yard (Renfrow School); iron post stamped "Iowa, 993, 1913".....	993. 558

T. 73 N., R. 21 W., at quarter corner between secs. 21 and 22, at T road east, in northwest corner of bridge floor, in plank; copper nail.....	Feet. 957. 97
T. 73 N., R. 21 W., at center of sec. 22, opposite T road south, on north side of east-west road, 2.5 feet south of wire gate, in top of peg; copper nail.....	1, 009. 29

From Renfrow School along highways west to Norwood, thence north to sec. 2, T. 74 N., R. 23 W.

T. 73 N., R. 21 W., about 0.15 mile west of southeast corner of sec. 17, at northwest corner of crossroads 33 feet west of center of crossroads, in top of charred maple stump; copper nail.....	1, 012. 93
T. 73 N., R. 21 W., 0.25 mile east of northwest corner of sec. 20, at southwest corner of T road south, 250 feet west of schoolhouse, at base of corner post; top of stone.....	967. 06
T. 73 N., R. 21 W., at quarter corner on north side of sec. 19, at northeast corner of road forks, on top of concrete wing wall of culvert; painted square.....	885. 53
T. 73 N., R. 22 W., at quarter corner on north side of sec. 24, at southeast angle of T road south, 6 feet east of corner post; iron post stamped "Iowa, 933, 1913".....	933. 123
T. 73 N., R. 22 W., near quarter corner on north side of sec. 23, at southeast corner of T road east, at extreme northwest corner of Juergen's yard, in root of maple tree; copper nail.....	962. 12
T. 73 N., R. 22 W., about 0.1 mile north of southwest corner of sec. 14, at T road east, on bridge over Whitebreast Creek, near southeast corner of bridge floor; top of bolt.....	838. 10
T. 73 N., R. 22 W., about 0.25 mile north of the southwest corner of sec. 15, at southeast corner of crossroads, south end of small plank culvert, in top of; copper nail.....	967. 47
T. 73 N., R. 22 W., at quarter corner on east side of sec. 17, in southwest angle at turn in road, just inside of fence, 3 feet southwest of corner post; iron post stamped "Iowa, 963, 1913".....	962. 892
T. 73 N., R. 22 W., at quarter corner between secs. 17 and 18, at center of crossroads, on top of section stone; chiseled square.....	1, 006. 87
T. 73 N., R. 22 W., at quarter corner on west side of sec. 18, at northeast angle of crossroads, at east end of culvert, in top plank; copper nail.....	994. 67
T. 73 N., R. 23 W., 0.25 mile north of the southwest corner of sec. 13, at northeast angle of T road east, in root of 8-inch elm tree; copper nail....	1, 034. 10
T. 73 N., R. 23 W., at quarter corner on south side of sec. 14, 0.5 mile east of Norwood, opposite center of T road south, at southeast corner of school yard, 2 feet south of corner post; iron post stamped "Iowa, 1037, 1913".....	1, 037. 519
Norwood, south end of concrete walk at church.....	1, 040. 60
Norwood, 1 mile north of, at southwest corner of crossroads, in churchyard, at south side, east end of concrete walk; painted square.....	1, 032. 85
T. 73 N., R. 23 W., at northeast corner of sec. 10, in southwest angle of crossroads, opposite mile board, "Lucas 10, Indianola 19, Des Moines 35," 4 feet south of telephone pole; iron post stamped "Iowa, 1023, 1913"....	1, 023. 127
Tps. 73 and 74 N., R. 23 W., at corner of secs. 2, 3, 34, and 35, on line between Lucas and Warren counties, at center of T road east, in top of section stone; bottom of square cut.....	1, 001. 44
T. 74 N., R. 23 W., at northwest corner of sec. 35, in southeast corner of crossroads, in root on west side of twin maple tree; copper nail.....	1, 016. 45

	Feet.
T. 74 N., R. 23 W., at quarter corner on east side of sec. 27, at southwest corner of crossroads, 7 feet south of telephone pole; iron post stamped "Iowa, 1021, 1913".....	1, 021. 180
T. 74 N., R. 23 W., at southwest corner of sec. 14, in northeast angle of crossroads, 1 mile east of Liberty Center, 75 feet northeast of section corner, in root of 14-inch cottonwood tree; copper nail.....	1, 014. 23
T. 74 N., R. 23 W., at northwest corner of sec. 14, in southeast angle of crossroads, 5 feet north of corner post, in stump of telephone pole; copper nail.....	1, 013. 64
T. 74 N., R. 23 W., at southeast corner of sec. 3, in northwest corner of crossroads, 2 feet west of corner post; iron post stamped "Iowa, 934, 1913".....	933. 865

From Norwood along highways south to Lucas, thence east to Chariton, thence north to Renfrow School.

T. 73 N., R. 23 W., at quarter corner on south side of sec. 14, 0.5 mile east of Norwood, opposite center of T road south, at southeast corner of school yard, 2 feet south of corner post; iron post stamped "Iowa 1037, 1913".....	1, 037. 519
T. 73 N., R. 23 W., at quarter corner between secs. 23 and 26, at center of crossroads, on section stone; chiseled circle.....	1, 014. 08
T. 73 N., R. 23 W., at center of sec. 35, opposite T road west, 4 feet north of osage post, on line with east-west fence on east side of road; iron post stamped "Iowa, 1030, 1913".....	1, 029. 841
T. 72 N., R. 23 W., near center of sec. 2, on west side of road, 16 feet south of east-west fence line, in west end of plank drain; copper nail.....	1, 036. 18
T. 72 N., R. 23 W., at quarter corner, on north side of sec. 11, in southwest angle of crossroads, 1 foot south of corner post, in top of wooden peg; wire nail.....	1, 044. 64
T. 72 N., R. 23 W., at center of sec. 14, 0.5 mile west by 0.5 mile north of Lucas, at center of crossroads, in top of rock presumed to be section stone; bottom of square cut.....	970. 89
Lucas, in front of Chicago, Burlington & Quincy R. R. station; top of rail..	888. 98
Lucas, near center of town, at southwest corner of Leehart's drug store; iron post stamped "Iowa, 895, 1913".....	895. 010
Lucas, 0.8 mile east of, at northeast angle of T road north, in top of sandstone rock 5 feet north of corner post; bottom of chiseled square.....	892. 21
Chicago, Burlington & Quincy R. R. crossing, 1 mile east of Lucas; top of rail.....	878. 5
Whitebreast Creek; water elevation, 11 a. m., July 31, 1913, "854.2".....	854. 3
Lucas, 1.8 miles east of, at southwest angle of T road south, 100 feet south of corner post, driven flush with ground; iron rod, 11 inches long.....	867. 35
T. 72 N., R. 22 W., near northeast corner of sec. 30, at northeast angle of crossroads, 2 feet north of corner post; iron post stamped "Iowa 1044, 1913".....	1, 043. 891
T. 72 N., R. 22 W., about 1,000 feet west of the southeast corner of sec. 20, at northeast corner of bridge over creek, in plank; copper nail.....	889. 35
T. 72 N., R. 22 W., at southeast corner of sec. 21, in northwest angle of crossroads, 1 foot south of corner post, in top of wooden peg; copper nail..	924. 16
T. 72 N., R. 22 W., at northeast corner of sec. 27, at southwest corner of crossroads, 2 feet northeast of corner post; iron post stamped "Iowa, 1046, 1913".....	1, 046. 474
T. 72 N., R. 22 W., at northwest corner of sec. 25, in southeast angle of T road south, 1 foot east of corner post, in top of osage peg; copper nail....	1, 027. 54

	Feet.
Crystal Lake; water elevation.....	975. 16
T. 72 N., Rs. 21 and 22 W., between secs. 19 and 24, respectively, on north side of road, at corporation limits of Chariton, west side, 6 inches south of east-west fence, in top of wooden peg; copper nail.....	958. 60
Chariton, in southwest corner of courthouse yard; iron post stamped "Iowa, 1041, 1913".....	1, 040. 984
Chariton, 1.2 miles north of, in southwest corner of T road west, about 0.2 mile east of greenhouse, on west side of 16-inch maple tree, in root of tree; iron wire nail with copper washer.....	1, 037. 32
T. 72 N., R. 21 W., northwest of center of sec. 17, 2 miles north of Chariton, at southeast angle of T road east, south end of plank drain, in top of; copper nail.....	1, 005. 42
Chariton, 3.2 miles north of, in northwest angle of crossroads, 3.5 feet north of corner post; iron post stamped "Iowa, 991, 1913".....	991. 101
T. 72 N., R. 21 W., west of center of sec. 4, opposite road to east, on west side of north-south road, 1 foot north of telephone pole; in top of wooden peg; copper nail.....	875. 17
T. 73 N., R. 21 W., north of quarter corner on south side of sec. 33, at jog in road about 0.2 mile north of township line, 1 foot east of telephone pole, in top of wooden peg; copper nail.....	993. 12
T. 73 N., R. 21 W., at quarter corner on south side of sec. 28, opposite T road south, 40 feet northeast of intersection, 3 feet south of fence; iron post stamped "Iowa, 974, 1913".....	974. 338
T. 73 N., R. 21 W., corner of secs. 27, 28, 33, and 34, near center of T road north, in root of 8-inch willow tree; copper nail.....	987. 91
T. 73 N., R. 21 W., at southeast corner of sec. 21, in northwest angle of T road west, 1 foot east of end of hedge fence, in top of osage peg; copper nail.....	1, 019. 07
T. 73 N., R. 21 W., quarter corner between secs. 21 and 22, at T road east, in northwest corner of bridge floor, in plank; copper nail.....	958. 04
T. 73 N., R. 21 W., at southeast corner of sec. 16, in northwest angle of T road west, in southeast corner of yard of Renfrow School; iron post stamped "Iowa, 993, 1913".....	993. 558

From Chariton southeast along highways 3.4 miles.

Chariton, in southwest corner of courthouse yard; iron post stamped "Iowa, 1041, 1913".....	1, 040. 984
Chariton, Chicago, Rock Island & Pacific Ry., in front of station; top of rail.....	1, 015. 9
Chariton, 0.96 mile southeast of, T. 72 N., R. 21 W., at center of sec. 29, in southeast angle of crossroads, in root of 14-inch maple tree; copper nail..	1, 027. 12
Chariton, 2.3 miles southeast of, near the southeast corner of sec. 28, T. 72 N., R. 21 W., on north side of road, 80 feet east of new concrete bridge, in root of 28-inch maple tree; copper nail.....	960. 64
Chariton, 3.4 miles southeast of, about 0.2 mile west of the northeast corner of sec. 34, T. 72 N., R. 21 W., on south side of road, 120 feet southwest of farmhouse, in top of 10-inch osage stump; copper nail.....	1, 025. 08

Attica and Knoxville quadrangles.

MARION COUNTY.

The elevations in the following list are based on various bench marks in this locality.

The leveling was done in 1908 by G. E. Heebink.

KNOXVILLE QUADRANGLE.

[Latitude 41° 15' -41° 30'; longitude 93°-93° 15'.]

From point 0.75 mile southeast of Pleasantville east by road to Mount Vernon Chapel.	
Pleasantville, 0.75 mile southeast of, 230 feet northwest of road crossing, in top of east end of railroad culvert; aluminum tablet stamped "Prim. Trav. Sta. No. 3, 882 Adj".....	Feet. 880. 347
T. 76 N., R. 21 W., 0.5 mile south of northwest corner of sec. 14, at northeast angle of crossroads, on stone; painted cross.....	915. 76
T. 76 N., R. 20 W., center of sec. 18, north of east and west road, 25 feet west of corner fence post, 1 foot south of fence; iron post stamped "913 Iowa".....	911. 782
T. 76 N., R. 20 W., 0.5 mile south of northeast corner of sec. 18, in center of road, in root of white-elm tree 32 inches in diameter; nail.....	907. 98
T. 76 N., R. 20 W., southwest corner of sec. 15, 28 feet north and east of center of crossroads, 3 feet west of fence, 10 feet north of corner fence post; iron post stamped "781 Iowa".....	779. 879
T. 76 N., R. 20 W., 0.25 mile west of northeast corner of sec. 24, west and 130 feet south of center of crossroads, 40 feet south of small wooden culvert, in angle of rail fence; iron post stamped "819 Iowa".....	817. 718
T. 76 N., R. 19 W., southeast corner of sec. 20, near Mount Vernon Chapel, in front yard of J. J. Woody, southeast of house and just inside fence along north side of road; iron post stamped "864 Iowa".....	862. 777
From Mount Vernon Chapel south by road to corner of Tps. 74 and 75 N., R. 19 W. (1.25 miles north of Attica).	
T. 76 N., R. 19 W., southeast corner of sec. 29, near Washington Church, in line with east and west road, in northeast root of maple tree 30 inches in diameter; 40-penny nail.....	876. 718
T. 76 N., R. 19 W., 0.25 mile north of southeast corner of sec. 27, in pasture of P. Augustine. 290 feet north of T road, near fence west of road, in fork of box-elder tree; 40-penny nail.....	797. 028
T. 75 N., R. 19 W., northeast corner of sec. 3, 18 feet east of center of north and south road, in angle of fence; iron post stamped "849 Iowa".....	847. 507
Rector, opposite signboard (Chicago, Rock Island & Pacific Ry.) top of rail.....	810. 4
T. 75 N., R. 19 W., center of sec. 15, north and 55 feet east of center of crossroads, 2 feet south of fence; iron post stamped "854 Iowa".....	852. 285
T. 75 N., R. 19 W., 0.5 mile north of southeast corner of sec. 27, south and 55 feet west of center of crossroads, 3 feet north of fence; iron post stamped "888 Iowa".....	886. 459
T. 75 N., R. 19 W., southeast corner of sec. 27, at center of crossroads; section corner stone.....	909. 96
From sec. 27, T. 76 N., R. 19 W., north to Coalridge Church and return (spur).	
T. 76 N., R. 19 W., corner of secs. 14, 15, 22, and 23, 3 miles west by 0.33 mile north of Howell station, in northwest corner of sec. 23, in Coalridge Church yard, 25 feet east and 25 feet south of center of crossroads; iron post stamped "Prim. Trav. Sta. No. 3, 1908, Iowa".....	822. 831
From Dallas north by road 1 mile.	
T. 75 N., R. 21 W., 0.25 mile north of southwest corner of sec. 23, at T road on east side of north and south road, 1 foot west of fence, 10 feet north of corner fence post; iron post stamped "912 Iowa".....	910. 688

From point near Percy east by road to Otley, thence via Fifield and Rosseau to Mount Vernon Chapel.

T. 77 N., R. 21 W., 0.25 mile west of northeast corner of sec. 13, at T road corner, 15 feet west and 60 feet south of center of crossroads, 1 foot east of fence; iron post stamped "825 Iowa".....	Feet. 823. 338
T. 77 N., R. 20 W., 0.5 mile east of southwest corner of sec. 9, 15 feet west and 50 feet north of center of crossroads, 3 feet east of fence; iron post stamped "824 Iowa".....	822. 294
T. 77 N., R. 20 W., 0.5 mile east of southwest corner of sec. 12, 30 feet south and 85 feet west of center of crossroads, 4 feet north of fence; iron post stamped "837 Iowa".....	835. 423
T. 77 N., R. 19 W., 0.5 mile south of northwest corner of sec. 9, at T road corner, east of north and south road, near residence of Arie Vriezelaar, in line with center of east and west road, 3 feet west of fence; iron post stamped "905 Iowa".....	903. 700
Otley, south side of main street, T. 77 N., R. 19 W., 0.38 mile west of northeast corner of sec. 22, at T road near west edge of village, 15 feet north of fence line, 425 feet west of railroad; iron post stamped "884 Iowa".....	882. 641
Otley, in front of station; top of rail.....	896. 0
T. 77 N., R. 19 W., 0.25 mile north of southwest corner of sec. 25, south of Pella-Otley road, 24 feet east and 20 feet south of center of crossroads, 2 feet north of fence; iron post stamped "883 Iowa".....	881. 652
T. 76 N., R. 19 W., southeast corner of sec. 2, west and 85 feet north of center of crossroads, 18 feet west of center of roadway, 30 feet east of bank of small creek; iron post stamped "749 Iowa".....	747. 844
Rosseau, 0.38 mile north and 0.06 mile west of southwest corner of sec. 9, T. 76 N., R. 19 W., east of north and south road, 85 feet south of residence of J. P. Amos; iron post stamped "763 Iowa".....	761. 053
T. 76 N., R. 19 W., 0.25 mile north of southwest corner of sec. 9, in west root of oak tree 24 inches in diameter; 40-penny nail.....	764. 87

ATTICA QUADRANGLE.

[Latitude 41°-41° 15'; longitude 93°-93° 15'.]

From point 1.25 miles north of Attica west by road to point 1 mile north of Dallas.

Tps. 74 and 75 N., R. 19 W., 20 feet west by 10 feet north of corner of secs. 2, 3, 34, and 35, 1.25 miles north of Attica, east of T road west; iron post stamped "Prim. Trav. Sta. No. 2, 1908, 908, Iowa".....	906. 387
T. 75 N., R. 19 W., sec. 32, southeast corner of, west and 50 feet south of center of crossroads, 2 feet east of fence; iron post stamped "824 Iowa".....	823. 044
Tps. 74 and 75 N., R. 20 W., 20 feet south and 25 feet west of corner of secs. 1, 2, 35, and 36; iron post stamped "Prim. Trav. Sta. No. 1, 1908, 916, Iowa".....	914. 247
T. 75 N., R. 20 W., 0.25 mile east of southwest corner of sec. 33, 20 feet south and 15 feet west of junction of T road north and east and west road; 3 feet north of fence; iron post stamped "901 Iowa".....	900. 001
T. 75 N., R. 21 W., 0.25 mile west of southeast corner of sec. 35, 18 feet east and 10 feet south of center of crossroads, near corner fence post at southeast angle of T road, in stone; aluminum tablet stamped "Prim. Trav. Sta. No. 4, 927, Iowa".....	925. 789

From point north of Attica by devious route, south along highways to Cedar Center School, thence west to Belinda School, thence north to sec. 4, T. 74 N., R. 20 W.

Tps. 74 and 75 N., R. 19 W., 20 feet west by 10 feet north of corner secs. 2, 3, 34, and 35, 1.25 miles north of Attica, east of T road west; iron post stamped "Prim. Trav. Sta. No. 2, 1908, 908, Iowa"	Feet. 906.387
Attica, one-fourth mile north of, at T road west, northwest angle of road junction, in root of 20-inch oak; nail	915.34
Attica, at center of town, in northeast corner of crossroads; iron post stamped "Iowa 923, 1913"	922.823
Attica, 1 mile south of, at Gullion Cemetery, at base of north gatepost, in concrete base; bottom of square cut	925.88
Attica, 1.9 miles south of, at road forks, 50 feet northeast of mile board "Knoxville 12, Attica 2 miles," 250 feet west of Indiana Chapel, in top of osage stump at head of drain; copper nail	905.69
T. 74 N., R. 19 W., at corner of secs. 22, 23, 26, and 27; top of section stone ..	901.02
T. 74 N., R. 19 W., sec. 27, 0.25 mile south of the northeast corner of, at northwest angle of T road north, 3 feet northwest of corner post, in field; iron post stamped "Iowa 868, 1913"	867.895
T. 74 N., R. 19 W., near center of sec. 26, at highway (covered) bridge over North Cedar Creek, in southwest corner of bridge floor; top of bolt painted white.	746.29
T. 74 N., R. 19 W., 0.25 mile south of center of sec. 35, on east side of north-south road, on line with east-west fence, 10 inches north of telephone pole, in hickory peg; copper nail	855.25
T. 73 N., R. 19 W., at center of sec. 2, at T road north, 15 feet south by 15 feet east of center of road intersection, 110 feet southwest of Eldorado Church; iron post stamped "Iowa 915, 1913"	914.797
T. 73 N., R. 19 W., at corner of secs. 2, 3, 10, and 11, at T road north, in section stone; bottom of square	915.25
T. 73 N., R. 19 W., sec. 10, at quarter corner on south side of, in northwest angle of T road north, 1.5 feet northeast of corner post, in top of peg; copper nail	863.39
T. 73 N., R. 19 W., sec. 22, at northwest corner of, at T road north, 200 feet southwest of Cedar Center schoolhouse, 27 feet east by 30 feet south of section corner; iron post stamped "Iowa 943, 1913"	942.694
T. 73 N., R. 19 W., sec. 21, at northwest corner of, opposite T road north, 18 feet south by 9 feet east of section corner, in top of wooden peg; copper nail	921.97
T. 73 N., R. 19 W., sec. 17, near southwest corner of, 47.2 feet due south of center of south wall of schoolhouse, in stump of twin-oak tree 7 inches in diameter; copper nail	909.43
T. 73 N., R. 19 W., at quarter corner between secs. 18 and 19, top of hill; top of quarter corner stone	884.13
T. 73 N., Rs. 19 and 20 W., 18 feet west of the corner of secs. 18, 19, 13, and 24, respectively, on line between Lucas and Monroe counties, in timber west of ravine, at corner of abandoned elbow road; iron post stamped "Iowa 842, 1913"	842.197
T. 73 N., R. 20 W., sec. 23, 0.25 mile north of quarter corner east side of, in southwest angle of T road west, 16 inches west of corner post, in peg; copper nail	791.34
T. 73 N., R. 20 W., sec. 22, 0.25 mile north by 0.25 mile east of center of, in southwest angle of T road south, 4 feet west of corner post; iron post stamped "Iowa 986, 1913"	986.636

	Feet.
T. 73 N., R. 20 W., sec. 22, 0.25 mile north of quarter corner on west side of, 120 feet east of center of crossroads, in northwest corner of bridge floor; top of bolthead painted white.....	912.44
T. 73 N., R. 20 W., sec. 20, northeast of center of, at crossroads, 1 foot north of H. M. Taylor's mail box and mile board "Chariton 12, Belinda 3 miles," in top of peg; copper nail.....	957.14
T. 73 N., R. 20 W., 0.25 mile north of quarter corner on west side of sec. 20, in northeast angle of crossroads, in southwest corner of school yard; iron post stamped "Iowa 1,000, 1913".....	1,000.408
T. 73 N., R. 20 W., 0.25 mile south of the northwest corner of sec. 17, opposite T road west, 25 feet east of section corner, 1.5 feet north of telephone pole, in top of wooden peg; copper nail.....	991.11
Belinda, 0.5 mile northeast of, at northwest corner of crossroads, at southeast corner of churchyard; iron post stamped "Iowa 982, 1913".....	982.198
Belinda, 0.5 mile north by 0.5 mile west of, opposite center of T road north, 6 feet west of gate, in root of twin-maple tree; copper nail.....	986.00
T. 73 N., R. 20 W., 0.25 mile east of quarter corner on north side of sec. 6, at county line between Marion and Lucas counties, in southwest angle of T road west, 1 foot southeast of corner post, in top of wooden peg; copper nail.....	973.66
T. 74 N., R. 20 W., 0.25 mile west of the southeast corner of sec. 30, in northwest angle of crossroads, 8 feet north of corner post; iron post stamped "Iowa 887, 1913".....	887.445
T. 74 N., R. 20 W., 0.25 mile east of quarter corner on north side of sec. 30, at elbow road (north to east) 1 foot east of corner post on inside of turn, in top of wooden peg; copper nail.....	898.27
T. 74 N., R. 20 W., at quarter corner on east side of sec. 19, in northwest angle of T road west, 5 feet north of corner post, in top of peg; copper nail.....	922.70
T. 74 N., R. 20 W., at quarter corner on east side of sec. 18, at northwest angle of crossroads, southeast corner of yard, in root of 18-inch maple tree; copper nail.....	924.56
T. 74 N., R. 20 W., in southeast corner of sec. 7, opposite T road east, on west side of north-south road, 15 feet north of fence corner; iron post stamped "Iowa 869, 1913".....	869.649
T. 74 N., R. 20 W., at northwest corner of sec. 16, in southeast angle of T road south, 20 inches east of corner post, in top of peg; copper nail....	906.34
T. 74 N., R. 20 W., at quarter corner on south side of sec. 9, at T road north, 20 feet north of road junction, in southeast corner of bridge floor; copper nail.....	807.17
T. 74 N., R. 20 W., at quarter corner on north side of sec. 9, in southwest angle of crossroads, south end of plank drain, in top of; copper nail....	869.37
T. 74 N., R. 20 W., at quarter corner on north side of sec. 4, in southwest angle of T road south, 1 foot east of corner post, in top of wooden peg; copper nail.....	881.16
T. 74 N., R. 20 W., 0.25 mile east of northwest corner of sec. 4, 20 feet south and 15 feet west of junction of T road north, 3 feet north of fence; iron post stamped "901 Iowa".....	900.001

From Belinda School west along highways to point near Renfrow School.

T. 73 N., R. 20 W., sec. 20, 0.25 mile north of quarter corner on west side of, in northeast angle of crossroads, in southwest corner of school yard; iron post stamped "Iowa 1000, 1913".....	1,000.408
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T. 73 N., R. 20 W., at quarter corner on north side of sec. 19, in southwest angle of T road west, 1.5 feet west of corner post, in top of wooden peg; copper nail.....	Feet. 999. 66
T. 73 N., R. 21 W., just west of quarter corner on south side of sec. 13, at northeast corner of wooden bridge over English Creek, in plank; copper nail.....	892. 13
T. 73 N., R. 21 W., at center of sec. 23, at T road west, 4 feet west of the northwest corner of Sam Brightwell's yard, in top of peg; copper nail....	1, 011. 80
From Belinda School by devious route along highways south to northwest corner of sec. 31, T. 72 N., R. 20 W., thence west 2 miles.	
T. 73 N., R. 20 W., 0.25 mile north of quarter corner on west side of sec. 20, in northeast angle of crossroads, in southwest corner of school yard; iron post stamped "Iowa 1000, 1913".....	1, 000. 408
T. 73 N., R. 20 W., 0.25 mile north of quarter corner on east side of sec. 30, in southwest angle of crossroads, 3 feet east of corner post, in top of peg; copper nail.....	984. 43
T. 73 N., R. 20 W., in northwest corner of sec. 32, at crossroads, in northeast corner of bridge floor; copper nail in plank.....	919. 31
T. 73 N., R. 20 W., about 0.35 mile east of center of sec. 32, in northeast angle of T road at road forks, 430 feet north of bridge over North Cedar Creek, 3 feet southeast of mail box, in top of peg; copper nail.....	839. 52
T. 72 N., R. 20 W., near quarter corner on east side of sec. 5, in northeast angle of road forks, 4 feet north of pasture gate (Baker's ranch); iron post stamped "Iowa 997, 1913".....	996. 704
T. 72 N., R. 20 W., near southeast corner of sec. 5, at T road south, 25 feet east by 15 feet north of center of road junction, in root of 8-inch hickory tree; copper nail.....	1, 012. 93
T. 72 N., R. 20 W., in southwest corner of sec. 9, in northeast angle of T road north, top of concrete wing wall of culvert; bottom of chiseled square.....	989. 95
T. 72 N., R. 20 W., at southeast corner of sec. 7, on north side of road forks, 60 feet west of steel highway bridge over creek, 30 feet north of road junction; iron post stamped "Iowa 880, 1913".....	880. 422
T. 72 N., R. 21 W., near southeast corner of sec. 13, on west side of road, opposite gate to P. D. Schreck's farmyard, 2 feet south of pasture gate, in top of peg; copper nail.....	1, 015. 89
T. 72 N., R. 21 W., 0.25 mile east by 0.25 mile south of center of sec. 24, 4.5 miles east of Chariton, in northwest angle of T road west, 4 feet south of telephone pole, in top of peg; copper nail.....	1, 007. 97
T. 72 N., Rs. 20 and 21 W., 0.25 mile north of quarter corner between secs. 25 and 30, at elbow of road east to south, in front yard of John Collinson, in root of 18-inch maple tree on west side of gate; copper nail.....	1, 031. 17
T. 72 N., R. 20 W., at northwest corner of sec. 31, 1 mile north by 1 mile west of Russell, in southeast angle of crossroads, 2 feet east of corner post; iron post stamped "Iowa 1036, 1913".....	1, 036. 227
T. 72 N., R. 21 W., at quarter corner on south side of sec. 26, 80 feet west of T road north, 4.2 miles southeast of Chariton, steel highway bridge over creek, in plank in northeast corner of bridge floor; copper nail.....	930. 90
From northwest corner of sec. 3, T. 72 N., R. 20 W., along highways east 8.5 miles, thence north to Cedar Center School.	
T. 72 N., R. 20 W., at southwest corner of sec. 29, in northeast angle of crossroads, 1 mile north of Russell, 3 feet east of mile board "Albia 23," in root of elm stump; copper nail.....	1, 027. 82

	Feet.
T. 72 N., R. 20 W., in southwest corner of sec. 28, in northeast angle of T road north, east end of plank culvert, in top of plank; copper nail....	1,023.67
T. 72 N., R. 20 W., at southwest corner of sec. 27, in northeast angle of T road north, private road south, 140 feet east of Victory School, 5 feet east of fence corner; iron post stamped "Iowa 1023, 1913".....	1,022.940
T. 72 N., R. 20 W., at corner of secs. 26, 27, 34, and 35, at center of crossroads, on section stone; chiseled square.....	983.81
T. 72 N., R. 20 W., in northwest corner of sec. 36, in southeast angle of crossroads, 250 feet west of schoolhouse, on tail wall of concrete drain; bottom of chiseled square.....	999.80
T. 72 N., R. 20 W., quarter corner on north side of sec. 36, 0.25 mile east of, in southwest angle of crossroads, north of La Grange Church, 5 feet west of fence corner; iron post stamped "Iowa 1012, 1913".....	1,012.489
T. 72 N., R. 19 W., near northeast corner of sec. 31, on south side of road, at crest of hill, on east side of drive leading into S. L. Auxier's residence, on concrete block at gate; painted square.....	1,003.95
T. 72 N., R. 19 W., at quarter corner between secs. 29 and 32, at T road north, in front of Wayne School, on section stone; chiseled circle.....	1,010.28
T. 72 N., R. 19 W., at quarter corner on south side of sec. 28, in northwest angle of T road north, 1.5 miles north of Melrose, 5 feet north of corner post; iron post stamped "Iowa 994, 1913".....	994.370
T. 72 N., R. 19 W., at center of sec. 21, in northwest angle of crossroads, 12 feet north of corner post, in top of wooden peg; copper nail.....	981.80
T. 72 N., R. 19 W., about 0.35 mile east of quarter corner on south side of sec. 16, in northwest angle of T road north, 4 feet west of corner post; iron post stamped "Iowa 983, 1913".....	983.039
T. 72 N., R. 19 W., about 0.25 mile west by 0.10 mile south of the northeast corner of sec. 16, on east side of road, 10 feet north of wire gate opening into cornfield, lone red-oak tree 2.5 feet in diameter, in top of stump at base of tree; copper nail.....	964.10
T. 72 N., R. 19 W., 0.25 mile east of quarter corner on north side of sec. 9, opposite secondary T road west, 50 feet northeast of John F. Foley's mail box, 1 foot south of telephone pole, in top of peg; copper nail.....	839.41
T. 72 N., R. 19 W., at center of sec. 3, in northwest angle of road forks, 150 feet northwest of wooden bridge over Whites Creek, 6 feet west of corner post; iron post stamped "Iowa 811, 1913".....	811.399
T. 73 N., R. 19 W., at center of sec. 34, in southeast angle of T road east, concrete foundation to corner post; center of letter A in "A. B. May 22, 1913".....	966.47
T. 73 N., R. 19 W., at quarter corner on south side of sec. 27, in northwest angle of crossroads, 3 feet northeast of corner post, in osage peg; copper nail.....	964.01
T. 73 N., R. 19 W., at quarter corner between secs. 22 and 27, at T road west, on section stone; chiseled square.....	936.90
T. 73 N., R. 19 W., at northwest corner of sec. 22, at T road north, 200 feet southwest of Cedar Center School, 27 feet east by 30 feet south of section corner; iron post stamped "Iowa 943, 1913".....	942.694

At Dallas.

Dallas, west side of town, stone at corporation limits, in center of road; painted "919.8" on fence.....	919.72
Dallas, at west side of village, 200 feet northwest of highway bridge over Chicago, Rock Island & Pacific Ry., at southwest corner of main east-west street with T road north, in root of 10-inch maple tree; copper nail.....	946.32

T. 75 N., R. 21 W., 0.25 mile west of southeast corner of sec. 35, 18 feet east by 10 feet south of center of crossroads, near corner of fence post, at south-east angle of T road, in stone; aluminum tablet stamped "Prim. Trav. Sta. No. 4, 927, Iowa".....	Feet. 925. 789
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Pella quadrangle.

MAHASKA AND MARION COUNTIES.

The elevations in the following list are based on the precise line from Council Bluffs to Des Moines.

The leveling was done in 1909 by G. E. Heebink.

PELLA QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 92° 45'-93°.]

From Otley eastward along highway 9 miles, thence south to Pella, thence southwest to Howell, thence northwest to sec. 2, T. 76 N., R. 19 W.

Otley, south side of main street, 0.4 mile west of northeast corner of sec. 22, T. 77 N., R. 19 W., at T road near north edge of village, 15 feet north of fence line, 425 feet west of railroad; iron post stamped "884 Iowa".....	Feet. 882. 641
T. 77 N., R. 19 W., southwest corner of sec. 14, T corner; corner stone in center of road.....	887. 55
T. 76 N., R. 19 W., southeast corner of sec. 13, in north root of large cotton-wood tree at end of road; 40-penny nail.....	902. 02
T. 77 N., R. 18 W., 0.5 mile north of the southeast corner of sec. 18, south side of east and west road, in north root of 10-inch soft-maple tree; 40-penny nail.....	873. 02
T. 77 N., R. 18 W., 0.5 mile north of the southeast corner of sec. 17, on east side of north and south road, in southwest root of soft-maple tree 30 inches in diameter, T corner; 40-penny nail.....	853. 82
T. 77 N., R. 18 W., southeast corner of sec. 17, in southeast corner of Bethel Church yard, 35 feet southeast of front entrance of church; iron post stamped "860 Iowa".....	858. 727
T. 77 N., R. 18 W., 0.3 mile east by 0.3 mile south of the northwest corner of sec. 22, T corner, in telephone post; three 40-penny nails.....	865. 33
T. 77 N., R. 18 W., 0.3 mile south by 0.3 mile west of the northeast corner of sec. 23, west side of north and south road, 100 feet northwest of T corner, 24 feet northeast of large oak tree, 5 feet east of north and south fence; iron post.....	835. 085
Pella, opposite station; top of rail.....	878. 0
Pella, southeast corner of Central College campus; iron post stamped "878 Iowa".....	876. 843
T. 76 N., R. 18 W., 0.5 mile north of the southeast corner of sec. 9, in tele- phone post; three 40-penny nails.....	853. 92
T. 76 N., R. 18 W., 0.3 mile west of the southeast corner of sec. 9, T corner, on highest point of large rock near corner fence post; painted square....	815. 10
Howell station, near, sec. 20, T. 76 N., R. 18 W., 525 feet north of Wabash R. R. crossing, 40 feet west of road near group of mail boxes on bank, 3 feet south of barb-wire fence, T corner; iron post.....	711. 960
Howell station, 0.7 mile west of railroad crossing; north rail	717. 7
Howell station, 2 miles northeast of railroad crossing; south rail	724. 3
T. 76 N., R. 19 W., southeast corner of sec. 2, 85 feet north of center of road, 18 feet west of road, 30 feet east of bank of small creek; iron post stamped "749 Iowa".....	747. 844

From point 9 miles east of Otley east 9 miles, thence south about miles, thence west to Pella.

T. 77 N., R. 18 W., 0.25 mile south of the northeast corner of sec. 14, 170 feet east of T corner, in north root of large cottonwood tree; 40-penny nail.....	Feet. 806.50
T. 77 N., R. 18 W., northeast corner of sec. 13, west side of north and south road, opposite stone house, in east root of maple tree 20 inches in diameter; 40-penny nail.....	757.88
T. 77 N., R. 17 W., 0.3 mile south of center of sec. 7, on projecting knob of fence post, T corner; painted square.....	751.64
T. 77 N., R. 17 W., 0.3 mile north of the southeast corner of sec. 8, on south side of east and west road, on bank, 18 feet east of corner fence post; iron post stamped "806 Iowa".....	804.856
T. 77 N., R. 17 W., 0.3 mile north by 0.2 mile west of the southeast corner of sec. 9, in base of corner fence post; three 40-penny nails.....	843.72
T. 77 N., R. 17 W., 0.3 mile east of the southwest corner of sec. 10, on stone 15 feet northwest of intersection of roads; painted square.....	820.35
T. 77 N., R. 17 W., southeast corner of sec. 10, in corner fence post; three 40-penny nails.....	857.35
T. 77 N., R. 17 W., 0.5 mile north by 0.3 mile east of southwest corner of sec. 14, in root of hickory tree; 40-penny nail.....	863.22
T. 77 N., R. 17 W., 0.5 mile north of the southeast corner of sec. 14, on north side of east and west road, 60 feet northwest of intersection of roads, 3 feet south of east and west fence; iron post stamped "875 Iowa".....	873.856
T. 77 N., R. 17 W., 0.3 mile south by 0.2 mile west of the northeast corner of sec. 23, in corner fence post; three 40-penny nails.....	854.24
T. 77 N., R. 17 W., 0.5 mile west of the northeast corner of sec. 25, in fence post at corner, T corner; three 40-penny nails.....	857.79
T. 77 N., R. 17 W., 0.5 mile east of the southwest corner of sec. 25, in corner fence post, T corner; three 40-penny nails.....	798.68
T. 77 N., R. 17 W., 0.5 mile south by 0.3 mile east of the northwest corner of sec. 36, on east side of north and south road 15 feet east of center of north and south road, 50 feet north of east and west road, 18 feet north of corner fence post, 3 feet west of north and south fence; iron post stamped "742 Iowa".....	740.216
T. 77 N., R. 17 W., 0.3 mile west of the southeast corner of sec. 36, at intersection of roads, in south root of 30-inch elm tree; three 40-penny nails..	844.29
T. 76 N., R. 17 W., 0.2 mile west of the southeast corner of sec. 1, in projecting knob of base of 14-inch oak tree; 40-penny nail; T corner.....	796.01
T. 76 N., R. 17 W., 0.3 mile west of the southeast corner of sec. 13, T corner, on west side of road, 40 feet north of center of road; iron post stamped "735 Iowa".....	733.317
T. 76 N., R. 17 W., southwest corner of sec. 15, on east side of road, 17 feet southeast of road intersection, 10 feet south of corner fence post; cross-roads.....	840.341
T. 76 N., R. 17 W., 0.5 mile south of the northwest corner of sec. 18, on east side of highway, 70 feet north of Chicago, Rock Island & Pacific Ry. track, 12 feet east of center of highway; iron post stamped "856 Iowa"..	854.548
T. 76 N., R. 18 W., southeast corner of sec. 11, center of roadway, railway crossing, south rail.....	870.7

From point 8.3 miles west of Tracy east to Foster, thence north to point 8.5 miles east of Pella.

T. 75 N., R. 19 W., 0.5 mile north of the southeast corner of sec. 27, south and 55 feet west of center of crossroads, 3 feet north of fence; iron post stamped "888 Iowa".....	Feet. 886.459
T. 75 N., R. 18 W., 0.25 mile north of the southwest corner of sec. 30, on north side of road near southwest corner of Vigilance School grounds; iron post stamped "886 Iowa".....	884.979
T. 75 N., R. 18 W., center of sec. 29, T corner, on highest point of rock at intersection; painted square.....	836.60
T. 75 N., R. 18 W., 0.25 mile east of quarter corner on west side of sec. 27; iron post stamped "849 Iowa".....	847.652
T. 75 N., R. 18 W., 0.5 mile north of southeast corner of sec. 26, T corner, at side of road; stone.....	757.70
Tracy, 2 blocks east of Chicago, Burlington & Quincy R. R. station, west side of street, 3 feet east of fence, 60 feet north of Chicago, Burlington & Quincy R. R. track; iron post stamped "730 Iowa".....	728.302
Tracy, 0.5 mile east of, railroad crossing; north rail.....	694.94
Tracy, 3.5 miles east of, east of wagon road, railroad crossing; top of south rail.....	704.62
T. 75 N., R. 17 W., 0.25 mile west of quarter corner on east side of sec. 27, on east side of road, 84 feet north of Chicago, Burlington & Quincy R. R. track, 3 feet west of fence, iron post stamped "700 Iowa".....	698.736
Foster, opposite station; top of rail.....	701.45
T. 75 N., R. 17 W., quarter corner on north side of sec. 25, T corner, on rock; painted square.....	729.29
T. 75 N., R. 17 W., quarter corner on north side of sec. 24, 30 feet west and 30 feet north of center of road, southeast corner of Charles Oswaldel's place, crossroads; iron post stamped "772 Iowa".....	771.045
T. 75 N., R. 17 W., 0.25 mile north of quarter corner on south side of sec. 12, at railway crossing; top of rail.....	810.53
T. 75 N., R. 17 W., near quarter corner on east side of sec. 11, railway crossing; top of rail.....	817.51
Leighton, 0.5 mile east of, railway crossing; top of rail.....	758.13
Leighton, quarter corner on south side of sec. 35, T. 76 N., R. 17 W., west side of road, 50 feet north of railroad; iron post stamped "761 Iowa".....	759.497
T. 76 N., R. 17 W., center of sec. 26, crossroads, in corner fence post; three 40-penny nails.....	848.67
T. 76 N., R. 17 W., quarter corner on east side of sec. 25, on stone at intersection of crossroads; painted square.....	842.51
T. 76 N., R. 17 W., 0.25 mile north of southwest corner of sec. 19, T corner; iron post stamped "Prim. Trav. Sta. No. 8, Iowa, 1908, 813".....	811.246
T. 76 N., R. 17 W., 0.3 mile west of the southeast corner of sec. 13, on west side of road, 40 feet north of road, T corner; iron post stamped "735 Iowa".....	733.317

Ames, Boone, Madrid, Ogden, Slater, and Webster City quadrangles.

BOONE, DALLAS, HAMILTON, POLK, STORY, AND WEBSTER COUNTIES.

The elevations in the following list were determined by lines of primary levels based on bench marks previously established in this locality.

The leveling was done in Ames, Boone, Ogden, and Webster City quadrangles in 1912 by S. R. Archer, in Madrid quadrangle in 1911 by Howard Clark, and in Slater quadrangle in 1910 by C. H. Semper.

The Iowa State College students ran an additional line in the Ames quadrangle in 1911 starting from T. 83 N., R. 24 W., sec. 30 and connecting with Chicago & North Western Railway level bench marks near Ames.

AMES QUADRANGLE.

[Latitude 42°-42° 15'; longitude 93° 30'-93° 45'.]

From Shipley along highway north 3 miles, thence west via Ames to Ontario, thence north to northeast corner of sec. 31, T. 85 N., R. 24 W., thence east 8 miles, thence south to point 3 miles north of Shipley.

T. 83 N., R. 23 W., northeast corner of NW. $\frac{1}{4}$ sec. 27, 0.2 mile west of Shipley, southwest corner of crossroads; iron post stamped "958".....	Feet. 957.011
T. 83 N., R. 23 W., corner of secs. 21, 22, 27, and 28, 0.8 mile west of Shipley, center of forks at T road north; chiseled square on top of corner stone, marked "961.1".....	960.11
T. 83 N., R. 23 W., southeast corner of sec. 16, northwest corner of crossroads; copper nail in top of corner fence post, marked "988.5".....	987.45
T. 83 N., R. 23 W., northwest corner of sec. 15, southeast corner of crossroads; copper nail in top of corner fence post, marked "968.2".....	967.15
T. 83 N., R. 23 W., southeast corner of sec. 4, 3.5 miles west of Nevada, 4.5 miles east of Ames, northwest corner of crossroads; iron post stamped "967".....	965.858
T. 83 N., R. 23 W., northeast corner of sec. 8, southwest corner of crossroads, just inside of fence corner; copper nail in root on north side of box-elder tree, marked "973.8".....	972.82
T. 83 N., R. 23 W., northwest corner of NW. $\frac{1}{4}$ sec. 7, 2 miles east of Ames, northwest corner of schoolhouse yard, southeast corner of road forks south; copper nail in root on west side of 2 $\frac{1}{2}$ -foot maple tree, marked "944.6".....	943.62
T. 83 N., R. 24 W., southeast corner of sec. 1, north-south township line between Grant and Washington townships, 1.5 miles east of Ames, northwest corner of crossroads, at fence corner; iron post stamped "940".....	939.336
T. 83 N., R. 24 W., near north center of NW. $\frac{1}{4}$ sec. 12, 1 mile east of Ames, southwest corner of steel highway bridge over Skunk River; painted bolthead on top of steel foundation pillar, marked "890.1".....	889.13
T. 83 N., R. 24 W., near southwest corner of sec. 1, northwest corner of small bridge just east of second-class road forks south; copper nail in top of piling, marked "889.7".....	888.69
Ames, Chicago & North Western Ry. crossing on Duff Avenue; top of north rail of north main track, marked "917.8".....	916.82
Ames, SW. $\frac{1}{4}$ sec. 2, T. 83 N., R. 24 W., southwest corner of intersection of story and Kellog streets, northeast corner of post-office building, in ground; iron post stamped "922".....	920.608
T. 83 N., R. 24 W., just west of north center of sec. 10, southwest corner of concrete bridge at base of concrete railing at stream crossing; chiseled square, marked "899.9".....	898.95
T. 83 N., R. 24 W., corner of secs. 3, 4, 9, and 10, center of T road south, on top of star in cover of manhole of water system; marked "908.2".....	907.22

	Feet.
T. 83 N., R. 24 W., near southeast corner of sec. 4, on south side of street at T road north leading to Ames College; 10 feet south of manhole; chiseled square on top of west end of concrete curbing, marked "937.65"	936. 67
Ames College, at Fort Dodge, Des Moines & Southern Electric line crossing highway just west of station; top of south rail.....	913. 2
T. 83 N., R. 24 W., near center of sec. 4, center of Iowa State College campus, 250 feet south of flagpole, 550 feet west of west entrance to Agriculture Building, 300 feet northwest of Stanton Memorial Chimes tower; iron post stamped "952".....	950. 977
Iowa State College, 8.5 feet east of southeast corner of Engineering Building, just inside of stone walk; brass plug cemented in tile (engineering students' bench-mark elevation brought north from near Kelly).....	960. 019
T. 83 N., R. 24 W., near center of NW. $\frac{1}{4}$ sec. 4, northwest corner of concrete bridge over stream, top of base of concrete guard rail; chiseled square, marked "915.1".....	914. 11
T. 84 N., R. 24 W., southwest corner of sec. 32, south edge of Ontario, in northeast corner of road forks at road north; copper nail in root of willow tree, marked "998.9".....	997. 89
Ontario, just east of station, at Chicago & North Western Ry. crossing; top of south rail.....	1,000. 6
T. 84 N., R. 24 W., west center of sec. 32, 0.5 mile north of Ontario, east side of north-south road at T road west; copper nail in base of butternut tree, marked "992.96".....	991. 99
Highway bridge over Onion Creek, spike head in northwest corner of flooring.....	933. 49
T. 84 N., R. 24 W., near northwest corner of sec. 29, north end of tile drain under private road east; on east side of north-south road; painted square on top of, marked "986.8".....	985. 79
T. 84 N., R. 24 W., east center of sec. 19, southwest corner of road at T road south, in base of 3-foot oak tree; copper nail, marked "953.0".....	951. 98
T. 84 N., R. 24 W., center of sec. 19, center of T road north at schoolhouse; painted square cut in top of stone corner, marked "994.2".....	993. 18
T. 84 N., R. 24 W., 300 feet east of southwest corner of sec. 17, northwest corner of forks at T road north, in southeast foundation of small shed at windmill; square cut in top of stone, marked "954.5".....	953. 48
T. 84 N., R. 24 W., northwest corner sec. 17, 1.5 miles west by 1 mile south of Gilbert station, southeast corner of crossroads, 5 feet south of fence corner; iron post stamped "965".....	964. 255
T. 84 N., R. 24 W., corner of secs. 5, 6, 7, and 8, 1.5 miles west of Gilbert station, center of crossroads; chiseled square cut on top of stone, marked "960.1".....	959. 12
T. 85 N., R. 24 W., southwest corner of sec. 32, on east-west township line between La Fayette and Franklin townships, 1.5 miles west by 1 mile north of Gilbert station, northeast corner of crossroads; copper nail in base of telephone pole, marked "993.2".....	992. 15
T. 85 N., R. 24 W., southwest corner of sec. 29, 1.5 miles west by 2 miles north of Gilbert station, northeast corner of crossroads, southwest corner of schoolhouse yard; iron post stamped "1048".....	1,047. 281
T. 85 N., R. 24 W., northwest corner of sec. 33, 0.5 mile west by 2 miles north of Gilbert station, southeast corner of crossroads; chiseled square on top of large stone, marked "1024.2".....	1,023. 23
Gilbert station, 2 miles north of, on railroad, just south of road crossing, north end of east guardrail of small railroad bridge; top of painted bolt-head, marked "1036.2".....	1,035. 22

T. 85 N., R. 24 W., southwest corner of sec. 27, 0.5 mile east by 2 miles north of Gilbert station, northeast corner of crossroads; copper nail in top of post at east end of drain under road north, marked "1037.7".....	Feet. 1,036.73
T. 85 N., R. 24 W., southwest corner of sec. 26, 1.5 miles east by 2 miles north of Gilbert station, northeast corner of crossroads, 10 feet north of fence corner; iron post stamped "1013".....	1,012.349
T. 85 N., R. 24 W., southeast corner of sec. 26, 3.5 miles south of Story City, northwest corner of crossroads, 50 feet west of fence corner; copper nail in base of willow stump, marked "959.1".....	958.10
T. 85 N., Rs. 23 and 24 W., corner of secs. 25, 36, 30, and 31, 3.5 miles south by 0.5 mile east of Story City; in center of crossroads; chiseled square on top of stone corner mark, marked "968.6".....	967.65
T. 85 N., R. 23 W., near south center of sec. 30, in northwest corner of flooring of steel highway bridge over Skunk River; painted spike head marked "944.5".....	943.53
T. 85 N., R. 23 W., southeast corner of sec. 30, northwest corner of forks at road north, 10 feet west of northwest fence corner, 40 feet northwest of section corner stone; iron post stamped "973".....	971.796
T. 85 N., R. 23 W., southeast corner of sec. 29, 3.5 feet west of T road south, northwest corner of bridge over Bear Creek; copper nail in plank flooring, marked "964.65".....	963.69
T. 85 N., R. 23 W., southeast corner of sec. 28, 1 mile west by 2 miles south of Roland, northwest corner of crossroads, 28 feet west of southeast corner of schoolhouse yard, inside of fence; copper nail in root on west side of 18-inch box-elder tree, marked "1026.6".....	1,025.682
Tps. 84 and 85 N., R. 23 W., corner of secs. 3, 4, 33, and 34, 1 mile west by 3 miles south of Roland, at road crossing; chiseled square on top of corner stone in center of road, marked "1038.9".....	1,037.92
T. 84 N., R. 23 W., southwest corner of sec. 3, 4 miles south by 1 mile west of Roland, northeast corner of crossroads; iron post stamped "1025"....	1,023.906
T. 84 N., R. 23 W., southwest corner of sec. 10, northeast corner of crossroads; copper nail in top of north end of plank drain under road to east, marked "1013.0".....	1,012.08
T. 84 N., R. 23 W., northeast corner of sec. 21, southwest corner of crossroads, 20 feet north of southwest fence corner; chiseled square in top of large rock on bank of ditch, marked "992.2".....	991.28
T. 84 N., R. 23 W., northeast corner of sec. 28, southwest corner of crossroads, 7 feet south of corner fence post; iron post stamped "986".....	985.177
T. 84 N., R. 23 W., southwest corner of sec. 27, northeast corner of crossroads; copper nail in base of telephone pole at fence corner, marked "1000.8".....	999.81
T. 84 N., R. 23 W., southeast corner of sec. 33, 1 mile north by 3.5 miles west of Nevada, on east-west township line between Milford and Grant townships, 60 feet northwest of center of crossroads; copper nail in base of telephone pole, marked "990.9".....	989.91
Top of north rail of Chicago & North Western Ry. crossing.....	978.1
From northeast corner of sec. 31, T. 85 N., R. 24 W. along highway north 7 miles, thence east to Randall.	
T. 85 N., R. 24 W., southwest corner of sec. 20, northeast corner of crossroads; top of north end of tile drain under road to east; painted square, marked "1032.8".....	1,031.82
T. 85 N., R. 24 W., southwest corner of sec. 17, 1.5 miles south by 4.5 miles west of Story City, northeast corner of crossroads; copper nail in top of fence anchor post, marked "1068.3".....	1,067.32

	Feet.
T. 85 N., R. 24 W., southeast corner of sec. 7, 0.5 mile south by 4.5 miles west of Story City, northwest corner of crossroads, at fence corner; iron post stamped "1047"	1, 045. 580
T. 85 N., R. 24 W., southeast corner of sec. 6, 0.5 mile north by 4.5 miles west of Story City, northwest corner of crossroads; copper nail in top of west end of plank drain under road north, marked "1018.5"	1, 017. 52
T. 86 N., R. 24 W., southeast corner of sec. 31, 4 miles west by 2 miles south of Randall, northwest corner of crossroads; copper nail in top of post at end of drain under north road, marked "1019.7"	1, 018. 70
T. 86 N., R. 24 W., southeast corner of sec. 30, 4 miles west by 0.1 mile south of Randall, northwest corner of crossroads, 15 feet north of northwest fence corner; on road side of 1-foot soft-maple tree; copper nail in root, marked "1041.7"	1, 040. 63
T. 86 N., R. 24 W., southeast corner of sec. 19, 4 miles west of Randall, northwest corner of crossroads; iron post stamped "1056"	1, 055. 205
T. 86 N., R. 24 W., northwest corner of sec. 28, 3 miles west of Randall, southeast corner of crossroads, southwest corner of plank bridge floor, 60 feet east of center of crossroads; copper nail in top, marked "1036.0"	1, 034. 95
T. 86 N., R. 24 W., northeast corner of sec. 28, 2 miles west of Randall, southwest corner of crossroads, northwest corner of bridge over creek; copper nail in top of west end of north plank bridge seat, marked "1029.5"	1, 028. 45
T. 86 N., R. 24 W., near southeast corner of sec. 22, 1 mile west of Randall, northeast corner of bridge crossing stream; copper nail in floor, marked "1018.1"	1, 017. 04
Randall, 0.5 mile west of, southeast corner of SW. $\frac{1}{4}$ sec. 23, T. 86 N., R. 24 W., northwest corner of road forks; chiseled square cut in top of north end of concrete drain, marked "1022.8"	1, 021. 69
Randall, T. 86 N., R. 24 W., near northeast corner of sec. 26, at north edge of town, in northwest corner of schoolhouse yard; iron post stamped "1019"	1, 017. 895
From northeast corner of sec. 35, T. 85 N., R. 24 W., along highway north 7 miles to Randall.	
T. 85 N., R. 24 W., southeast corner of sec. 23, 2.5 miles south of Story City, northwest corner of road forks, copper nail in base of willow tree at fence corner, marked "1088.6." (This marking is probably an error)	987. 66
T. 85 N., R. 24 W., southwest corner of sec. 13, 1.5 miles south of Story City, northeast corner of crossroads, copper nail in top of east end, south side of plank drain under road north, marked "999.9"	998. 89
T. 85 N., R. 24 W., northwest corner of sec. 13, southwest edge of Story City, southeast corner of crossroads; copper nail in base of telephone pole, marked "1012.7"	1, 011. 69
Story City, street crossing at east edge of, near center of sec. 12, T. 85 N., R. 24 W., at road leading north on half-section line, northeast corner of street intersection; chiseled square in top of concrete crosswalk at gutter crossing, marked "1001.4"	1, 000. 47
Story City, northeast part of, near center of sec. 12, T. 85 N., R. 24 W., 1 block north of Main Street, at southwest corner of high-school building; iron post stamped "1000"	998. 864
T. 85 N., R. 24 W., southwest corner of sec. 1, road crossing Chicago & North Western Ry., northeast corner of intersection; top of bolthead at southeast corner of bridge No. 2205", marked "1019.3"	1, 018. 35
T. 85 N., R. 24 W., east center of sec. 2, southwest corner of crossing; top of bolthead at north end of guardrail of railroad bridge 2205, marked "1024.9"	1, 024. 01

T. 86 N., R. 24 W., southwest corner of sec. 36, 2 miles south of Randall, northeast corner of Chicago & North Western Ry. crossing east-west county-line road; spike in post of cattle guard, marked "1018.7".....	Feet. 1,017.74
T. 86 N., R. 24 W., east center of sec. 35, south side of road at bend to east, east side of railroad; spike in post of cattle guard, marked "1014.1"....	1,013.20
T. 86 N., R. 24 W., south center of SE. $\frac{1}{4}$ sec. 26, 1 mile south of Randall, northwest corner of crossroads; copper nail in base of telephone pole, marked "1017.4".....	1,016.47
From northeast corner of sec. 33, T. 85 N., R. 23 W. along highway north 7 miles, thence west to Randall.	
T. 85 N., R. 23 W., southeast corner of sec. 21, 1 mile south by 1 mile west of Roland, on west side of road at T road east, at fence line, at foot of telephone pole, 50 feet northwest of road forks, 35 feet north of east-west section line; iron post stamped "995".....	993.096
T. 85 N., R. 23 W., northwest corner of sec. 22, 1 mile west of Roland, southeast corner of crossroads; copper nail in base of electric-light line pole, marked "1022.1".....	1,020.73
Roland, 1 mile west of, top of south rail at Iowa Central Ry. crossing....	1,024.0
T. 85 N., R. 23 W., east center of sec. 9, 1.5 miles north by 1 mile west of Roland, southwest corner of crossroads; iron post stamped "1029".....	1,027.347
T. 85 N., R. 23 W., west center of SW. $\frac{1}{4}$ sec. 3, southeast corner of concrete bridge over Long Dick Creek; chiseled square cut in base of concrete railing, marked "1013.2".....	1,011.85
T. 86 N., R. 23 W., southeast corner of sec. 33, county line between Hamilton and Story counties, 3 miles north by 1 mile west of Roland, northwest corner of crossroads; chiseled square on top of north guard of concrete culvert under road west, marked "1024.9".....	1,023.61
T. 86 N., R. 23 W., southwest corner of sec. 27, 4 miles north by 1 mile west of Roland, northeast corner of crossroads; painted square on top of north end of tile drain under road east, marked "1056.96".....	1,055.67
T. 86 N., R. 23 W., southwest corner of sec. 22, 4 miles east of Randall, northeast corner of crossroads; at fence corner; iron post stamped "1093"....	1,091.423
T. 86 N., R. 23 W., northeast corner of sec. 29, 3 miles east of Randall, southwest corner of crossroads, at fence corner; chiseled square cut in top of large stone, marked "1046.8".....	1,045.58
T. 86 N., R. 23 W., southeast corner of sec. 19, 2 miles east of Randall, northwest corner of crossroads; chiseled square on top of large rock, marked "1031.2".....	1,029.92
Randall, 1 mile east of, southwest corner of sec. 19, T. 86 N., R. 23 W., on township line between Scott and Ellsworth townships, northeast corner of crossroads; chiseled square on top of stone at west end of drain under road, marked "1002.97".....	1,001.75
From Story City along highway east 4 miles.	
T. 85 N., R. 23 W., center of sec. 7, 1 mile east of Story City, at center of T road south; chiseled square in top of corner stone, marked "998.0"....	997.06
T. 85 N., R. 23 W., east center of sec. 8, 2.5 miles east of Story City, southwest corner of crossroads; copper nail in base of telephone pole, marked "1009.8".....	1,008.87
From Ontario west along highway to Jordan.	
T. 84 N., R. 25 W., southeast corner of sec. 25, at county line between Boone and Story counties, 4.5 miles east of Jordan, northwest corner of forks at T road west, at fence corner; iron post stamped "1016".....	1,014.972

T. 84 N., R. 25 W., corner of secs. 25, 26, 35, and 36, 3.5 miles east of Jordan in center of crossroads; chiseled square cut in top of corner stone, marked "1011.5".....	Feet. 1, 010.524
T. 84 N., R. 25 W., northwest corner of sec. 35, north-south section line crossing east-west road, south side of road about 20 feet east of section line, inside of fence; copper nail in top of willow stump, marked "1042.9".....	1, 041.93
From point 2 miles south of Mackey east along highway to northeast corner of sec. 31, T. 85 N., R. 24 W.	
T. 85 N., R. 25 W., southwest corner of sec. 26, 2 miles south by 1 mile east of Mackey, northeast corner of crossroads; copper nail in base of telephone pole, marked "964.3".....	963.25
T. 85 N., R. 25 W., northwest corner of sec. 36, 2 miles south by 2 miles east of Mackey, south side of road at T road north, east side of private road south; copper nail in base of telephone pole, marked "978.98".....	977.97
T. 85 N., R. 25 W., southeast corner of sec. 25, on north-south county line between Boone and Story counties, 2 miles south by 3 miles east of Mackey, northwest corner of crossroads; copper nail in base of telephone pole, marked "969.1".....	968.09
From point 5 miles north of Mackey east along highway to northeast corner of sec. 30, T. 86 N., R. 24 W.	
T. 86 N., R. 25 W., southwest corner of sec. 23, 2 miles north by 1 mile west of Rosendale, northeast corner of crossroads, southwest corner of yard to residence, inside of fence corner; copper nail in root of 2-foot cottonwood tree facing fence corner, marked "1089.8".....	1, 088.66
T. 86 N., R. 25 W., near southwest corner of sec. 24, 160 feet east of crossroads, 2 miles north of Rosendale, east side of north end of drain under road to east; copper nail in top of cedar post marked "1052.5".....	1, 051.31
T. 86 N., R. 24 W., southwest corner of sec. 19, on line between Ellsworth and Clear Lake townships, 5 miles west of Randall, northeast corner of crossroads; copper nail in top of corner fence post, marked "1046.7".....	1, 045.48
From point 4 miles north of Kelley north and east via Iowa State College to point near bridge 565 on Chicago & North Western Ry. (double line).	
[Bench marks established by Iowa State College students.]	
Dairy Farm station, south side of east-west highway, square cut on north-west corner of west head wall of 14-inch V. P., 19 feet north of pole A183..	975.28
Spike in track side of pole A177, 1.1 feet above ground.....	974.13
Square cut on northwest corner of west head wall of 2-foot V. P., 11 feet south of pole A173.....	967.45
Ames, at southeast corner of Knapp Street and Welch Avenue; on letters "St" of the word "St. Paul" on projecting base of cap of fire hydrant..	963.60
Ames, spike in track side of electric-light pole 9 feet south by 24 feet east of pole A156, north side of Knapp Street, east of track.....	964.33
Ames, spike in pole A145, on side away from the track, 4 feet above ground, east side of Ridge Avenue.....	946.54
Ames, square cut on corner of the retaining wall on southeast corner of Boone and Ridge streets, about 1.5 feet above sidewalk.....	945.34
Ames, 1.7 feet west of east end of north railing of Boone Street concrete bridge, about 100 feet west of Welsh Street.....	932.48

Ames, brass plug in concrete marked "B. M. 1," 38.5 feet west by 2.8 feet north of northwest corner of chemistry building, 18.4 feet east of 6-foot concrete walk running north-south in front of engineering laboratory, 45.2 feet southeast of southeast corner of engine room, 42.2 feet east by 4 feet south of the northeast corner of engineering laboratory; at Iowa State College.....	Feet. 955.99
Ames, southeast corner of concrete platform of the Fort Dodge, Des Moines & Southern R. R. station, 500 feet north of central building of Iowa State College.....	952.34
Ames, top of track bolt cemented into north end of east back wall of Chicago & North Western Ry. bridge 566A (railroad elevation 939.33).....	936.87
Ames, southwest corner of south coping of bridge 566; square cut (railroad elevation 929.09).....	926.63
Ames, top of track bolt cemented into north end of east back wall of bridge 565 (railroad elevation 926.99).....	924.523
Ames, b. m. 2, Iowa State College.....	913.44
Ames, cross on concrete monument.....	944.56

BOONE QUADRANGLE.

[Latitude 42°-42' 15"; longitude 93° 45'-94°.]

From bench mark 2 miles north by 0.5 mile east of Luther along highway north 1 m.le, thence east 3 miles, thence north to northeast corner of sec. 28, T. 86 N., R. 25 W.

T. 83 N., R. 25 W., southwest corner of sec. 7, on north-south township line between Colfax and Worth townships, northeast corner of crossroads, at fence corner, top of large rock; chiseled square, marked "1121.96".....	1, 121.06
T. 83 N., R. 25 W., northwest corner of sec. 17, southeast corner of crossroads, at northwest corner of grove; copper nail in root on north side of soft-maple tree, marked "1106.95".....	1, 106.04
T. 83 N., R. 25 W., corner of secs. 8, 9, 16, and 17, in center of crossroads; chiseled square on top of corner stone, marked "1082.4".....	1, 081.47
T. 83 N., R. 25 W., southeast corner of sec. 9, 1.5 miles east by 3 miles south of Jordan, northwest corner of crossroads, 7 feet north of fence corner; iron post stamped "1095".....	1, 093.738
T. 83 N., R. 25 W., northeast corner of sec. 9, 1.5 miles east by 2 miles south of Jordan, southwest corner of crossroads, inside of fence corner; copper nail in root of forked soft-maple tree, marked "1071.1".....	1, 070.21
Tps. 83 and 84 N., R. 25 W., corner of secs. 33, 34, 3, and 4, 1.5 miles east by 1 mile south of Jordan; in center of crossroads; chiseled square in top of corner stone, marked "1070.8".....	1, 069.88
T. 84 N., R. 25 W., southwest corner of sec. 27, 1.5 miles east of Jordan, northeast corner of crossroads; iron post stamped "1040".....	1, 039.379
T. 84 N., R. 25 W., southwest corner of sec. 22, northeast corner of road forks at T road east, top south end of east side of concrete drain under road north; chiseled square, marked "1045.8".....	1, 044.81
T. 84 N., R. 25 W., west center of sec. 22, 1.5 miles east by 1.5 miles north of Jordan, northeast corner of crossroads, in corner fence post; copper nail in post about 1½ feet above ground, marked "1061.3".....	1, 060.36
T. 84 N., R. 25 W., southwest corner of sec. 15, northeast corner of crossroads, inside of fence corner, just north of corner fence post; copper nail in base of willow tree, marked "1064.5".....	1, 063.50
T. 84 N., R. 25 W., southwest corner of sec. 10, northeast corner of crossroads, 65 feet northeast of center of crossroads; copper nail in base of telephone pole, marked "1045.9".....	1, 044.91

	Feet.
T. 84 N., R. 25 W., southeast corner of sec. 4, 5.5 miles west of Gilbert station, north side of road opposite T road south, just west of section line at foot of telephone pole; iron post stamped "Prim. Trav. Sta. No. 3, 1912, 1034"	1, 032. 988
T. 84 N., R. 25 W., northwest corner of sec. 3, 45 feet northeast of north end of bridge over branch of Squaw Creek, just south of township line between Jackson and Harrison townships, east side of road at fence line; copper nail in root on west side of red-oak tree, marked "972.2"	971. 19
T. 85 N., R. 25 W., southwest corner of sec. 27, 2 miles south of Mackey, northeast corner of crossroads, just east of fence corner; iron post stamped "1009"	1, 008. 180
T. 85 N., R. 25 W., corner of secs. 21, 22, 27, and 28, 1 mile south of Mackey, 20 feet east of center of crossroads, in center of road east; chiseled square cut in top of stone, marked "1025.2"	1, 024. 12
T. 85 N., R. 25 W., southwest corner of sec. 15, just west of Mackey, northeast corner of crossroads, at schoolhouse; copper nail in base of telephone pole, marked "1004.9"	1, 003. 87
T. 85 N., R. 25 W., southeast corner of sec. 9, 1 mile north of Mackey, northwest corner of crossroads, at fence corner; iron post stamped "978"	976. 833
T. 85 N., R. 25 W., corner of secs. 3, 4, 9, and 10, 2 miles north of Mackey, 10 feet south of center of crossroads; chiseled square on top of stone, marked "1025.96"	1, 024. 87
T. 86 N., R. 25 W., southeast corner of sec. 33, 3 miles north of Mackey, northwest corner of crossroads, in west end of plank drain under road to north, at mail-box post; copper nail, marked "1028.9"	1, 027. 75
T. 86 N., R. 25 W., northeast corner of sec. 33, 4 miles north of Mackey, southwest corner of crossroads; copper nail in base of telephone pole, marked "1039.2"	1, 038. 10
T. 86 N., R. 25 W., southeast corner of sec. 21, 5 miles north of Mackey, 8 miles west of Randall, northwest corner of crossroads, at fence corner; iron post stamped "1061"	1, 060. 100
From point 3 miles north by 0.5 mile east of Luther along highway northwest to Boone, thence north and east to northeast corner of sec. 28, T. 86 N., R. 25 W.	
T. 83 N., R. 25 W., southwest corner of sec. 7, 0.5 mile east by 3 miles north of Luther, northeast corner of crossroads; chiseled square on top of large rock, marked "1121.96"	1, 121. 06
T. 83 N., Rs. 25 and 26 W., corner of secs. 1, 6, 7, and 12, center of road forks at T road south; chiseled square on top of corner stone, marked "1144.1"	1, 143. 18
T. 83 N., R. 26 W., south center of SE. $\frac{1}{4}$ sec. 2, east-west road crossing Milwaukee & St. Louis R. R., on north side of road, east side of railroad; spike in base of telephone pole, marked "1140.0"	1, 139. 10
Tps. 83 and 84 N., R. 26 W., Milwaukee & St. Louis R. R. crossing township-line road between sec. 2, T. 83 N., and sec. 35, T. 84 N.; top of rail.	1, 138. 5
T. 84 N., R. 26 W., southeast corner of sec. 34, 1 mile east by 2.5 miles south of Boone, just north of township line between Des Moines and Worth townships, southwest corner of crossroads, just west of fence corner; iron post stamped "1119"	1, 117. 929
T. 84 N., R. 26 W., east center of sec. 27, 1.5 miles southeast of Boone, southwest corner of crossroads, west end of drain under road to south; chiseled square on top of stone, marked "1141.7"	1, 140. 73
Boone, T. 84 N., R. 26 W., just north of southeast corner of sec. 21, Chicago & North Western Ry. overhead-crossing road to north on north-south section line, north entrance of subway, west side of, at base of abutment, in top of concrete curbing running north; chiseled square, marked "1116.6"	1, 115. 63

	Feet.
Boone, in grass plot on north side of east entrance to post-office building; iron post stamped "1134".....	1, 133.406
Boone, 1 mile north of, northwest corner of sec. 22, T. 84 N., R. 26 W., at fair grounds, southeast corner of crossroads; chiseled square on top of concrete foundation of manhole of storm sewer, marked "1140.0".....	1, 139.08
T. 84 N., R. 26 W., corner of secs. 9, 10, 15, and 16, 2 miles north of Boone, in center of road forks at T road west; chiseled square on top of corner stone, marked "1141.85".....	1, 140.89
T. 84 N., R. 26 W., northeast corner of sec. 9, 3 miles north of Boone, southwest corner of crossroads, at fence corner; iron post stamped "1135".....	1, 133.829
T. 84 N., R. 26 W., northwest corner of sec. 3, 4 miles north of Boone, southeast corner of crossroads, 20 feet southeast of center of roads, 17 feet northwest of southeast fence corner; chiseled square on top of stone, marked "1131.8".....	1, 130.78
T. 85 N., R. 26 W., west center of sec. 34, 4.5 miles north of Boone, southeast corner of crossroads; chiseled square on top of stone at fence corner, marked "1138.7".....	1, 137.75
T. 85 N., R. 26 W., west center of SW. $\frac{1}{4}$ sec. 27, 5.2 miles north of Boone, houses on both east and west sides of road, in front of house on east side of road, on fence line east of road, 20 feet south of gate to house; copper nail in root of 1 $\frac{1}{2}$ -foot maple tree, marked "1176.8".....	1, 175.80
T. 85 N., R. 26 W., east center of SE. $\frac{1}{4}$ sec. 21, 6.1 miles north of Boone, 0.1 mile north of crossroads; southeast corner of schoolhouse yard, west side of road; iron post stamped "1177".....	1, 176.455
T. 85 N., R. 26 W., southeast corner of sec. 16, 7 miles north of Boone, northwest corner of crossroads; copper nail in top of north end of plank drain under road to west, marked "1137.0".....	1, 136.01
T. 85 N., R. 26 W., northeast corner of sec. 16, 0.5 mile north by 2.2 miles east of Ridgeport, southwest corner of crossroads; copper nail in base of telephone pole, marked "1163.0".....	1, 162.02
T. 85 N., R. 26 W., northeast corner of sec. 9, southwest corner of crossroads, 7 feet south of southwest fence corner; iron post stamped "1138".....	1, 136.704
T. 86 N., R. 26 W., southwest corner of sec. 34, on county line between Webster and Boone counties, northeast corner of crossroads; copper nail in base of corner fence post, marked "1106.4".....	1, 105.38
T. 86 N., R. 26 W., northwest corner of sec. 34, 2.5 miles east by 3 miles south of Stratford, southeast corner of crossroads, at fence corner; iron post stamped "1084".....	1, 082.577
T. 86 N., R. 26 W., southeast corner of sec. 27, northwest corner of crossroads; painted square on top of west end of tile drain under road north, marked "1045.4".....	1, 044.45
T. 86 N., R. 26 W., northwest corner of sec. 36, southeast corner of crossroads, at foot of corner fence post; chiseled square on top of stone, marked "1061.4".....	1, 060.47
T. 86 N., R. 25 W., northwest corner of sec. 31, on north-south township line between Marion and Clear Lake townships, 1 mile west by 4.5 miles south of Stanhope, southeast corner of crossroads, at fence corner; iron post stamped "1033".....	1, 031.596
T. 86 N., R. 25 W., 0.1 mile east of south center of sec. 30, northeast corner of T road north, in corner fence post; copper nail marked "1030.5".....	1, 029.63
T. 86 N., R. 25 W., southwest corner of sec. 20, 3.5 miles south of Stanhope, northeast corner of T road north, in base of corner fence post; copper nail, marked "1046.0".....	1, 045.17

T. 86 N., R. 25 W., corner of secs. 20, 21, 28, and 29, 3.5 miles south by 1 mile east of Stanhope, in center of T road south at forks; chiseled square on top of corner stone, marked "1062.5".....	Feet. 1,061.71
T. 86 N., R. 25 W., southeast corner of sec. 21, 5 miles north of Mackey, northwest corner of crossroads; iron post stamped "1061".....	1,060.100
From northeast corner of sec. 33, T. 86 N., R. 26 W., along highways by indirect route, to sec. 19, T. 86 N., R. 27 W., thence south to center of T. 83 N., R. 27 W.	
T. 86 N., R. 26 W., corner of secs. 28, 29, 32, and 33, 1.5 miles east by 3 miles south of Stratford, center of crossroads; chiseled square on top of stone, marked "1076.0".....	1,075.00
T. 86 N., R. 26 W., northeast corner of sec. 29, 2.5 miles south by 1.5 miles east of Stratford, 60 feet south of road forks west; painted square on top of west end of tile drain under road to south, marked "1074.3".....	1,073.26
T. 86 N., R. 26 W., north center of sec. 30, 2.5 miles south of Stratford, south side of road, 55 feet west of center of road at forks north, at fence corner; iron post stamped "1121".....	1,120.101
T. 86 N., R. 27 W., 0.1 mile west of south center of sec. 24, 280 feet east of house on north side of road; chiseled square on top of stone at north end of drain under road, marked "1124.9".....	1,123.94
T. 86 N., R. 27 W., south center of sec. 23, at T road east, west side of road; copper nail in base of corner fence post, marked "1128.1".....	1,127.10
T. 85 N., R. 27 W., east center of SE. $\frac{1}{4}$ sec. 9, 1 mile east by 1.2 miles north of Pilot Mound, northwest corner of crossroads; copper nail in base of corner fence post, marked "1159.1".....	1,158.17
T. 86 N., R. 27 W., southwest corner of sec. 15, 1 mile east of Pilot Mound, northeast corner of road forks north, at fence corner; iron post stamped "1121".....	1,120.316
T. 84 N., R. 27 W., northwest corner of sec. 10, 4 miles south by 1 mile east of Pilot Mound, southeast corner of road forks south, northwest corner of schoolhouse yard; iron post stamped "1119".....	1,118.017
T. 84 N., R. 27 W., west center of NW. $\frac{1}{4}$ sec. 15, northeast corner of crossroads; chiseled square in top of stone, marked "1111.7".....	1,110.79
T. 84 N., R. 27 W., 0.2 mile north of center of sec. 22, southeast corner of road forks east, 15 feet west of east fence line, 50 feet south of center of road forks; 8-penny nail about 1 foot above ground in south side of oak tree, marked "930.626".....	929.73
T. 84 N., R. 27 W., near east center of SE. $\frac{1}{4}$ sec. 21, west side of road, top of hill, 200 feet south of bend in road to south, southeast corner of yard to house; spike in east side of trunk of hickory tree 1 foot in diameter, 1 foot above ground and marked "1088.2".....	1,087.28
T. 84 N., R. 27 W., south center of SE. $\frac{1}{4}$ sec. 21, 1.5 miles north by 1.8 miles east of Ogden, center of road forks south; chiseled square on top of corner stone, marked "1088.5".....	1,087.56
T. 84 N., R. 27 W., southwest corner of sec. 27, 0.5 mile north by 2 miles east of, on east side of north-south road at T road west, near telephone pole; iron post stamped "1064".....	1,063.191
T. 84 N., R. 27 W., southeast corner of sec. 33 (near), southwest corner of crossroads; chiseled square on top of west end of concrete drain under road south, marked "1081".....	1,080.10
T. 83 N., R. 27 W., southeast corner of sec. 4, 1.5 miles south by 2 miles east of Ogden, in northwest corner of T road north, southeast corner of schoolhouse yard; iron post stamped "1082".....	1,081.348

T. 83 N., R. 27 W., southwest corner of sec. 10, on north side of road at T road south, foot of corner fence post, west side of gate; chiseled square on concrete foundation, marked "1089.6".....	Feet. 1,088.74
T. 83 N., R. 27 W., northwest corner of sec. 22, southeast corner of cross-roads, northwest corner of schoolhouse yard, inside fence corner; iron post stamped "Prim. Trav. Sta. No. 14, 1093".....	1,092.280

MADRID QUADRANGLE.

[Latitude 41° 45'-42"; longitude 93° 45'-94".]

From sec. 23, T. 82 N., R. 25 W., west to Madrid.

T. 82 N., R. 25 W., south corner between secs. 26 and 27; spike in telephone pole, marked "U. S. B. M. 1008".....	1,007.00
T. 82 N., R. 25 W., south corner between secs. 27 and 28; spike in corner fence post, marked "U. S. B. M. 1010".....	1,008.46
T. 82 N., R. 25 W., southeast corner of sec. 29; iron post stamped "1000".....	998.766

From Madrid north 9 miles, thence west to point 3 miles south by 2 miles east of Ogden, thence south 9 miles, thence east to Madrid.

Madrid, on south end of middle pier of cement railroad bridge about 250 feet east of station; aluminum tablet stamped "997".....	995.769
Madrid, 1.9 miles north of, on east side of north-south highway; spike in base of telephone pole at T road.....	1,042.24
Madrid, 2.4 miles north of, southwest corner of sec. 18, Garden Township, at T road; iron post stamped "1033".....	1,031.730
Madrid, 3.3 miles north of, at southwest corner of sec. 7, Garden Township, at road crossing; spike in base of telephone pole.....	1,060.45
Madrid, 4.4 miles north of, southwest corner of sec. 6, Garden Township, at T road; spike in base of telephone pole, marked "1077.70".....	1,076.37
Madrid, 5.9 miles north of, at T road, southwest corner of sec. 31, Colfax Township; iron post stamped "1080".....	1,078.397
Madrid, 7 miles north of, at road crossing, northeast corner of sec. 36, Worth Township; copper nail in root of maple tree.....	1,100.75
Madrid, 8 miles north of, at road crossing, southwest corner of sec. 19, Colfax Township; spike in base of telephone pole.....	1,097.79
Madrid, 9 miles north of, at road crossing, southeast corner of sec. 13, Worth Township; iron post stamped "1106".....	1,104.565
Madrid, 8 miles north by 1 mile west of, at road crossing, in sec. 23, Worth Township; spike in base of telephone pole.....	1,120.11
Madrid, 8 miles north by 3 miles west of, southwest corner of sec. 15, Worth Township; iron post stamped "Prim. Trav. Sta. No. 15, 1094".....	1,092.664
Madrid, 7.5 miles north by 3 miles west of, at T road, in front of Gildea School, in sec. 22, Worth Township; copper nail in root of oak tree on east side of north-south highway.....	1,089.77
Moingona, 1.5 miles southeast of, northwest corner of sec. 20, Marcy Township, west abutment of Sixteen to One Bridge over Des Moines River....	872.80
Moingona, 1.5 miles south of, at Y road, southeast corner of sec. 13, Marcy Township; iron post stamped "1060".....	1,058.725
Moingona, 1.5 miles south by 1.2 miles west of, at T road, southeast corner of sec. 14, Marcy Township; spike in base of telephone pole.....	1,080.18
Ogden, 3 miles south by 2 miles east of, at Marcy Center School, northwest corner of sec. 22, Marcy Township, in corner of school lot; iron post stamped "Prim. Trav. Sta. No. 14, 1093".....	1,092.28

Ogden, 4 miles south by 2 miles east of, at road crossing, northeast corner of sec. 28, Marcy Township; spike in base of telephone pole.....	Feet. 1,075.12
Ogden, 5 miles south by 2 miles east of, at road crossing, southwest corner of sec. 27, Marcy Township; spike in base of telephone pole.....	1,085.24
Ogden, 6 miles south by 2 miles east of, at road crossing, southeast corner of sec. 33, Marcy Township; iron post stamped "1088".....	1,087.114
Ogden, 7 miles south by 2 miles east of, at road crossing, southwest corner of sec. 3, Peoples Township; spike in base of telephone pole.....	1,108.50
Ogden, 8 miles south by 2 miles east of, at road crossing; southeast corner of sec. 9, Peoples Township; spike in base of telephone pole.....	1,090.17
Ogden, 9 miles south by 2 miles east of, at road crossing near church, northeast corner, of sec. 21, Peoples Township; iron post stamped "1072"....	1,071.035
Ogden, 10 miles south by 2 miles east of, at road crossing, southeast corner of sec. 21, Peoples Township; spike in base of telephone pole.....	1,021.78
Woodward, 2.5 miles west by 3 miles north of, at road crossing; northwest corner of sec. 26, Peoples Township; spike in base of telephone pole....	1,071.49
Woodward, 1.5 miles west by 2.5 miles north of, at T road, southwest corner of sec. 24, Peoples Township; spike in base of fence post.....	1,072.43
Woodward, 0.5 mile west by 2.5 miles north of, at road crossing, northeast corner of sec. 25, Peoples Township; spike in base of telephone pole....	1,058.08
Woodward, 2 miles north of, at T road, center of sec. 30, Cass Township; iron post stamped "1038".....	1,036.898
Woodward, 2 miles north by 1 mile east of, at T road, center of sec. 29, Cass Township; spike in base of telephone pole.....	1,023.94
Madrid, 3 miles west of, at road crossing, southeast corner of sec. 28, Cass Township; iron post stamped "894".....	892.973
From point 2 miles east of Madrid south to point 1.5 miles north of Granger, thence west to point 0.5 mile south by 3 miles west of Woodward, thence north to point 3 miles north by 2.5 miles west of Woodward.	
T. 81 N., R. 25 W., northeast corner of sec. 5; spike in telephone pole, marked, "U. S. B. M. 991".....	989.69
T. 81 N., R. 25 W., southeast corner of sec. 5; spike in corner fence post, marked "U. S. B. M. 992".....	991.00
Madrid, 2 miles east by 3 miles south of, at T road, northeast corner of sec. 17, Madison Township; spike in base of fence post.....	938.17
Madrid, 2 miles east by 3.5 miles south of, at road crossing near United Brethren Church, west side of sec. 16, Madison Township; spike in root of maple tree.....	975.07
Madrid, 2 miles east by 4.5 miles south of, at crossroads, west side of sec. 21, Madison Township; iron post stamped "951".....	949.429
High Bridge, 1.5 miles east by 0.25 mile north of, at T road, west side of sec. 20, Madison Township; spike in base of telephone pole.....	914.62
High Bridge, 1.5 miles east of, at T road, southwest corner of sec. 20, Madison Township; spike in base of fence post.....	929.03
Granger, 1.5 miles north by 2 miles east of, at T road in front of school-house, southeast corner of sec. 31, Madison Township; iron post stamped "974".....	972.673
Granger, 2 miles north of, at T road, center of sec. 36, Des Moines Township; spike in base of fence post.....	982.99
Granger, 1.5 miles north of, at T road; spike in base of fence post.....	952.48
Granger, 1.5 miles north by 1 mile west of, at road crossing; spike in base of telephone pole.....	902.89

	Feet.
Granger, 1.5 miles north by 2 miles west of, at Nixon Electric R. R. station; spike in base of trestle post at overhead crossing	877. 05
Granger, 1.5 miles north by 2.5 miles west of, at T road; copper nail in southwest corner of bridge floor over Beaver Creek	868. 79
Moran, 2.5 miles south by 1 mile east of, at Y road, southeast corner of sec. 32, Des Moines Township; iron post stamped "878"	876. 688
Moran, 2.5 miles south of, at road crossing, southwest corner of sec. 32, Des Moines Township; spike in base of fence post	928. 33
Woodward, 5 miles south of, at road crossing, southwest corner of sec. 31, Des Moines Township; spike in base of fence post	983. 61
Woodward, 5 miles south by 1 mile west of, at road crossing, northwest corner of sec. 1, Sugar Grove Township; spike in base of fence post	982. 40
Woodward, 5 miles south by 2 miles west of, at T road, northwest corner of sec. 2, Sugar Grove Township; spike in base of fence post	954. 08
Woodward, 5 miles south by 3 miles west of, at road crossing, southeast corner of sec. 33, Beaver Township; iron post stamped "955"	954. 107
Woodward, 4 miles south by 3 miles west of, at road crossing, southeast corner of sec. 28, Beaver Township; spike in base of fence post	930. 85
Woodward, 3 miles west by 3 miles south of, at road crossing, northwest corner of sec. 27, Beaver Township; spike in base of telephone pole	941. 37
Woodward, 2 miles south by 3 miles west of, at T road near school building, northwest corner of sec. 22, Beaver Township; spike in base of telephone pole	961. 13
Beaver Park station on electric railroad, at crossing; top of rail	909. 86
Woodward, 1 mile south by 2 miles west of, at T road, north side of sec. 14, Beaver Township; iron post stamped "910"	909. 150
Woodward, 2 miles west of, at road crossing; southeast corner of sec. 3, Beaver Township; spike in base of telephone pole	950. 81
Woodward, 0.5 mile north by 2 miles west of, at T road, southeast corner of sec. 34, Peoples Township; spike in base of fence post	1, 007. 94
Woodward, 1 mile north by 2 miles west of, at road crossing, west side of sec. 35, Peoples Township; spike in base of fence post	1, 016. 31
Woodward, 1.5 miles north by 2 miles west of, at T road, southeast corner of sec. 27, Peoples Township; spike in base of fence post	1, 038. 34
From point 2.5 miles south by 1 mile east of Moran south and east to NE. $\frac{1}{4}$ sec. 16, T. 80 N., R. 26 W.	
T. 80 N., R. 26 W., 200 feet east of southwest corner of sec. 4; spike head in northeast corner of wooden bridge over small creek	917. 50

OGDEN QUADRANGLE.

[Latitude 42°-42° 15'; longitude 94°-94° 15'.]

From Des Moines River near center of T. 86 N., R. 27 W., south along highways indirectly to point 4 miles south of Pilot Mound. (See Boone quadrangle list for additional elevations.)

T. 86 N., R. 27 W., near center of sec. 20, bend in road to west, east side of road at bend; copper nail in base of telephone pole, marked "1122.3"	1, 121.33
T. 86 N., R. 27 W., west center of sec. 20, northeast corner of crossroads, at fence corner; iron post stamped "Prim. Trav. Sta. No. 6, 1912, 1130"	1, 128. 531
T. 86 N., R. 27 W., southeast corner of sec. 19, northwest corner of forks at T road west; copper nail in base of corner fence post, marked "1132.6"	1, 131. 66
T. 86 N., R. 27 W., northeast corner of sec. 31, southwest corner of crossroads, in corner of fence post; copper nail marked "1129.5"	1, 128. 55

	Feet.
T. 86 N., R. 27 W., northeast corner of sec. 32, 4 miles north of Pilot Mound, 60 feet southwest of center of crossroads, on west side of road; copper nail in root of 3-foot cottonwood tree, marked "1133.9".....	1, 132. 95
T. 85 N., R. 27 W., north center of SW. $\frac{1}{4}$ sec. 4, 2.8 miles north of Pilot Mound, southeast corner of crossroads; copper nail in base of telephone pole, marked "1140.0".....	1, 139. 09
T. 85 N., R. 27 W., near center of SW. $\frac{1}{4}$ sec. 9, 1.5 miles northeast of Pilot Mound, southeast corner of road forks east, south end of drain under road to east, 50 feet east of center of road forks; chiseled square on top of stone, marked "1140.7".....	1, 139. 74
T. 85 N., R. 27 W., southwest corner of sec. 16, northeast edge of Pilot Mound, northeast corner of crossroads; copper nail in base of telephone pole, marked "1110.3".....	1, 109. 32
T. 85 N., R. 27 W., 0.2 mile north of southwest corner of sec. 21, bend in road to southeast, north side of mound, east side of road, 15 feet north of fence corner; nail in top of stake in ground at fence post, marked "1124.9"....	1, 123. 94
T. 85 N., R. 27 W., 0.1 mile east of southwest corner of sec. 21, 1 mile south of Pilot Mound, in center of road forks at T road north; chiseled square on top of stone, marked "1127.7".....	1, 126. 77
T. 85 N., R. 27 W., north center of NW. $\frac{1}{4}$ sec. 33, 2.2 miles south of Pilot Mound, southeast corner of crossroads; chiseled square on top of stone on south side of east road, marked "1122.6".....	1, 121. 67
T. 84 N., R. 27 W., north center of NW. $\frac{1}{4}$ sec. 4, on line between townships Pilot Mound and Yell, southwest corner of road forks at T road west; copper nail in top of south end of plank drain under road west, marked "1101.5".....	1, 100. 60
T. 84 N., R. 27 W., south center of SW. $\frac{1}{4}$ sec. 4, northwest corner of road forks north; copper nail in base of telephone pole, marked "1110.0".....	1, 109. 09

SLATER QUADRANGLE.

[Latitude 41° 45'-42"; longitude 93° 20'-93° 45'.]

From NE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 18, T. 80 N., R. 24 W. north to Polk City.

T. 80 N., R. 24 W., NE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 18, 150 feet west of road fork, Corydon Bridge; iron post stamped "850 Adj 1903".....	848. 913
T. 80 N.; R. 25 W., northwest corner of sec. 12, north side of road at three corners; spike in telephone pole, marked "U. S. B. M. 906".....	904.43
Polk City, in northwest corner of front face of Polk City Savings Bank; aluminum tablet stamped "890".....	888. 624

From Polk City north to sec. 36, T. 83 N., R. 25 W., thence east to sec. 27, T. 83 N., R. 23 W., thence south and west to Polk City.

T. 81 N., R. 25 W., southeast corner of NW. $\frac{1}{4}$ sec. 36, at three corners, road to west; top of rock marked "U. S. \square B. M. 916".....	914. 41
T. 81 N., R. 25 W., 450 feet north of northwest corner of sec. 25, on west side of road; spike in telephone pole, marked "U. S. B. M. 931".....	931. 14
T. 81 N., R. 25 W., northeast corner of sec. 23; iron post stamped "956".....	954. 557
T. 81 N., R. 25 W., northwest corner of sec. 13; spike in telephone pole, marked "U. S. B. M. 960".....	958. 48
T. 81 N., R. 25 W., northwest corner of sec. 12; spike in fence post, marked "U. S. B. M. 1001".....	999. 52
T. 82 N., R. 25 W., southeast corner of sec. 35; iron post stamped "1008".....	1, 007. 114
T. 82 N., R. 25 W., southwest corner of sec. 25; spike in base of telephone pole marked "U. S. B. M. 1024".....	1, 022. 33

	Feet.
T. 82 N., R. 25 W., southwest corner of sec. 25; spike in fence post, marked "U. S. B. M. 1040"	1, 038. 63
T. 82 N., R. 25 W., southeast corner of sec. 14; iron post stamped "1049" ..	1, 047. 809
T. 82 N., R. 25 W., northeast corner of sec. 14; spike in telephone pole, marked "U. S. B. M. 1044"	1, 042. 59
T. 82 N., R. 25 W., southwest corner of sec. 1; spike in fence post, marked "U. S. B. M. 1040"	1, 037. 60
T. 82 N., R. 25 W., northwest corner of sec. 1; iron post stamped "1046" ..	1, 044. 226
T. 83 N., R. 25 W., northwest corner of sec. 36; spike in fence post marked "U. S. B. M. 1049"	1, 047. 96
T. 83 N., R. 25 W., southeast corner of sec. 25; spike in telephone pole, marked "U. S. B. M. 1040"	1, 038. 76
T. 83 N., R. 24 W., southeast corner of sec. 30; iron post stamped "1032" ..	1, 030. 455
T. 83 N., R. 24 W., southwest corner of sec. 28; spike in telephone pole, marked "U. S. B. M. 1003"	1, 001. 60
T. 83 N., R. 24 W., southeast corner of sec. 28; spike in base of telephone pole, marked "U. S. B. M. 1017"	1, 015. 64
T. 83 N., R. 24 W., center of sec. 27, at northwest corner of crossroads; iron post stamped "987"	986. 151
T. 83 N., R. 24 W., center of sec. 26, southeast corner of crossroads; spike in telephone pole, marked "U. S. B. M. 943"	941. 79
T. 83 N., R. 24 W., center of line between secs. 25 and 26, southwest corner of crossroads; top of large rock, marked "□ U. S. B. M. 930"	928. 30
T. 83 N., R. 24 W., center of east side of sec. 25; spike in telephone pole, marked "U. S. B. M. 932"	930. 28
T. 83 N., R. 23 W., 0.25 mile east of west end of south border of sec. 19; iron post stamped "870"	869. 015
T. 83 N., R. 23 W., 0.25 mile east of southwest corner of sec. 20, northeast corner of crossroads; spike in telephone pole, marked "U. S. B. M. 888" ..	886. 92
T. 83 N., R. 23 W., southwest corner of sec. 21; spike in telephone pole, marked "U. S. B. M. 921"	919. 81
T. 83 N., R. 23 W., northeast corner of NW. $\frac{1}{4}$ sec. 27; iron post stamped "958"	957. 011
T. 83 N., R. 23 W., northwest corner of NE. $\frac{1}{4}$ sec. 34; spike in telephone pole, marked "U. S. B. M. 972"	970. 36
T. 83 N., R. 23 W., southwest corner of SE. $\frac{1}{4}$ sec. 34; spike in telephone pole, marked "U. S. B. M. 1010"	1, 008. 33
T. 82 N., R. 23 W., northeast corner of NW. $\frac{1}{4}$ sec. 10; iron post stamped "942"	940. 907
T. 82 N., R. 23 W., southeast corner of SW. $\frac{1}{4}$ sec. 10; spike in corner post, marked "U. S. B. M. 918"	916. 56
Cambridge, 1 mile northeast of, iron bridge over county ditch, top of east abutment of north wing wall; marked "□ U. S. B. M. 855"	853. 32
Cambridge, in front face of Citizens State Bank; aluminum tablet stamped "872"	870. 442
Cambridge, in front of station; top of rail.	861. 6
T. 82 N., R. 23 W., southwest corner of SE. $\frac{1}{4}$ sec. 28; spike in telephone pole, marked "U. S. B. M. 884"	882. 93
T. 81 N., R. 23 W., northwest corner of NE. $\frac{1}{4}$ sec. 4, line between Story and Polk counties; spike in telephone pole, marked "U. S. B. M. 906"	904. 51
T. 81 N., R. 23 W., northwest corner of NE. $\frac{1}{4}$ sec. 9; iron post stamped "910"	908. 698

T. 81 N., R. 23 W., about 0.25 mile east of northwest corner of sec. 18, southeast corner of crossroads; spike in telephone pole, marked "U. S. B. M. 898".....	Feet. 896. 96
T. 81 N., R. 23 W., southeast corner of sec. 17; spike in telephone pole, marked "U. S. B. M. 981".....	979. 38
T. 81 N., R. 23 W., northwest corner of sec. 28; iron post stamped "986".....	984. 513
T. 81 N., R. 23 W., southwest corner of sec. 28; spike in telephone pole, marked "U. S. B. M. 985".....	983. 84
T. 80 N., R. 23 W., southeast corner of sec. 32; spike in telephone pole, marked "U. S. B. M. 982".....	981. 26
T. 80 N., R. 23 W., northeast corner of sec. 6; iron post stamped "959".....	958. 215
T. 81 N., R. 23 W., southwest corner of sec. 31; spike in telephone pole, marked "U. S. B. M. 974".....	972. 56
T. 81 N., R. 24 W., corner between secs. 35 and 36; spike in telephone pole, marked "U. S. B. M. 943".....	942. 12'
T. 81 N., R. 24 W., center of sec. 35, road south.....	946
T. 81 N., R. 24 W., southwest corner of sec. 35; iron post stamped "979".....	977. 418
T. 80 N., R. 24 W., northeast corner of sec. 4; spike in telephone pole, marked "U. S. B. M. 981".....	980. 08
T. 81 N., R. 24 W., southwest corner of sec. 33; spike in telephone pole, marked "U. S. B. M. 975".....	974. 22
T. 80 N., R. 24 W., northeast corner of sec. 6; iron post stamped "977".....	975. 742
T. 81 N., R. 24 and 25 W., between secs. 1 and 6; spike in telephone pole, marked "U. S. B. M. 879".....	878. 22
Polk City, in front of station; top of rail.....	850. 6

From sec. 26, T. 83 N., R. 24 W., south to sec. 4, T. 80 N., R. 24 W.

T. 82 N., R. 24 W., 0.25 mile north of center of sec. 2, road to east; spike in telephone pole, marked "U. S. B. M. 977".....	976. 11
T. 82 N., R. 24 W., southwest corner of SE. $\frac{1}{4}$ sec. 2; iron post stamped "979".....	977. 405
T. 82 N., R. 24 W., northwest corner of NE. $\frac{1}{4}$ sec. 14; spike in telephone pole, marked "U. S. B. M. 1001".....	1, 000. 12
T. 82 N., R. 24 W., southwest corner of SE. $\frac{1}{4}$ sec. 14; spike in telephone pole, marked "U. S. B. M. 1003".....	1, 001. 99
Huxley, near center of north side of sec. 26, T. 82 N., R. 24 W., 50 feet west of electric-railway station; iron post stamped "1040".....	1, 038. 481
T. 82 N., R. 24 W., northwest corner of NE. $\frac{1}{4}$ sec. 27; spike in telephone pole, marked "U. S. B. M. 1048".....	1, 046. 79
T. 82 N., R. 24 W., northwest corner of NE. $\frac{1}{4}$ sec. 34; spike in telephone pole, marked "U. S. B. M. 1037".....	1, 035. 94
T. 82 N., R. 24 W., southwest corner of SE. $\frac{1}{4}$ sec. 34; spike in telephone pole, marked "U. S. B. M. 1021".....	1, 019. 49
T. 82 N., R. 24 W., corner of secs. 2, 3, 34, and 35.....	1, 017
T. 81 N., R. 24 W., southwest corner of sec. 2; iron post stamped "1010".....	1, 008. 810
T. 81 N., R. 24 W., southeast corner of sec. 10; spike in telephone pole, marked "U. S. B. M. 1009".....	1, 007. 38
T. 81 N., R. 24 W., southeast corner of sec. 9; spike in telephone pole, marked "U. S. B. M. 985".....	983. 97
T. 81 N., R. 24 W., northeast corner of sec. 21; iron post stamped "1007".....	1, 005. 593
T. 81 N., R. 24 W., northeast corner of sec. 28; spike in telephone pole, marked "U. S. B. M. 989".....	987. 64
T. 81 N., R. 24 W., northwest corner of sec. 34; spike in telephone pole, marked "U. S. B. M. 995".....	993. 58

From Kelley north 4 miles.

[Established by Iowa State College students.]

Kelley, on west side of equalizer foundation in south pipe line (of 2), 33 feet west of pole 770, 21 feet east of similar equalizer in north pipe line; square cut.....	Feet. 1, 027. 23
Kelley, square cut on track side of concrete base of eastbound home signal, 10.5 feet east of point of switch, 30 feet east of pole 766.....	1, 027. 14
Kelley, square cut on east end of baggage-door lintel of station of Fort Dodge, Des Moines & Southern Ry., opposite pole 763.....	1, 029. 29
Kelley, spike in track side of pole 757, 1 foot above ground.....	1, 030. 69
Kelley, spike in track side of pole A414, 1 foot above ground.....	1, 029. 73
T. 83 N., R. 24 W., spike in track side of pole A386, south side of east-west road along north line of sec. 32.....	1, 013. 03
Pole A360, 1 foot above ground, in track side of; spike.....	1, 015. 89
T. 83 N., R. 24 W., spike in track side of pole A332, 1 foot above ground, first pole north of east-west road along north line of sec. 29.....	1, 023. 31
Pole A308, 1.3 feet above ground, in track side of; spike.....	1, 021. 40
T. 83 N., R. 24 W., spike in track side of pole A273, 1 foot above ground, pole is on south side of east-west road along north line of sec. 28.....	1, 004. 33
Zumwalt station, spike in telephone pole 39 feet south of pole A253, 16 feet west of center line of track, 1 foot above ground.....	983. 91
Pole A225, 45 feet north of, on northeast corner of east head wall of 12-inch pipe; square cut.....	959. 42
Pole A195, 1 foot above ground, in track side of; spike.....	935. 66

WEBSTER CITY QUADRANGLE.

[Latitude 42° 15'-42° 30'; longitude 93° 45'-94°.]

Bench marks near southwest corner of quadrangle.

T. 86 N., R. 27 W., north center of sec. 23, 1.5 miles south by 2 miles west of Stratford, inside of fence corner, southeast corner of crossroads; iron post stamped "1111".....	1, 110. 058
T. 86 N., R. 27 W., near north center of NW. $\frac{1}{4}$ sec. 22, southwest corner of road forks at T road south; copper nail in corner fence post, marked "1106.9".....	1, 105. 93
T. 86 N., R. 27 W., near north center of sec. 21, east end of south side of steel highway bridge over Des Moines River; painted bolthead in top of southeast circular pier, marked "920.5".....	919. 55

Burlington quadrangle.

[Latitude 40° 45'-41°; longitude 91°-91° 15'.]

DES MOINES COUNTY.

The elevations in the following list are based on Mississippi River Commission bench marks in accord with the 1907 adjustment. These bench marks were not changed by the 1912 adjustment.

The leveling was done in 1910 by S. R. Archer.

Bench marks established at Burlington.

Burlington, top of water table, northwest corner of Front and Valley streets, marked "537.48".....	Feet. 537. 66
Burlington, Chicago, Burlington & Quincy R. R. bridge over Mississippi River; chiseled square on top of north wing wall of west abutment, marked "U. S. B. M. 542.2".....	542. 37

Burlington, Chicago, Burlington & Quincy R. R. bridge over Mississippi River, on south end of bridge seat of west abutment; chiseled square cut in top, marked "535.7" (U. S. Corps of Engineers bench mark)..... Feet. 535.902

Edgington and Muscatine quadrangles.

MUSCATINE COUNTY.

The elevations in the following list were determined in 1913 by C. R. French and depend on heights of bench marks of the Mississippi River Commission:

EDGINGTON QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 90° 45'-91°.]

From Montpelier north and west to Sweetland, thence southwest to point 1.5 miles northeast of Muscatine Bridge.

Montpelier, on street running north from station, opposite and in line with south side of schoolhouse, 0.5 meter east of wire fence on west side of street; iron post stamped "Mississippi River Commission 1892," surmounting U. S. Corps of Engineers b. m. 145/3. (The cap on this pipe is quite loose, varying from 0.01 to 0.02 foot in elevation).....	Feet. 604.94
T. 77 N., R. 1 E., near northwest corner of sec. 13, 1.25 miles north of Montpelier, west side of road, south side of drain, on top of fence post (about on level with roadbed); copper nail marked "702.94".....	702.95
T. 77 N., R. 1 E., about middle of west line of NW. $\frac{1}{4}$ sec. 12, southeast corner of T road south, 2.5 feet above center of road, 6 feet east of corner fence post; copper nail about middle of brace post, marked "762.20"...	762.23
T. 77 N., R. 1 E., center of north half of sec. 11; T road north, marked "733".....	733
T. 77 N., R. 1 E., about center of W. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 11, in southeast corner of T road south, 3 feet south of fence post, 15 feet east of fence line; iron post stamped "696".....	695.922
T. 77 N., R. 1 E., about center of N. $\frac{1}{2}$ sec. 10, on south side of road opposite drive to residence of O. A. Bohnsack, in base of brace post; copper nail.....	659.40
T. 77 N., R. 1 E., near north line of sec. 9; T road east, marked "629.9"...	630
T. 77 N., R. 1 E., about middle of north line of NE. $\frac{1}{4}$ sec. 9, southeast corner of bridge over branch of Pine Creek, 150 feet west of north-south road, 1 foot north of east end of south truss; copper nail in floor, marked "633.10".....	633.16
T. 77 N., R. 1 E., near northeast corner of sec. 8, 100 feet west of crest of hill, 70 feet south of roadway, opposite barn, on top of stump in field; copper nail, marked "710.63".....	710.70
T. 77 N., R. 1 E., northwest corner of NE. $\frac{1}{4}$ sec. 8, southeast corner of crossroads, in northwest corner of Patterson schoolhouse lot; iron post stamped "Prim. Trav. Sta. No. 2 Iowa 1910, 728".....	728.044
T. 77 N., R. 1 E., northwest corner of sec. 8, 150 feet east of crossroads, near middle of south side of bridge, in floor; copper nail, marked "654.50"...	654.58
T. 77 N., R. 1 E., northwest corner of sec. 7, southeast corner of T road east, east end of wooden drainpipe; copper nail, marked "715.36".....	715.45
T. 77 N., meridian line SE. $\frac{1}{4}$ sec. 1, R. 1 W., middle of east line; T road west, marked "724.9".....	725
T. 77 N., R. 1 W., near southwest corner of sec. 1, north side of road, on east side of Pine Creek, 20 feet northeast of northeast corner of bridge over Pine Creek, 15 feet northwest of 6-inch box elder, 10 feet east of 4-foot box elder, 13 feet east of 6-inch box elder; iron post stamped "623"...	622.864

	Feet.
T. 77 N., R. 1 W., near center of south line of NW. $\frac{1}{4}$ sec. 2, on telegraph road, south end of east steel floor beam of bridge over Pine Creek; painted square, marked "637.65".....	637.77
T. 77 N., R. 1 W., about quarter corner between secs. 2 and 3; T road south, marked "665.6".....	666
T. 77 N., R. 1 W., near northwest corner of SW. $\frac{1}{4}$ sec. 3, on south side of road, 30 feet west of telegraph pole 485, 10 feet east of north-south fence line, in base of brace post; copper nail marked "748.26".....	748.39
Sweetland, T. 77 N., R. 1 W., northeast corner of NW. $\frac{1}{4}$ sec. 9, southwest corner of crossroads, 5 feet west of fence corner, 1 foot north of fence; iron post stamped "752".....	752.651
T. 77 N., R. 1 W., southwest corner of SE. $\frac{1}{4}$ sec. 9, northeast corner of crossroads, on north concrete head wall of drain; chiseled square marked "741.84".....	742.00
T. 77 N., R. 1 W., northeast corner of NW. $\frac{1}{4}$ sec. 21, southwest corner of crossroads, west end of cast-iron drainpipe; painted square, marked "723.31".....	723.48
T. 77 N., R. 1 W., about center of SW. $\frac{1}{4}$ sec. 21, south tree of row of four maple trees on north side of walk leading to Mr. Sabbath's residence; in root of tree; copper nail marked "731.63".....	731.81
T. 77 N., R. 1 W., near west line of sec. 28, northeast corner of road forks, northeast from river road, 1.5 feet west of fence, 20 feet north of fence; iron post stamped "558.8".....	559.054
T. 77 N., R. 1 W., NW. $\frac{1}{4}$ sec. 29, near middle of south line, at road forks, southeast corner of bridge on river road; top of plank backing for steel abutment marked "558.70".....	558.90

MUSCATINE QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 91°-91° 15'.]

Near Muscatine Bridge.

Muscatine Bridge, 1.5 miles above, 1 meter north of hedge fence on property of Capt. John W. Anderson, 1 meter east of east line of John Berry's property, 3 meters 34° to 12-inch wild-cherry tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 141/4). (Cap of iron pipe had been removed; the pipe was removed, the line tied to copper bolt, and then pipe was put in place again, but no new elevation for top established).....	595.68
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Nebraska City quadrangle.

FREMONT COUNTY.

The elevations in the following list are based on bench mark 327 established by the Missouri River Commission 3,884 feet north of the railroad station at Nebraska City Junction, Iowa. The bench mark is a buried stone with a copper bolt, 3 feet under ground, surmounted by an iron post with a cap terminating in a rounded knob, marked "Missouri River Commission;" the accepted elevation of the top of cap is 923.689 feet.

The leveling was done in 1905 by F. W. Hughes.

NEBRASKA CITY QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 95° 45'-96°.]

Vicinity of Nebraska City Junction.

Nebraska City Junction, 3,884 feet north of station, 45 feet east of Chicago, Burlington & Quincy R. R. track, on sand knoll; top of cap of iron pipe marked "Missouri River Commission".....	Feet. 923. 689
Nebraska City Junction, 600 feet north of station, 40 feet west of Chicago, Burlington & Quincy R. R. tracks; iron post stamped "Prim. Trav. Sta. No. 1, 924, Adj, 1903".....	922. 450
Nebraska City Junction, 2 miles west of, 40 feet south of crossing, 30 feet east of center of road; iron post stamped "923, Adj, 1903".....	922. 291

Canton and Elk Point quadrangles.**LYON AND PLYMOUTH COUNTIES.**

The elevations in the following list were determined by primary leveling extended from bench marks of the Missouri River Commission and the Coast and Geodetic Survey.

The leveling was done in the Canton quadrangle in 1896 by Alfred Tyler, and in the Elk Point quadrangle in 1898 by D. C. Wray.

CANTON QUADRANGLE.

[Latitude 43°-43° 30'; longitude 96° 30'-97°.]

Near Granite; portion of circuit, most of which is in South Dakota.

T. 99 N., R. 48 W., northwest corner of sec. 6; iron post stamped "Ynkt 1420".....	Feet. 1, 419. 700
T. 100 N., R. 48 W., northwest corner of sec. 19; iron post stamped "Ynkt 1343".....	1, 343. 277

ELK POINT QUADRANGLE.

[Latitude 42° 30'-43°; longitude 96° 30'-97°.]

From sec. 3, T. 91 N., R. 49 W., east to line between Rs. 48 and 49 W., thence north to Akron.

T. 91 N., R. 48 W., sec. 6, northwest corner of; iron post stamped "Ynkt 1314".....	1, 313. 920
T. 92 N., R. 48 W., sec. 6, northwest corner of; iron post stamped "Ynkt 1140".....	1, 139. 544

APPENDIX A.

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

Blair, Burlington, Canton (30'), Dakota, Davenport, Edgington, Elkader (30'), Elk Point (30'), Fort Madison, Galena, Hamburg, Honey Creek, Hudson, Ireton, Keokuk, Lancaster (30'), Lomax, McPaul, Milan, Miles, Missouri Valley, Muscatine, Nebraska City, Omaha and vicinity, Onawa, Peosta (30'), Tekamah, and Waukon (30') quadrangles.

ALLAMAKEE, CLAYTON, DES MOINES, DUBUQUE, FREMONT, HARRISON, JACKSON, LEE, LYON, MILLS, MONONA, MUSCATINE, PLYMOUTH, POTTAWATTAMIE, SCOTT, SIOUX, AND WOODBURY COUNTIES.

The following descriptions and elevations, taken from reports of the Coast and Geodetic Survey, are republished by permission of the superintendent of that bureau. The bench marks were established by the Coast and Geodetic Survey, by the Mississippi River Commission, and by the Missouri River Commission from precise leveling, and were included in the 1912 adjustment by the Coast and Geodetic Survey. The elevations are likely to be changed but little by any future adjustment.

KEOKUK QUADRANGLE.

[Latitude 40° 15'–40° 30'; longitude 91° 15'–91° 30'.]

At Keokuk.

Keokuk, in coping of shore side of lower lock of Des Moines Rapids canal, in recess between stone steps and stone pier of lower hydraulic tower, on south side of pier; copper bolt (U. S. C. E. p. b. m. 1).....	Feet. 493. 641
Keokuk, in south face of Iowa shore pier of railroad bridge, 8 inches above bench of pier, in tenth stone from west end; copper bolt (U. S. C. E. p. b. m. 2).....	494. 346
Keokuk, in southwest corner of three-story stone building, owned by Mr. Patterson, facing on Water Street, second door from corner of Johnson Street, 8 inches above doorsill, on inner side of outer wall, 50 feet from corner of Water and Johnson streets; copper bolt (U. S. C. E. p. b. m. 3).....	509. 559
Des Moines River bridge, at intersection of cross cut in upper surface of stone buttress; small conical hole (U. S. C. E. p. b. m. 4).....	499. 828

From Keokuk north near Mississippi River to a point near Viele station.

Keokuk, 2 miles above, in coping of west wall of sluiceway at south end of middle canal lock; copper bolt (U. S. C. E. p. b. m. 1).....	501. 571
Nashville, in top of coping of west wall near southwest tower of guard lock; brass bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 2).....	507. 922
Montrose, in upper foundation stone of brick store building on south corner of Main and Cedar streets, on east side, 3 feet from north corner; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 3).....	530. 432
Viele station, 1 mile south of, in top of west end of south abutment of Chicago, Burlington & Quincy R. R. bridge over Painter Creek; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 4).....	543. 293

FORT MADISON QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 91° 15'-91° 30'.]

From point near Vile station north-northeast near Mississippi River to point 9 miles north of Fort Madison.

Vile station, 0.5 mile south of, in northeast cornerstone of middle pier of Chicago, Burlington & Quincy R. R. bridge over Little Devils Creek; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 5).....	Feet. 537. 361
Vile station, 0.5 mile north of, in top of stone abutment of Chicago, Burlington & Quincy R. R. bridge over Devils Creek; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 6).....	542. 318
Fort Madison, in water table of Central Hotel on Front Street, near station, near center of building on south side; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 7).....	534. 513
Fort Madison, in middle of west side of brick chimney of woodenware factory on northeast corner of Front Street and Broadway, 3 feet above base of chimney in building owned by W. H. Cretzinger; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 8).....	539. 671
Fort Madison, 4 miles above, on brick house of James Gibbs, in top foundation stone on south side, 3 feet from southeast corner, house stands about 150 meters west of Chicago, Burlington & Quincy R. R. track; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 9).....	545. 996

LOMAX QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 91°-91° 15'.]

From point 9 miles north of Fort Madison northeast near Mississippi River to point south of Burlington.

Fort Madison, 9 miles north of, on east abutment of Chicago, Burlington & Quincy R. R. bridge over Skunk River, in north end of abutment; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 10).....	548. 076
Burlington, 3.5 miles south of, on south side of Chicago, Burlington & Quincy R. R., on north side of stone building known as Patterson's grocery near northeast corner, 2½ feet from ground; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 11).....	540. 156

MUSCATINE QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 91°-91° 15'.]

From Port Louisa north near Mississippi River to point 5 miles northeast of Muscatine.

Port Louisa, on top of southeast corner of stone foundation of tall chimney of old sawmill (mill now torn down) (U. S. C. E. p. b. m. 24).....	545. 429
Muscatine, 7.5 miles south of, 22 meters south of gate leading to Esquire Walton's house, 8 meters north of wagon road, 15 meters from edge of river bank; top of stone with block over it and three marking stakes set 3 feet off and three small black-locust trees blazed near by; top of stone is about 1 foot below surface of ground (U. S. C. E. p. b. m. 25).....	544. 428
Muscatine, 7 miles below, on brick foundation of E. Beatty's dwelling on right bank of river, in east side of northeast corner of foundation; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 26).....	548. 539
Muscatine, on brick chimney of Hershey's lower sawmill, on middle of east face of chimney, about 3 feet above ground; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 27).....	550. 455
Muscatine, on waterworks chimney, in north face, about 1.1 meters from ground; copper bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 28).....	551. 964

Muscatine, 50 meters north of station, on north abutment of wagon bridge, in northeast corner of abutment; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 29).....	Feet. 552.417
Muscatine, 3 miles north of, on abutment of Chicago, Rock Island & Pacific R. R. bridge, in top of stone coping of south end of west abutment; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 30).....	553.595

EDGINGTON QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 90° 45'-91°.]

From point 5 miles northeast of Muscatine east near Mississippi River to West Davenport.

Muscatine, 5 miles northeast of, on abutment of Chicago, Rock Island & Pacific R. R. bridge over Sweetland Creek, in west end of north abutment; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 31).....	552.814
Muscatine, 6 miles above, in natural rock on line of Chicago, Rock Island & Pacific R. R., in face of rock where it has been blasted off for railroad bed, 4 feet above track, 20 feet north of center of track, 740 meters west of bridge 77; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 32).....	561.452
Fairport, on foundation of pottery owned by John Feasted, in west side near southwest corner of stone foundation, 350 meters above railroad station and near river bank; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 33).....	555.550
Montpelier, 2 miles north of, on middle pier of bridge over Pine Creek, on line of Chicago, Rock Island & Pacific R. R., in north end of pier of bridge 60; brass bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 34)...	554.605
Montpelier, 1 kilometer south of, on south pier of Chicago, Rock Island & Pacific R. R. bridge 52, in west end of pier; brass bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 35).....	564.812
Montpelier, 0.5 mile east of station, on west abutment of Chicago, Rock Island & Pacific R. R. bridge 45, in south end of abutment; brass bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 35a).....	557.309
Buffalo, on William Karge's brick store and post-office building, in east side near southeast corner, 3 feet above foundation, at northwest corner of Hecker and Second streets; brass bolt (U. S. C. E. p. b. m. 36).....	565.438
Buffalo, 0.5 mile east of, on foundation of brick house of Eliza M. Dodge, in upper foundation stone on west side, near southwest corner, 1 meter from ground, 100 meters north of Chicago, Rock Island & Pacific R. R.; brass bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 37).....	568.936

DAVENPORT QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 90° 30'-90° 45'.]

Near Davenport.

West Davenport, at lower end of, near river bank, in west side near southwest corner of foundation of vinegar works, 0.4 meter from ground; brass bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 38).....	567.505
Davenport, in north abutment of Rock Island & Davenport R. R. bridge over main channel of Mississippi River, in coping of east or upper side of abutment, on plane with sidewalk, 4.1 meters from river face of abutment and 0.1 meter inside of railing; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 39).....	573.562

MILAN QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 90° 30'-90° 45'.]

From point near Davenport east near Mississippi River to point near Watertown, Ill.

Arsenal Island, at lower end of, on base of stone tower of United States arsenal stone building A1865, in east side of northeast corner, 4 feet from ground; copper bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 40).. Feet.
577. 627

MILES QUADRANGLE.

[Latitude 42°-42° 15'; longitude 90° 15'-90° 30'.]

From point near Harris Landing, Ill., northwest near Mississippi River to point near Bellevue.

Golden's wood yard, 0.3 mile below log house at, opposite Island 253, 56 feet from top of bank, 2 feet below fence on lower side of clearing and upper side of woods, which runs at about right angles to river bank, 8 feet from 10-inch ash tree, blazed facing bench; copper bolt set in tile surmounted by iron pipe (U. S. C. E. p. b. m. 315):

Copper bolt..... 587. 722

Cap on pipe..... 591. 685

Bellevue, 5.5 miles below, at third tree from river of same row of trees where t. b. m. 333 is located, on south side of slough at foot of Island 250, 88 feet from northwest corner of Mr. Golden's log house; copper bolt set in tile and surmounted by iron pipe (U. S. C. E. p. b. m. 313):

Copper bolt..... 589. 002

Cap on pipe..... 592. 972

Bellevue, 3.5 miles below, on line of Chicago, Milwaukee & St. Paul Ry., 705 feet below stone culvert on which t. b. m. 331 is located, 177 feet below lower side of C. A. Harrington's stone barn, 40 feet above wooden drain under track, at lower end of small cut, 33 feet east from center of track, 1.5 feet west of east right-of-way fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 311):

Copper bolt..... 595. 636

Cap on pipe..... 599. 628

Bellevue, 3.5 miles below, on line of Chicago, Milwaukee & St. Paul Ry. track, 250 feet above C. A. Harrington's house, on southwest corner of stone culvert, 3 feet above south side and 3 inches back from west end, marked "U□S"; highest point in square (U. S. C. E. p. b. m. 331).....

600. 412

Bellevue, 2.5 miles below, 0.2 mile below bridge 42K, 0.3 mile below milepost 142-19, on line of Chicago, Milwaukee & St. Paul Ry., 279 feet above sluiceway under track, 12 feet west of center of track, on west side of ditch, on natural outcropping of ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 329).....

605. 721

Bellevue, 2 miles below, 558 feet above center of Chicago, Milwaukee & St. Paul Ry. bridge 42K over Duck Creek, 148 feet above milepost 142-19, at upper side of highway crossing, at south side of fence running to cattle guard, 20 feet east of center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 309):

Copper bolt..... 605. 166

Cap on pipe..... 609. 146

GALENA QUADRANGLE.

[Latitude 42° 15'-42° 30'; longitude 90° 15'-90° 30'.]

From point near Bellevue northwest near Mississippi River to point near Gordons Ferry.

Bellevue, in lower end of, on river bank, in first building above sawmill, a two-story stone store, owned by M. G. Heiler, at its west front, second door from north end, marked "U □ S"; copper bolt (U. S. C. E. p. b. m. 308).....	Feet. 610. 858
Bellevue, in south end of, on line of Chicago, Milwaukee & St. Paul Ry., on bridge 44K over Mill Creek, between flour mill and sawmill, on north pier at its east end, marked "U □ S"; highest point in square (U. S. C. E. p. b. m. 326).....	608. 355
Bellevue, at river shore, on Killburn & Co.'s warehouse, on projecting stone at east end of south wall, just below iron-bolt plate; highest point in circle cut in stone (U. S. C. E. old. U. S. b. m.).....	597. 033
Bellevue, on southeast corner of Court and Second streets, on front of stone store owned by John Baumann, on lower end of water table, 2½ feet above south corner; copper bolt marked "U. S. ⊙ P. B. M." (U. S. C. E. p. b. m. 307).....	619. 297
Bellevue, in upper part of, on west line of Front Street, in northeast corner of lot owned by Mrs. Booth, 2 feet south from north side of lot and south side of street; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 305):	
Copper bolt.....	618. 900
Cap on pipe.....	622. 899
North Bellevue, 1 mile above, 40 feet back from high-water line on river bank, 45 feet north of bank of creek which is crossed by Chicago, Milwaukee & St. Paul Ry. bridge 48K where p. b. m. 302 is located, about 984 feet from said railroad, 410 feet below large stone arch culvert under wagon road, 36 feet south from another wagon road winding around south point of bluff; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 303 and 304):	
Copper bolt.....	591. 761
Cap on pipe.....	595. 734
North Bellevue, 1 mile above, on line of Chicago, Milwaukee & St. Paul Ry., 1,279 feet below milepost 138-23, in north abutment, east end of bridge 48K, on third course of stone from top; copper bolt marked "U. S. ⊙ P. B. M." (U. S. C. E. p. b. m. 302).....	626. 521
Bellevue slough, behind, 262 feet from low-water edge, 1.2 miles below Smiths, 3 miles above North Bellevue, 1,900 feet above bridge 50K, 150 feet below stone culvert on right of way at east fence, but a few feet below t. b. m. 323; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 300 and 301):	
Copper bolt.....	606. 203
Cap on pipe.....	610. 176
Smiths station, 1.2 miles below, behind Bellevue slough, on Chicago, Milwaukee & St. Paul Ry., 148 feet below stone culvert about in center of short, heavy fill, at lower end of long curve, 60 feet east of center of track, several feet outside of right of way, 1,902 feet above bridge 50, on 10-inch oak tree; spike in root (U. S. C. E. t. b. m. 323).....	608. 798

Smiths station, 0.8 mile above, on opposite side of track from t. b. m. 321, at head of Bellevue slough, 110 feet above bridge 56, 55 feet below lower line of A. M. Brown's house, 12 feet below cattle guard, on river side of track, 16 feet from center, on small bench of ground between cattle guard and gate leading down to river; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 298 and 299):	
Copper bolt.....	602. 147
Cap on pipe.....	606. 130
Smiths station, above, at point of bluff at head of Bellevue slough, at lower end of cut, in front of house owned by A. M. Brown, 15 feet below path running to this house, 125 feet above bridge 56, at upper side of cattle guard, 12 feet west of center of track, on natural ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 321).....	607. 607
Gordons Ferry, 1.5 miles below, 0.3 mile below milepost 132-29, on low ridge at upper side of coulee, 49 feet west from center of Chicago, Milwaukee & St. Paul Ry. track, on right of way, at west fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 296 and 297):	
Copper bolt.....	607. 203
Cap on pipe.....	611. 216
Gordons Ferry, 1.2 miles below, on line of Chicago, Milwaukee & St. Paul Ry., 396 feet below milepost 132-29, 18 feet west of center of track, 0.5 foot above surface of ground, on flat rock, marked "U □ S"; highest point in square (U. S. C. E. t. b. m. 318).....	611. 180
Gordons Ferry, 250 feet below bridge 64, 215 feet below station, 125 feet above lower headblock of siding, 45 feet below lower side of stockyard, 34 feet from center of main track on bluff side; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 294 and 295):	
Copper bolt.....	614. 320
Cap on pipe.....	618. 303
Gordons Ferry, 0.5 mile above, 1,876 feet below bridge 66, 1,213 feet above water tank, midway between two projecting points of bluff 12 feet west from center of track, 1½ feet above grade on natural ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 315).....	612. 082
Gordons Ferry, 1 mile above, 345 feet above Tete du Mort Creek, 215 feet below bridge 68, on which t. b. m. 314 is located, 75 feet below old stone building, 27 feet west of center of Chicago, Milwaukee & St. Paul Ry. track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 292 and 293):	
Copper bolt.....	600. 707
Cap on pipe.....	604. 710
Gordons Ferry, 1 mile above, on line of Chicago, Milwaukee & St. Paul Ry., 52 feet below sign "Gordon's Ferry one mile," on south abutment, river end of bridge 68K, just above ruins of large stone house, on fourth course of stone from top, on center of north end of inner stone, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 314).....	599. 185

PEOSTA 30' QUADRANGLE.

[Latitude 42°-42° 30'; longitude 90° 30'-91°.]

From point near Gordons Ferry northwest, near Mississippi River, to point near Dubuque.

Gordons Ferry, 3 miles above, 285 feet above t. b. m. 312, 125 feet below center of bridge 72K, opposite head of Island 235, 43 feet west of center of Chicago, Milwaukee & St. Paul Ry. track, on right of way, at railroad fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 290 and 291):	
Copper bolt.....	Feet. 604.415
Cap on pipe.....	608.417
Snyder's wood yard, opposite head of Island 235, 1,270 feet above milepost 128-33, 410 feet below bridge 72K, 12 feet west of center of track, on lower end of very large inclined rock at rocky point, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 312).....	611.489
Ninemile Island, 1 mile below foot of, on south abutment of bridge 76, west end, on second course of stone from top, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 311).....	611.551
Ninemile Island, opposite foot of, at wood yard, 20 feet below road leading from wood yard across Chicago, Milwaukee & St. Paul Ry. track up bluff, 36 feet east from center of track and 2 feet west of east right-of-way fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 288 and 289):	
Copper bolt.....	603.772
Cap on pipe.....	607.771
Massey station, 1.4 miles below, on south abutment of Chicago, Milwaukee & St. Paul Ry. bridge 78K, west end, on second course of stone from top, on southwest corner, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 308).....	607.082
Ninemile Island, behind, 0.5 mile below Massey station, 1,970 feet below milepost 124-37, 449 feet above Chicago, Milwaukee & St. Paul Ry. bridge 80K, 170 feet below bridge 82K, 30 feet west of center of track, spike in base of black-oak tree (U. S. C. E. t. b. m. 307).....	609.690
Shawondasse Club station, 6 miles below Dubuque, on line of Chicago, Milwaukee & St. Paul Ry., 76 feet below south end of platform and 86 feet above boundary fence between Paul Eiffer's and Frank Noel's lands, on west side of track, 47.1 feet from center; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 286 and 287):	
Copper bolt.....	602.771
Cap on pipe.....	606.771
Dubuque, 5 miles below, 0.5 mile above Ninemile Island, near Cattes siding, on south abutment of bridge 86, where t. b. m. 304 is located, on river end of abutment, lowest course of stone, on northeast corner of step, now marked "□"; highest point in square (U. S. C. E. old U. S. b. m. 24).....	591.042
Cattes siding, near, 5 miles below Dubuque and 0.5 mile above head of Ninemile Island, on south abutment of bridge 86, river end, on second course of stone below bridge seat, on northeast corner, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 304).....	607.315
Cattes siding, 1 mile below, 1.3 miles above head of Ninemile Island, on line of Chicago, Milwaukee & St. Paul Ry., directly opposite milepost 122-39, on bluff side, 9 feet from center, on natural ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 303).....	615.054

Cattes siding, 72 feet above lower headblock of switch at, 15 feet west from center of side track, in natural ledge of rock marked "U□S," opposite foot of Island 228; highest point in square (U. S. C. E. t. b. m. 302)....	Feet. 617.226
Cattes siding, 669 feet above upper headblock of switch to, on upper side of coulee, where t. b. m. 301 is located, 344 feet below milepost 121-40, 43 feet from center of track, on bluff side, in fence corner by gate; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 284-285):	
Copper bolt.....	613.031
Cap on pipe.....	617.030
Dubuque, 3.2 miles below, 660 feet below milepost 121-40, 370 feet above upper headblock of siding at Cattes and 295 feet below Creston Crossing, on lower side of coulee, 25 feet west of center of track, on natural ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 301)..	616.807
Dubuque, 1 mile below, at point of bluff on south side of Rugdale hollow, through which Illinois Central Ry. passes from river, 36 feet from t. b. m. 299, 623 feet from Chicago, Milwaukee & St. Paul Ry. bridge, 180 feet above house owned by R. Smith, 131 feet west from center of track, 43 feet northwest from blazed elm on upper side of large flat rock; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 282 and 283):	
Copper bolt.....	610.038
Cap on pipe.....	614.037
Dubuque, 1 mile below, at point of bluff on lower side of ravine through which the Illinois Central Ry. passes from river, 623 feet below bridge on Chicago, Milwaukee & St. Paul Ry. track, 164 feet above house owned by R. Smith, 98 feet west of center of Chicago, Milwaukee & St. Paul Ry. track, on top of large flat rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 299).....	610.779
Dubuque, in southern extremity of, at bluff, 0.1 mile below sawmill, directly opposite end of runway to mill, 305 feet above headblock of sawmill siding, 26 feet west from center of siding, in recess in face of rock bluff; copper bolt (U. S. C. E. p. b. m. 281).....	612.463

LANCASTER 30' QUADRANGLE.

[Latitude 42° 30'-43°; longitude 90° 30'-91°.]

From Dubuque northwest near Mississippi River to point near Buena Vista.

Dubuque, at river front below harbor, on southeast corner of Houser & Linnehan's boat store, 1½ feet above corner, on water table, in center of buttress, marked "⊙"; highest point of circle in circle (U. S. C. E. old U. S. b. m. b).....	606.311
Dubuque, at river front below harbor, on Diamond Joe store, on upstream end of upstream stone doorsill, marked "□"; highest point of circle in square (U. S. C. E. old U. S. b. m. a).....	607.450
Dubuque, on Illinois Central station, at north end, about in center of east side of tower, in water table; highest point in square (U. S. C. E. t. b. m. 297).....	608.309
Dubuque, on west end and first pier of Illinois Central Ry. bridge across Mississippi River, at upper end of pier, near its west edge, about in center of bridge-seat stone; copper bolt marked "U. S. ⊙ P. B. M." (U. S. C. E. p. b. m. 280).....	618.106
Dubuque, north side of Fourth Street, opposite Chicago, Milwaukee & St. Paul Ry. station, on Page House, on water table 6 inches in front of west window, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 296).....	608.391

Dubuque, on Jess's store, on southwest corner of First and Main streets, near southeast corner of Jess's store, on north end of doorstep; highest point in square (U. S. C. E. city b. m.).....	Fect. 608.976
Dubuque, on Julien House, on north side of Second Street, at east door of older part of Julien House, on east end of doorstep, which is about 32 feet west of Iowa Street; highest point in square (U. S. C. E. city b. m.)..	612.626
Dubuque, at northeast corner of United States post-office building, 10 inches south of north corner and 3 feet above stone pavement; copper bolt marked "U. S. ☉ P. B. M." (U. S. C. E. p. b. m. 279).....	644.838
Dubuque, on southwest corner of Elm and Ninth streets, on end of curb abutting against the northeast corner of Chicago, St. Paul & Kansas City freight house, marked "U☐S"; highest point in square (U. S. C. E. t. b. m. 295).....	607.548
Dubuque, at northwest corner of Fifteenth and Pine streets, on south side of Iowa Coffin Co.'s warehouse, on west end of first doorstep from Pine Street; copper bolt marked "U. S. ☉ P. B. M." (U. S. C. E. p. b. m. 278)	609.624
Dubuque, 0.5 mile below Chicago, Milwaukee & St. Paul Ry. shops, at southeast corner of Iowa Coffin Co.'s warehouse, on top of foundation stone; highest point in square (U. S. C. E. t. b. m. 294).....	609.500
Dubuque, in upper part of, on line of Chicago, Milwaukee & St. Paul Ry., at northwest corner of their freight-car repair shop, on southwest corner of foundation stone, marked "U☐S"; highest point in square (U. S. C. E. t. b. m. 293).....	611.085
Eagle Point, 0.2 mile below Dubuque Woodenware Co.'s works, on line of Chicago, Milwaukee & St. Paul Ry., 2,181 feet above milepost 115-46, 394 feet above bridge 114, 267 feet below bridge 114½, over sewer, on upper end of mound built up from earth excavation from opposite side of track, 1½ feet west from east fence and 13.6 feet from center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 276 and 277):	
Copper bolt.....	608.017
Cap on pipe.....	612.010
Eagle Point, Dubuque, in main building of Dubuque Woodenware Co., on river bank, in foundation on south side, 1.8 feet from west corner and 2.1 feet above ground; copper bolt, marked "U. S.☉P. B. M." (U. S. C. E. t. b. m. 275).....	605.875
Eagle Point, Dubuque, on Dubuque Woodenware Co.'s drying house, east of railroad tracks, on top of stone foundation, 10 feet from west side, on lower side of building, marked "U☐S"; highest point in square (U. S. C. E. t. b. m. 291)	608.864
Eagle Point, above Dubuque, at prominent point of river bank covered with large rock, above ferry landing, on southwest portion of very large triangular-shaped rock lying at water's edge; highest point in bottom part of letter "B" cut on rock (U. S. C. E. old U. S. b. m. 23).....	594.527
Eagle Point, 1.25 miles above, 0.2 mile below milepost 113-48, midway between two small wooden-box culverts, 20 feet west of center of track, on natural ledge, marked "U☐S"; highest point in square (U. S. C. E. t. b. m. 289).....	618.348
Eagle Point, 2.3 miles above, 58 feet south of small stone culvert on which t. b. m. 287 is located, 436 feet below bridge 122K, 896 feet below railroad platform in front of Mr. James Cushing's house, 23.3 feet east of center of track, on right of way; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 273 and 274):	
Copper bolt.....	608.283
Cap on pipe.....	612.279

Eagle Point, 2.3 miles above, 1,569 feet below milepost 112-49, 1,161 feet above bridge 120K, 377 feet below bridge 122K, 836 feet below small railroad platform in front of Mr. Cushing's house, 6 feet west from center of track, on upper end of capstone of small stone culvert, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 287).....	Feet. 611. 406
Edmore Siding, 0.8 mile above, on right of way of Chicago, Milwaukee & St. Paul Ry. track, 531 feet below south end of bridge 124K over Little Maquoketa River, 6.8 miles above Dubuque, on west side of track, 2 feet from fence, opposite center of curve in railroad line; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 271 and 272):	
Copper bolt.....	612. 309
Cap on pipe.....	616. 308
Little Maquoketa River bridge, 1.5 miles above, on line of Chicago, Milwaukee & St. Paul Ry., 0.7 mile above Zollicoffer Lake, 1,076 feet above milepost 109-52, 12 feet west of track, on large flat rock inside of bank, inclining perhaps 30° to horizon, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 283).....	616. 590
Little Maquoketa River, 2.2 miles above, on line of Chicago, Milwaukee & St. Paul Ry., 3.1 miles below Specht Ferry, 912 feet below milepost 108-53, and opposite lower end of bridge 128 over Leisures Creek, 49 feet east from center of track, on right of way, in corner of fence formed by main fence and wing fence to bridge 128, in slope of bluff; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 269 and 270):	
Copper bolt.....	618. 092
Cap on pipe.....	622. 119
Specht Ferry, 1.5 miles below, at Parsons bar, on extreme point of bluff, between rock quarry where t. b. m. 280 is located and railroad bridge 134, 25.5 feet south from center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 267 and 268):	
Copper bolt.....	609. 572
Cap on pipe.....	613. 585
Specht Ferry, 1.5 miles below, at Parsons bar, in cove or borrow pit at lower end, and base of heavy sidehill cut, 300 feet more or less above bridge 134, where railroad leaves river bank and enters woods, on natural ledge of hard rock, 50 feet from track center, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 280).....	618. 565
Specht Ferry, 0.3 mile below Chicago, Milwaukee & St. Paul station at, 0.5 mile above milepost 106-55, 82 feet below large bare ledge of rock inclining at an angle of about 45° with horizon, on bluff side of track, 10 feet from center, on natural ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 279).....	617. 899
Specht Ferry, 354 feet below center of Chicago, Milwaukee & St. Paul station, 164 feet below bridge 140, 174 feet below lower side of stone milk house, 1 foot above fence forming west side of railroad cattle pen, on bluff side of track, 37.4 feet from center; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 265 and 266):	
Copper bolt.....	611. 409
Cap on pipe.....	615. 409
Specht Ferry, at northeast corner of Specht's house, on water table, but a few inches above corner, marked "B⊙M"; highest point on front segment of circle (U. S. C. E. old U. S. b. m. a)	615. 927
Specht Ferry, on upper stone doorstep to Specht's stone house, downstream end, front edge, marked "⊙"; highest point in upper portion of circle (U. S. C. E. old p. b. m. 30).....	615. 452

Frenchtown Landing, 35 feet above t. b. m. 277, 1,335 feet above milepost 104-57, 80 feet below bridge 148, 60 feet above platform on side of railroad and at entrance to picnic grounds, on east side of coulee, 38 feet south from center of track, on right of way, 1½ feet from south limit, under extreme northwest point of table-land forming picnic ground; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 263 and 264):	
Copper bolt.....	Feet. 610. 878
Cap on pipe.....	614. 877
Frenchtown Landing, 0.2 mile above milepost 104-57, 115 feet below bridge 148, 25 feet above end of platform at entrance to picnic grounds, 20 feet south from center of track, on flat rock, embedded, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 277).....	614. 002
Island 207, in front of, 919 feet above milepost 102-59, 79 feet above section post 10-11, on west abutment of bridge 156, at its north end, on fourth stone step from top, 3 inches from end face of third step, 9 inches back from east face; copper bolt marked "U. S. ⊙ P. B. M." (U. S. C. E. p. b. m. 262).....	615. 622
Finley Landing, on line of Chicago, Milwaukee & St. Paul Ry., 649 feet below milepost 101-60, 180 feet above bridge 162, on right of way, 2 feet from south fence and 38 feet from center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 260 and 261):	
Copper bolt.....	618. 870
Cap on pipe.....	622. 873
Waupeton, 2.1 miles below, 1.2 miles below Cameron, on line of Chicago, Milwaukee & St. Paul Ry., 2,053 feet above milepost 100-61, 100 feet below very large and conspicuous piece of ledge covered with vines lying on bluff side of right of way, on boulder marked "U□S"; highest point in square (U. S. C. E. t. b. m. 273).....	626. 449
Waupeton, 853 feet below, 612 feet below bridge 172, on north face of bluff, at point where it begins to curve to south, 36 feet south from center of Chicago, Milwaukee & St. Paul Ry. track, 2 feet south from south right-of-way fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 258 and 259):	
Copper bolt.....	615. 842
Cap on pipe.....	619. 831
Waupeton, 1,171 feet above station, 420 feet below milepost 97-64, 262 feet above bridge 174, on bluff side of track, 10 feet from center, on natural ledge of rock, about level with grade, marked "U□S" on its face; highest point in square (U. S. C. E. t. b. m. 270).....	626. 302
Waupeton, 1.2 miles above, 593 feet below milepost 96-65, 377 feet above bridge 180K, just below prominent ledge of white rock on bluff side of track, 10 feet from center, also 146 meters below bridge 182, 2 feet above grade of track, on ledge of rock marked "U□S"; highest point in square U. S. C. E. t. b. m. 269).....	629. 438
Waupeton, 1.5 miles above, 1,739 feet above milepost 96-65, 122 feet above bridge 186K over Dry Hollow, on bluff side of track, 16.5 feet from center, just outside of right of way fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 256 and 257):	
Copper bolt.....	623. 781
Cap on pipe.....	627. 781

Buena Vista, 2 miles below, 1,575 feet below section post 11-12, 1,411 feet below bridge 188K, 775 feet above Dry Hollow Bridge 186K, on line of Chicago, Milwaukee & St. Paul Ry., 10 feet south from center, on ledge of rock marked "U□S"; highest point in square (U. S. C. E. t. b. m. 267).....	Feet. 627. 696
Buena Vista, 0.8 mile below, 1,840 feet below milepost 94-67, 590 feet below bridge 194, on bluff side of track, 15 feet from center, on embedded bowlder, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 265).....	628. 161
Buena Vista, at southeast corner of R. & E. Meuth's general store, 6 inches from south face and 4.3 feet above ground, in wall marked the same as p. b. m. 247, that is "U. S. ⊙ P. B. M."; copper bolt (U. S. C. E. p. b. m. 255).....	627. 519
Buena Vista, 82 feet above station and 35 feet above road crossing, on bluff side of track, 9 feet from center, about 2.5 feet above grade, on hard ledge of rock, marked "U□S"; being highest point in square (U. S. C. E. t. b. m. 264).....	627. 197
Buena Vista, 1 mile above, opposite foot of Island 196, 2,986 feet above milepost 93, 15 feet toward the bluff from center of Chicago, Milwaukee & St. Paul Ry. track, on upper one of three large, prominent pieces of rock lying but a few feet from each other, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 262).....	625. 684
Buena Vista, 2.6 miles above, 53 feet below center of bridge 204K, on right of way of Chicago, Milwaukee & St. Paul Ry., at fence on bluff side, 36 feet from center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 253 and 254):	
Copper bolt.....	617. 115
Cap on pipe.....	621. 114

ELKADER 30' QUADRANGLE.

[Latitude 42° 30'-43°; longitude 91°-91° 30'.]

From point near Buena Vista north near Mississippi River to point near South McGregor.

Turkey River Junction, 1,689 feet below station, 1,660 feet above milepost 90, 50 feet above very large and prominent bowlder on west side of track, 328 feet above farmhouse at point of woods on river side of track, 15 feet west of center, on ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 258).....	623. 119
Turkey River Junction, 1,148 feet above station, at upper end of Chicago, Milwaukee & St. Paul Ry. bridge 212, over Turkey River, on west end of pier, carrying also t. b. m. 257, 14 inches east from extreme point of rounding capstone; copper bolt marked "U. S. ⊙ P. B. M." (U. S. C. E. p. b. m. 252).....	616. 498
Turkey River, on line of Chicago, Milwaukee & St. Paul Ry., on upper stone pier of bridge 212, on west side of track, 9 feet from west end of pier and 7 inches back from its north face; highest point in square, marked "U□S" (U. S. C. E. t. b. m. 257).....	616. 485
Turkey River, 1,552 feet above bridge 212 over, on line of Chicago, Milwaukee & St. Paul Ry., 118 feet above cattle guard, 249 feet below sign "Turkey River Junction, stop," 13 feet west of center of track, 23 feet below t. b. m. 257, 2 feet above grade of ties, in ledge of rock, marked "U. S. ⊙ P. B. M."; copper bolt (U. S. C. E. p. b. m. 251).....	626. 403

Turkey River Junction, 738 feet above switch, 1,575 feet above Chicago, Milwaukee & St. Paul Ry. bridge 212 over Turkey River, 8 feet west from center of track, 2 feet above grade of track, on natural ledge of rock, marked "U□S" on its face; highest point in square (U. S. C. E. t. b. m. 256).....	Feet. 624. 681
Turkey River, on north side of, 1.8 miles above point of bluff at Chicago, Milwaukee & St. Paul Ry., 331 feet below milepost 87 (from La Crosse), 12 feet west of center of track, on ledge of rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 254).....	630. 694
Guttenberg, 3 miles below, 3.2 miles above point of bluff at railroad on north side of Turkey River, on bridge 236, north abutment, east end, 1 foot west from end of abutment and 6 inches north of its south face, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 253)	622. 220
Guttenberg, 2.2 miles below, 63 feet below t. b. m. 252, on opposite side of track, 1.5 feet east of west right-of-way fence and 18 feet from center, 0.5 mile below where track comes to bluff, 150 feet above bridge 258, at place where wagon road turns up into coulee and 24½ feet east of center of road; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 249 and 250):	
Copper bolt.....	616. 842
Cap on pipe	620. 839
Guttenberg, 2.2 miles below station, on line of Chicago, Milwaukee & St. Paul Ry., 213 feet above bridge 258, at lower end of cut, 17 feet east of center of track, on an embedded boulder, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 252).....	622. 988
Guttenberg, on Chicago, Milwaukee & St. Paul Ry., 2,254 feet below station, on upper abutment of bridge 274, on river side of track, on fourth course of stone from top, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 50).....	616. 301
Guttenberg, on west side of Front Street, 72.7 feet above northwest corner of Front and Goethe streets, in Clayton County Bank building, 8.5 feet upstream from south side of entrance way and 3.7 feet above bottom step, marked "U. S. ⊙ P. B. M."; copper bolt (U. S. C. E. p. b. m. 248).....	638. 200
Guttenberg, on northeast corner of Herder and First streets, on front of Joseph Huene's general store, in doorstep, 5.8 feet from southwest corner of building, 4.5 inches from angle of casing, and 3½ inches back from face of stone; copper bolt, marked "U. S. ⊙ P. B. M." (U. S. C. E. p. b. m. 247).	631. 593
Guttenberg, 2.3 miles above, on line of Chicago, Milwaukee & St. Paul Ry., midway between bridges 284 and 286, 2,001 feet below milepost 80, at light cut, 28.5 feet east of center of track and 2 feet west of right-of-way fence, 30 feet west of blazed 14-inch hickory tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 245 and 246):	
Copper bolt.....	617. 535
Cap on pipe	621. 528
Eckard station, 1 mile below, opposite head of McMillan Island, on line of Chicago, Milwaukee & St. Paul Ry., 1,722 feet above milepost 79 from La Crosse, 722 feet above first road crossing below Eckard, 27 feet west of center of track, on an embedded rock, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 245).....	623. 014

Eckard siding, 0.2 mile below, where Chicago, Milwaukee & St. Paul Ry. comes to bluff, 215 feet above milepost 78-83, opposite upper end of curve, 96½ feet west of center of track, 4½ feet from corner of fence, between this fence and highway which runs parallel with railroad, 82 feet above cluster of butternut trees; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 243 and 244):	
Copper bolt.....	Feet. 620. 008
Cap on pipe.....	624. 015
Clayton, nearly 3 miles below, 4 feet farther down the river than p. b. m. 242, 2 feet above grade of track, marked "U□S" on face of ledge; highest point in square (U. S. C. E. t. b. m. 241).....	628. 306
Clayton, nearly 3 miles below, opposite lower part of Island 182, 141 feet below milepost 76, on line of Chicago, Milwaukee & St. Paul Ry., 45 feet above highest point of heavy rock-cut waste, about in center of long sidehill rock cut, at prominent point of bluff in steeply inclined face of rock, 4½ feet above grade, marked "U. S.⊙P. B. M."; copper bolt (U. S. C. E. p. b. m. 242).....	630. 674
Clayton, 1 mile below, 866 feet below milepost 74, 230 feet above wooden sand hopper, on more northerly one of two large boulders, 19 feet west of center of track; highest point in square cut on top face, 1 foot from edge, marked "U□S" (U. S. C. E. t. b. m. 239).....	632. 053
Clayton, on south side of Main Street, 656 feet back from river bank, on southwest corner of Main and Douglas streets, on brick building occupied by Frank Lier & Co., on east end of doorstep, marked "U. S.⊙P. B. M."; copper bolt (U. S. C. E. p. b. m. 241).....	650. 304
Clayton, at Chicago, Milwaukee & St. Paul Ry. station, on top stone of foundation pier, at northeast corner of platform, behind center of circle "⊙" (U. S. C. E. t. b. m. "Old U. S. b. m."; also called "Old p. b. m. 27")	626. 137
Clayton, in upper end of, on large stone mill at west side of Chicago, Milwaukee & St. Paul Ry. track, on river front of building at lower window and lower end of window sill; top of ring bolt, 1 inch above surface (U. S. C. E. old U. S. b. m. b.).....	622. 541
Sny McGill station, 1,214 feet below lower switch block of, 50 feet below milepost 70 from La Crosse, just east of west right of way fence, 30 feet from center of track, behind islands 176 and 178 on line of Chicago, Milwaukee & St. Paul Ry.; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 239 and 240):	
Copper bolt.....	624. 539
Cap on pipe.....	628. 532
Island 176, at head of, 482 feet above milepost 68 from La Crosse, on south abutment of bridge 378K of Chicago, Milwaukee & St. Paul Ry., at its east end, on third course of stone from top, 3 feet west from east end of stone and 3 inches back from north face, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 232).....	624. 822
South McGregor, 3.2 miles below, 0.5 mile below mouth of Wisconsin River, 1,968 feet below milepost 67 of Chicago, Milwaukee & St. Paul Ry., 45 feet west of center of track, directly opposite lower end of bridge K382, in which t. b. m. 231 is located, in steeply inclined face of hard ledge of rock, marked "U. S.⊙P. B. M."; copper bolt (U. S. C. E. p. b. m. 238).....	635. 872
Wisconsin River, 0.5 mile below mouth of, on south abutment of bridge K382, on river end of second course of stone from top, 1 foot from northeast corner of stone, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 231).....	627. 561

South McGregor, 1.8 miles below, 275 feet above milepost 66, directly opposite Picture Rock, on right of way of Chicago, Milwaukee & St. Paul Ry., 35 feet east of center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. p. b. m. 236 and 237):	
Copper bolt.....	Feet. 627. 771
Cap on pipe.....	631. 774
South McGregor, 1.8 miles below, 55 meters above milepost 66, on bluff side of Chicago, Milwaukee & St. Paul Ry., 15 feet from center, on large prominent boulder, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 230).....	632. 167

WAUKON 30' QUADRANGLE (PRAIRIE DU CHIEN 15' QUADRANGLE).

[Latitude 43°-43° 30'; longitude 91°-91° 30'.]

From point near South McGregor north near Mississippi River to North McGregor.

South McGregor, southwest from little park in center of town, in west end of brick building owned by Mrs. J. Reynolds, now occupied by Huntington Grain Firm, 23 inches south from northwest corner and 4 feet and 10 inches above ground; copper bolt, marked "U. S.⊙P. B. M." (U. S. C. E. p. b. m. 235).....	632. 804
South McGregor, on north side of Main Street, just above Masonic block, in brick building occupied by Elbling Cigar Manufactory, in stone doorsill 2 feet from southwest corner of building, 4.5 inches back from front line; copper bolt marked "U. S.⊙P. B. M." (U. S. C. E. p. b. m. 234).....	631. 655
South McGregor, at northwest corner of Main Street and railroad, at sidewalk entrance to Gregor McGregor's residence, on river end of bottom step, on level with sidewalk, marked "U□S"; highest point in square (U. S. C. E. t. b. m. 228).....	628. 838
North McGregor, on north side of North Street, in O. A. Bratsberg's brick store, in water table 1 foot east of entrance, marked "U. S⊙P. B. M."; copper bolt (U. S. C. E. p. b. m. 233).....	631. 292
North McGregor, 131 feet below station, 8 feet east of southeast corner of small wagon road and footbridge, 6 feet below floor on river end of south abutment; highest point in square, marked "U□S" (U. S. C. E. t. b. m. 227).....	620. 727

HAMBURG QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 95° 30'-95° 45'.]

From point near Hamburg northerly along Chicago, Burlington & Quincy R. R. to Nebraska City Junction.

Hamburg, 1.5 miles south of station, in pedestal block forming bridge seat at west end of south pier of bridge over Nishnabotna River, 0.67 foot south of south edge of bedplate under inclined end post, 10 feet west of track center; copper belt in stone (U. S. C. E. p. b. m. 323).....	908. 328
Hamburg, 1,998 feet north of station, 43 feet east of railway; in bench-mark stone; copper bolt in stone surmounted by iron pipe (U. S. C. E. p. b. m. 324):	
Copper bolt.....	903. 017
Cap on pipe.....	907. 045
Hamburg, 3.8 miles north of, in southeast corner of W. H. Frake's doorway, 46 feet southeast of southeast corner of Frake's dwelling, 52 feet southwest of southwest corner of schoolhouse, 328 feet west of track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 110/2):	
Copper bolt.....	905. 530
Cap on pipe.....	909. 519

Nebraska City Junction, 1.25 miles south of station, 384 feet west of house occupied by Johnson Gibson, 35 feet north of north end of farm gate, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 326):

	Feet.
Copper bolt.....	915. 877
Cap on pipe.....	919. 900

NEBRASKA CITY QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 95° 45'-96°.]

From Nebraska City Junction northwest along Chicago, Burlington & Quincy R. R. to point near McPaul.

Nebraska City Junction, 3,884 feet north of station, 45 feet east of railroad, on sand knoll; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 327):

Copper bolt.....	919. 664
Cap on pipe.....	923. 689

Percival, 3 miles south of station, 13 feet north of farm gate, 627 feet north of road crossing, 45 feet east of railroad; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 328):

Copper bolt.....	920. 162
Cap on pipe.....	924. 181

Percival, 784 feet north of center of station, 46 feet east of tracks; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 329):

Copper bolt.....	926. 192
Cap on pipe.....	930. 221

McPAUL QUADRANGLE.

[Latitude 40° 45'-41°; longitude 95° 45'-96°.]

From point near McPaul north along Chicago, Burlington & Quincy R. R. to point near Pacific Junction.

McPaul, 1.3 miles southwest of station, 656 feet north by 26 feet west of southeast corner of SW. $\frac{1}{4}$ sec. 5, T. 69 N., R. 42 W., on land of William Woods, 3 feet west of hedge on west side of public road; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 330 equals 114/3):

Copper bolt.....	931. 360
Cap on pipe.....	935. 352

McPaul, 4,941 feet north of station, 46 feet south of center of public road, 13 feet south of fence corner, 48 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 331):

Copper bolt.....	936. 875
Cap on pipe.....	940. 890

Bartlett, 6,522 feet south of station, 1,214 feet south of L. M. Gannon's house, 82 feet east of center of public road, 45 feet west of railroad; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 332):

Copper bolt.....	938. 289
Cap on pipe.....	942. 305

Bartlett, 6,486 feet north of station, 46 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 333):

Copper bolt.....	941. 553
Cap on pipe.....	945. 572

Haynies siding, 2.5 miles south of, on east side of public road, on land of Bruce Collier, 984 feet south of Thomas Collier's house, 1,099 feet west of track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 334 equals 116/3):	
Copper bolt.....	944.545
Cap on pipe.....	948.551
Haynies siding, 174 feet northwest of south headblock, 43 feet south of fence corner of west right-of-way fence, 45 feet west of track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 335):	
Copper bolt.....	947.702
Cap on pipe.....	951.714

OMAHA AND VICINITY QUADRANGLE.

[Latitude 41°-41° 23'; longitude 95° 45'-96° 05'.]

From point near Pacific Junction north along Chicago, Burlington & Quincy R. R. and Chicago & Northwestern Ry. to Crescent.

Pacific Junction, 1.5 miles southwest of, on land owned by Charles Kroon, 32 feet east by 51 feet south of northwest corner of NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 32, T. 72 N., R. 42 W.; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 336 equals 117/3):	
Copper bolt.....	949.519
Cap on pipe.....	953.538
Pacific Junction, 4,455 feet north of railway crossing at, 1,151 feet south of railway bridge over old channel of Keg Creek, 43 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 337):	
Copper bolt.....	954.883
Cap on pipe.....	958.896
Hentons station, 2.5 miles south of, on line between secs. 5 and 8, T. 72 N., R. 43 W., 308 feet east of quarter-section corner and 46 feet east of railway, land on east side belongs to J. Martin; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 338):	
Copper bolt.....	957.997
Cap on pipe.....	962.022
Hentons station, in northeast corner of James Meisner's dooryard, 3 feet from each fence and 259 feet northeast of station; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 339):	
Copper bolt.....	962.219
Cap on pipe.....	966.228
Hentons, 2.5 miles north of station, 741 feet south of bridge 11, section 38, 427 feet west of Hans Schroeder's house, 43 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 340):	
Copper bolt.....	969.017
Cap on pipe.....	973.030
Island Park, 1,148 feet south of station, 164 feet south of public-road crossing, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 341):	
Copper bolt.....	967.718
Cap on pipe.....	971.737

Council Bluffs, 4 miles southeast of Chicago, Burlington & Quincy station, 615 feet south of railway bridge over Mosquito Creek, 49 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 342):	
Copper bolt.....	Feet. 970. 461
Cap on pipe.....	974. 473
Council Bluffs, in stone doorsill of Chicago, Milwaukee & St. Paul round-house, 0.3 foot from east side of door frame and same from front face of sill, 8 feet from southwest corner of building; top of copper bolt in stone (U. S. C. E. p. b. m. 343).....	981. 002
Omaha, Nebr., in southeast corner of post-office building at Fifteenth and Dodge streets; top of small projection on top surface of third course of stone above sidewalk (U. S. C. E. city b. m.).....	1, 040. 969
Omaha, Nebr., on upper surface of water table of post-office building, corner of Fifteenth and Dodge streets, 5.71 feet east of southwest corner of building; copper bolt in stone (U. S. C. E. p. b. m. 344).....	1, 039. 932
Omaha, Nebr., in top of pedestal block supporting first iron post on north side and west of cylindrical piers at west end of Omaha and Council Bluffs wagon bridge; top of copper bolt in stone (U. S. C. E. p. b. m. 345).....	981. 478
Omaha, Nebr., 59 feet south of south cylindrical pier next to river, 137 feet southeast of south cylindrical pier next to approach abutment at west end of Union Pacific Ry. bridge over Missouri River, 39 feet east of east switch track of Burlington & Missouri River Ry.; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 346 equals gage b. m.):	
Copper bolt.....	971. 645
Cap on pipe.....	975. 612
Omaha, Nebr., near, 3,976 feet east of east portal of Union Pacific Ry. bridge over Missouri River, midway between two tracks of Union Pacific Ry.; cross cut on top of stone post (U. S. C. E. t. b. m. 804).....	1, 005. 933
Council Bluffs Union Station, in window sill of second window west of northeast corner of station, 0.4 foot from east jamb and 0.3 foot from face of sill; copper bolt in stone (U. S. C. E. p. b. m. 347).....	986. 570
Council Bluffs, in southwest corner of courthouse yard, 3 feet from west fence and 3 feet from south fence; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 348 equals 121/2):	
Copper bolt.....	990. 339
Cap on pipe.....	994. 355
Council Bluffs, 197 feet above upper end of ways of United States boat yard, 112 feet from river bank, 3 feet from northwest corner of boat-yard storehouse; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 349 equals 122/2):	
Copper bolt.....	975. 362
Cap on pipe.....	979. 378
Council Bluffs, 4 miles above, 62 feet south of south end of bridge 1066, 404 feet north of milepost 4, 28 feet east of Chicago & Northwestern Ry. track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 350):	
Copper bolt.....	995. 615
Cap on pipe.....	999. 621
Council Bluffs, 6 miles north of Union Station, 630 feet north of shore end of upper Government dike, 367 feet north of south end of bridge 1043, 16 feet west of Chicago & Northwestern Ry. track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 351):	
Copper bolt.....	986. 740
Cap on pipe.....	990. 756

HONEY CREEK QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 95° 45'-96°.]

From Crescent north along Chicago & Northwestern Ry. to Loveland.

Crescent, 183 feet south of station, 15 feet east of railroad, in small park belonging to railway company; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 352):	
Copper bolt.....	988.440
Cap on pipe.....	992.459
Honey Creek, 1.8 miles south of station, 112 feet north of north end of railway bridge 1007, 1,936 feet south of milepost 12, 49 feet east of Chicago & Northwestern Ry. track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 353):	
Copper bolt.....	996.097
Cap on pipe.....	1,000.106
Honey Creek, near station, in west end of south bridge seat of plate-girder bridge 998 over Honey Creek, 4 feet west of south end of west girder; copper bolt (U. S. C. E. p. b. m. 354).....	1,004.808
Honey Creek, 2 miles north of station, 2,730 feet south of milepost 16 and 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 355):	
Copper bolt.....	1,000.641
Cap on pipe.....	1,004.660

MISSOURI VALLEY QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 95° 45'-96°.]

From Loveland west and north along Chicago & Northwestern Ry. to point near California Junction.

Loveland, on southwest corner of bridge 979 over Boyer Creek, 0.3 foot east of bedplate under inclined end post, 2.5 feet from north edge of abutment; copper bolt in stone (U. S. C. E. p. b. m. 356).....	1,000.119
Missouri Valley, 2.2 miles south of, 300 feet south of south end of bridge 978, 90 feet south of milepost 20, 46 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 357):	
Copper bolt.....	994.995
Cap on pipe.....	999.007
Missouri Valley, at northwest corner of Second and Erie streets, in southeast corner of Kreder's billiard hall, 7½ inches west of east face of building and 11.23 feet above sidewalk; copper bolt (U. S. C. E. p. b. m. 358).....	1,006.448
Missouri Valley, 3 miles west of, 335 feet east of east end of railway bridge 4, 886 feet west of milepost 3, 47 feet north of Sioux City & Pacific Ry. track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 359):	
Copper bolt.....	1,001.635
Cap on pipe.....	1,005.654
California Junction, 758 feet east of station, northwest corner of A. W. Smith's orchard, 3 feet from each fence, 56 feet south of Sioux City & Pacific Ry. track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 360 equals 127/3):	
Copper bolt.....	1,002.475
Cap on pipe.....	1,006.481

BLAIR QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 96°-96° 15'.]

From point near California Junction northerly along Chicago & Northwestern Ry. to point near River Sioux.

California Junction, 1.8 miles north of station, 70 feet south of public-road crossing, 44 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 361):	Feet.
Copper bolt.....	1,005.293
Cap on pipe.....	1,009.306
Modale, 0.8 mile south of, 195 feet north of railway bridge 10, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 362):	
Copper bolt.....	1,008.745
Cap on pipe.....	1,012.737
Modale, 1 mile north of, 2,320 feet north of milepost 11, 60 feet south of highway crossing, 46 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 363):	
Copper bolt.....	1,010.123
Cap on pipe.....	1,014.132
Mondamin, 2 miles south of, 7 feet west of west right of way fence, 54 feet west of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 364):	
Copper bolt.....	1,013.797
Cap on pipe.....	1,017.813
Mondamin, 246 feet east of tracks, in center of sandstone block in southwest corner of brick building occupied by D. Ganet & Co., 0.71 foot from west wall of building; copper bolt (U. S. C. E. p. b. m. 365).....	1,025.041
Mondamin, 2,238 feet north of station, 889 feet south of public-road crossing, 33 feet south of milepost 17, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 366):	
Copper bolt.....	1,022.003
Cap on pipe.....	1,026.005
Mondamin, 2.2 miles north of, 246 feet north of public-road crossing, 299 feet north of dwelling of Joseph Krummel, 105 feet east of tracks, in corner of field; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 367 equals 130/2):	
Copper bolt.....	1,020.506
Cap on pipe.....	1,024.499

TEKAMAH QUADRANGLE.

[Latitude 41° 45'-42°; longitude 96°-96° 15'.]

From point near River Sioux north along Chicago & Northwestern Ry. to Onawa.

River Sioux, 2.5 miles south of, 3,553 feet north of milepost 20, 51 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 368):	
Copper bolt.....	1,025.851
Cap on pipe.....	1,029.857
River Sioux, 1,260 feet south of station, 541 feet south of milepost 23, 45 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 369 equals 131/3):	
Copper bolt.....	1,031.986
Cap on pipe.....	1,035.982

River Sioux, 2.2 miles north of station, 1,634 feet north of milepost 25, 47 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 370):	Feet.
Copper bolt.....	1,028.922
Cap on pipe.....	1,032.928
Blencoe, 4.5 miles south of, 165 feet south by 92 feet east of p. b. m. 372, 1,345 feet south of milepost 28, 46 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 371):	
Copper bolt.....	1,031.133
Cap on pipe.....	1,035.136
Blencoe, 4.5 miles south of, 1,148 feet south of milepost 28, 46 feet west of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 372 equals 132/4): Cap on pipe.....	1,031.930
Blencoe, 1.8 miles south of, 1,483 feet north of milepost 30, 1,305 feet south of railway bridge 25, 46 feet east of tracks; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 373):	
Copper bolt.....	1,034.132
Cap on pipe.....	1,038.134
Blencoe, 623 feet north of station, 525 feet west of tracks, 25 feet north by 58 feet east of northeast corner of Isaac Fleener's house; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 374 equals 133/4):	
Copper bolt.....	1,037.229
Cap on pipe.....	1,041.218
Onawa, 4 miles south of, 44 feet east of railway, on line with south side of E. S. Cody's farmhouse, 259 feet east of same; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 375):	
Copper bolt.....	1,042.268
Cap on pipe.....	1,046.291
Onawa, 2.2 miles south of, 1,585 feet south of milepost 37, 1,056 feet south of east-west road crossing, 45 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 376):	
Copper bolt.....	1,044.512
Cap on pipe.....	1,048.535

ONAWA QUADRANGLE.

[Latitude 42°-42° 15'; longitude 96°-96° 15'.]

From Onawa northwest along Chicago & Northwestern Ry. to near Salix station.

Onawa, at Iowa Avenue entrance of courthouse, 1.12 feet from face of sill, 0.43 foot from west jamb; copper bolt in west end of stone doorsill (U. S. C. E. p. b. m. 377).....	1,052.436
Onawa, in northwest corner of German Lutheran churchyard, corner of Granite and Maple streets, 3 feet from alley fence, 3 feet from southwest corner of a stable; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 378 equals 134/3):	
Copper bolt.....	1,047.662
Cap on pipe.....	1,051.727
Onawa, 2.2 miles north of, 810 feet north of milepost 41, 180 feet north of north end of railway bridge 40, 44 feet east of Sioux City & Pacific Ry. track; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 379):	
Copper bolt.....	1,048.252
Cap on pipe.....	1,052.252

Whiting station, 2.8 miles south of, 958 feet south of milepost 44, 46 feet east of railway, 3 feet from east right-of-way fence, 6 feet south of south fence of road crossing; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 380):	Feet.
Copper bolt.....	1, 051. 186
Cap on pipe.....	1, 055. 211
Whiting station, 1,050 feet south of, 66 feet south of south headblock at Whiting, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 381):	
Copper bolt.....	1, 057. 058
Cap on pipe.....	1, 061. 129
Whiting station, 2.5 miles north of, 282 feet south of milepost 49, 46 feet east of railway, opposite Daley's dwelling; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 382):	
Copper bolt.....	1, 060. 444
Cap on pipe.....	1, 064. 460
Sloan, 3 miles south of, 1,345 feet south of milepost 52, 47 feet west of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 383 equals 138/3):	
Copper bolt.....	1, 062. 826
Cap on pipe.....	1, 066. 888
Sloan, 1,335 feet south of, 47 feet west of railway, 3 feet south of south side of east-west public road; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 384):	
Copper bolt.....	1, 068. 075
Cap on pipe.....	1, 072. 078
Sloan, on corner of Fourth and Evans streets; cross cut on northeast corner of stone doorsill of State bank (U. S. C. E. p. b. m. 385):	1, 076. 622
Sloan, 5,256 feet north of station, 879 feet south of milepost 56, 49 feet west of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 386 equals 139/3):	
Copper bolt.....	1, 069. 624
Cap on pipe.....	1, 073. 630

DAKOTA QUADRANGLE.

[Latitude 42° 15'-42° 30'; longitude 96° 15'-96° 30'.]

From point near Salix northwest along Chicago & Northwestern Ry. to point 6 miles above Sioux City.

Salix, 2.5 miles south of, 240 feet south of farm crossing, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 387):	
Copper bolt.....	1, 071. 825
Cap on pipe.....	1, 075. 851
Salix, 1,270 feet south of station, 144 feet north of south headblock at Salix siding, 46 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 388 equals 140/3):	
Copper bolt.....	1, 078. 718
Cap on pipe.....	1, 082. 721
Salix, 2.8 miles north of, 623 feet north of road crossing, 361 feet north of C. W. Wheeler's house, 47 feet east of railway, south side of old river bed; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 389):	
Copper bolt.....	1, 085. 552
Cap on pipe.....	1, 089. 558

Sargents Bluff, 2.8 miles south of, 1,900 feet south of milepost 66, 656 feet north of road crossing, 1,352 feet north of Louis Godferson's house, 46 feet east of railway; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 390):	
Copper bolt.....	Feet. 1,085.257
Cap on pipe.....	1,089.273
Sargents Bluff, in lot 1, block 2, 10 feet from southwest corner of E. T. Berry's house, 52 feet from northwest corner of Tenth and Walnut streets; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 391 equals 142/3):	
Copper bolt.....	1,090.273
Cap on pipe.....	1,094.263
Sargents Bluff, 3 miles north of, 47 feet east of railway, 1,476 feet south of road crossing, 2 feet west of east right of way fence; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 392):	
Copper bolt.....	1,093.039
Cap on pipe.....	1,097.055
Sioux City, 558 feet south of Missouri River bridge, 148 feet north of railway bridge 60, 20 feet east of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 393):	
Copper bolt.....	1,098.038
Cap on pipe.....	1,102.058
Sioux City, in northwest corner of east pier of Missouri River bridge, 2 feet above ground, in seventeenth course of masonry below coping course; copper bolt (U. S. C. E. p. b. m. 394).....	1,105.670
Sioux City, 103 feet west of west side of eastern or shore pier of Missouri River bridge, almost vertically under north truss of east span and 69 feet west of railway; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 395, gage bench mark):	
Cap on pipe.....	1,094.076
Sioux City, in southwest corner of courthouse yard, 72 feet from southwest corner of courthouse, 135 feet from southeast corner of same; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 396 equals 143/3):	
Copper bolt.....	1,106.218
Cap on pipe.....	1,110.237
Sioux City, 39 feet north of northeast corner of Fifth and Pierce streets; top of ring bolt in sidewalk stone (U. S. C. E. t. b. m. 996).....	1,108.512
Sioux City, 3.5 miles above, 0.25 mile north of electric railway power house at Riverside Park, 121 feet north of north headblock, at foot of bluff, 52 feet east of railway, copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 397):	
Copper bolt.....	1,100.296
Cap on pipe.....	1,104.312
Sioux City, 6 miles above, 515 feet south of south end of railway bridge over Big Sioux River, 3 feet east of west right-of-way fence; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 398):	
Copper bolt.....	1,102.875
Cap on pipe.....	1,106.884

Sioux City, 6 miles above, on land of Mrs. Rose Pacquette, 50 feet west of Chicago, Milwaukee & St. Paul Ry. track, 190 feet south of south end of railway bridge over Big Sioux River, 5 feet west of right-of-way-fence; copper bolt in bench-mark stone surmounted by iron pipe (U. S. C. E. p. b. m. 399):

	Feet.
Copper bolt.....	1, 098. 367
Cap ¹ on pipe	1, 102. 373

CANTON QUADRANGLE.

[Latitude 43°-43° 30'; longitude 96° 30'-97°.]

From Beloit south along Chicago, Milwaukee & St. Paul R. R. to point near Fairview.

Beloit, 420 meters north of station, 13 meters west of track, 4 meters south of private road to orphan asylum, 1 meter east and 2 meters south of northeast corner of garden plot owned by J. Widdy, 1 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. A).....	1, 244. 177
Beloit, 170 meters south of station, 31 meters east of track, 14 meters south of roadway, on a jasper rock, in garden plot, 2 meters south and 1 meter east of northwest corner, 0.4 meter below rails; bottom of square hole (U. S. C. & G. S. b. m. B).....	1, 246. 911
Beloit, 3 kilometers south of, 13 meters west of railway track, 4 meters north of private road, 110 meters north of trestle over ravine, 1 meter east of fence, 0.3 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. C).....	1, 236. 435
Elm Springs, 5 kilometers northwest of, 13 meters west of railway, 8 meters north of road, on south line of sec. 5, T. 97, R. 48, 2 meters north and 1 meter east of fences, 0.2 meter below rails; top of iron pipe (U. S. C. & G. S. b. m. D).....	1, 280. 109

HUDSON QUADRANGLE.

[Latitude 43°-43° 15'; longitude 96° 15'-96° 30'.]

From point near Fairview south along Chicago, Milwaukee & St. Paul R. R. to point near Hawarden.

Austin, 1.2 kilometers south of, 1.6 kilometers south of railway bridge over Big Sioux River, 13 meters west of railway, 6 meters north of road, 1 meter west of fence, 0.8 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. E).....	1, 200. 313
Hawarden, 5 kilometers north of, on south sandstone pier of railway bridge over Big Sioux River, 0.4 meter north of south edge and 2 meters west of east end of capstone, 2 meters east of center of track, 1.7 meters below rails; bottom of square hole (U. S. C. & G. S. b. m. F).....	1, 182. 593
Hawarden, 3 kilometers north of, 13 meters west of railway, 9 meters west of road, opposite crossing, 3 meters south and 1 meter east of northeast corner of field owned by M. Austin; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. G).....	1, 177. 488
Calliope, 5.9 meters south of northeast corner of McCaull-Webster elevator, 18 meters west of railway and 55 meters south of station, 0.4 meters above ground, 0.25 meter north of south end of foundation wall (pink jasper); at east edge; square hole (U. S. C. & G. S. b. m. H).....	1, 181. 566
Hawarden, in doorway of Wood & Fleshman (1902) block, 1.8 meters south of center and 2.2 meters east of front edge of front step; a yellow circle in blue square tiling, 5 centimeters on each edge, the most southeasterly blue square in the design (U. S. C. & G. S. b. m. I).....	1, 180. 650

¹ In 1905 cap reported stolen.

Hawarden, on north side of Dakota Street, 20 meters west of west line of Kansas Street, at southwest corner of lot 14, block 5, on south sidewalk line; center of cap upon upper end of piece of heavily galvanized 3-inch iron pipe, 8 feet long, resting on rock 6 feet underground (U. S. C. & G. S. b. m. City)..... 1, 177. 347 Feet.

IRETON QUADRANGLE.

[Latitude 42° 45'-43"; longitude 96° 15'-96° 30'.]

From point near Hawarden south along Chicago, Milwaukee & St. Paul R. R. to point 4.5 kilometers south of Hawarden.

Hawarden, 1 kilometer south of, 13 meters east of railway, 10 meters north of road, 1 meter west and 2 meters north of southwest corner of field owned by John Abbey, at level of rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. J)..... 1, 172. 675

Hawarden, 3 kilometers south of, 14 meters west of railway, 6 meters west of road, opposite crossing, 1 meter east of west road fence, at level of rails; iron pipe (U. S. C. & G. S. b. m. K)..... 1, 171. 267

ELK POINT QUADRANGLE.

[Latitude 42° 30'-43"; longitude 96° 30'-97°.]

From point 4.5 kilometers south of Hawarden south along Chicago, Milwaukee & St. Paul R. R. to point near Westfield.

Hawarden, 4.5 kilometers south of, 500 meters north of railway cut, 240 meters by rail south of section line, 13 meters northwest of railway and 5 meters south of road, 0.4 meter below rails, marked by bowlder; iron pipe (U. S. C. & G. S. b. m. L)..... 1, 165. 361

Chatsworth, 1 kilometer north of, 20 meters east of railway, 13 meters north of road, 2 meters east and 1 meter north of southwest corner of pasture, 1.7 meters below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. M)..... 1, 155. 405

Chatsworth, 25 meters north of station, 29 meters east of railway, 12 meters south of road, on jasper rock 1 meter south and 0.5 meter west of north-west corner of meadow; bottom of square hole (U. S. C. & G. S. b. m. N)..... 1, 159. 833

Chatsworth, on east pier of north pair, under railway water tank, 36 meters south of station, 5.5 meters west of track, in top bevel, 0.19 meter above ground, at east edge and 0.24 meter south of north edge; bottom of square hole (U. S. C. & G. S. b. m. O)..... 1, 161. 753

Chatsworth, 2.3 kilometers south of, 330 meters north of railway bridge, 3 meters north of road, 13 meters west of railway, 1 meter east of fence, 0.5 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. P)..... 1, 154. 348

Akron, 1.4 kilometers north of, 13 meters south of railway bridge, 6 meters south of road, 15 meters west of railway, 0.5 meter east of pasture fence, 1.6 meters below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. Q)..... 1, 138. 640

Akron, in front doorsill (jasper) of Akron Savings Bank, 0.47 meter north-west of southeast side of doorway, 0.12 meter southwest of front edge, 0.45 meter above sidewalks; bottom of square hole (U. S. C. & G. S. b. m. R)..... 1, 146. 283

Akron, at northeast corner of Reed and Second streets, at north sidewalk line, 0.13 meter west of southwest corner of building, north side of top edge of 1-inch galvanized-iron pipe set solidly in cement flush with sidewalk. (U. S. C. & G. S. b. m. City)..... 1, 145. 135

	Feet.
Akron, 1.5 kilometers south of, 15 meters west of railway, 40 feet west of road along track, 6 meters north of road, 2 meters north and 0.5 meter east of southeast corner of cultivated field, 0.4 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. S).....	1, 136. 343
Akron, 4 kilometers south of, 13 meters west of railway, 7 meters north of road, 1 meter east of fence, 0.3 meter above rails; iron pipe (U. S. C. & G. S. b. m. T).....	1, 134. 841
Westfield, 15 meters west of railway, 21 meters north of road, 6.55 meters south of northeast corner of Hopkins elevator, 0.3 meter above ground, 0.1 meter north of south edge of jasper rock, at east edge; bottom of square hole (U. S. C. & G. S. b. m. V).....	1, 129. 926
Westfield, 1 kilometer north of, 13 meters west of railway, 12 meters south of road, 1 meter west of fence, 0.3 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. U).....	1, 129. 263
Westfield, 1.6 kilometers south of, 14 meters east of railway, 15 meters west of road along track, 5 meters north of road, 1 meter south and west of fences, 0.6 meter below rails; copper bolt in top of stone post lettered "U. S. B. M." (U. S. C. & G. S. b. m. W).....	1, 121. 937
Westfield, 3.2 kilometers south of, 14 meters east of railway, 12 meters west of road along track, 6 meters north of road, 0.8 meter below rails; iron pipe (U. S. C. & G. S. b. m. X).....	1, 127. 225
Westfield, 4.2 kilometers south of, 1,017 meters east of bridge over Big Sioux River, 4 meters east of private road, 14 meters south of track, on jasper rock of quartzite, roughly squared for building purposes, about 1 by 0.5 by 3 meters, set 1 meter north of fence and 0.2 meter above rails; bottom of square hole (U. S. C. & G. S. b. m. Y).....	1, 116. 369
Westfield, 5.2 kilometers south of, at east end of railway bridge over Big Sioux River, on northeast pier of central four under old railway water tank, on extreme northwest corner of stone, at upper level, 0.4 meter above ground; bottom of square hole (U. S. C. & G. S. b. m. Z).....	1, 118. 088

APPENDIX B.

ELEVATIONS ESTABLISHED BY THE MISSISSIPPI RIVER COMMISSION, THE MISSOURI RIVER COMMISSION, AND THE CORPS OF ENGINEERS, UNITED STATES ARMY.

PRIMARY LEVELING.

Blair, Burlington, Clinton, Coalfield, Dakota, Des Moines, Donnellson, Edgington, Eldon, Elkader (30'), Floris, Fort Madison, Galena, Hamburg, Kahoka, Keithsburg, Keokuk, Keosauqua, Knoxville, Le Claire, Lomax, McPaul, Milan, Miles, Milo, Missouri Valley, Mount Zion, Muscatine, Nebraska City, Omaha and vicinity, Onawa, Oquawka, Ottumwa, Peosta (30'), Pella, Savanna, Tekamah, Wapello, and Waukon (30') quadrangles.

ALLAMAKEE, CLAYTON, DAVIS, DES MOINES, DUBUQUE, FREMONT, HARRISON, JACKSON, LEE, MAHASKA, MARION, MILLS, MONONA, MUSCATINE, POLK, POTTAWATTAMIE, SCOTT, VAN BUREN, WAPELLO, WARREN, AND WOODBURY COUNTIES.

The following descriptions and elevations of bench marks from Keokuk, Iowa, to New Albin, Iowa, are taken from a report by the Mississippi River Commission, published at St. Louis, Mo., in 1899; the descriptions and elevations of bench marks along the Missouri River from Hamburg, Iowa, to Sioux City, Iowa, from a report of the United States Corps of Engineers for 1891, part 6; and the list of bench marks along the Des Moines River from a special list furnished by the Chief of Engineers, United States Army. These data are republished by permission of the Chief of Engineers, United States Army. The elevations taken from the reports and the list mentioned above have been corrected to agree with the 1912 adjustment of the Coast and Geodetic Survey.

Along the Mississippi River the lines of bench marks called stone lines are placed normal to the river at intervals of about 3 miles and are numbered consecutively from Cairo northward. Each stone line generally consists of four bench marks, two on each side of the river, the one farthest from the river on the left (east) bank being No. 1.

The elevations of the stone-line bench marks were determined by the ordinary leveling by the topographic party, running from the adjacent precise-level bench marks. The discrepancies between the precise and ordinary leveling, between successive precise-level bench marks, have averaged about 0.06 foot.

The bench marks above Alton, Ill., consist of a flat tile 4 inches thick and 18 inches square, with a copper bolt leaded vertically into the upper face at the center. The tile is set about 3 feet below the surface of the ground and is surmounted by a 4-inch iron post 4 feet

long, upon which an iron cap is bolted. The words "Mississippi River Commission" and letters "U. S." are printed on both tile and cap.

Where standard bench marks are not used, descriptions of the marks employed are given. The numbers of Mississippi River Commission bench marks are given in parentheses and refer to the surface mark.

In the descriptions of bench marks of the Missouri River Commission along the Missouri River the letters "b. m." refer to permanent bench marks which are designated by fractions, the numerator standing for the number of the bench-mark line counting from the mouth of the river up and the denominator for the number in the line counting from the one on the right bank farthest from the river. The bench marks are similar to those along the Mississippi River described above.

KEOKUK QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 91° 15'-91° 30'.]

Keokuk, below, on south side of right of way fence on south side of Chicago, Burlington & Quincy R. R., 150 meters from right bank, 400 meters below or west of lower one of sawmills on right bank, 500 meters above head of Island 405, which is at upper mouth of Des Moines River; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 110/3):	
Copper bolt.....	Feet. 487. 20
Cap on pipe.....	491. 17
Keokuk, second door from corner of Johnson Street, in southwest corner of three-story stone building, owned by Mr. Patterson, facing on Water Street, 8 inches above west doorsill, on inner side of outer wall, 15 meters from corner of Water and Johnson streets; copper bolt (U. S. C. E. p. b. m. 3).....	509. 559
Keokuk, in wall at upper end of front of Brown's warehouse; spike (U. S. C. E. p. b. m. 52 Mackenzie equals high-water mark of 1851).....	498. 58
Keokuk, at northwest corner of Union Station building on Water Street, near foot of Exchange Street; top of wagon-guard stone (U. S. C. E. city b. m.).....	506. 74
City datum.....	483. 24
Keokuk, in south face of Iowa shore abutment of railroad bridge, 8 inches above bench of abutment, in tenth stone from west end; copper bolt (U. S. C. E. p. b. m. 2).....	494. 346
Keokuk, in stone masonry at extreme lower end of east wall or pier of lower lock of Des Moines Rapids canal; cut in stone (U. S. C. E. zero, U. S. Engineer gage, lower lock) elevation of zero.....	477. 84
Keokuk, at side of U. S. Engineers' gage on extreme lower end of east wall or pier of lower lock of Des Moines Rapids canal; marks cut in stone masonry and figures by them (U. S. C. E. high-water marks of 1851, 1888, 1881):	
1851.....	498. 80
1888.....	497. 48
1881.....	496. 78

Hamilton, 350 meters southwest of station, 1 meter north of south right-of-way fence of Toledo, Peoria & Western R. R., 18 meters north of east of sycamore tree, 25 meters northwest of black oak, 16 meters southwest of black oak, all blazed facing pipe; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 111/1):	
Copper bolt.....	504. 62
Cap on pipe.....	508. 57
Keokuk and Hamilton bridge, 270 meters east of east end of, 45 meters north of railroad track, in woods 13 meters southeast of road, 75 meters east of where road joins railroad before crossing bridge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 111/2):	
Copper bolt.....	487. 45
Cap on pipe.....	491. 41
Keokuk, on top of coping on outer corner of apex of lower gate recess on shore side of lower lock of Des Moines Rapids canal (U. S. C. E. canal b. m. Stickney).....	493. 60
Des Moines Rapids canal, 920 meters below lower end of sluiceway of middle lock of, in yard about 30 meters west of railroad, 30 meters above house, 70 meters above an old ice house, the road from top of bluff at Rand Park passes about 15 meters west of stone and joins road up west side of railroad at point about 50 meters north of stone; stone post (U. S. C. E. Δ lower base).....	513. 55
Keokuk, 2 miles above, in coping of west wall of sluiceway at south end of middle canal lock; copper bolt (U. S. C. E. p. b. m. 1).....	501. 571
Des Moines Rapids canal, in stone masonry on east side of middle lock of, just below lower gate; gage is cut in stone (U. S. C. E. b. m. lower gage, middle lock).....	484. 04
Des Moines Rapids canal, just below lower gate, on east side of middle lock, marks and figures cut in masonry by gage (U. S. C. E. high-water marks of 1891, 1888, 1881):	
1891.....	498. 84
1888.....	497. 54
1881.....	496. 84
Des Moines Rapids canal, in stone masonry on east side of middle lock of, just above upper gate; cut in stone (U. S. C. E. upper gage, middle lock).....	492. 00
Des Moines Rapids canal, on north side of sluiceway from dry dock of middle lock of, cut in stone (U. S. C. E. rapids gage, middle lock).....	485. 98
Des Moines Rapids canal, on north side of sluiceway from dry dock of middle lock of; mark and figures cut in stone masonry by gage (U. S. C. E. high-water mark 1888, rapids, middle lock).....	499. 85
Des Moines Rapids canal, 30 meters north of switch at upper end of middle lock, 3 meters west of railroad, immediately opposite entrance to dry dock from canal; stone post (U. S. C. E. Δ upper base).....	502. 01
Des Moines Rapids canal, 1 mile above middle lock of, in timber on left bank, about 20 meters from left bank, 11½ meters east of center of road up river bank, 15 meters west of center of old road up river, but farther up on hillside, 130 meters north of half-section line, which is a lane on bluff, on north side of small cemetery, 40 meters north of wash or small ravine on hillside, on land of Martha Parsons, 400 meters above some exposed rocks near left bank at low water; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 112/2):	
Copper bolt.....	549. 30
Cap on pipe.....	553. 32

Des Moines Rapids canal, 1 mile above middle lock of, between railroad track and osage orange hedge, 18.25 meters west of center of track, 4.5 meters east of hedge, 44.75 meters south of center of culvert 39A, 80 meters below large ice house standing between canal and railroad, 15.5 meters north of gateway leading up bluff to vineyard and wine cellar, 45 meters west of canal, 30 meters above point opposite figure 35 painted on west slope of canal wall; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 112/2):	
Copper bolt.....	Feet. 519. 04
Cap on pipe.....	523. 07
Sandusky, 1 mile above, on southwest corner of west end of south abutment of culvert 36A of St. Louis, Keokuk & Northwestern R. R. (U. S. C. E. 32 R.B.).....	511. 78
Des Moines Rapids canal, 1 mile below guard lock at upper end of, on side of bluff between railroad and public road, 13 meters west of center of track, at point 140.7 meters north of small box culvert, 15 meters east of center of road at point 58 meters south of blazed maple tree by roadside where it ascends to pass over point of hill, 25 meters west of canal, nearly opposite figures 68 painted on west slope of canal wall; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 113/3):	
Copper bolt.....	525. 14
Cap on pipe.....	529. 15
Nashville, in top of coping of west wall near southwest tower of guard lock; top of brass bolt, marked "U. S. P. B. M." (U. S. C. E. p. b. m. 2).....	507. 922
Nashville (Galland post office), on east side of guard lock, just above upper gate of Des Moines Rapids canal; gage cut in stone masonry (U. S. C. E. "gage at guard lock").....	496. 94
Des Moines Rapids canal, 580 meters above a point on railroad opposite upper gate of guard lock of, 3 meters east of track, 4 meters from south end of culvert, at upper end of large gravel bar, nearly opposite U. S. light on large stone pier; stone post (U. S. C. E. "channel survey b. m.")...	517. 66
Des Moines Rapids canal, 1,250 meters above point on railroad opposite upper gate of guard lock of, 250 meters above U. S. light on upper end of long narrow towhead, at top edge of right bank of river, on north side of mouth of ravine, 20 meters east of railroad, opposite north end of culvert; stone post (U. S. C. E. "channel survey b. m.").....	518. 28
At Keokuk.	
Keokuk, on northwest corner of east abutment of Chicago, Burlington & Quincy R. R. bridge near mouth of Des Moines River, 1 foot from face of abutment; cross mark (U. S. C. E. b. m. 1).....	496. 63
FORT MADISON QUADRANGLE.	
[Latitude 40° 30'-40° 45'; longitude 91° 15'-91° 30'.]	
Nashville and Montrose, about halfway between, between river bank and public road, directly in front of residence of Charles Hummel, between an old stone culvert and west corner of hedge inclosing an orchard on hillside, 14 meters from river bank, 8 meters from wagon track of public road at point 13 meters south of where small ravine crosses road, 27.5 meters from corner of hedge and 18.7 meters from 8-inch hickory tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 114/2):	
Copper bolt.....	519. 43
Cap on pipe.....	523. 46

Nashville and Montrose, about halfway between, on little hillock between public road and railroad, on section line running west from river on south line of Solferino farm, 61 meters from river bank, 56.5 meters from center of road, 43.7 meters from center line of railroad, 37 meters from large arched stone culvert on railroad; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 114/3):	Feet.
Copper bolt.....	523. 59
Cap on pipe.....	527. 60
Montrose, in upper foundation stone of brick store building on south corner of Main and Cedar streets, on east side, 3 feet from north corner; copper bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 3).....	530. 432
Montrose, just above, 125 meters below mouth of Jack Creek, 110 meters above upper warehouse in Montrose and 15 meters from river bank, in root of 30-inch tree in willow grove; spike (U. S. C. E. "61 Mackenzie") marked by circular iron plate spiked in tree.....	507. 33
Montrose, on east side of first warehouse above station, near center of building, marked with black paint; high-water marks (U. S. C. E. high-water marks of 1851, 1888, 1881, 1880):	
1851.....	514. 65
1888.....	513. 09
1881.....	512. 25
1880.....	511. 40
Nauvoo, Ill., opposite, on right bank of river, 11 meters from bank, in cluster of large soft maple trees, at mouth of Excelsior Slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 115/3):	
Copper bolt.....	505. 29
Cap on pipe.....	509. 30
Montrose, 1.5 miles above, on sand ridge on west side of wagon road, 10 feet inside of fence, 300 meters below milepost 30, 300 meters above small shanty near corner of hedge fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 115/4 equals ⊙ Sand Ridge):	
Cap on pipe.....	546. 88
Devils Island, 22 meters from bank of river, midway between shore and small slough running parallel with shore; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 116/3):	
Copper bolt.....	506. 90
Cap on pipe.....	510. 90
Devils Island, 740 meters back of previous bench mark, on small ridge between pond and overflowed ground back; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 116/4):	
Copper bolt.....	507. 59
Cap on pipe.....	511. 59
Fort Madison, 450 meters below station at, in top of north corner of stone pier of railroad water tank, on second pier northwest of spout to tank; top of stone (U. S. C. E. b. m. 4 R. B.).....	522. 54
Viele station, 1 mile south of, in top of west end of south abutment of Chicago, Burlington & Quincy R. R. bridge over Panther Creek; copper bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 4).....	543. 293
Viele station, 0.5 mile below, in northeast corner stone of middle pier of Chicago, Burlington & Quincy R. R. bridge over Sugar Creek; copper bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 5).....	537. 361

Viele station, 0.5 mile north of, in top of stone abutment of Chicago, Burlington & Quincy R. R. bridge over Little Devils Creek; copper bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 6).....	Feet. 542.318
Fort Madison, in water table of Hotel Anteres, on Front Street near station, near center of building on south side; copper bolt marked "U. S. P. B. M." (U. S. C. E. p. b. m. 7).....	534.513
Fort Madison, lower part of, on hillside, 12 meters southeast of center of public road, 80 meters from river bank, at point where bluffs turn back from river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 117/1):	
Copper bolt.....	575.56
Cap on pipe.....	579.56
Niota Island, on sandy ridge which extends along west bank of, 69 meters 68° to north corner of little frame house, 25 meters north to water's edge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 117/2):	
Copper bolt.....	513.29
Cap on pipe.....	517.31
Fort Madison, in vacant lot belonging to Mr. Wilson, in southwest quarter of block inclosed by Spruce Street on west, Division Street on south, Locust Street on east, and Des Moines Street on north, 1.5 meters from line of lot west belonging to J. C. Atlee, 46.5 meters east of Spruce Street, 11 meters south of alley running east and west through block; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 117/3):	
Copper bolt.....	524.07
Cap on pipe.....	528.08
Fort Madison Bridge, in south side of second stone pier from Iowa end of; cut in stone (U. S. C. E. zero of gage).....	502.53
Fort Madison, cut in stone on west end of north abutment of Fort Madison Bridge (U. S. C. E. high-water marks 1880, 1888, 1851):	
1880.....	518.66
1888.....	519.26
1851.....	524.13

LOMAX QUADRANGLE.

[Latitude 40° 30' - 40° 45'; longitude 91° - 91° 15'.]

Pontoosac, Ill., on shore opposite to, in cluster of large soft maple trees, west of large patch of willows, 45 meters from bank, between two long dikes, 500 meters above lower and 200 meters below upper dike; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 119/3):	
Copper bolt.....	511.39
Cap on pipe.....	515.37
Green Lake, 150 meters south of outlet of, 807 meters back of above-described bench mark, by side of wagon road, in heavy timber, 7.5 meters 320° to 30-inch elm tree, 13.2 meters 58° to 36-inch elm tree, 8 meters 158° to 11-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 119/4):	
Copper bolt.....	512.79
Cap on pipe.....	516.80
Burlington Island, 15 meters from east shore opposite foot of Two Mile Island, 18.3 meters 165° from 15-inch ash tree, 9.2 meters 253° 30' from 30-inch elm tree, 10 meters 70° from 22-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 122/1):	
Copper bolt.....	515.13
Cap on pipe.....	519.13

Island 380, 60 meters from head, 17 meters from top of bank, 7.4 meters 148° to 41-inch elm tree, 4.5 meters 235° to 9-inch ash tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 122/2):

Copper bolt.....	516.56
Cap on pipe.....	520.57

Burlington Island, at foot of, in field 2 meters north of hedge fence on hill near top, abreast the 4-mile post on Chicago, Burlington & Quincy R. R., a two-story stone house with red roof is on slope of hill about 100 meters from stone; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. "Pat"):

Copper bolt.....	638.71
Cap on pipe.....	642.68

BURLINGTON QUADRANGLE.

[Latitude 40° 45'-41°; longitude 91°-91° 15'.]

Burlington Island, in interior of, 560 meters back of following-described bench mark, on east side of an old wagon road, 13 meters 184° to 25-inch elm tree, 10 meters 248° to 18-inch white oak; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 123/1):

Copper bolt.....	516.72
Cap on pipe.....	520.73

Burlington Island, on west shore of, on narrow ridge 5 meters from shore, 3 meters 336° to 12-inch willow tree, 3 meters 29° 30' to 15-inch willow, 0.7 meter 121° 30' to 15-inch willow; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 123/2):

Copper bolt.....	516.02
Cap on pipe.....	520.96

Three-mile post on Chicago, Burlington & Quincy R. R., on brow of bluff above, in front of dwelling house, 4.5 meters 308° to 6-inch hickory, 4.8 meters 128° to 7-inch hickory, 2.5 meters 186° 30' to 8-inch oak; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 123/3):

Copper bolt.....	646.99
Cap on pipe.....	651.01

Burlington, in southeast corner of west abutment of bridge, on stone used as bridge seat and in same course of masonry as those upon which plate girder rests; square cut (U. S. C. E. b. m. 13 R. B.).....

535.90

Burlington, on northwest corner of Front and Valley streets; top of water table (U. S. C. E. b. m. 1).....

537.48

Burlington, on northeast corner of Main and Valley streets; top of stone door sill (U. S. C. E. b. m. 2).....

538.22

Burlington, on lower side of round pier to draw span by bridge; high-water mark of 1851.....

530.28

Burlington, in side of upper stone of mouth of sewer emptying just below elevator; cut (U. S. C. E. high-water mark of 1888).....

529.59

Burlington, private marks in Diamond Jo warehouse (U. S. C. E. high-water marks, 1880, 1881, 1888, 1892, 1892):

1880.....	527.60
1881.....	528.49
1888.....	529.17
1892.....	529.50
1892.....	528.40

Burlington, in upper part of, nearly on line with bench marks 124/2 and 124/3, 4.7 meters 314° to 30-inch cottonwood, 7.8 meters 148° 30' to 8-inch locust, 3.2 meters 48° 30' to 18-inch elm, in woods on ridge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 124/1):	
Copper bolt.....	Feet. 520. 16
Cap on pipe.....	524. 16
Burlington, in upper part of, on sandy ridge, 25 meters from water's edge at old warehouse levee, 60 meters below ferry landing and about 120 meters from old sawmill; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 124/2):	
Copper bolt.....	521. 34
Cap on pipe.....	525. 33
Burlington, in upper part of, on brow of bluff at corner of lots of Mr. Church-all and Mrs. Foote, 50 meters north of tall chimney of waterworks engine house; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 124/3):	
Copper bolt.....	633. 64
Cap on pipe.....	637. 66
Otter Island, at foot of, near large swamp, 626 meters back of following-described bench mark, 1.3 meters 46° to 15-inch cottonwood, 8 meters 136° 30' to 18-inch elm tree, 10.2 meters 292° to 30-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 125/1):	
Copper bolt.....	519. 79
Cap on pipe.....	523. 80
Otter Island, at foot of, at head of riprap, 14 meters from water's edge, 6.5 meters 303° to 15-inch black oak, 11.5 meters 12° to 24-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 125/2):	
Copper bolt.....	520. 49
Cap on pipe.....	524. 50
Otter Island, 13 meters west of small slough on, 400 meters above foot of island, 100 meters from east side of island, 7.4 meters 65° to 18-inch cottonwood tree, 6 meters 176° 30' to 15-inch cottonwood; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 125/3):	
Copper bolt.....	519. 06
Cap on pipe.....	523. 04
O'Connell Island, 8 meters from east shore, 250 meters above point opposite head of Rush Island, 5.6 meters 149° to 28-inch maple tree, 8.9 meters 232° 30' to 9-inch maple tree, 7.2 meters 301° to 15-inch maple tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 125/4):	
Copper bolt.....	519. 58
Cap on pipe.....	523. 58

OQUAWKA QUADRANGLE.

[Latitude 40° 45'-41°; longitude 90° 45'-91°.]

Oquawka, 0.5 mile above, on Iowa shore, 10 meters from river bank, 140 meters below Government light opposite upper end of Oquawka, Ill.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 128/3):	
Copper bolt.....	525. 15
Cap on pipe.....	529. 14
On small ridge 674 meters back of preceding bench mark, 4.3 meters 222° to 18-inch hickory tree, 6.8 meters 15° to 12-inch ash tree, 6.6 meters 125° to 20-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 128/4):	
Copper bolt.....	525. 35
Cap on pipe.....	529. 36

Johnson Island, 400 meters below foot of, 8 meters from water's edge, 5.7 meters 194° to 12-inch ash, 3.6 meters 72° to 7-inch maple, 10.2 meters 293° to 18-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 129/3):

Copper bolt.....	Feet. 525.96
Cap on pipe.....	529.98

KEITHSBURG QUADRANGLE.

[Latitude 41°-41° 15'; longitude 90° 45'-91°.]

Benton Bay, 500 meters below upper end of, 18 meters from shore, 9.1 meters 341° 30' to 10-inch locust, 1 meter 206° to 34-inch elm tree, 19.3 meters 73° to 20-inch elm tree, 18 meters 87° to 20-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 130/2):

Copper bolt.....	527.77
Cap on pipe.....	531.79

Island 360, on lower end of, 20 meters from bank of main channel, 8.2 meters 94° to 30-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 130/3):

Copper bolt.....	524.70
Cap on pipe.....	528.72

New Boston, Ill., 1 mile below, on right bank, 25 meters from shore, 7.3 meters 94° 30' to 8-inch locust tree, 6.4 meters 341° to 15-inch elm, 8.8 meters 281° to 30-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 133/3):

Copper bolt.....	532.19
Cap on pipe.....	536.12

New Boston, Ill., 1 mile below, on right bank, on back edge of slough 892.4 meters back of preceding bench mark, 7.5 meters 279° 30' to 12-inch black-oak tree, 9.7 meters 28° 30' to 12-inch elm tree, 9.9 meters 205° 30' to 8-inch ash tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 133/4):

Copper bolt.....	529.51
Cap on pipe.....	533.53

WAPELLO QUADRANGLE.

[Latitude 41°-41° 15'; longitude 91°-91° 15'.]

Iowa City landing, 0.25 mile above, 20 meters from west edge of swamp, 813 meters back of following-described bench mark, 9.3 meters 16° 30' to 15-inch ash tree, 6.9 meters 79° 30' to 15-inch willow, 6.7 meters 238° 30' to 12-inch birch tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 134/1):

Copper bolt.....	529.49
Cap on pipe.....	533.51

Iowa City landing, 0.25 mile above, on ridge between wide sand bar and narrow slough running parallel to river, 10 meters from natural river bank, 14 meters 319° to 18-inch maple tree, 4.6 meters 63° 30' to 24-inch cottonwood, 11.2 meters 269° to 12-inch willow tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 134/2):

Copper bolt.....	533.22
Cap on pipe.....	537.22

Iowa City landing, 0.25 mile above, 10 meters from bank just north of dry slough, 17.5 meters 43° to 12-inch black oak, 8.7 meters 297° to 15-inch black oak; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 134/3):	
Copper bolt.....	Feet. 530. 46
Cap on pipe.....	534. 46
Iowa City landing, 0.25 mile above, on top of old embankment, apparently a railroad dump, 970 meters back of bench mark 134/3, on line with bench marks 134/2 and 134/3, 9.3 meters 283° to 15-inch cottonwood tree, 9 meters 38° 30' to 15-inch cottonwood, 2.6 meters 176° to 20-inch cottonwood tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 134/4):	
Copper bolt.....	540. 05
Cap on pipe.....	544. 07
Port Louisa landing, 2.5 miles below, 842 meters back of bench mark 135/2, 16.6 meters 300° to 18-inch elm tree, 14.6 meters 201° to 15-inch elm tree, 2.2 meters 82° to 9-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 135/1):	
Copper bolt.....	532. 01
Cap on pipe.....	536. 02
Port Louisa landing, 2.5 miles below, 10 meters from river shore, 7.6 meters 73° to 18-inch elm tree, 11.6 meters 191° to 30-inch cottonwood tree, 13.2 meters 316° to 10-inch black-oak tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 135/2):	
Copper bolt.....	533. 93
Cap on pipe.....	537. 96
Turkey Island, on, 8 meters from east shore, 13 meters 333° to 8-inch willow, 15 meters 76° to 18-inch maple tree, 10 meters 137° to 10-inch willow tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 135/3):	
Copper bolt.....	532. 44
Cap on pipe.....	536. 45
Port Louisa landing, 2.5 miles below, on main shore, 10 meters from river bank, 18 meters 301° to 36-inch elm tree, 8.5 meters 126° to 48-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 135/4):	
Copper bolt.....	533. 78
Cap on pipe.....	537. 79
Port Louisa, in woods opposite, 279 meters from river, 11 meters west of slough, 45 meters above junction with another slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 136/1):	
Copper bolt.....	533. 44
Cap on pipe.....	537. 46
Port Louisa, 35 meters from shore in small open timber opposite, directly opposite foot of small towhead, 8.7 meters 18° to 30-inch elm tree, 4 meters 137° to 8-inch triple elm, 4 meters 200° to 12-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 136/2):	
Copper bolt.....	534. 10
Cap on pipe.....	538. 11
Port Louisa, in open spot at corner of roads on line of road running back from Port Louisa to the bluffs, on point where old house once stood, east of bridge over Muscatine Slough, 23 meters south of fence and 19 meters west of another fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 136/3):	
Copper bolt.....	537. 03
Cap on pipe.....	541. 03

Port Louisa, on line of wire fence on south side of road running back from Port Louisa, 135 feet west of fence corner at bend in road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 136/4):	Feet.
Copper bolt.....	536. 18
Cap on pipe.....	540. 24

MUSCATINE QUADRANGLE.

[Latitude 41° 15'–41° 30'; longitude 91°–91° 15'.]

Island 346, on clearing on, 0.25 mile above foot of island, 25 meters from bank of river, 70 meters from bank of Illinois Slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 137/2):	
Copper bolt.....	535. 83
Cap on pipe.....	539. 85
Port Louisa, 3 miles above, 40 meters from river bank, 18 meters east of wagon road, 5.4 meters 29° to 18-inch cottonwood, 21.6 meters 319° to 30-inch elm, 12.7 meters 242° to 15-inch locust, 5 meters from bank is a sycamore (48 inches in diameter) nearly in line with bench mark and elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 137/3):	
Copper bolt.....	538. 11
Cap on pipe.....	542. 14
Muscatine, 7 miles below, 1,149.5 meters (distance read by stadia) back of bench mark 138/2, in low ground on prairie, 40 meters west of small lake, 50 meters north of cultivated piece of ground which rises about 5 feet higher than prairie, midway between two old wagon roads that join 15 meters south; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 138/2):	
Copper bolt.....	532. 81
Cap on pipe.....	536. 79
Muscatine Island, 30 meters from river bank, 1 meter west of E. Beatty's front-yard fence, 4 meters 200° to 15-inch coffee-bean tree, 6 meters 80° to 24-inch honey locust, 30 meters 94° to northeast corner of Beatty's house; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 138/3):	
Copper bolt.....	545. 14
Cap on pipe.....	549. 16
Copperas Creek, in open spot 100 meters below mouth of, 30 meters back of narrow island whose head is 100 meters above mouth of creek, 15 meters above fence corner, 4 meters east of wagon road, 80 meters below dwelling house on main bank of river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 139/1):	
Copper bolt.....	539. 86
Cap on pipe.....	543. 87
Blanchard Island, 1 mile below head, on ridge 100 meters from river, 60 meters from slough on west, 25 meters from small slough on east; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 139/2):	
Copper bolt.....	541. 85
Cap on pipe.....	545. 86
Muscatine, 3.5 miles below, on property of D. Freeman, at intersection of two wire fences one north-south and the other east-west, north of two lone cottonwood and birch trees; 204 meters north of south line of sec. 22, 156 meters west of levee; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 139/3):	
Copper bolt.....	539. 81
Cap on pipe.....	543. 84

Muscatine Island, along east-west hedge on property belonging to R. F. Parmelee, 12.5 meters 90° to center SE. $\frac{1}{4}$ sec. 21 along hedge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 139/4):	Feet.
Copper bolt.....	547. 42
Cap on pipe.....	551. 39
Muscatine, in lower part of, on ridge between two sloughs, 7 meters west of one slough and 12 meters east of another slough, 100 meters above their junction, 530 meters from river bank, 486 meters from bench mark 140/2; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 140/1):	
Copper bolt.....	538. 41
Cap on pipe.....	542. 44
Muscatine, in lower part of, north of lumber yards, on side hill in meadow belonging to Weltz, 58 meters north of Bowling Green road along north-south fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 140/4):	
Copper bolt.....	644. 85
Cap on pipe.....	648. 88
Muscatine, on east side of waterworks building in top of stone foundation; cut (U. S. C. E. high-water mark of 1881).....	548. 04
Muscatine, top of northeast corner of west abutment of Front Street wagon bridge, about 50 meters northeast of station (U. S. C. E. b. m.).....	549. 71
Muscatine, in Iowa side of second pier, on southwest corner of pier; elevation of highway of 1892.....	549. 19
Muscatine, southeast corner of east pier on north side of railroad track, Muscatine high bridge; top of stone (U. S. C. E. b. m., city b. m.).....	552. 03
Muscatine, on lower pier of third pair of tubular piers from Illinois side of Muscatine wagon bridge; high-water mark of 1892.....	548. 95
Muscatine Bridge, 1.5 miles above, in timber 80 meters from river bank, on main bank, about 0.25 mile below head of Island 334; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 141/2):	
Copper bolt.....	542. 84
Cap on pipe.....	546. 89
Muscatine Bridge, 1.5 miles above, 0.5 meter north of south right-of-way fence of Chicago, Rock Island & Pacific Ry., 192 meters west of bridge 93, 18 meters west of switch where siding runs to tile factory, 14.5 meters south of railroad track; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 141/3):	
Copper bolt.....	542. 57
Cap on pipe.....	546. 60
Muscatine Bridge, 1.5 miles above, 1 meter north of hedge fence, on property of Capt. John W. Anderson, 1 meter east of east line of John Berry's property, 3 meters 34° to 12-inch wild-cherry tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 141/4):	
Copper bolt.....	595. 68
Cap on pipe.....	599. 77

EDGINGTON QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 90° 45'-91°.]

Island 331, opposite foot of, 0.25 mile south of river, on line of north-south fence, 30 meters above fence corner at foot of bluff; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 142/2):	
Copper bolt.....	563. 84
Cap on pipe.....	567. 85

Muscatine, 4.5 miles above, on property of Mrs. McDonald, 30 meters below small creek crossed by railroad bridge 78, 5 meters east of southeast corner of house, 1 meter east of large apple tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 142/3):	
Copper bolt.....	Feet. 569.33
Cap on pipe.....	573.37
Fairport, 0.25 mile above, 1 meter north of south fence of Muscatine-Davenport wagon road, 295 meters east of east line of street which is eastern boundary of Fairport; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 143/3):	
Copper bolt.....	592.38
Cap on pipe.....	596.40
T. 17, R. 4 W., on or very close to line between secs. 27 and 28, on property of Hayes, on bench at foot of bluffs, 140 meters back from Andalusia Slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 144/1):	
Copper bolt.....	607.59
Cap on pipe.....	611.65
Island 325, on north side of, opposite a point about 400 meters below foot of Island 326, 25 meters from bank of river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 144/2):	
Copper bolt.....	545.49
Cap on pipe.....	549.44
Fairport, 3.5 miles above, on property of J. B. Bar, 0.5 meter west of line between secs. 21 and 22, 150 meters from railroad track, on side of hill at edge of timber, 10.7 meters south of intersection of north-south section line, south line of J. C. Fitchner; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 144/3):	
Copper bolt.....	630.89
Cap on pipe.....	634.90
Montpelier, on bench about 0.25 mile above slough between islands 324 and 325, on cleared grassy spot at edge of timber, 91 meters back of wagon road, 100 meters back of Andalusia Slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 145/2):	
Copper bolt.....	627.39
Cap on pipe.....	631.42
Montpelier, on street running north from station, opposite and in line with south side of schoolhouse, 0.5 meter east of wire fence on west side of street; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 145/3):	
Copper bolt.....	600.91
Cap on pipe.....	604.94
Andalusia, 0.5 mile below, 0.25 mile from river, in Rock Island wagon road, 1 meter north of south fence, 100 meters west of Edgington road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 146/2):	
Copper bolt.....	582.26
Cap on pipe.....	586.28
MILAN QUADRANGLE.	
[Latitude 41° 15'–41° 30'; longitude 90° 30'–90° 45'.]	
Buffalo, 0.8 mile below, on property of W. L. Clark, 1 meter south and 2 meters east of center of SE. $\frac{1}{4}$ sec. 21, 400 meters from river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 146/3):	
Copper bolt.....	613.63
Cap on pipe.....	617.63

Linwood, 0.25 mile above hotel at, 1 meter east of west fence of road on section line dividing secs. 23 and 24, 2 meters north of north fence on Davenport road, 20 meters from river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 147/3):	Feet.
Copper bolt.....	558.96
Cap on pipe.....	562.97
Rockingham, 15 meters from river, 0.5 meter east of fence on Davenport wagon road, 136 meters northeast of Homann's south line; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 148/3):	
Copper bolt.....	555.02
Cap on pipe.....	559.00
Davenport, 3 miles below, 0.5 meter west of fence on Davenport wagon road along bluffs, 1,569.5 meters back from bench mark 148/3, 35.5 meters 229° to northwest corner of Fairview schoolhouse; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 148/4):	
Copper bolt.....	616.22
Cap on pipe.....	620.12
Davenport, in top of corner of foundation on glucose works in southern part of, on southwest corner of east wing of building; copper bolt marked "M. R. C. ⊙ B. M. U. S." (U. S. C. E. b. m. 149/3).....	563.63
Davenport, top of top bolt in fire plug at west end of retaining wall, Davenport end of Government bridge (U. S. C. E. t. b. m. 3 r. b.).....	566.05
Davenport, top of water table southwest corner of Davenport waterworks (U. S. C. E. t. b. m. 5 r. b.).....	564.94
Davenport, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	560.17
Davenport, in front of passenger station of Chicago, Rock Island & Pacific Ry.; base of rail.....	592.12
Davenport, top of stone doorsill west end of stone of Masonic Temple entrance on Third Street (U. S. C. E. city b. m.).....	583.33
Davenport, top of water table northwest corner of Chicago, Rock Island & Pacific Ry. passenger station (U. S. C. E. city b. m.).....	593.38
Davenport and Rock Island Bridge, on draw pier; Government gage; elevation of zero.....	542.52

LE CLAIRE QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 90° 15'-90° 30'.]

Davenport, 500 meters above last lumber yard above, 30 meters from bank of river, 0.5 meter north of fence, in oak grove, 115 meters above culvert across creek, 11.5 meters 334° 30' to 10-inch hickory tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 150/3):	
Copper bolt.....	585.77
Cap on pipe.....	589.82
Rock Island Rapids, opposite guide pier 22; on top of solid ledge of rock at extreme point of rock at bend (U. S. C. E. b. m. 22 R. B.) (Col. King) ...	560.58
Moline, just below iron post opposite upper end of, on solid ledge of rock (U. S. C. E. b. m. 21 R. B.).....	559.82
Rock Island, 1.5 miles above head of, on property of George Walker, 60 meters east of east line of club grounds belonging to M. Y. Cady, 0.5 meter east of wire fence between properties of George Walker and Lawrence Rasmussen, 25 meters south of river, 125 meters north of Chicago, Burlington & Quincy R. R.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 151/2):	
Copper bolt.....	564.04
Cap on pipe.....	568.06

Rock Island, 1.5 miles above head of, on property of Young Stokes, 0.5 meter west of line between properties of Stokes and Hartman, 400 meters south of Pleasant Valley wagon road, 300 meters north of river bank on high ridge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 151/3):	
Copper bolt.....	Feet. 568. 31
Cap on pipe.....	572. 33
Rock Island, 1.5 miles above head of, cut on top of solid ledge of rock opposite and below guide pier 16, marked "B. M. 15" black on white (U. S. C. E. b. m. 15 R. B.).....	557. 90
Hampton, 0.8 mile below, 0.5 meter west of east wagon road fence and 0.5 meter south of east-west line through center of sec. 13, T. 78, R. 4 W., 100 meters south of Mr. Dodd's house, 170 meters south of Pigeon Creek, near foot of bluffs; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 152/4):	
Copper bolt.....	588. 47
Cap on pipe.....	592. 49
Spencer Creek, 100 meters above mouth of, opposite point midway between red barn and white house in walnut grove on left bank, 10 meters above road running back to farmhouse on bluff; highest point of large sandstone rock (U. S. C. E. t. b. m. 6 R. B.).....	562. 23
Le Claire, lower edge of, 1 meter west of east right of way fence of railroad, 325 meters above bridge 370 over Barber Creek, on line of fence dividing lots owned by James Clark and George Cooley, 0.5 mile below Port Byron, Ill., 10 meters E. 4° to east end of north abutment of bridge 468; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 154/2):	
Copper bolt.....	583. 72
Cap on pipe.....	587. 74
Le Claire, near northeast corner of Louis Schworm's house on Dodge Street, southwest corner of alley between Main Street and Wisconsin Avenue; copper bolt leaded horizontally in east face of stone porch 1 foot above ground, 8 inches from northeast corner of porch and 2.6 feet from top of porch, marked "M. R. C. U.⊙S. B. M." (U. S. C. E. b. m. 154/3).....	601. 00
Le Claire, on southeast corner of old frame warehouse between river and rear of building, 1 block north of Becker's store (U. S. C. E. high-water mark of 1870).....	573. 81
Princeton, 1.5 miles below, on property of Adam McCoy, 1 meter from southeast corner, at junction of wagon roads, one running along river and the other on line between secs. 14 and 15, T. 79, R. 5 E., 30 meters from bank of river; copper bolt in tile surmounted by iron pipe. (U. S. C. E. b. m. 155/3):	
Copper bolt.....	589. 29
Cap on pipe.....	593. 32
Princeton, 1 mile below, in northeast corner of footplate on northeast corner of iron bridge over Bud Creek; bolt with battered top (U. S. C. E. t. b. m. 11 R. B.).....	580. 27
Princeton, cut in stone culvert near river near center of town (U. S. C. E. high-water mark of June 16, 1880).....	580. 95
• Cordova, in northwest corner of stone warehouse; cut (U. S. C. E. high-water mark of 1860).....	580. 63
Princeton, 1 mile above, on bluff wagon road, 2 meters north of south road fence, 150 meters west of where road turns from river and runs west, 130 meters east of north-south road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 156/3):	
Copper bolt.....	587. 04
Cap on pipe.....	591. 07

Princeton, 1.5 miles northwest of, 1 meter north of south fence on bluff wagon road, at dividing line between Mary and Chas. Pinneo, 100 meters toward river from brick house belonging to Pinneo, at east end of picket fence, copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 156/4):	
Copper bolt.....	Feet. 587. 00
Cap on pipe.....	591. 02
CLINTON QUADRANGLE.	
[Latitude 41° 45'-42"; longitude 90°-90° 15']	
Wapsipinicon River, 200 meters above mouth of, 10 meters from river bank opposite foot of Adams Island, 20 meters north of a shanty, 8 meters 219° 30' to 20-inch white-oak tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 157/3):	
Copper bolt.....	575. 64
Cap on pipe.....	579. 64
Albany, 3 miles below, 15 meters from river bank, opposite point midway between Island 295 and first towhead below, 2.5 meters 121° 30' to 15-inch elm, 58 meters 326° 30' to 18-inch elm tree; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 158/3):	
Copper bolt.....	574. 66
Cap on pipe.....	578. 68
Comanche Distillery building, top of upper foundation stone on southeast corner of, 2 feet above ground; cross cut in boards above (U. S. C. E. t. b. m. 16 R. B.).....	584. 99
Comanche, cut in foundation on east side of warehouse (U. S. C. E. high-water mark, June 25, 1880).....	584. 53
Comanche, in root of first large birch tree 100 meters above old sawmill piling at upper end of; nail (U. S. C. E. t. b. m. 17 R. B.).....	576. 77
Comanche, in front of station on branch of Chicago, Burlington & Quincy R. R., base of rail (U. S. C. E. b. m.).....	597. 28
Comanche, 1 mile north of, 0.5 mile from river, on north-south wagon road, 80 meters north of north fence of cemetery, on ridge 0.5 meter west of east fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 159/4):	
Copper bolt.....	607. 19
Cap on pipe.....	611. 21
Clinton, in extreme southern part of, opposite stock yards, 1 meter east of fence on west side of street forming west line of Chancy Park addition, 131 meters north of north line of Liberty Street; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 160/4):	
Copper bolt.....	633. 80
Cap on pipe.....	637. 83
Clinton, in front of Chicago, Burlington & Quincy R. R. passenger station base of of rail (U. S. C. E.).....	590. 19
Clinton, in front of Chicago & North Western Ry. passenger station; base of rail (U. S. C. E.).....	590. 83
Clinton, cut on third capstone of west abutment of Chicago & North Western Ry. bridge (U. S. C. E. railroad b. m.).....	592. 42
Clinton, at waterworks, cut on top of square stone 1 foot above ground on building line on north side of Sixth Avenue at waterworks (U. S. C. E. t. b. m. 20 r. b. equals city b. m.).....	587. 25
Clinton, on northwest corner of Oliver Messer's warehouse; high-water mark of 1880.....	587. 10

Clinton, on iron safe inside of Smith & Oaks's warehouse on river bank; high-water mark of 1892.....	Feet. 584.30
Clinton, at east end of Chicago & North Western Ry. bridge; base of rail over east abutment (U. S. C. E. b. m.).....	593.08
Clinton, at Chandler Street, 648.6 meters back of following-described bench mark, on wagon road running parallel to Chicago, Burlington & Quincy R. R. tracks, 0.5 meter west of fence on east side of road, 225 meters south of north line of property of Chicago & North Western Ry., 14.5 meters 209° 30' to southwest corner of white house owned by Chicago & North Western Ry.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 161/1):	
Copper bolt.....	591.59
Cap on pipe.....	595.60
Clinton, at Chandler Street, 1.5 miles below Lyons wagon bridge across river, on prominent point, 25 meters from shore; copper bolt in top of tile surmounted by iron pipe (U. S. C. E. b. m. 161/2):	
Copper bolt.....	584.77
Cap on pipe.....	588.72
Clinton, 1 meter south by 0.5 meter east of southwest corner of Chandler and North First Streets, one block south of Joyce's sawmill; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 161/3):	
Copper bolt.....	593.34
Cap on pipe.....	597.35
Lyons, 1 mile above, 30 meters above yard limits of Chicago, Milwaukee & St. Paul Ry., 12 meters west of that railroad company's tracks, on side of bluff near bottom, 1 meter east of fence, 5.5 meters above fence corner, 100 meters below house of Peter Johnson; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 162/3):	
Copper bolt.....	599.34
Cap on pipe.....	603.38
Fulton Island, in scattering timber on, 100 meters from river bank, opposite center of Island 279, 200 meters above head of small slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 164/2):	
Copper bolt.....	580.80
Cap on pipe.....	584.80
Elk River, 0.25 mile below mouth of, 200 meters from river bank, opposite head of Island 281, on small ridge 10 meters east of slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 164/3):	
Copper bolt.....	576.83
Cap on pipe.....	580.86
Elk River Junction, opposite north end of station at, 0.5 meter east of west right-of-way fence of Chicago, Milwaukee & St. Paul Ry.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 164/4):	
Copper bolt.....	589.21
Cap on pipe.....	593.23

SAVANNA QUADRANGLE.

[Latitude 42°-42° 15'; longitude 90°-90° 15'.]

Island 276, 0.25 mile above, 0.25 mile below head of slough, 30 meters from shore, in bunch of tall cottonwood trees; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 165/2):	
Copper bolt.....	577.59
Cap on pipe.....	581.60

Island 276, 0.25 mile above head of, 14 meters from top of bank and on south bank of small slough below mouth of Dark Slough, 10 meters west is 12-inch hickory; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 165/3):	
Copper bolt.....	Feet. 582. 31
Cap on pipe.....	586. 32
Elk River Junction, 3 miles above, in maple timber on high ground, 4 meters west of large slough, 742 meters from river bank, 4 meters north to 6-inch burr oak; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 165/4):	
Copper bolt.....	579. 22
Cap on pipe.....	583. 24
Sabula, 0.5 mile below, in heavy timber, 0.5 mile below Sabula Bridge, 235 meters east of east bank of chute behind Savanna Island, 50 meters back of dry slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 166/1):	
Copper bolt.....	577. 92
Cap on pipe.....	581. 83
Sabula, 0.5 mile below bridge at, on sand ridge back of willow bar, 50 meters from bank, ridge lies between two small dry sloughs; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 166/2):	
Copper bolt.....	581. 33
Cap on pipe.....	585. 29
Sabula, 0.8 mile below, in bunch of elms on Island 269, 200 meters below its head, 150 meters from river bank in line with cleared strip 50 meters wide running back from river, 100 meters from levee; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 166/3):	
Copper bolt.....	580. 69
Cap on pipe.....	584. 72
Sabula, in front of Chicago, Milwaukee & St. Paul Ry. passenger station; base of rail.....	603. 84
Sabula railroad bridge, cut on top of south end of second pier from right bank (U. S. C. E. t. b. m. 27 R. B.).....	598. 07
Sabula bridge, gage on pier west of draw pier (U. S. C. E.), zero of gage...	571. 98
Savanna, at upper end of, on high bank on east side of slough through Kellars Island, in open timber, on ridge between the before-mentioned slough and a dry slough, 752 meters from river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 167/4):	
Copper bolt.....	581. 42
Cap on pipe.....	585. 44
Lainsville, 250 meters below, 0.5 meter from fence on right of way of Chicago, Milwaukee & St. Paul Ry., 25 meters above small bridge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 168/3):	
Copper bolt.....	606. 50
Cap on pipe.....	610. 52
Arnolds landing, on right bank opposite, at head of Island 259, 25 meters from river bank, in open timber partly cleared; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 169/3):	
Copper bolt.....	584. 07
Cap on pipe.....	588. 06
Arnolds landing, on right bank opposite, 696 meters from river bank, on east bank of slough in open timber; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 169/4):	
Copper bolt.....	584. 77
Cap on pipe.....	588. 79

MILES QUADRANGLE.

[Latitude 42°-42° 15'; longitude 90° 15'-90° 30'.]

Island 256, 0.8 mile above, 0.5 meter south of fence on north side of wagon road on line of division fence of Warner and A. O. Hunt, on sand prairie, 1,356.8 meters back of following-described bench mark; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 170/1):	Feet.
Copper bolt.....	631. 60
Cap on pipe.....	635. 63
Maquoketa River, 1.25 miles below mouth of, 30 meters from river bank, in thick timber 0.25 mile above Island 256, on south bank of small slough leading back from river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 170/3):	
Copper bolt.....	584. 82
Cap on pipe.....	588. 80
Island 256, 0.8 mile above, 20 meters from west bank of small dry slough, in open bottom land, 746 meters from river bank, in open pocket in timber extending to bluffs on west, 60 meters west of edge of timber; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 170/4):	
Copper bolt.....	585. 33
Cap on pipe.....	589. 34
Green Island, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail.....	597. 80
Bellevue, 6 miles below, 50 meters from shore, in wagon road along river, 0.5 meter from east fence and 6 meters south of south fence along east-west wagon road, 100 meters below Mr. Degear's house; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 171/2):	
Copper bolt.....	616. 01
Cap on pipe.....	620. 02
Island 253, 0.25 mile above small island and opposite point just below, on sandy ridge in maple timber 20 meters northeast of slough 40 meters wide, 15 meters from river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 171/3):	
Copper bolt.....	587. 76
Cap on pipe.....	591. 76
Bellevue, 6 miles below, 480 meters from river, 32 meters west of slough and 25 meters east of another slough, on narrow neck of land between two sloughs; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 171/4):	
Copper bolt.....	583. 96
Cap on pipe.....	587. 96
Island 249, 0.25 mile below head of ? in timber 15 meters west of large slough, 595.7 meters back of following-described bench mark; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 172/1):	
Copper bolt.....	583. 08
Cap on pipe.....	587. 10
Island 249, 0.25 mile below point opposite head of, 40 meters from bank of slough, in bunch of elms; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 172/2):	
Copper bolt.....	586. 00
Cap on pipe.....	590. 03

Bridge 40K, 55 meters above, 1 meter west of west right of way fence of Chicago, Milwaukee & St. Paul Ry., 60 meters above wagon bridge which is at foot of bluffs where wagon road turns from river and appears to go up bluffs; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 172/3):		Feet.
Copper bolt.....		604. 80
Cap on pipe.....		608. 88
Bellevue, upper end of, on east line of north and south alley running between Front and Second streets, inside of fence on property of Mose Bean (Mr. Bean's house is a large yellow frame building facing Front Street and one block south of Harmony Park); copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 173/3):		
Copper bolt.....		626. 34
Cap on pipe.....		630. 36

GALENA QUADRANGLE.

[Latitude 42° 15'-42° 30'; longitude 90° 15'-90° 30'.]

Bellevue, 3 miles above, 863.5 meters back of following-described bench mark, 15 meters from bank and at intersection of slough with Yonkers Lake, at large bend in slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 174/1):		
Copper bolt.....		587. 93
Cap on pipe.....		591. 95
Island 243, 0.25 mile above foot of, 30 meters from shore, in timber, 300 meters from head of Crooked Slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 174/2):		
Copper bolt.....		588. 79
Cap on pipe.....		592. 79
Island 243, 0.5 mile above foot of, 0.5 meter west of west right of way fence of Chicago, Milwaukee & St. Paul Ry., on property belonging to Mr. Efferding, on top of 25-foot railroad cut; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 174/3):		
Copper bolt.....		637. 98
Cap on pipe.....		642. 02
Bellevue, 3 miles above, 0.25 meter north of east-west wire fence, on very high ridge, 0.8 mile from river, a rocky point stands about 0.25 mile north of bench mark on property of John Weinert, 20 meters west of a gate, 100 meters west of jog in wire fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 174/4):		
Copper bolt.....		746. 96
Cap on pipe.....		750. 99
Gordons Ferry, 1 mile above, in pasture 0.5 meter west of west right-of-way fence of Chicago Great Western R. R. and Illinois Central R. R. tracks, 900 meters from river, 232 meters east of slough, 30 meters north of gate in fence at railroad crossing, 60 meters north of railroad bridge 743 on Chicago Great Western R. R., 70 meters below fence corner; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 176/1):		
Copper bolt.....		596. 22
Cap on pipe.....		600. 23
Island 237, 20 meters from river bank on, in open ground, 200 meters above head of Harris Slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 176/2):		
Copper bolt.....		588. 06
Cap on pipe.....		592. 09

Gordons Ferry, 0.5 mile above, 0.5 meter west of right of way fence of Chicago, Milwaukee & St. Paul Ry., on bench above railroad track, 10 meters from perpendicular rock bluff and about 150 meters below large bridge 66K across creek; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 176/3):		
Copper bolt.....		Feet. 614.26
Cap on pipe.....		618.26

PEOSTA 30' QUADRANGLE.

[Latitude 42°-42° 30'; longitude 90° 30'-91°.]

Dubuque, 9 miles below, on right of way of Chicago, Milwaukee & St. Paul Ry., 0.5 meter from fence, opposite a point about 10 meters below a post on roadbed marked "34-127," 400 meters below railroad bridge 74K; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 177/3):		
Copper bolt.....		623.20
Cap on pipe.....		627.18
Massey, 50 meters below railroad station, on right of way of Chicago, Milwaukee & St. Paul Ry., 50 meters toward river from foot of bluffs, 0.5 meter from farthest fence from river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 178/3):		
Copper bolt.....		619.67
Cap on pipe.....		623.62
Dubuque, 3 miles below, on property of Joe Herod, 15 meters back from river bank, 0.5 meter from right of way fence of railroad, 15 meters north of perpendicular rock cliff, 100 meters below railroad bridge 92K; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 179/3):		
Copper bolt.....		608.53
Cap on pipe.....		612.49
Dubuque, 0.8 mile above railroad bridge over river at, on right bank below shops of Chicago, Milwaukee & St. Paul Ry., 0.5 meter north of southeast corner of small stockyards which are just south of roundhouse of that railroad, 50 meters southeast of roundhouse and 25 meters back from bank of slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 180/3):		
Copper bolt.....		607.48
Cap on pipe.....		611.48
Eagle Bluffs, at upper end of, 3 miles above Dubuque, on property of Chris Brant along right of way of Chicago, Burlington & Quincy R. R., 50 meters above end of switch, 150 meters below milepost on roadbed marked "241-190," 200 meters below two-story frame house, at foot of bluffs in draw; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 181/1):		
Copper bolt.....		605.92
Cap on pipe.....		609.88
Dubuque, 3 miles above, at foot of bluffs, 8 meters toward bluffs from center of Chicago, Milwaukee & St. Paul Ry. track, 125 meters above signboard reading "Slow, 6 miles per hour," 100 meters below a point opposite ferry landing on left bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 181/3):		
Copper bolt.....		614.35
Cap on pipe.....		618.30
Edmore siding, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E.).....		614.74

Island 217, on left bank of, 10 meters from river bank, 0.25 mile below head of island; copper bolt in tile surmounted by iron pipe (U. S. C. E. 182/2):	
Copper bolt.....	Feet. 600. 02
Cap on pipe.....	603. 99
Zollicoffer Lake, 150 meters above railroad station at, in right of way of Chicago, Milwaukee & St. Paul Ry., 0.5 meter from fence, at foot of bald bluff, 25 meters above upper end of curve at station; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 182/3):	
Copper bolt.....	623. 54
Cap on pipe.....	626. 13
Spechts Ferry, 1.5 miles below, outside of right of way of Chicago, Burlington & Quincy R. R., at jog in fence just below small gully, 130 meters above milepost 234-197, 100 meters below point opposite small log house at foot of bluffs; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 183/1):	
Copper bolt.....	614. 01
Cap on pipe.....	617. 98
Island 213, on right bank of, 0.8 mile below its head, 15 meters back from bank of river on high ground, opposite rock quarry on right bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 183/2):	
Copper bolt.....	598. 90
Cap on pipe.....	602. 87
Spechts Ferry, 1.5 miles below, 0.5 meter west of east right-of-way fence of Chicago, Milwaukee & St. Paul Ry., between tenth and eleventh telegraph poles, below signboard which reads "Slow to 6 miles an hour," 55 meters above wagon road crossing at rock quarry, 175 meters above railroad bridge 138K; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 183/3):	
Copper bolt.....	613. 35
Cap on pipe.....	617. 3
Spechts Ferry, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E.).....	613. 80
Spechts Ferry, 1.5 miles above, in right of way of Chicago, Burlington & Quincy R. R., along nearest fence to river, 176 meters below iron railroad bridge over Grant River, 42 meters below small railroad bridge, 75 meters above small frame house; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 184/1):	
Copper bolt.....	610. 64
Cap on pipe.....	614. 59
Frenchtown landing, on right of way of Chicago, Milwaukee & St. Paul Ry., at fence, at upper end of small picnic grounds, 25 meters below end of bridge 148K; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 184/3 equals U. S. P. B. M. 263):	
Copper bolt.....	610. 88
Cap on pipe.....	614. 88
Finley landing, 0.8 mile above, on right of way of Chicago, Burlington & Quincy R. R., 100 meters above upper end of railroad bridge at foot of bluffs, 0.5 meter from fence, 10 meters above small log house, 10 meters below milepost 204-227; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 185/1):	
Copper bolt.....	615. 07
Cap on pipe.....	619. 00

Island 204, about opposite foot of, on Island 203, on lower end of island, 20 meters from river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 185/2):	
Copper bolt.....	Feet. 602. 31
Cap on pipe.....	606. 25
Hurricane Island, opposite head of first towhead below foot of, on south side of Chicago, Milwaukee & St. Paul Ry. track, 6.5 meters north of south right-of-way fence, on prominent high ridge running out from bluff, 6 meters from and 4.5 meters higher than railroad track; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 185/3 equals \triangle Rumpel):	
Copper bolt.....	637. 29
Cap on pipe.....	641. 25
Waupeton, 0.25 mile below, at foot of bluffs, 0.5 meter from right-of-way fence of Chicago, Burlington & Quincy R. R., 5 meters above upper end of railroad bridge, 200 meters below milepost 224-207; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 186/1):	
Copper bolt.....	621. 28
Cap on pipe.....	625. 22
Waupeton, 260 meters below, 187 meters below railroad bridge 172, on north face of bluff at point where it begins to curve to south, 11 meters south from center of Chicago, Milwaukee & St. Paul Ry. track, 0.6 meter south from right-of-way fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 186/3 equals p. b. m. 258-259):	
Copper bolt.....	615. 84
Cap on pipe.....	619. 83
Waupeton, opposite Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	623. 97
Buena Vista, 0.5 mile below, on right of way of Chicago, Milwaukee & St. Paul Ry., 25 meters below lower end of railroad bridge 194, 7 meters from center of track toward bluffs; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 187/3):	
Copper bolt.....	624. 80
Cap on pipe.....	628. 75
Buena Vista, opposite Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	625. 32
Cassville, 0.5 mile below, on small island opposite pickle factory, 45 meters back from bank of river, 30 meters from slough at head of island, in small cleared space in willows; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 188/3):	
Copper bolt.....	603. 57
Cap on pipe.....	607. 53
Buena Vista, 2.6 miles above, on line of Chicago, Milwaukee & St. Paul Ry. track, 16 meters below center of bridge 204K, at fence on bluff side, 11 meters from center of track; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 188/4):	
Copper bolt.....	617. 11
Cap on pipe.....	621. 11
Turkey River junction, opposite Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	621. 66

ELKADER 30' QUADRANGLE.

[Latitude 42° 30'-43°; longitude 91°-91° 30'.]

Island 189, on, 400 meters above its foot, 75 meters from right bank of Cassville Slough, 100 meters below mouth of small slough which empties into Cassville Slough, on small clearing on ridge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 189/2):	
Copper bolt.....	Feet. 605. 01
Cap on pipe.....	608. 97
Island 189, opposite a point 0.5 mile above foot of, on right bank of Guttenberg Channel, 50 meters below head of small slough and 10 meters back from bank of river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 189/3):	
Copper bolt.....	603. 73
Cap on pipe.....	607. 68
Turkey River station, 0.5 mile above, on right of way of Chicago, Milwaukee & St. Paul Ry., 0.5 meter from north fence, 8.5 rail lengths above a sign "Turkey River Stop Junction"; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 189/4):	
Copper bolt.....	607. 00
Cap on pipe.....	610. 97
Island 189, on, on high ridge 80 meters from left bank of Guttenberg Channel, 25 meters above patch of trees and willows along river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 190/3):	
Copper bolt.....	608. 37
Cap on pipe.....	612. 31
Guttenberg, 3 miles below, on right bank on right of way of Chicago, Milwaukee & St. Paul Ry., 1 meter from fence, 5 meters west of small ravine, 10 meters above bridge 238; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 190/4):	
Copper bolt.....	635. 30
Cap on pipe.....	639. 20
Guttenberg, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	620. 61
Guttenberg, at upper end of, on island in front of Swift Slough, 20 meters from left bank of Guttenberg Channel, 400 meters from head of island; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 191/3):	
Copper bolt.....	609. 03
Cap on pipe.....	612. 98
Guttenberg, on property of John Hirschbueller, corner of Second Street and Washington Avenue, at his north line, 10 meters east of east line of Second Street; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 191/4):	
Copper bolt.....	621. 54
Cap on pipe.....	625. 49
McMillan Island, 400 meters above head of, on right bank, 15 meters back from river bank, 100 meters below bench mark the bank is very steep; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 192/3):	
Copper bolt.....	609. 59
Cap on pipe.....	613. 53
Eckard, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	622. 93

Island 181, 400 meters above foot of, 20 meters back from bank of river, just above head of Island 182; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 193/2):	
Copper bolt.....	Feet. 609.87
Cap on pipe.....	613.82
Bagley, 1 mile below, on right of way of Chicago, Milwaukee & St. Paul Ry., 500 meters above milepost 76-85, opposite upper end of small curve which is second one above a perpendicular rock cut, and curves toward bluffs, 37 meters above Government light, 3 meters from center of track toward bluffs, rock is 0.6 meter higher than track and is marked "U. S." in large letters on side facing track; copper bolt in rock (U. S. C. E. b. m. 193/3).....	630.90
Clayton, opposite Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	623.46
Island 181, 20 meters back from river bank, 600 meters above small slough which empties into river opposite Clayton, 100 meters below upper end of high timber (bank in front of bench mark is steep, but becomes sloping 100 meters below); copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 194/2):	
Copper bolt.....	613.24
Cap on pipe.....	617.19
Clayton, 0.25 mile above station, on right of way of Chicago, Milwaukee & St. Paul Ry., 1.5 meters from fence, on slope of bluff, 5 meters above railroad bridge 352; 10 meters above a Government light; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 194/3):	
Copper bolt.....	644.26
Cap on pipe.....	648.20
Island 176, on, 25 meters back from bank of river, 100 meters above head of Wyalusing Slough, which is opposite Wyalusing, Wis.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 195/3):	
Copper bolt.....	612.73
Cap on pipe.....	616.68
Wyalusing, on side of bluff, 1 meter east of perpendicular rock cliff, 25 meters west of center of Chicago, Milwaukee & St. Paul Ry. track, 40 meters above log house, on path leading from log house to spring, 300 meters above railroad bridge 364 over Sny McGill Creek; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 195/4):	
Copper bolt.....	649.08
Cap on pipe.....	653.03

WAUKON 30' QUADRANGLE.

[Latitude 43°-43' 30'; longitude 91°-91° 30'.]

McGregor, 1.8 miles below, on right of way of Chicago, Milwaukee & St. Paul Ry., 11 meters east of center of track, 84 meters above milepost 66, directly opposite Pictured Rocks; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 196/3):	
Copper bolt.....	627.78
Cap on pipe.....	631.78
McGregor, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	627.17
North McGregor, in front of station; base of rail (U. S. C. E. b. m.).....	627.74

North McGregor, at upper end of, where bluffs come out to tracks, 0.5 meter east of perpendicular rock cliff and at an elevation about 9 meters higher than railroad tracks, 15 meters above sign "R. R. Crossing Stop 400 feet;" copper bolt in solid rock surmounted by iron pipe (U. S. C. E. b. m. 197/3):	
Copper bolt.....	Feet. 664. 02
Cap on pipe.....	666. 75
Island 166, planted on, 20 meters back from shore on high ground, 600 meters above head of Island 169; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 198/2):	
Copper bolt.....	616. 07
Cap on pipe.....	620. 05
Yellow River station, 300 meters above, on south side of bluff about 0.5 mile above Yellow River, opposite a point 5 meters above headblock of switch; 15 meters west of center of railroad track; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 198/3):	
Copper bolt.....	655. 68
Cap on pipe.....	659. 65
Island 166, on high ground at west edge of garden and 30 meters below small house at north end of cultivated field, 20 meters back from shore, 15 meters south of dead 4-foot cottonwood which branches into four prongs about 12 feet above ground, opposite mouth of Paint Creek, 800 meters below Government light; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 199/2):	
Copper bolt.....	620. 10
Cap on pipe.....	624. 06
Johnsonport, 200 meters above last house in upper end of, 2 meters west of west right-of-way fence of Chicago, Milwaukee & St. Paul Ry., 150 meters above mouth of Paint Creek, 143 meters above bridge 438K; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 199/3):	
Copper bolt.....	637. 25
Cap on pipe.....	641. 21
Island 163, planted on, on high ground in bunch of cottonwoods, 30 meters back from east shore, 100 meters above a running slough opposite foot of Island 164, 25 meters north of small dry slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 200/3):	
Copper bolt.....	615. 02
Cap on pipe.....	618. 98
Waukon Junction, 1.25 miles above, at foot of bluffs, 0.5 mile above triangulation station "Painted Rocks," in corner of fences, 1 meter west of west right of way fence of Chicago, Milwaukee & St. Paul Ry., 15 meters north of road crossing, 30 meters below bridge 456; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 200/4):	
Copper bolt.....	633. 30
Cap on pipe.....	637. 27
Harpers Ferry, 1.5 miles below, on northeast corner of downstream stone abutment of Chicago, Milwaukee & St. Paul Ry. bridge 462K, at lower end of bottom land where Harpers Slough strikes bluffs, 2.5 feet below track, on first course of stone, 9 feet east of center; square cut (U. S. C. E. t. b. m. 20, R. B.):	
Copper bolt.....	630. 25
Island 162, opposite head of, on irregular-shaped island just below Island 161, in small clump of heavy timber 15 meters from shore; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 201/3):	
Copper bolt.....	615. 65
Cap on pipe.....	619. 62

Harpers Ferry, 1.5 miles above, on main bank, 600 meters from foot of bluffs, 0.5 meter east of fence along wagon road, 500 meters below two-story frame house standing opposite triangulation station "Oil Spring," 150 meters below land line between John Martell on north and Peter Joice on south, 150 meters below upper end of row of cottonwood trees standing along bank of slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 201/4):	
Copper bolt.....	Feet. 638. 14
Cap on pipe.....	642. 07
Island 158, planted on, 150 meters below head of island, on high ground in bunch of elms, 50 meters back from shore; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 202/3):	
Copper bolt.....	614. 62
Cap on pipe.....	618. 58
Lynxville, opposite, at side of old wagon road, 0.5 meter west of west right-of-way fence of Chicago, Milwaukee & St. Paul Ry., nearly opposite upper end of railroad curve, on side of bald, grassy, round-topped bluff, 200 meters below where Harpers Slough turns away from bluffs toward Lynxville; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 202/4):	
Copper bolt.....	649. 93
Cap on pipe.....	653. 86
Island 151, on, 50 meters back from shore, opposite center of small island, a little below a point opposite a Government light, two large elms stand close to bench mark, one of which appears to be tallest tree in vicinity; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 203/2):	
Copper bolt.....	615. 59
Cap on pipe.....	619. 65
Crooked Slough, opposite head of, at foot of bluffs, along wagon road, 1 meter west of right-of-way fence of Chicago, Milwaukee & St. Paul Ry., 175 meters below a sign "1500 Feet to Sta." (Heytmans), 15 meters above whistling post and 25 meters above lower end of small curve; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 203/3):	
Copper bolt.....	647. 28
Cap on pipe.....	651. 24
Lansing, 6.5 miles below, 1 mile above Heytmans Landing, on downstream side and river end of upstream stone abutment of Chicago, Milwaukee & St. Paul Ry. bridge 504K, 2.7 feet below top of rail and 12 feet toward river from center of track, 300 meters below signboard "Station 1 mile," 70 feet above whistling post; square cut (U. S. C. E. t. b. m. 23 R. B.)....	633. 86
Carol Island, planted on, 250 meters below head of Ferry Slough, 25 meters back from shore, opposite foot of first small island below head of Ferry Slough, 100 meters above a log cabin, in bunch of elms; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 204/2):	
Copper bolt.....	618. 62
Cap on pipe.....	622. 59
Capoli Bluff, on right bank directly under, 0.5 meter outside of right-of-way fence of Chicago, Milwaukee & St. Paul Ry. (bluff side), 25 meters above upper end of sharp curve around foot of Capoli Bluff; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 204/3):	
Copper bolt.....	654. 43
Cap on pipe.....	658. 37

Island 148, 400 meters above head of, on large island, in bunch of willows, 50 meters back from shore, 150 meters above head of bay; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 205/2):	Feet.
Copper bolt.....	615. 50
Cap on pipe.....	619. 45
Lansing, 2 miles below station, in meadow at foot of bluffs on property of Julius Nelson, 0.5 meter toward bluffs from fence along wagon road, 155 meters below milepost 123-38, 120 meters above culvert 518; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 205/3):	
Copper bolt.....	653. 78
Cap on pipe.....	657. 74
Lansing, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	632. 69
Lansing, on southeast corner of G. W. Herndt's warehouse; high-water mark of June, 1880.....	633. 98
Island 146, on high ground in bunch of elms, 40 meters back from shore at Government light, opposite upper end of Lansing; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 206/2):	
Copper bolt.....	619. 61
Cap on pipe.....	623. 57
Lansing, opposite 1-mile post above, 34 meters back from railroad, at foot of bluffs, 75 meters above an old mill that stands on bank of slough, and is last building in upper end of Lansing; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 206/3):	
Copper bolt.....	644. 83
Cap on pipe.....	648. 77
Lansing, 1.5 miles above, on upstream side and river end of downstream abutment of Chicago, Milwaukee & St. Paul Ry. bridge 530K, 0.8 foot below track and 7 feet east of center; square cut (U. S. C. E. t. b. m. 26, R. B.).....	637. 35
Island 140, opposite foot of island 141, 30 meters back from shore, 100 meters below upper end of timber, 30 meters below an old shed, inside a lot, 1 meter from east fence; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 207/3):	
Copper bolt.....	620. 70
Cap on pipe.....	624. 67
Lansing, 3 miles above, planted at foot of bluffs, 1 meter east of west right-of-way fence of Chicago, Milwaukee & St. Paul Ry., 425 meters above bridge 540K, 475 meters above a house, 0.5 mile above triangulation station Cowles, opposite end of railroad curve, 0.5 mile below school-house; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 207/4):	
Copper bolt.....	640. 19
Cap on pipe.....	644. 15
Lansing, 3.8 miles above, on downstream side and river end of upstream stone abutment of Chicago, Milwaukee & St. Paul Ry. bridge 546K, 3 feet below track, 8 feet toward river from center; square cut (U. S. C. E. t. b. m. 27, R. B.).....	635. 73
Kains siding, in front of Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	634. 52

Battle Island (137), on high sand ridge, 0.5 mile above foot of island, 75 meters from edge of sand bar, 20 meters from main bank, 100 meters below lower end of small willows on bar; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 208/2):	
Copper bolt.....	Feet. 622. 11
Cap on pipe.....	626. 06
Island 139, about opposite center of Battle Island, 100 meters back from bank of river, 25 meters below south end of dam across slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 208/3):	
Copper bolt.....	619. 93
Cap on pipe.....	623. 87
Island 139, in timber on west bank of small dry slough, in bend of large slough, 50 meters east and 50 meters south from bank of slough; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 208/4):	
Copper bolt.....	621. 53
Cap on pipe.....	625. 47
New Albin, 5 miles below, 1 mile above Kains siding, on upstream side and river end of downstream abutment of Chicago, Milwaukee & St. Paul Ry. bridge 560K, 125 meters above milepost 29-132, 3 feet below track, 10 feet toward river from center; square cut (U. S. C. E. t. b. m. 28, R. B.).....	636. 18
Island 135, 100 meters above its lower end, on ridge, 100 meters above lower end of timber, 50 meters back from shore, 200 meters below point opposite warehouse at Tippetts Landing; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 209/3):	
Copper bolt.....	622. 09
Cap on pipe.....	626. 05
Lost Slough, 75 meters east from east bank of, in low ground, in small bunch of willows; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 209/4):	
Copper bolt.....	618. 49
Cap on pipe.....	622. 45
New Albin, opposite Chicago, Milwaukee & St. Paul Ry. station; base of rail (U. S. C. E. b. m.).....	648. 53
New Albin, top of city corner stone on west side of Chicago, Milwaukee & St. Paul Ry. track, 2 blocks north of station and just north of grain elevator (U. S. C. E. t. b. m. 29, R. B.).....	650. 12
New Albin, top of pipe monument on State line between Iowa and Minnesota (U. S. C. E. t. b. m. 30, R. B.).....	648. 74
New Albin, top of city corner stone which is on Iowa-Minnesota State line, 35 meters west of pipe monument, 8 meters east of east right-of-way fence of Chicago, Milwaukee & St. Paul Ry. (U. S. C. E. t. b. m. 31, R. B.).....	648. 06

KAHOKA QUADRANGLE.

[Latitude 40°-40° 30'; longitude 91° 30'-92°.]

From Keokuk northwest near Des Moines River to Santa Fe R. R. bridge crossing Des Moines River between Hinsdale and Belfast.

Keokuk, 10 miles northwest of, in ground on north side of Chicago, Rock Island & Pacific Ry. track at milepost 10 above Keokuk; top of rail set vertically in ground (U. S. C. E. b. m. 2).....	512. 56
Keokuk, 11 miles northwest of, on north side of Chicago, Rock Island & Pacific Ry. track, at milepost 11 above Keokuk; top of rail set vertically in ground (U. S. C. E. b. m. 3).....	515. 24

DONNELSON QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 91° 30'-91° 45'.]

From point 11 miles northwest of Keokuk northwest along Chicago, Rock Island & Pacific Ry. to point 33 miles above Keokuk.

	Feet.
Hinsdale and Belfast, top and extreme southwest corner of east abutment of Santa Fe R. R. bridge crossing Des Moines River between; top of abutment (U. S. C. E. b. m. 4).....	560.68
Keokuk, 19 miles northwest of, at milepost 19 above Keokuk, in ground north side of Chicago, Rock Island & Pacific Ry.; top of rail set vertically (U. S. C. E. b. m. 5).....	532.10
Belfast station, 100 feet east of, in ground on south side of railroad, at milepost 20 above Keokuk; top of rail set vertically in ground (U. S. C. E. b. m. 6).....	526.79
Belfast station, 1 mile northwest of, at milepost 21 above Keokuk, in ground on north side of railroad; top of rail set vertically (U. S. C. E. b. m. 7).....	530.57
Belfast station, 2 miles northwest of, at milepost 22 above Keokuk, in ground north of railroad; top of rail set vertically (U. S. C. E. b. m. 8).....	549.35
Belfast station, 3 miles northwest of, at milepost 23 above Keokuk, in ground north of railroad; top of rail set vertically (U. S. C. E. b. m. 9).....	558.43
Belfast station, 4 miles northwest of, at milepost 24 above Keokuk, in ground north of railroad; top of rail set vertically (U. S. C. E. b. m. 10).....	544.32
Belfast station, 5 miles northwest of, in ground north of railroad; top of rail set vertically at milepost 25 above Keokuk (U. S. C. E. b. m. 11).....	548.21
Belfast station, 6 miles northwest of, at milepost 26 above Keokuk, in ground on north side of railroad; top of rail set vertically (U. S. C. E. b. m. 12).....	542.72
Belfast station, 7 miles northwest of, at milepost 27 above Keokuk, in ground on north side of railroad; top of rail set vertically (U. S. C. E. b. m. 13).....	560.61
Belfast station, 8 miles northwest of, at milepost 28 above Keokuk, in ground on north side of railroad; top of rail set vertically (U. S. C. E. b. m. 14).....	553.40
Farmington, about midway between milepost 30 and Chicago, Burlington & Kansas City R. R. water tank, on north side of Chicago, Rock Island & Pacific Ry.; top of rail set vertically in ground (U. S. C. E. b. m. 15).....	570.17
Farmington, top of northwest corner of downstream end of first pier from north or left-bank side of river of highway bridge (U. S. C. E. b. m. 94).....	554.09
Farmington, 1 mile northwest of, in ground on north side of railroad, at milepost 31 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 16).....	561.27

KEOSAUQUA QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 91° 45'-92°.]

From point 1 mile northwest of Farmington northwest along Chicago, Rock Island & Pacific Ry. to point near Keosauqua.

Farmington, 3 miles northwest of, in ground on north side of railroad, at milepost 33 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 17).....	574.33
Farmington, 4 miles northwest of, in ground on north side of railroad, at milepost 34 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 18).....	561.88
Farmington, 5 miles northwest of, in ground on north side of railroad, at milepost 35 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 19).....	560.71
Bonaparte, in front of station; top of rail (U. S. C. E. b. m. 20).....	564.09

Bonaparte, 1 mile northwest of, in ground on north side of railroad, at milepost 37 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 21)	Feet. 574. 37
Bonaparte, 2 miles northwest of, in ground on north side of railroad, at milepost 38 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 22)	568. 72
Bonaparte, 3 miles northwest of, in ground on north side of railroad, at milepost 39 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 23)	574. 51
Bentonsport, in front of station; top of rail (U. S. C. E. b. m. 24).....	574. 59
Bentonsport, near, on north side of railroad, at milepost 40 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 25).....	569. 65
Bentonsport, about 1.5 miles northwest of, on north side of railroad, at milepost 41 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 26)	577. 61
Bentonsport, about 2.5 miles northwest of, on north side of railroad, at milepost 42 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 27)	584. 84
Bentonsport, about 3.5 miles northwest of, on north side of railroad, at milepost 43 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 28)	578. 22
Keosauqua, at southwest corner of concrete porch floor of Manning Hotel (U. S. C. E. b. m. 29).....	579. 14
Keosauqua, on top of east end of south abutment of highway bridge; cross mark (U. S. C. E. b. m. 30).....	588. 41

At Bentonsport.

Bentonsport, top of upstream end of first pier from north end of highway bridge (U. S. C. E. b. m. 92).....	569. 88
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At Bonaparte.

Bonaparte, high-water mark of 1903, on north end of retaining wall of approach to highway bridge; chisel mark (U. S. C. E. b. m. 93).....	557. 93
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MOUNT ZION QUADRANGLE.

[Latitude 40° 45'-41°; longitude 91° 45'-92°.]

From Keosauqua northwest along Chicago, Rock Island & Pacific Ry. to milepost 52, above Keokuk.

Pittsburg highway bridge, on top stone at angle in abutment, on south end of east abutment; cross mark (U. S. C. E. b. m. 31).....	593. 36
Kilbourne, in ground on north side of railroad, at milepost 48 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 32).....	596. 96
Kilbourne, top of southwest corner of north abutment of highway bridge (U. S. C. E. b. m. 91).....	599. 86
Kilbourne, 1 mile northwest of, in ground on north side of railroad, at milepost 49 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 33)	601. 41
Kilbourne, 2 miles northwest of, in ground on north side of railroad, at milepost 50 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 34)	603. 95
Kilbourne, 3 miles northwest of, in ground on north side of railroad, at milepost 51 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 35)	598. 71

ELDON QUADRANGLE.

[Latitude 40° 45'-41°; longitude 92°-92° 15'.]

From point 3 miles northwest of Kilbourne northwest along Chicago, Rock Island & Pacific Ry. to point 4 miles northwest of Eldon.

Kilbourne, 4 miles northwest of, in ground on north side of railroad, at milepost 52 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 36)	603. 38
Kilbourne, 5 miles northwest of, in ground on north side of railroad, at milepost 53 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 37)	606. 18

	Feet.
Kilbourne, 6 miles northwest of, in ground on north side of railroad, at milepost 54 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 38)	609.05
Kilbourne, 7 miles northwest of, in ground on north side of railroad, at milepost 55 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 39)	610.11
Kilbourne, 8 miles northwest of, in ground on north side of railroad, at milepost 56 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 40)	605.65
Selma, in front of station; top of rail (U. S. C. E. b. m. 41).....	615.79
Selma, top of upstream side of second tube pier west of east end of highway bridge (U. S. C. E. b. m. 89).....	613.28
Eldon, on south side of street that crosses highway bridge, on ground on north side of railroad, at milepost 64 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 42).....	625.86
Eldon, on top of and at northwest corner of first stone pier from north end of Chicago, Rock Island & Pacific Ry. bridge (U. S. C. E. b. m. 88)....	623.68
Eldon, on top of and at northwest corner of first stone pier from north end of highway bridge (U. S. C. E. b. m. 87).....	622.23
Eldon, 1 mile northwest of, in ground on north side of railroad, at milepost 65 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 43).....	619.80

At Douds-Leando Bridge.

Douds and Leando, top of upstream end of north abutment of highway bridge between (U. S. C. E. b. m. 90)	612.20
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FLORIS QUADRANGLE.

[Latitude 40° 45'-41'; longitude 92° 15'-92° 30'.]

From point 1 mile northwest of Eldon northwest along Chicago, Rock Island & Pacific Ry. to point near Ottumwa.

Eldon, 4 miles northwest of, in ground on north side of railroad at milepost 68 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 44).....	632.22
Cliffland, in front of station; top of rail (U. S. C. E. b. m. 45).....	630.49
Cliffland, top of southeast corner on downstream end of first concrete pier from north end of highway bridge (U. S. C. E. b. m. 86).....	636.00
Eldon, 7 miles northwest of, in ground on north side of railroad at milepost 71; top of rail set vertically (U. S. C. E. b. m. 46).....	631.19
Ottumwa, near, in ground on north side of railroad, at milepost 74 above Keokuk; top of rail set vertically (U. S. C. E. b. m. 47).....	642.53

OTTUMWA QUADRANGLE.

[Latitude 41°-41° 15'; longitude 92° 15'-92° 30'.]

In the vicinity of Ottumwa.

Ottumwa, northwest corner of topmost stone on east end of north abutment of Vine Street highway bridge (U. S. C. E. b. m. 48).....	644.66
Ottumwa, above, on top and 0.5 foot from point of south end of concrete pier under east end of first girder from west end of Chicago, Burlington & Quincy bridge, pier is first one east of west abutment (U. S. C. E. b. m. 79)	653.67
Ottumwa, in top of west tube of second pier south of north or left bank, Blackhawk highway bridge (U. S. C. E. b. m. 80).....	649.15
Ottumwa, bottom of upstream end of third cross beam from south end of Market Street bridge (U. S. C. E. b. m. 82).....	643.32
Ottumwa, top of west side of second pier south of north or left bank of river, Chicago, Milwaukee & St. Paul bridge (U. S. C. E. b. m. 81).....	645.82

Ottumwa, bottom of downstream or east girder in south span of Wabash R. R. bridge (U. S. C. E. b. m. 83).....	Feet. 646. 75
Ottumwa, bottom of east side of first transverse beam south of fourth tubular pier from north end of Vine Street highway bridge (U. S. C. E. b. m. 84).	643. 53
Ottumwa, northwest corner of west wing of north abutment of Vine Street highway bridge (U. S. C. E. b. m. 85).....	644. 54

COALFIELD QUADRANGLE.

[Latitude 41°-41° 15'; longitude 92° 30'-92° 45'.]

From Chillicothe northwest along Chicago, Rock Island & Pacific Ry. to Eveland Church.

Chillicothe, southeast corner of southeast wing of west abutment of highway bridge (U. S. C. E. b. m. 49).....	659. 73
Chillicothe, top of extreme south point of abutment at west end of highway bridge (U. S. C. E. b. m. 78).....	659. 73
Chillicothe, near, on north side of railroad, at milepost 87 above Keokuk, set vertically in ground; top of rail (U. S. C. E. b. m. 50).....	704. 93
Eddyville, southeast of, on north side of railroad, at milepost 88 above Keokuk; top of rail set vertically in ground (U. S. C. E. b. m. 51).....	686. 76
Eddyville, southeast of, on north side of railroad, at milepost 89 above Keokuk; top of rail set vertically in ground (U. S. C. E. b. m. 52).....	670. 33
Eddyville, in front of Iowa Central station; top of rail (U. S. C. E. b. m. 53).	669. 79
Eddyville, near, in north end of timber cap on bank bent of piling at east end of Chicago & North Western Ry. bridge; top of railroad spike (U. S. C. E. b. m. 74).....	685. 44
Eddyville, top of downstream end of third pier from east end of Iowa Central Ry. bridge (U. S. C. E. b. m. 75).....	671. 30
Eddyville, top of downstream end of first pier from left bank or Eddyville side of highway bridge (U. S. C. E. b. m. 76).....	671. 00
Eddyville, on south end of water table of post-office building (De Long Building), at connection of cement blocks and brick wall, first and second building north side of Main Street (U. S. C. E. b. m. 77).....	671. 61
Eveland Church, at northeast corner of; iron post (U. S. C. E. b. m. 54 equals U. S. Geological Survey primary traverse station mark).....	681. 30
Eveland, top of upstream end of second pier from north or left bank of highway bridge (U. S. C. E. b. m. 72).....	688. 13

At Gately.

Gately, upstream edge of north pier tube at east end of highway bridge (U. S. C. E. b. m. 73).....	683. 94
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KNOXVILLE QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 93°-93° 15'.]

At Dunreath.

Dunreath, in front of Chicago, Rock Island & Pacific Ry. station; top of rail (U. S. C. E. b. m. 55).....	741. 07
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From Red Rock northwest along Wabash R. R. to Bennington.

Red Rock, near, in ground on south side of Wabash R. R., at milepost "Des Moines 27"; top of rail set vertically (U. S. C. E. b. m. 56).....	759. 07
Red Rock, top of round bolthead between two hexagonal nuts on extreme east side of north shore pier of highway bridge at (U. S. C. E. b. m. 62).	735. 08

Red Rock, on top of downstream end of outcropping ledge of red sandstone about 1 mile above highway bridge at Red Rock, river makes a sharp bend when it strikes this ledge, from which it is presumed the locality takes its name; square cut (U. S. C. E. b. m. 61).....	Feet. 723. 91
Percy, 2 miles below, in root of twin 8-inch hackberry tree on fence line, 15 feet from bank of river, 15 feet east of small house owned by fishing club, on land of J. Gould; 20d. nail in bench cut (U. S. C. E. b. m. 60).	743. 34
Bennington, top of rim of upstream edge of iron casing tube of second pier from north end of highway bridge near Morgan Valley on Wabash R. R. (U. S. C. E. b. m. 59).....	754. 41

MILO QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 93° 15'-93° 30'.]

Near Runnells.

Runnells, 1 mile above, in top of south pier of highway bridge across Des Moines River; aluminum tablet (U. S. C. E. b. m. 58 equals U. S. Geological Survey primary traverse station mark).....	764. 01
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DES MOINES QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 93° 30'-93° 45'.]

At point 6 miles below Des Moines.

Des Moines, 6 miles below; top of east side of concrete pier at north end of Chicago, Burlington & Quincy R. R. bridge (U. S. C. E. b. m. 57).....	790. 12
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PELLA QUADRANGLE.

[Latitude 41° 15'-41° 30'; longitude 92° 45'-93°.]

From Howell southeasterly near Des Moines River to Fosterdale.

Howell, 800 feet east of station, in ground on south side of Wabash R. R. track; top of rail set vertically (U. S. C. E. b. m. 63).....	712. 78
Howell; top of east tube pier at north end of highway bridge (U. S. C. E. b. m. 64).....	714. 03
Fifield, above; top of west side of north shore pier of highway bridge (U. S. C. E. b. m. 65).....	727. 17
Fifield, in front of Wabash R. R. station; top of rail (U. S. C. E. b. m. 66).....	725. 91
Harvey, opposite; top of nut on west side of north tube pier of highway bridge across cut-off (U. S. C. E. b. m. 67).....	705. 30
Harvey, near, on top of south or downstream side of west shore pier of Chicago, Rock Island & Pacific Ry. bridge; cross mark (U. S. C. E. b. m. No. 68).....	705. 40
Bellefontaine; hexagonal bolthead on downstream side of east or right-bank pier of highway bridge (U. S. C. E. b. m. 69).....	696. 16
Tracy, below, 2 feet from point of north end of east pier of Chicago, Burlington & Quincy Ry. bridge (U. S. C. E. b. m. 70).....	690. 86
Fosterdale, 0.5 mile south of, in east side of burr-oak tree on bank of river, about 200 feet upstream from residence of A. B. Henry; twentypenny nail, which is also high-water mark of 1903 (U. S. C. E. b. m. 71).....	689. 82

HAMBURG QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 95° 30'-95° 45'.]

From point near Otoe City northerly near Missouri River to Nebraska City.

T. 67 N., R. 43 W., 1,200 feet west of east line of sec. 34, in southeast corner of orchard belonging to Oliver Taylor, on left bank, on north side of State-line road between Missouri and Iowa; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 109/2):	Feet.
Copper bolt.....	911.36
Cap on pipe.....	915.41
T. 67 N., R. 43 W., 5,180 feet east of east line of sec. 34, on south side of State-line road, in southeast angle of fence formed by intersection of north-south and east-west roads, on premises owned by Joseph Payne; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 109/3):	
Copper bolt.....	905.27
Cap on pipe.....	909.34
T. 67 N., R. 42 W., near corner of secs. 7, 8, 17, and 18, at northwest corner of inclosed pasture about 600 feet S. 6¼° (mag.) E. from house owned by Moses Payne; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 110/3):	
Copper bolt.....	903.86
Cap on pipe.....	907.93

NEBRASKA CITY QUADRANGLE.

[Latitude 40° 30'-40° 45'; longitude 95° 45'-96°.]

From Nebraska City northerly near Missouri River to Jones Point, Nebr.

T. 68 N., R. 44 W., in northeast quarter of sec. 1, 665 feet south of north line of the quarter, 500 feet east of west line of the quarter, 610 feet south of house of Paul Heinlin, on left bank, on west side of north-south road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 112/2):	
Copper bolt.....	925.43
Cap on pipe.....	929.50
Wyoming, Nebr., 0.5 mile below, 180 feet from river bank, on small elevation in dooryard of Edward W. Neligh, 160 feet south of small spring brook; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 113/1):	
Copper bolt.....	950.23
Cap on pipe.....	954.28
T. 69 N., R. 44 W., 667 feet west of northeast corner of NW ¼ sec. 30, in yard of Delos Williams, 75 feet south of east-west road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 113/2):	
Copper bolt.....	928.50
Cap on pipe.....	932.57
T. 69 N., R. 43 W., in northeast corner of sec. 30, in dooryard of F. E. Wadhams; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 113/3):	
Copper bolt.....	928.93
Cap on pipe.....	933.00

McPAUL QUADRANGLE.

[Latitude 40° 45'-41"; longitude 95° 45'-96°.]

From Jones Point, Nebr., northerly along Missouri River to point near Plattsmouth.

T. 69 N., R. 43 W., 810 feet north of southwest corner of sec. 5, on east side of north-south road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 114/2):	Feet.
Copper bolt.....	931.21
Cap on pipe.....	935.29
T. 70 N., R. 43 W., 45 feet east of northwest corner of northeast quarter of sec. 17, on east side of north-south road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 115/2):	
Copper bolt.....	939.57
Cap on pipe.....	943.64
T. 71 N., R. 43 W., not far from center of NE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 30, on west side of road running along an old river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 116/2):	
Copper bolt.....	944.99
Cap on pipe (approximate).....	948.98
T. 72 N., R. 43 W., 40 feet south by 128 feet east of northwest corner of sec. 31, on south side of east-west road, in dooryard of Mrs. Lizzie Smith; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 117/2):	
Copper bolt.....	951.94
Cap on pipe.....	955.99

OMAHA AND VICINITY QUADRANGLE.

[Latitude 41°-41° 23'; longitude 95° 45'-96° 05'.]

From point near Plattsmouth northerly near Missouri River to point near Desoto, Nebr.

T. 72 N., R. 44 W., 1,010 feet south of northeast corner of sec. 12, on land owned by Alvin Lincoln, 1.25 miles from river, on west side of north-south road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 118/2):	
Copper bolt.....	952.93
Cap on pipe.....	956.99
T. 73 N., R. 44 W., 0.25 mile east by 430 feet south of northwest corner of sec. 12, on east side of old stage road, 300 feet north of house of J. C. Cole; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 119/2):	
Copper bolt.....	961.34
Cap on pipe.....	965.40
T. 73 N., R. 43 W., on south line of sec. 6, 603 feet east of southwest corner of SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 6, in dooryard of C. H. W. Busse; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 119/3):	
Copper bolt.....	968.92
Cap on pipe.....	973.00
Florence, 3 miles east of, at intersection of north-south and east-west roads, in northwest corner of C. E. Osborn's yard near northwest corner of SW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 34, T. 76 N., R. 44 W.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 123/2):	
Copper bolt.....	984.00
Cap on pipe.....	988.08

T. 76 N., R. 44 W., 352 feet S. 79° 55' E. (mag.) from center of sec. 9, on south side of road, on land owned by Mr. Corby; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 124/2):

	Feet.
Copper bolt.....	983. 15
Cap on pipe.....	987. 24

MISSOURI VALLEY QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 95° 45'-96°.]

Opposite De Soto, Nebr.

Deoto, Nebr., opposite, on left bank, 1.25 miles from river bank, in southwest corner of sec. 25, T. 78 N., R. 45 W., opposite side of road from H. B. Hendrick's house, from which it is distant about 200 feet; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 126/2):

Copper bolt.....	998. 47
Cap on pipe.....	1, 002. 53

BLAIR QUADRANGLE.

[Latitude 41° 30'-41° 45'; longitude 96°-96° 15'.]

From point near Blair, Nebr., northerly near Missouri River to point near Newton, Nebr.

T. 79 N., R. 45 W., 150 feet west of one-quarter post between secs. 22 and 27, between Soldier River and Horse Shoe Lake, on north side of east-west road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 128/3):

Copper bolt.....	1, 012. 83
Cap on pipe.....	1, 016. 90

T. 79 N., R. 45 W., on west side of section-line road between secs. 3 and 4, 1,208 feet south of northeast corner of sec. 4, on land owned by John Harrington, 2 miles from river; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 129/3):

Copper bolt.....	1, 013. 67
Cap on pipe.....	1, 017. 74

TEKAMAH QUADRANGLE.

[Latitude 41° 45'-42°; longitude 96°-96° 15'.]

From point near Newton, Nebr., northerly near Missouri River to point nearly east of Decatur, Nebr.

River Sioux, 4.5 miles north of, at west right of way fence of Sioux City & Pacific R. R., 608 feet north of south line of Monona County; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 132/4):

Copper bolt.....	1, 027. 88
Cap on pipe.....	1, 031. 94

T. 82 N., R. 45 W., at northwest corner of NE. ¼ SE. ¼ sec. 7, in southeast angle formed by crossroads, on land owned by Thorley heirs, 1.5 miles from river bank; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 133/3):

Copper bolt.....	1, 038. 19
Cap on pipe.....	1, 042. 26

ONAWA QUADRANGLE.

[Latitude 42°-42° 15'; longitude 96°-96° 15'.]

From point nearly east of Decatur, Nebr., northerly near Missouri River to point near Sloan, Iowa.

Decatur, Nebr., opposite, in NE. $\frac{1}{4}$ sec. 4, T. 83 N., R. 46 W., on north side of road along south side of quarter, 0.25 mile west of southeast corner of quarter; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 135/2):	Feet.
Copper bolt.....	1, 051. 58
Cap on pipe.....	1, 055. 65
T. 84 N., R. 46 W., 760 feet west of corner of secs. 25, 26, 35, and 36, on south side of road, on premises of Oscar Tuttle; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 135/3):	
Copper bolt.....	1, 049. 00
Cap on pipe.....	1, 053. 05
T. 84 N., R. 46 W., 990 feet north of southwest corner of sec. 7, opposite Blackbirds Hill, on east side of section-line road, 490 feet south of G. H. Brooks's house; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 137/2):	
Copper bolt.....	1, 061. 76
Cap on pipe.....	1, 065. 81
T. 84 N., R. 46 W., 476 feet north of southeast corner of sec. 4, on west side of section-line road, on land owned by M. Crawford; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 137/3):	
Copper bolt.....	1, 058. 25
Cap on pipe.....	1, 062. 32
T. 85 N., R. 47 W., 1,068 feet north of west quarter post of sec. 22, opposite Omaha Mission, on east side of section-line road, in dooryard of George Nelson; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 138/2):	
Copper bolt.....	1, 066. 95
Cap on pipe.....	1, 071. 02
Winnebago Reservation, Nebr., near south line of where it comes to river, 35 feet back from edge of bluff, 360 feet north of spring brook, 50 feet higher than bottom land; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 139/1):	
Copper bolt.....	1, 122. 00
Cap on pipe.....	1, 126. 05
T. 86 N., R. 47 W., 1,670 feet south of northeast corner of sec. 26, on west side of north-south road; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 139/2):	
Copper bolt.....	1, 071. 28
Cap on pipe.....	1, 075. 35

DAKOTA QUADRANGLE.

[Latitude 42° 15'-42° 30'; longitude 96° 15'-96° 30'.]

From point near Sloan, Iowa, northerly near Missouri River to Dakota City, Nebr.

T. 87 N., R. 48 W., 680 feet north of southwest corner of sec. 12, at east side of section-line road, on premises of E. R. Allen; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 141/2):	
Copper bolt.....	1, 087. 84
Cap on pipe.....	1, 091. 90

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