

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, DIRECTOR

BULLETIN 460

RESULTS OF SPIRIT LEVELING
IN IOWA

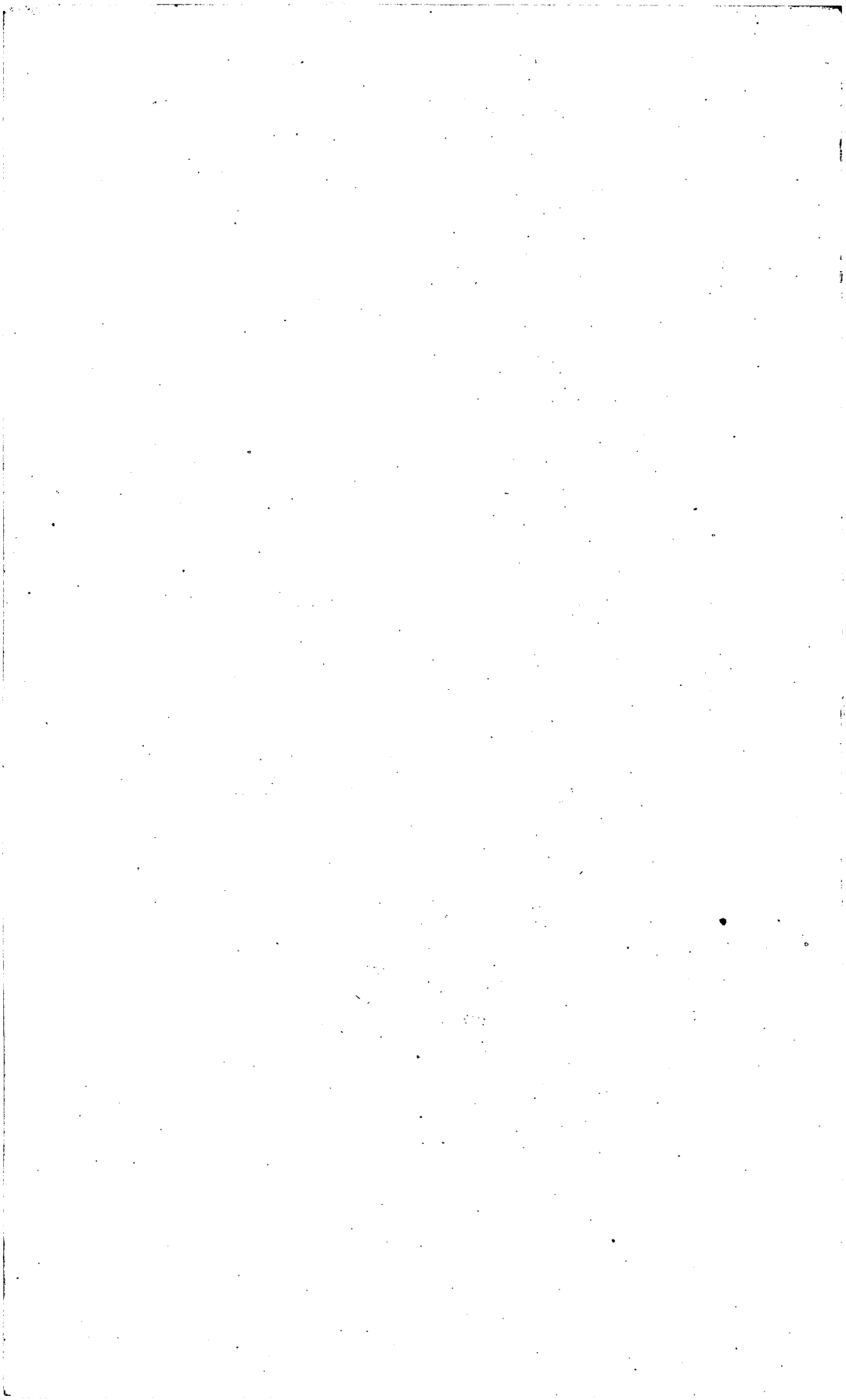
1896 TO 1909, INCLUSIVE

R. B. MARSHALL, CHIEF GEOGRAPHER

WORK DONE IN COOPERATION WITH THE STATE OF IOWA
FROM 1907 TO 1909, INCLUSIVE



WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

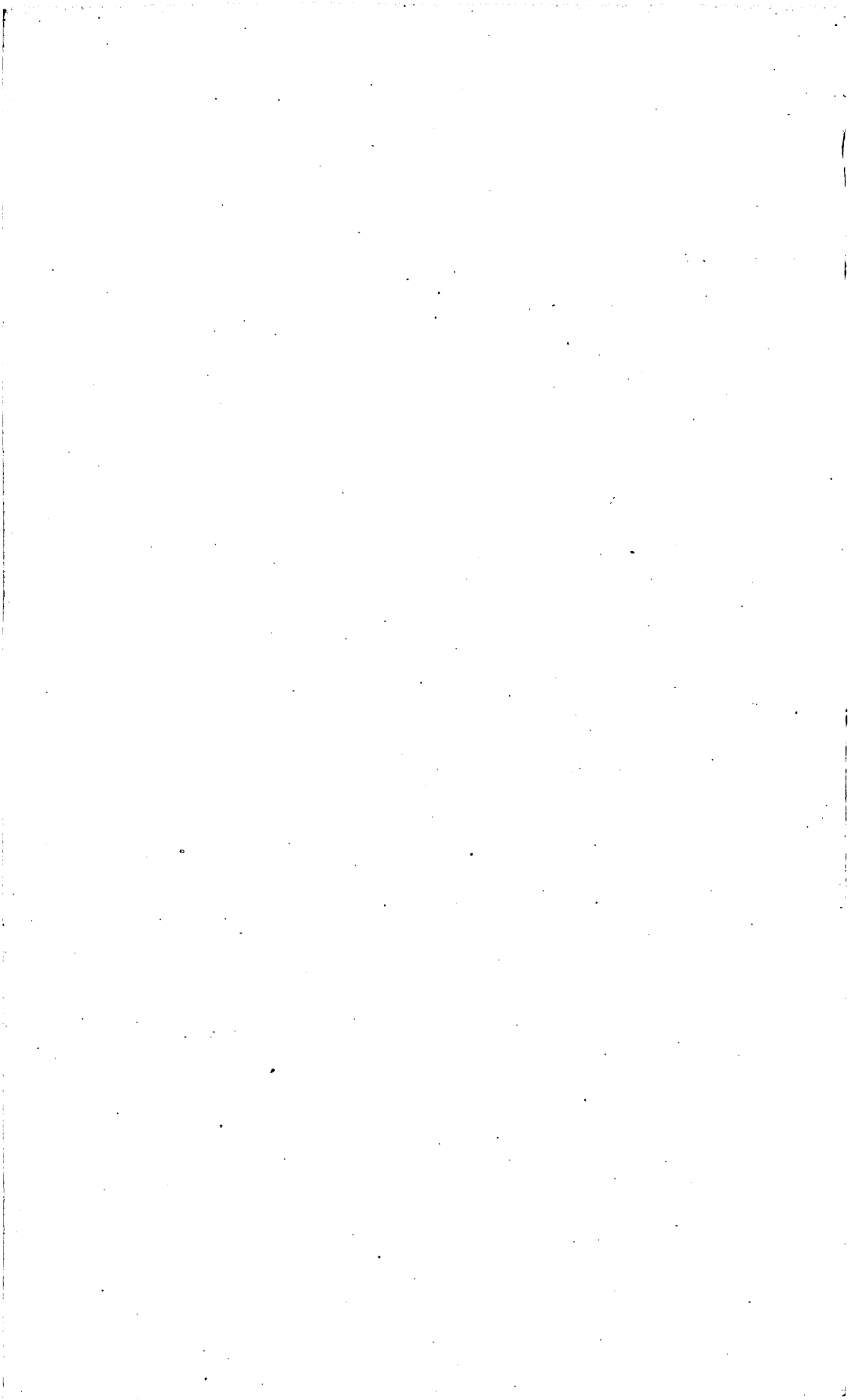


CONTENTS.

	Page.
Introduction.....	5
Scope of the work.....	5
Personnel.....	5
Classification.....	5
Bench marks.....	6
Datum.....	6
Topographic maps.....	7
Precise leveling.....	7
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).....	7
Primary leveling.....	11
Decorah, Elkader, Lancaster, Oelwein, and Waukon quadrangles (Alla- makee, Buchanan, Clayton, Delaware, Dubuque, Fayette, and Winne- shiek counties).....	11
Farley and Peosta quadrangles (Delaware, Dubuque, Jones, and Linn counties).....	17
Kahoka quadrangle (Lee County).....	19
Des Moines quadrangle (Polk County).....	19
Waukee quadrangle (Dallas and Polk counties).....	20
Chariton, Indianola, and Milo quadrangles (Marion and Warren counties).....	21
Attica and Knoxville quadrangles (Marion County).....	23
Pella quadrangle (Mahaska and Marion counties).....	25
Nebraska City quadrangle (Fremont County).....	28
Canton and Elk Point quadrangles (Lyons and Plymouth counties).....	28
Index.....	31

ILLUSTRATION.

PLATE I. Designs for bench marks.....	6
---------------------------------------	---



RESULTS OF SPIRIT LEVELING IN IOWA, 1896 TO 1909, INCLUSIVE.

R. B. MARSHALL, Chief Geographer.

INTRODUCTION.

Scope of the work.—All results of spirit leveling in the State of Iowa previously published by the United States Geological Survey and the results of later work are included in this report, rearranged by quadrangles. All the elevations are based on the precise-level net as adjusted in 1907 by the Coast and Geodetic Survey to a common mean sea-level datum. The part of this net which lies within or along the borders of Iowa comprises the line of the Mississippi River Commission along the eastern border of the State from Keokuk to New Albin and the precise level line of the Missouri River Commission along the western border of the State from Hamburg to near Sioux Falls, S. Dak.

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 D. H. Baldwin, topographer, and since 1907 under the general direction of E. M. Douglas, geographer.

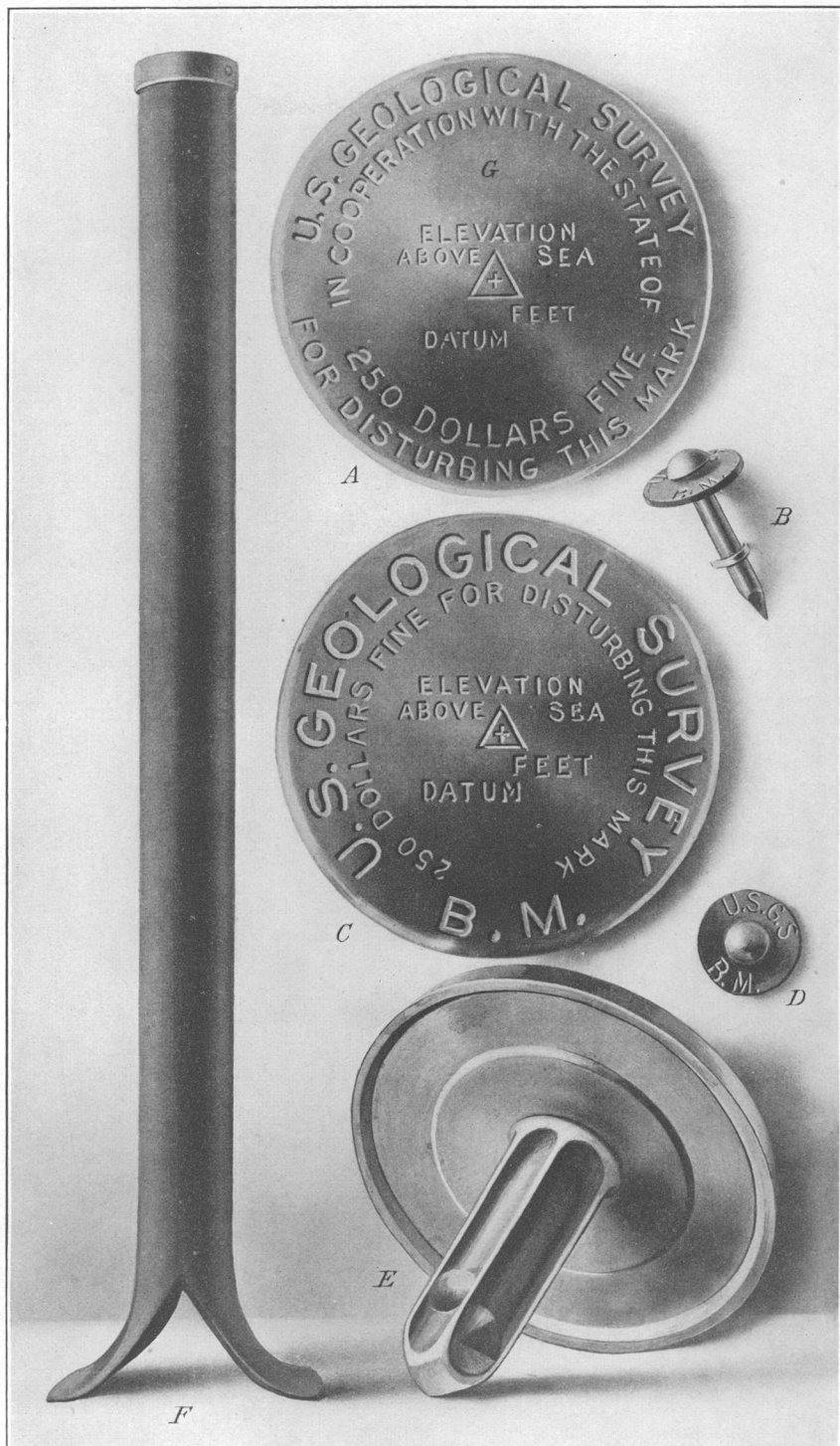
Classification.—The elevations are classified as precise or primary according to the methods employed in their determination. For precise level lines instruments and rods of the highest grade known are used, each line is run both forward and backward, and every precaution is taken to guard against error. The allowable divergence between the forward and 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 represented in feet by $0.05\sqrt{D}$, in which D is the length of the circuit in miles, sufficient care being given the work to

maintain this standard. For levels of both classes careful office adjustments are made, the small outstanding errors being distributed over the lines.

Bench marks.—The standard bench marks are of two forms. The first form is a circular bronze or aluminum tablet (*C* and *E*, Pl. I), 3.5 inches in diameter and 0.25 inch thick, having a 3-inch stem, which is cemented in a drill hole in solid rock in the wall of some public building, bridge abutment, or other substantial masonry structure. The second form (*F*, Pl. I), to be set in the ground where no masonry or rock is available, consists of a hollow wrought-iron post 3.5 inches outside diameter and 4 feet long. The bottom is spread out to a width of 10 inches in order to give a firm bearing on the earth. A bronze or aluminum-bronze cap is riveted over 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 1.5 inches in length driven through a copper washer 0.875 inch in diameter. The tablets as well as the caps on the iron posts are appropriately lettered, and where States have cooperated in the leveling the fact of such cooperation is indicated by the addition of the State name (*G*, Pl. I).

The numbers stamped on the bench marks described in the following pages are the elevations to the nearest foot as determined by the levelman. These numbers are stamped with 0.1875 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 their adjusted values, using the markings as identification numbers only.

Datum.—All 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 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 great accuracy is desired they must extend over several years. At ocean stations the half-tide level and



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.

mean sea level usually differ but little. It is assumed that there is no difference between the mean sea level as determined from observations in the Atlantic Ocean, Gulf of México, or 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 for published results will be made from time to time as the precise level lines of the 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 15, 1911. They may be obtained except as noted for 5 cents each, or \$3 a hundred, on application to the Director of the Survey at Washington, D. C.

Amana.	Marion.
Anamosa.	Mechanicsville.
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) (10 cents).
Davenport (Iowa—Ill.).	Oxford.
Decorah.	Peosta (Iowa—Ill.).
Des Moines.	Rock Island (Iowa—Ill.).
Dewitt.	Savanna (Iowa—Ill.).
Durant.	Shellsburg.
Elk Point (S. Dak.—Nebr.—Iowa).	Stanwood.
Elkader (Iowa-Wis.).	Tipton.
Fairfax.	Waukee.
Farley.	Waukon (Iowa-Wis.).
Goose Lake (Iowa—Ill.).	West Liberty.
Iowa City.	Wheatland.
Kahoka (Mo.—Iowa—Ill.).	Wilton Junction.
Lancaster (Wis.—Iowa—Ill.).	Winthrop.
Leclaire (Iowa—Ill.).	
Maquoketa.	

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 at Council Bluffs eastward along the Chicago, Rock Island & Pacific Railway to Des Moines by R. L. Libby. The elevations are referred to the 1907 adjustment.

Omaha and vicinity.

Council Bluffs, in southwest corner of courthouse yard, 3 feet from west fence and 3 feet from south fence; permanent bench mark 348, same as 121-2, top of cap.....	Feet. 995. 370
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; permanent bench mark 343, top of copper bolt leaded vertically in stone.....	982. 010
Council Bluffs, in front of station; top of rail.....	982. 9
Council Bluffs, in south wall of post office, near southwest corner; aluminum tablet.....	1, 001. 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.....	995. 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, 020. 720
Weston, 3 miles west of, 0.25 mile south of milepost 491, in concrete culvert on east side of track; aluminum tablet.....	1, 022. 296

NEOLA QUADRANGLE.

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, 037. 4
Weston, 100 feet north of Chicago, Rock Island & Pacific Ry. station, 15 feet west of track; iron post.....	1, 038. 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, 074. 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, 073. 536
Underwood, in front of station; top of rail.....	1, 078. 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, 089. 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, 096. 820
Neola, in front of station; top of rail.....	1, 099. 7
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, 188. 345
Minden, in front of station; top of rail.....	1, 197. 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, 202. 385

HARLAN QUADRANGLE.

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, 290. 328
Shelby, in front of station; top of rail.....	1, 297
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, 295. 654
Avoca, 3 miles northwest of, in southeast wing wall of stone culvert, third step from top; aluminum tablet.....	1, 193. 860

AVOCA QUADRANGLE.**Avoca east along Chicago, Rock Island & Pacific Ry. to Walnut.**

	Feet.
Avoca, in stone water table of Avoca bank, on south side, 10 feet from southwest corner; aluminum tablet.....	1, 159. 769
Avoca, near southwest corner of Avoca Hotel, between building and sidewalk; iron post.....	1, 156. 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 an 0.75 inch brass pipe.....	1, 166. 147
Avoca, 2 miles east of, in northwest abutment of bridge 459; aluminum tablet.....	1, 172. 039

MARNE QUADRANGLE.**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, 286. 285
Walnut, in front of station; top of rail.....	1, 295. 8
Walnut, 2.5 miles east of, in northwest abutment of bridge 449; aluminum tablet.....	1, 287. 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, 185. 096
Marne, in front of station; top of rail.....	1, 194. 3
Marne, 3 miles east of, in northwest stone abutment of bridge 444; aluminum tablet (reset in 1906 by railroad engineer).....	1, 212. 1
Marne, 3 miles east of, on northeast corner of east abutment; chiseled cross..	1, 211. 18

WIOTA QUADRANGLE.**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.....	1, 160. 311
Atlantic, on east side of south wing of county courthouse, 4 feet above ground; aluminum tablet.....	1, 216. 088
Atlantic, 0.5 mile east of, in southwest abutment of bridge 440, 375 feet east of road crossing; aluminum tablet.....	1, 155. 720
Wiota, 50 feet north of track, opposite point on track about 700 feet west of station; iron post.....	1, 200. 238
Wiota, in front of station; top of rail.....	1, 204. 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, 233. 213
Anita, 1 mile west of, in northeast corner of concrete culvert A-2; aluminum tablet.....	1, 244. 318
Anita, in front of station; top of rail.....	1, 257. 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, 253. 360

FONTANELLE QUADRANGLE.**Adair 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, 321. 798
--	-------------

CASEY QUADRANGLE.

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

	Feet.
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, 400. 355
Adair, in front of station; top of rail.....	1, 405. 2
Adair, 3 miles east of, in southwest abutment of bridge 402; aluminum tablet.....	1, 274. 002
Casey, 2.8 miles west of, in southwest stone abutment of bridge 397; aluminum tablet.....	1, 254. 485
Casey, in front of station; top of rail.....	1, 229. 9
Casey, in stone foundation of T. J. Burns's store, in south wall, halfway between Main Street and alley; aluminum tablet.....	1, 249. 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, 224. 927

PANORA QUADRANGLE.

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, 280. 018
Menlo, in front of station; top of rail.....	1, 266. 2
Menlo, 30 feet south of track, opposite point 300 feet east of station, 75 feet east of road crossing; iron post.....	1, 264. 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, 211. 150
Stuart, in front of station; top of rail.....	1, 209. 0
Stuart, in stone water table of high school, about 6 feet east of entrance; aluminum tablet.....	1, 207. 045

ADEL QUADRANGLE.

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

Dexter, in front of station; top of rail.....	1, 149. 3
Dexter, in stone water table of National Bank of Dexter, on north side of building, 1 foot from northwest corner; aluminum tablet.....	1, 153. 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, 145. 048
Earlham, 100 feet south of track opposite point on track 560 feet east of station, 150 feet south of derailing switch, 2 feet north of fence; iron post..	1, 105. 188
Earlham, in front of station; top of rail.....	1, 107. 1
Earlham, 1.5 miles east of, in south side of a concrete culvert, near telegraph pole 485-30; aluminum tablet.....	1, 066. 576
De Soto, 1.5 miles west of, in southwest stone abutment of bridge 368; aluminum tablet.....	921. 595

WAUKEE QUADRANGLE.

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.....	889. 266
De Soto, in front of station; top of rail.....	892. 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.....	873. 406

	Feet.
Van Meter, in front of station; top of rail.....	874.5
Van Meter, 1.25 miles east of, in southwest abutment of bridge 358; aluminum tablet.....	862.901
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".....	858.618
Booneville, in front of station; top of rail.....	857.3
Booneville, 2 miles east of, in southwest abutment of bridge 353, aluminum tablet.....	846.155
Commerce, 2.5 miles west of, in northwest corner of concrete culvert; aluminum tablet.....	835.843
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.....	837.074
Commerce, in front of station; top of rail.....	837.5

DES MOINES QUADRANGLE.

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.....	812.271
Valley Junction, in front of station; top of rail.....	813.9
Valley Junction, 1 mile east of, 70 feet south of track, 100 feet west of right-of-way gate; iron post.....	806.924
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".....	796.560
Des Moines, in foundation stone 1 foot east of southwest corner of post office; aluminum tablet stamped "809".....	808.351
Des Moines, in northeast corner of yard adjoining city hall, 60 feet north of Locust Street; iron post stamped "804".....	803.510
Des Moines, in front of Chicago, Rock Island & Pacific Ry. station; top of rail.....	800.2

PRIMARY LEVELING.

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

ALLAMAKEE, BUCHANAN, CLAYTON, DELAWARE, DUBUQUE, FAYETTE, AND WINNE-
SHIEK 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 by the 1907 adjustment is accepted as 644.949 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.

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. 733.714
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".....	1,194.443
T. 90 N., R. 1 W., north line of sec. 17, southeast corner of O. W. Burns's field; iron post stamped "1159 DBQ".....	1,160.004
T. 90 N., R. 1 E., south side of sec. 4, in ledge of rock; bronze tablet stamped "1049 DBQ".....	1,050.005
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".....	622.750
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".....	1,181.309
T. 91 N., R. 1 E., in fraction of Jefferson township, near northeast corner of sec. 2, in field; iron post stamped.....	897.928

ELKADER QUADRANGLE.

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".....	631.803
T. 93 N., R. 2 W., near north line of sec. 31, in school grounds; iron post stamped "681 DBQ".....	682.254
Garnaville, SE. $\frac{1}{4}$ sec. 18, T. 93 N., R. 3 W., southeast corner of park; iron post stamped "1065 DBQ".....	1,066.960
T. 94 N., R. 3 W., SW. $\frac{1}{4}$ sec. 8, northwest corner of schoolhouse yard; iron post stamped "699 DBQ".....	700.435
T. 95 N., R. 3 W., SE. $\frac{1}{4}$ sec. 33, southwest corner of schoolhouse; iron post stamped "1103 DBQ".....	1,104.874

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".....	1,111.636
Farmersburg, crossing south of station; top of rail.....	905.6
T. 94 N., R. 5 W., southwest corner of sec. 15, southwest corner of schoolhouse yard; iron post stamped "1177 DBQ".....	1,178.716
Elkader, in front of station; top of rail.....	724.7
Elkader, sec. 23, T. 93 N., R. 5 W., northeast corner of courthouse yard; iron post stamped "759 DBQ".....	760.220
Mederville, SW. $\frac{1}{4}$ sec. 22, T. 92 N., R. 5 W., southwest corner of schoolhouse yard; iron post stamped "767 DBQ".....	768.200
T. 92 N., R. 4 W., SW. $\frac{1}{4}$ sec. 16, in southeast corner of schoolhouse yard; iron post stamped "929 DBQ".....	930.828
T. 92 N., R. 3 W., SW. $\frac{1}{4}$ sec. 9, in schoolhouse grounds; iron post stamped "959 DBQ".....	960.400

Mederville south along highway to Manchester.

T. 91 N., R. 5 S., quarter corner south side of sec. 16; iron post stamped "1240 DBQ".....	1,241.990
T. 90 N., R. 5 W., southwest corner of sec. 21; iron post stamped "1016 DBQ".....	1,017.470

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

	Feet.
Greeley, sec. 20, T. 90 N., R. 4 W.; iron post stamped "1142 DBQ".....	1, 143. 933
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. 320
Luxemburg, sec. 21, T. 90 N., R. 2 W., in Catholic churchyard; iron post stamped "1179 DBQ".....	1, 180. 816

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, 039. 058
---	-------------

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".....	639. 490
T. 91 N., R. 3 W., near center of sec. 13, 100 feet east of junction of roads; iron post stamped "897".....	898. 350
T. 91 N., R. 4 W., northwest corner of sec. 22, at northwest corner of schoolhouse; iron post stamped "1168".....	1, 169. 050

OELWEIN QUADRANGLE.

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

Osborne, at crossing; top of rail.....	753. 2
Volga, at crossing; top of rail.....	790. 1
Volga, in southeast corner of school yard; iron post stamped "794 DBQ".....	795. 343
Arlington, northeast corner of sec. 28, T. 92 N., R. 7 W.; iron post stamped "1080 DBQ".....	1, 081. 371
T. 92 N., R. 8 W., northeast corner of sec. 21; in school yard; iron post stamped "1168".....	1, 169. 116
Maynard, northeast corner of sec. 21, T. 92 N., R. 9 W.; iron post stamped "1164 DBQ".....	1, 165. 362
Maynard, 120 feet south of station, at crossing; top of rail.....	1, 102. 2
Randallia, southeast corner sec. 16, T. 93 N., R. 9 W.; iron post stamped "1128 DBQ".....	1, 129. 282

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

Randallia, in front of station; top of rail.....	1, 103. 8
Albany, sec. 14, T. 93 N., R. 8 W., 1,100 feet north of school building, iron post stamped "930 DBQ".....	931. 937
Wadena, in front of station; top of rail.....	874. 1
Wadena, in front of station; iron post stamped "874 DBQ".....	874. 685

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 Randallia.

T. 93 N., R. 6 W., NE. $\frac{1}{4}$ sec. 21, southeast corner of school yard; iron post stamped "1147 DBQ".....	1, 148. 933
T. 94 N., R. 6 W., NE. $\frac{1}{4}$ sec. 33, northeast corner of school yard; iron post stamped "876 DBQ".....	877. 785
Elgin, in front of station; top of rail.....	835. 3
T. 94 N., R. 7 W., SE. $\frac{1}{4}$ sec. 16, in school yard; iron post stamped "989 DBQ".....	990. 126
Clermont, in front of station; top of rail (on spur line).....	854. 8
West Union, south meridian stone in county fair grounds; aluminum tablet stamped "111 DBQ".....	1, 112. 363

West Union, corner Main and Walnut Streets, coping stone south wall of building of public school; aluminum tablet stamped "1186 DBQ".....	Feet. 1, 187. 770
West Union, in front of Chicago, Milwaukee & St. Paul Railway station; top of rail.....	1, 104. 8
West Union, at junction of Chicago, Milwaukee & St. Paul Railway with Chicago, Rock Island & Pacific Railway.....	1, 106. 9
West Union, in front of Chicago, Rock Island & Pacific Railway station; top of rail.....	1, 106. 1
T. 94 N., R. 9 W., NE. $\frac{1}{4}$ sec. 16, at road crossing; iron post stamped "1194 DBQ".....	1, 195. 642
Hawkeye (on spur line), in front of station of Chicago, Milwaukee & St. Paul Railway; top of rail.....	1, 176. 7

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. 544
Strawberry Point, in front of station; top of rail.....	1, 217. 4
Dundee, at railroad station; iron post stamped "997 DBQ".....	998. 047
Dundee, in front of station; top of rail.....	998. 2
Manchester, in front of station; top of rail.....	942. 1

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, 115. 011
T. 91 N., R. 8 W., NE. $\frac{1}{4}$ sec. 21, at crossroads; iron post stamped "1143 DBQ".....	1, 144. 585
Oelwein, in north wall of post office, coping stone; aluminum tablet stamped "1044 DBQ".....	1, 045. 547
Hazelton, at railroad station; iron post stamped "995 DBQ".....	996. 874
T. 90 N., R. 8 W., NE. $\frac{1}{4}$ sec. 21, at side of wagon road; iron post stamped "1063 DBQ".....	1, 064. 169
T. 90 N., R. 7 W., NE. $\frac{1}{4}$ sec. 21, at road crossing; iron post stamped "1061 DBQ".....	1, 062. 151
Lamont, in front of station; top of rail.....	1, 045. 8

WAUKON QUADRANGLE.

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, 097. 164
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, 180. 247
Monona, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	1, 215. 9
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. 844
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".....	788. 051
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. 940
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, 138. 125

Harpers Ferry northwest along highway to Dalby, thence west to Waukon, thence 3 miles north to Iron Mines, thence east to Village Creek.

	Feet.
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, 062. 274
T. 98 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, 150. 240
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".....	1, 239. 026
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. 628
T. 98 N., R. 5 W., 1,300 feet northeast of center of sec. 17, 15 feet southeast of northwest corner post of north fence line; iron post stamped "1320 DBQ".....	1, 321. 349
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. 810
Village Creek post office, near northwest corner of schoolhouse; iron post stamped "646 DBQ".....	647. 372

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 southwest corner of implement warehouse of Nielande & Co.; aluminum tablet stamped "653 DBQ".....	654. 843
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. 883
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, 061. 188
New Albin schoolhouse, 22 feet northeast of northeast corner of; iron post stamped "652 DUBQ".....	653. 377
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. 868

DECORAH QUADRANGLE.

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. 826
Postville, in front face of Commercial House; aluminum tablet stamped "1195 DBQ".....	1, 194. 816
Postville, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	1, 197. 6
Lybrand, T. 96 N., R. 6 W., southwest corner of schoolhouse yard; iron post stamped "1186 DBQ".....	1, 185. 954
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, 169. 180

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

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. 837
---	-------------

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".....	Feet. 729. 928
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, 087. 175
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, 136. 183
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, 264. 185
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, 213. 123
T. 99 N., R. 9 W., southeast corner of sec. 16, in northeast corner of school yard; iron post stamped "1139 DBQ".....	1, 139. 510
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. 705
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, 159. 293
T. 98 N., from center of range 6 W. to center of range 8 W., thence south to Nordness, T. 97 N., 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".	845. 105
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, 059. 282
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. 427
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. 6
Decorah, in front of Chicago, Milwaukee & St. Paul Ry. station; top of rail.....	863. 5
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. 502
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. 975
Conover, in front of station; top of rail.....	1, 235. 6
Conover, sec. 15, T. 97 N., R. 9 W., north of front entrance to village hall; iron post stamped "1233 DBQ".....	1, 233. 799
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. 444
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. 519
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, 020. 021
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. 724

T. 95 N., R. 8 W., 0.5 mile north of center of sec. 21, in school yard; iron post stamped "983 DBQ".....	Feet. 983.938
Clermont, in sec. 34, T. 95 N., R. 7 W., in northeast corner of school yard; iron post stamped "861 DBQ".....	862.081

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 644.949 feet above mean sea level. The elevations published for these bench marks in the appendix to the eighteenth annual report are unreliable. Many gross 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.

Dubuque southwest to Fillmore.

Dubuque, northeast corner of Grandview and Dodge streets; iron post stamped "875".....	Feet. 874.596
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".....	1,071.024
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"....	1,065.683
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".....	879.694

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".....	858.544
*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".....	912.486
*Zwingle station, sec. 35, T. 87 N., R. 2 E., Chicago, Milwaukee & St. Paul Ry., west end of platform; iron post stamped "902".....	894.077
*Lamotte, sec. 4, T. 86 N., R. 3 E., corner Market and Water Streets, 40 feet northeast of railroad; iron post stamped "923".....	914.761
*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".....	700.249
*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".....	709.929

18 SPIRIT LEVELING IN IOWA, 1896 TO 1909, INCLUSIVE.

*St. Donatus post office, near center of sec. 7, T. 87 N., R. 4 E.; iron post stamped "674".....	Feet. 666.128
*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, 114.652

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, 041.685
*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".....	860.148

FARLEY QUADRANGLE.

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".....	951.897
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".....	948.000
T. 87 N., R. 2 W., center of sec. 16, at southeast corner of junction of wagon roads; iron post stamped "886".....	877.997
T. 87 N., R. 3 W., corner secs. 10, 11, 14, and 15; iron post stamped "952"...	943.104
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".....	896.974
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".....	921.306
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, 108.248

Sand Springs southwest along Chicago, Milwaukee & St. Paul Ry., thence northwest along same railway 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".....	840.197
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"...	862.806
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, 007.308

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, 130.166
---	------------

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".....	942.408
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, 012.066
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, 079.768
Delaware, in front of Illinois Central R. R. station; top of rail.....	1, 065.5
Manchester, 150 feet south of stock yards, on west side of Illinois Central R. R. track, south side of street; iron post stamped "949".....	939.902

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 crossing 150 feet west of Illinois Central R. R., north side of road and south of station; iron post stamped "1055".....	Feet. 1,046.258
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".....	1,000.889
T. 86 N., R. 5 W., northwest corner sec. 10, opposite side of road from Stromburg's residence; iron post stamped "1013".....	1,004.345
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".....	967.878

Kahoka quadrangle.

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 foundation of house of R. Sargent; aluminum tablet stamped "555 A".....	Feet. 555.847
---	------------------

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 elevation accepted by the 1907 adjustment being 808.351 feet above mean sea level.

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

DES MOINES QUADRANGLE.

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. 808.351
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".....	803.978
Valley Junction, in foundation of public school, 1 foot west of entrance door; aluminum tablet stamped "821 ADJ 1903".....	820.615
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".....	869.097
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".....	934.983

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"....	Feet. 832. 943
Ridgedale schoolhouse, near center sec. 36, T. 80 N., R. 25 W., southeast corner school yard, opposite road south; iron post stamped "959 ADJ 1903".....	958. 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".....	949. 972
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".....	796. 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".....	781. 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".....	795. 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".....	820. 296
Berwick, 200 feet north of station, east of road, 20 feet north of elm; iron post stamped "841 ADJ 1903".....	840. 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".....	941. 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".....	937. 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".....	996. 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".....	963. 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".....	849. 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 elevations of these bench marks by the 1907 adjustment are, respectively, 873.406 and 837.074 feet above mean sea level, as determined by an unadjusted 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.

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

	Feet.
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".....	982. 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, 036. 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, 034. 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, 031. 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".....	949. 675

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).....	892. 391
--	----------

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, 048. 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, 072. 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, 023. 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, 028. 993
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".....	969. 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 place, 200 yards east of house; iron post stamped "867".....	867. 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".....	880. 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".....	884. 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".....	975. 226
T. 79 N., R. 25 W., southeast corner of SE. $\frac{1}{4}$ sec. 21, 20 feet west of junction T road south, in field, 20 feet from large tree at corner; iron post stamped "956 Prim. Trav. Sta. No. 2".....	955. 389

Chariton, Indianola, and Milo quadrangles.

MARION AND WARREN COUNTIES.

The elevations in the following list are based on a bench mark at Levey in the Des Moines quadrangle, and upon the 1907 adjustment datum.

The leveling was done in 1907 by W. A. Gelbach.

MILO QUADRANGLE.

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.

	Feet.
Carlisle, in front of station; top of rail.....	785. 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".....	782. 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".....	913. 891
T. 76 N., R. 23 W., center of NE. $\frac{1}{4}$ 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".....	931. 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".....	942. 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".....	958. 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".....	895. 377
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".....	966. 179
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".....	942. 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".....	941. 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".....	773. 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".....	888. 171
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".....	935. 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".....	868. 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".....	894. 119

Pleasantville, 0.75 mile southeast of, 230 feet northwest of road crossing, in top of east end of railroad culvert; primary traverse station 3; aluminum tablet stamped "882 ADJ".....	Feet. 881.347
Pleasantville, in front of station; top of rail.....	927.4
Wheeling, 0.75 mile east of, north side of road, 120 feet west of track at road crossing; iron post stamped "910 ADJ".....	909.872
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".....	772.050
Swan station, in front of; top of rail.....	764.3
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".....	762.635
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".....	773.828

INDIANOLA QUADRANGLE.**SW. $\frac{1}{2}$ 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".....	947.812
--	---------

CHARITON QUADRANGLE.**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".....	936.347
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".....	977.674
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".....	925.701

Attica and Knoxville quadrangles.**MARION COUNTY.**

The elevations in the following list are based on a bench mark at Levey, in the Des Moines quadrangle, and upon the 1907 adjustment datum.

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

KNOXVILLE QUADRANGLE.**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. 881.347
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.....	916.76

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".....	Feet. 912. 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.....	908. 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".....	780. 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".....	818. 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".....	863. 777

Mount Vernon Chapel south by road to corner of T. 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.....	877. 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.....	798. 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".....	848. 507
Rector, opposite sign board (Chicago, Rock Island & Pacific Ry.); top of rail.....	811. 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".....	853. 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".....	887. 459
T. 75 N., R. 19 W., southeast corner of sec. 27, at center of crossroads; section corner stone.....	910. 96

Sec. 27, T. 76 N., R. 19 W., north to Coalridge Church and return (Spur).

T. 76 N., R. 19 W., corner secs. 14, 15, 22 and 23, 3 miles west by 0.33 mile north of Howell station, in northwest corner 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".....	823. 831
---	----------

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".....	911. 688
---	----------

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".....	824. 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".....	823. 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".....	Feet. 836. 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".....	904. 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".....	883. 641
Otley, in front of station; top of rail.....	897. 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".....	882. 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".....	748. 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".....	762. 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.....	765. 87

ATTICA QUADRANGLE.

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 sections 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".....	907. 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".	824. 044
Tps. 74 and 75 N., R. 20 W., 20 feet south and 25 feet west of corner of sections 1, 2, 35, and 36; iron post stamped "Prim. Trav. Sta. No. 1-1908-916-IOWA".....	915. 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".....	901. 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".....	926. 789

Pella quadrangle.**MAHASKA AND MARION COUNTIES.**

The elevations in the following list are based on precise line from Council Bluffs to Des Moines in accordance with the 1907 adjustment.

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

PELLA QUADRANGLE.

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. 883. 641

T. 77 N., R. 19 W., southwest corner of sec. 14, T corner; corner stone in center of road	Feet. 888.55
T. 76 N., R. 19 W., southeast corner of sec. 13, in north root of large cottonwood tree at end of road; 40-penny nail.....	903.02
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.....	874.02
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.....	854.82
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".....	859.727
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.....	866.33
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.....	836.085
Pella, opposite station; top of rail.....	879.0
Pella, southeast corner of Central College campus; iron post stamped "878 IOWA".....	877.843
T. 76 N., R. 18 W., 0.5 mile north of the southeast corner of sec. 9, in telephone post; three 40-penny nails.....	854.92
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....	816.10
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.....	712.960
Howell station, 0.7 mile west of, railroad crossing; north rail.....	718.7
Howell station, 2 miles northeast of, railroad crossing; south rail.....	725.3
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".....	748.844
Point 9 miles east of Otley east 9 miles, thence south about 9 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	807.50
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	758.88
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	752.64
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"	805.856
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.....	844.72
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.....	821.35
T. 77 N., R. 17 W., southeast corner of sec. 10, in corner fence post; three 40-penny nails.....	858.35

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.....	Feet. 864. 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".....	874. 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.....	855. 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.....	858. 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.....	799. 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 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".....	741. 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.	845. 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.....	797. 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".....	734. 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; crossroads.....	841. 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 Railway track, 12 feet east of center of highway; iron post stamped "856 IOWA".....	855. 548
T. 76 N., R. 18 W., southeast corner of sec. 11, center of roadway, railway crossing, south rail.....	871. 7

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".....	887. 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".....	885. 979
T. 75 N., R. 18 W., center of sec. 29, T corner, on highest point of rock at intersection; painted square.....	837. 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".....	848. 652
T. 75 N., R. 18 W., 0.5 mile north of southeast corner of sec. 26, T corner, at side of road; stone.....	758. 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".....	729. 302
Tracy, 0.5 mile east of, railroad crossing; north rail.....	695. 94
Tracy, 3.5 miles east of, east of wagon road, railroad crossing; top of south rail.....	705. 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".....	699. 736

	Feet.
Foster, opposite station; top of rail.....	702.45
T. 75 N., R. 17 W., quarter corner on north side of sec. 25, T corner, on rock; painted square.....	730.29
T. 75 N., R. 17 W., quarter corner on north side of sec. 24, on west side of road, 30 feet west of center of road, 30 feet north of center of road, southeast corner of Chas. Oswandel's place, crossroads; iron post stamped "772 IOWA".....	772.045
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.....	811.53
T. 75 N., R. 17 W., near quarter corner on east side of sec. 11, railway crossing; top of rail.....	818.51
Leighton, 0.5 mile east of, railway crossing; top of rail.....	759.13
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".....	760.497
T. 76 N., R. 17 W., center of sec. 26, crossroads, in corner fence post; three 40-penny nails.....	849.67
T. 76 N., R. 17 W., quarter corner on east side of sec. 25; on stone at intersection of crossroads; painted square.....	843.51
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".....	812.246
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".....	734.317

Nebraska City quadrangle.

FREMONT COUNTY.

The elevations in the following list are based on a bench mark 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 924.589 feet.

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

NEBRASKA CITY QUADRANGLE.

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. 924.589
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".....	923.350
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".....	923.191

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, and accord with the 1907

adjustment. A correction of plus 0.755 foot has been applied to the elevation, published in part 3 of the Report for 1894 of the Chief of Engineers, United States Army, for Elk Point and points west. Elk Point is a junction point with a precise-level line of the Coast and Geodetic Survey, which crosses the Canton and Elk Point quadrangles along the Chicago, Milwaukee & St. Paul Railway.

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.

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 "YNKTN 1420"	Feet. 1, 421. 000
T. 100 N., R. 48 W., northwest corner of sec. 19; iron post stamped "YNKTN 1343"	1, 448. 967

ELK POINT QUADRANGLE.

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 "YNKTN 1314"	1, 315. 200
T. 92 N., R. 48 W., sec. 6, northwest corner of; iron post stamped "YNKTN 1140"	1, 140. 824

INDEX.

A.		Page.			Page.
Ackworth		22	Delaware		18
Adair		9, 10	Delaware County		11, 17
Adair County		7	Delhi		18
Adel		21	Des Moines		11, 19
Adel quadrangle		10	Des Moines quadrangle		11, 19, 20
Akron		29	De Soto		10
Allamakee County		11	Dexter		10
Anita		9	Dorchester		15
Ankeny		20	Douglas, E. M., work of		5
Argand		19	Dubuque		17, 18
Arlington		13	Dubuque County		11, 17
Atlantic		9	Dundee		14
Attica		25	Dyersville		18
Attica quadrangle		25			
Avoca		8, 9	E.		
Avoca quadrangle		9	Earlham		10
B.			Elgin		13
Baldwin, D. H., work of		5	Elkader		12
Bankston		12	Elkader quadrangle		12-13
Beaver Creek		20	Elk Point quadrangle		29
Bellevue Township		17	Elon		15
Berwick		20	F.		
Bluffton		15-16	Farley		18
Booneville		11	Farley quadrangle		18-19
Bowsher		20	Farmersburg		12
Burns, Tim, work of		11	Fayette County		11
Buchanan County		11	Fifield		25
Butler Township		17	Fillmore		17
C.			Fontanelle quadrangle		9
Caloma		22	Ford		22-23
Campbell		21	Fort Atkinson		16
Canton quadrangle		29	Foster		28
Carlisle		22	Fremont County		28
Casey		10	French, F. C., work of		11
Casey quadrangle		10	G.		
Cass County		7	Gannett, S. S., work of		5
Castolia		16	Garnaville		12, 13
Chariton quadrangle		23	Gelbach, W. H., work of		20, 21
Chicago, Burlington & Quincy Railroad		22	Golden		19
Chicago Great Western Railway		12	Granite		29
Chicago, Milwaukee & St. Paul Railway		13, 18	Greeley		13
Chicago, Rock Island & Pacific Railway		7, 11, 19-20	Guthrie County		7
Clayton Center		13	Guttenberg		12
Clayton County		11	H.		
Clermont		13, 17	Harlan quadrangle		8
Coalridge Church		24	Harpers Ferry		15
Commerce		11, 21	Hartford		22
Conover		16	Hawkeye		14
Corydon Bridge		20	Hazleton		14
Council Bluffs		8	Heebink, G. E., work of		23, 25
D.			Herron, W. H., work of		5
Dalby		15	Hespa		15-16
Dallas		24	Hewitt, C. E., work of		11
Dallas Center		21	Highlandville		16
Dallas County		7, 20	Holy Cross		12
Decorah		16	Hopkinton		18
Decorah quadrangle		15-17	Howell		24, 26
			Hughes, F. W., work of		19, 28

I.		Page.			Page.
Illinois Central Railroad.....		18, 19	Peosta quadrangle.....		17-18
Indianola quadrangle.....		23	Percy.....		23
Iron Mines.....		15	Pleasantville.....		22-23
J.			Plymouth County.....		28
Jackson County.....		17	Polk County.....		7, 19, 20
Jones County.....		17	Postville.....		15, 16
K.			Pottawattamie County.....		7
Kahoka quadrangle.....		19	R.		
Kimball Corner.....		19	Randalia.....		13
Knoxville quadrangle.....		23-25	Rector.....		24
L.			Rees, H. V., work of.....		19
Lamont.....		14	Reesville.....		14
Lancaster quadrangle.....		12	Renshaw, J. H., work of.....		5
Lamotte.....		17	Rosseau.....		25
Lansing.....		15	Ryan.....		19
Lattners.....		12	S.		
Lee County.....		19	Sageville.....		12
Leighton.....		28	St. Donatus.....		18
Levey.....		20, 22	Sand Springs.....		18
Libby, R. L., work of.....		7	Sandyville.....		22
Linn County.....		17	Shelby.....		8
Ludlow.....		16	Shelby County.....		7
Luxemburg.....		13, 18	Spillville.....		16
Lybrand.....		15	Springwater.....		15-16
Lyon County.....		28	Steele, M. A., work of.....		11
M.			Strawberry Point.....		14
Mahaska County.....		25	Stuart.....		10
Manchester.....		12, 14, 18, 19	Swan.....		23
Marion County.....		21, 23, 25	T.		
Marion township.....		13	Tracy.....		27
Marne.....		9	Tyler, Alfred, work of.....		29
Marne quadrangle.....		9	U.		
Marshall, R. B., work of.....		5	Underwood.....		8
Maynard.....		13	Union Prairie.....		15
McGregor.....		12	V.		
Mederville.....		12, 13	Valley Junction.....		11, 19
Menlo.....		10	Van Meter.....		10-11, 21
Millville.....		12	Village Creek.....		15
Milo quadrangle.....		21-22	Vincennes.....		19
Minden.....		8	Volga.....		13, 14
Monona.....		14, 15	W.		
Monticello.....		19	Wadena.....		13
Mount Vernon Chapel.....		24	Walnut.....		9
N.			Warren County.....		21
National.....		12	Watson.....		14
Nebraska City Junction.....		28	Waukee.....		21
Nebraska City quadrangle.....		28	Waukee quadrangle.....		10-11, 20-21
Neola.....		8	Waukon.....		15
Neola quadrangle.....		8	Waukon Junction.....		14
New Albin.....		15	Waukon quadrangle.....		14-15
Newell, G. W., work of.....		17	West, F. H., work of.....		20
Nordness.....		16	Westgate.....		13
North McGregor.....		14	Weston.....		8
O.			West Union.....		13-14
Oelwein.....		14	Wheeling.....		23
Oelwein quadrangle.....		13	Wilson, H. M., work of.....		5
Ortonville.....		21	Wilson, John, work of.....		11
Osborne.....		13	Winneshiek County.....		11
Ossian.....		16	Wiota.....		9
Otley.....		25	Wiota quadrangle.....		9
Otter Creek Township.....		17	Worthington.....		18
P.			Wray, D. C., work of.....		29
Panora quadrangle.....		10	Y.		
Pella.....		26	Youngstown.....		20
Pella quadrangle.....		25-28	Z.		
Peosta.....		18	Zorn, G. W., work of.....		11
			Zwingle.....		17