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RESULTS OF SPIRIT LEVELING IN KANSAS

1896 TO 1913, INCLUSIVE

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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 KANSAS FROM 1896 TO 1913, INCLUSIVE.

R. B. MARSHALL, Chief Geographer.

INTRODUCTION.

Previous publication.—All results of spirit leveling in Kansas published by the United States Geological Survey in Bulletin 473 and all the results of later work are included in this report. Elevations are based on heights of bench marks along precise-level lines of the Coast and Geodetic Survey and of the Missouri River Commission, as adjusted in 1912 by the Coast and Geodetic Survey, and are likely to be changed but slightly by any future adjustment. The elevations of bench marks in the western part of the State are based on railroad data, and are, therefore, only approximate.

Personnel.—The field work before 1903 was done under the general direction of J. H. Renshaw, geographer; that for 1903 to 1906, inclusive, under H. M. Wilson, geographer; and the later work under W. H. Herron, geographer, and since 1908 under the general supervision of R. B. Marshall, chief geographer. The names of the various levelmen are given in the introductions to the several lists. The office work of computation, adjustment, and preparation of lists was done mainly by S. S. Gannett, geographer, under the general direction of E. M. Douglas, geographer.

Classification.—No precise leveling has been done by the United States Geological Survey in Kansas. 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 this class careful office adjustments are made, the circuit errors being distributed over the lines.

Bench marks.—The standard bench marks are of two forms. The first form is a circular bronze or aluminum tablet (C and E , Pl. I), $3\frac{1}{2}$ inches in diameter and one-quarter 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. 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, which is set about 3 feet in the ground. 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 inch in diameter. The tablets, as well as the caps on the iron posts, are appropriately lettered, and cooperation by States is indicated by the addition of the State name (*G*, Pl. I).

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

Datum.—All United States Geological Survey elevations are referred to mean sea level, which is the level that the sea would assume if the influence of winds and tides were eliminated. This level is not the elevation determined from the mean of the highest and the lowest tides, nor is it the half sum of the mean of all the high tides and 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 level as determined from observations in the Atlantic Ocean, the Gulf of Mexico, or the Pacific Ocean.

The connection with tidal stations for bench marks in certain areas that lie at some distance from the sea coast is still uncertain, and this fact is indicated by the addition of a letter or 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 United States Geological Survey or other Government organizations are extended.

Topographic maps.—Maps of the following quadrangles wholly or partly in Kansas have been published by the United States Geological Survey up to May 1, 1914. 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.

Abilene.	Kinsley.
Albany (Colo.-Kans.).	Lakin.
Anthony.	Larned.
Arapahoe (Nebr.-Kans.).	Lawrence.
Ashland. ¹	Leavenworth (Kans.-Mo.).
Atchison (Kans.-Mo.).	Leavenworth and vicinity (Kans.-Mo.), double sheet (20 cents).
Beloit.	Lyons.
Burden.	Mankato.
Burlingame.	Marysville.
Burlington.	Meade.
Caldwell.	Medicine Lodge.
Cheyenne Wells (Colo.-Kans.).	Minneapolis.
Clay Center.	Mound City (Kans.-Mo.).
Coldwater.	Ness.
Concordia.	Newton.
Cottonwood Falls.	Norton.
Dodge.	Olathe (Kans.-Mo.).
Eldorado.	Osborne.
Ellis.	Oskaloosa (Kans.-Mo.).
Ellsworth.	Parkerville.
Emporia.	Parsons.
Eskridge.	Phillipsburg.
Eureka.	Plainville.
Fort Scott (Kans.-Mo.).	Pratt.
Fredonia.	Red Cloud (Nebr.-Kans.).
Garden.	Russell.
Garnett.	Salina.
Granada (Colo.-Kans.).	Sedan.
Great Bend.	Seneca.
Hays.	Sitka. ¹
Hebron (Nebr.-Kans.).	Smith Center.
Hiawatha.	Spearville.
Hill.	Superior (Nebr.-Kans.).
Holdrege (Nebr.-Kans.).	Syracuse.
Hutchinson.	Topeka.
Independence.	Vilas (Colo.-Kans.).
Iola.	Wamego.
Joplin (Kans.-Mo.-Okla.).	Washington.
Joplin district (Mo.-Kans.-Okla.), double sheet (20 cents).	Wellington.
Junction City.	Wichita.
Kansas City (Kans.-Mo.).	Wyandotte (Okla.-Mo.-Kans.).
Kingman.	

¹ Sitka sheet, on scale of 1:62500, has been reduced and forms part of Ashland sheet, on scale of 1:125000.

PRIMARY LEVELING.**Joplin district.****CHEROKEE COUNTY.**

The elevations published in the following list are based on bench mark "CIII" of the Coast and Geodetic Survey at Carthage, Mo., at the southwest corner of Main and Limestone streets, a cross cut on the rounded top of a 6 by 6 inch limestone post buried in the ground 2.3 feet west of intersection of the inside lines of sidewalk. The elevation of this bench mark, as corrected by the 1912 adjustment of that Survey, is accepted as 941.645 feet above mean sea level.

The leveling was done in 1904 by D. C. Wray.

All bench marks dependent upon this datum are stamped with the letters "Crthg" in addition to the figures of elevation.

For additional data for the same area see Bulletin 568, "Results of spirit leveling in Missouri."

JOPLIN DISTRICT.

[Latitude 37°-37° 15'; longitude 94° 15'-94° 45'.]

T. 35 S., R. 25 E., northeast corner of sec. 11, 24 feet west of corner stone; iron post stamped "1016 Crthg".....	Feet. 1,015.667
Galena, west side of Euclid Avenue, between Seventh and Eighth streets, 2 feet north of southeast corner of foundation of schoolhouse; aluminum tablet stamped "976 Crthg".....	975.797
Baxter Springs, 51 feet west of southeast corner of city hall, in third course of stone below water table; aluminum tablet stamped "842 Crthg"....	841.956
T. 33 S., R. 25 E., SE. $\frac{1}{4}$ sec. 12, 45 feet south of corner stone, at west side of State line road; iron post stamped "914 Crthg".....	913.491
T. 32 S., R. 25 E., northwest corner of sec. 19, 4 feet east of corner fence post, southeast of crossroads; iron post stamped "904 Crthg".....	903.405
T. 33 S., R. 24 E., northeast corner of sec. 1, 40 feet south and 15 feet west of corner stone in center of crossroads; iron post stamped "893 Crthg"...	892.453
T. 34 S., R. 24 E., northeast corner of sec. 1, 40 feet south and 30 feet west of corner stone in center of crossroads; iron post stamped "862 Crthg"...	861.370

Iola and Parsons quadrangles.**ALLEN, BOURBON, CRAWFORD, LABETTE, AND NEOSHO COUNTIES.**

The elevations in the following list are based on an aluminum tablet stamped "968 Iola," in the northeast corner of Northup's National Bank building at Iola, Kans., the elevation of which is accepted as 971.089 feet above mean sea level. The initial point upon which this work depends is the bronze tablet established by the Indian Territory levels in the school building at Chetopa, Kans., the elevation of which as now accepted is 4.450 feet higher than published in Bulletin 175.

The leveling was done in 1902 by Fox Wood.

PARSONS QUADRANGLE.

[Latitude, 37°-37° 30'; longitude, 95°-95° 30'.]

From Chetopa north along Missouri, Kansas & Texas Ry. to Erie, thence along highway to La Harpe. (Double-rodged line.)

	Feet.
Erie, in east wing of courthouse; bronze tablet stamped "892 Iola".....	894. 680
T. 26 S., R. 20 E., northeast corner of sec. 31, in north end of stone pier at south end of iron bridge over Big Creek; aluminum tablet stamped "940 Iola".....	942. 633
T. 25 S., R. 19 E., southeast corner of sec. 36, in south side of schoolhouse, near corner of sections; bronze tablet stamped "1068 Iola".....	1, 070. 893
T. 24 S., R. 19 E., southeast corner of sec. 36; iron post stamped "1032 Iola".....	1, 034. 867

IOLA QUADRANGLE.

[Latitude, 37° 30'-38°; longitude, 95°-95° 30'.]

From Erie along highway east and around Tps. 27 and 28 S., R. 21 E.

T. 29 S., R. 21 E., 0.25 mile east of northwest corner of sec. 6, north side of schoolhouse; bronze tablet stamped "896 Iola".....	898. 675
T. 28 S., R. 22 E., 0.25 mile south of northwest corner of sec. 31, east side of road, north end of bridge over Big Walnut Creek, in rock abutment; bronze tablet stamped "897 Iola".....	899. 842
T. 27 S., R. 21 E., southeast corner of sec. 36; iron post stamped "952 Iola".....	954. 771
Portersville, northeast corner of schoolhouse; aluminum tablet stamped "1008 Iola".....	1, 010. 730
Savonburg, in west wing of schoolhouse; bronze tablet stamped "1057 Iola".....	1, 060. 358
T. 27 S., R. 20 E., southeast corner of sec. 36; iron post stamped "1022 Iola".....	1, 024. 806
T. 27 S., R. 19 E., southeast corner of sec. 36, in northeast corner of church; bronze tablet stamped "1004 Iola".....	1, 006. 732
T. 26 S., R. 18 E., southeast corner of sec. 36; iron post stamped "997 Iola".....	1, 000. 096
North Valley, southeast corner of sec. 36, T. 27 S., R. 18 E., in southeast corner of schoolhouse; bronze tablet stamped "909 Iola".....	910. 914

From northeast corner of T. 26 S., R. 19 E., west through Humboldt and south along range line between Rs. 17 and 18 E., thence along township line between Tps. 28 and 29 S.

Humboldt, 3 miles east of, northwest corner of Central Avenue schoolhouse; bronze tablet stamped "976 Iola".....	979. 212
T. 26 N., R. 18 E., southwest corner of sec. 30, in southwest corner of schoolhouse; aluminum tablet stamped "953 Iola".....	955. 423
T. 27 S., R. 17 E., southeast corner of sec. 36; iron post stamped "981 Iola".....	983. 509
T. 28 S., R. 17 E., southeast corner of sec. 36; iron post stamped "957 Iola".....	959. 738
Urbana, southeast corner of church; aluminum tablet stamped "954 Iola".....	956. 904
T. 24 S., R. 20 E., southeast corner of sec. 36; iron post stamped "1091 Iola".....	1, 093. 958
T. 24 S., R. 21 E., southeast corner of sec. 36; iron post stamped "1062 Iola".....	1, 065. 593

T. 23 S., R. 21 E., southeast corner of sec. 36; iron post stamped "1043 Iola".....	Feet. 1, 045. 307
T. 24 S., R. 20 E., northeast corner of sec. 1, on north side of schoolhouse; bronze tablet stamped "1024 Iola".....	1, 026. 743
T. 24 S., R. 20 E., sec. 7, northwest corner of schoolhouse; bronze tablet stamped "1059 Iola".....	1, 061. 641

From La Harpe west along railroad and highway and around T. 25 S., Rs. 18 and 19 E.

Iola, in northwest corner of Northup's National Bank building; bronze tablet stamped "968 Iola".....	971. 089
T. 24 S., R. 17 E., southeast corner of sec. 25; iron post stamped "1010 Iola".....	1, 012. 342
T. 23 S., R. 18 E., southeast corner of sec. 31; iron post stamped "1050 Iola".....	1, 052. 460
T. 23 S., R. 19 E., northeast corner of sec. 1, in northeast corner of schoolhouse; bronze tablet stamped "1022 Iola".....	1, 024. 445

Independence quadrangle.

MONTGOMERY AND WILSON COUNTIES.

The elevations in the following list are based on an aluminum tablet stamped "824 Independence," in the northwest corner of the courthouse at Independence, Kans., the elevation of which is accepted as 827.237 feet above mean sea level. The initial point upon which these levels depend is the bronze tablet established by the Indian Territory (now part of Oklahoma) levels at Coffeyville, Kans., the present accepted elevation of which is 4.454 feet higher than that published on page 88, in Bulletin 175.

The leveling was done in 1903 by Fox Wood.

INDEPENDENCE QUADRANGLE.

[Latitude, 37°-37° 30'; longitude, 95° 30'-96°.]

From Coffeyville west along highway 6 miles to Deering, thence north 30 miles, thence east 6 miles, thence south to Coffeyville.¹

Coffeyville, Ried Building; bronze tablet stamped "731 Independence." (See Indian Territory levels, Bulletin 175).....	Feet. 735. 826
Coffeyville, 4 miles west of, on township line, south side of bridge across Onion Creek, in east pier; chiseled cross.....	740. 39
Deering, in southwest corner of store of H. L. Towles; aluminum tablet stamped "763 Independence".....	766. 554
T. 34 S., R. 16 E., northwest corner of sec. 6, in northwest corner of Meyers's residence; aluminum tablet stamped "882 Independence".....	884. 484
Independence, northwest corner of courthouse; aluminum tablet stamped "824 Independence".....	827. 237
Sycamore, southeast corner of schoolhouse; aluminum tablet stamped "829 Independence".....	831. 447
Neodesha, southeast corner of Fourth and Main streets, in north side of brick building (Dr. F. T. Allen's store); aluminum tablet stamped "817 Independence".....	819. 870
Tps. 29 and 30 S., R. 16 E., on line between secs. 3 and 34, 12 feet from east rail, in east end of concrete railroad culvert; aluminum tablet stamped "842 Independence".....	845. 370

¹The error distributed in this line is excessive.

T. 30 S., R. 17 E., 0.25 mile east of northwest corner of sec. 6, in northeast corner of Mrs. Ann Clegg's house; aluminum tablet stamped "871 Independence".....	Feet. 873. 666
T. 31 S., R. 17 E., 0.1 mile east of northwest corner of sec. 6, in northeast corner of schoolhouse (district 80); aluminum tablet stamped "901 Independence".....	904. 004
T. 32 S., R. 16 E., northeast corner of sec. 12, in wall of schoolhouse; aluminum tablet stamped "853 Independence".....	895. 124
T. 33 S., R. 16 E., northwest corner of sec. 1, in northwest corner of church; aluminum tablet stamped "758 Independence".....	761. 741
Liberty, southeast corner of Methodist Church; aluminum tablet stamped "757 Independence".....	760. 977
From Deering west along highway 6 miles to Fawn, thence north about 30 miles to sec. 35, T. 29 S., R. 14 E., thence west 2 miles; return line south from Elk City and Havana to southwest corner of T. 24 S., R. 14 E., thence east 6 miles to Fawn.	
Tyro, in northeast corner of schoolhouse; aluminum tablet stamped "896 Independence." (Reported destroyed in 1909).....	898. 227
T. 33 S., R. 15 E., sec. 36, in northwest corner of schoolhouse; aluminum tablet stamped "831 Independence".....	833. 233
T. 32 S., R. 15 E., northwest corner of sec. 30, in northwest corner of schoolhouse; aluminum tablet stamped "821 Independence".....	823. 242
T. 31 S., R. 14 E., near sec. 23, southeast corner of schoolhouse; aluminum tablet stamped "918 Independence".....	920. 226
La Fontaine, in southeast corner of schoolhouse; aluminum tablet stamped "918 Independence".....	920. 331
T. 29 S., R. 14 E., near sec. 36, in southwest corner of schoolhouse; aluminum tablet stamped "928 Independence".....	930. 112
Buxton, northeast corner of Christian Church; aluminum tablet stamped "979 Independence".....	980. 984
T. 30 S., R. 14 E., sec. 33, in northwest corner of Henry Cox's residence; aluminum tablet stamped "891 Independence".....	893. 236
Elk City, in wing of brick schoolhouse; aluminum tablet stamped "833 Independence".....	835. 487
T. 32 S., R. 14 E., sec. 30, residence of C. Curtis, in west foundation of front porch; aluminum tablet stamped "853 Independence".....	855. 432
Havana, in schoolhouse; aluminum tablet stamped "762 Independence".....	763. 778
T. 34 S., R. 14 E., sec. 31, in south side of house of M. M. Freidlin; aluminum tablet stamped "757 Independence".....	759. 195

Atchison, Kansas City, and Oskaloosa 30' quadrangles, including Easton and Leavenworth 15' quadrangles.

ATKINS AND LEAVENWORTH COUNTIES.

The elevations are based on bench marks of the Missouri River Commission.

The leveling was done by S. K. Atkinson in 1906 and by G. E. Heebink in 1908-9.

KANSAS CITY QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 94° 30'-95°.]

Standard bench mark of the Missouri River Commission.

Connor, about 2.5 miles above, 1,265 feet below first road crossing below Popes Siding, 1,315 feet below bridge 79, across small creek, 220 feet above center of small bridge where the Gilman or bottom road turns east away from track, about 0.5 mile east of houses of E. Piper and Mr. Tull, 33 feet west of center of track on line of right of way; copper bolt in bench-mark stone (Mo. R. Comm. p. b. m. 247).....	Feet. 755. 428
Top of cap.....	759. 477

**From point 2.5 miles north of Connor west to sec. 20, T. 8 S., R. 22 E., and north to
Boling.**

Lipps, 310 feet west of mail box, on south side of road, 6 inches below surface of embankment, marked by large piece of limestone; iron stake marked "803".....	801. 89
T. 9 S., R. 23 E., at intersection of Dalton and Maltby roads, on highest part of section corner stone; square marked "882".....	881. 58
T. 9 S., R. 23 E., southwest corner of sec. 32; corner stone marked "928".....	927. 11
Lansing, 2 miles south by 0.4 mile east of, Leavenworth-Kansas City road north of Maltby road, in limestone 3 by 3 feet by 1.5 feet forming abut- ment of small bridge; aluminum tablet stamped "860".....	859. 655
T. 9 S., R. 23 E., southwest corner of sec. 31, on stone; chiseled square marked "878".....	877. 50
Lansing, 0.5 mile south by 1.5 miles west of, intersection of Brighton and Lambourn roads, quarter corner west side of sec. 26, T. 9 S., R. 22 E.; gas pipe with bronze cap marked "963".....	961. 785
T. 9 S., R. 22 E., quarter corner on north side of sec. 34, near Spring Hill schoolhouse, at T road south, on stone; chiseled square marked "956".....	954. 94
T. 9 S., R. 22 E., southwest corner of sec. 28, at west end of new Lawrence road, on stone; chiseled square.....	1, 017. 59
T. 9 S., R. 22 E., quarter corner on east side of sec. 29, east end of old Lawrence road; iron pipe set 3 feet in ground and projecting 1 foot above ground, stamped "1043".....	1, 042. 187
T. 9 S., R. 22 E., southwest corner of sec. 20, on granite boulder; chiseled square marked "966".....	965. 39
Boling, 1 mile northeast of, on southeast corner of Atchison, Topeka & Santa Fe Ry. bridge 17; bolt painted white and marked "U. S. 914"....	913. 42

LEAVENWORTH 15' (KANSAS CITY 30') QUADRANGLE.

[Latitude, 39° 15'-39° 30'; longitude, 94° 45'-95°.]

From Leavenworth west to Hund, thence south 1 mile.

Hund, 40 feet south of Union Pacific R. R. tracks, 20 feet west of wagon road; iron post stamped "834".....	832. 721
Hund, 1 mile south of, on stone abutment of steel bridge 130; chiseled square marked "846".....	829. 50

OSKALOOSA QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 95°-95° 30'.]

From Springdale south to Ackerland, thence east along railroad to Boling.

Springdale, 1.5 miles south of, at crossroads near mail box 60, in north root of forked oak tree; nail.....	947. 609
Ackerland, 1 mile north of, northeast corner of sec. 36, T. 9 S., R. 20 E.; section stone marked "1006".....	1, 005. 4

	Feet.
Ackerland, 300 feet east of station, intersection of railroad with main north-south pike; point on track, marked "1041".....	1,039.48
Ackerland, 1 mile east of, 2 miles west of Jarbalo, on southwest corner of railroad bridge 32; bolt painted white and marked "U. S. 971".....	970.29
Milepost 15; top of rail.....	965.36
Jarbalo, 1 mile west of, railroad crossing; joint on south rail, marked "919".....	917.95
Jarbalo, 120 feet east of station, 30 feet south of tracks; iron post stamped "871".....	870.623
Jarbalo, 1 mile east of, southwest corner of bridge 29; bolt painted white and marked "857".....	856.15
Jarbalo, 2 miles east of, in southeast corner of bridge 26; bolt painted white and marked "866".....	864.45
Milepost 11; top of vertical rail.....	873.59
Boling, in front of sign; top of rail.....	916.0
Boling, 200 feet northeast of station, 3 feet south of main track; large iron cylinder set in ground, marked "U. S. 914".....	912.77

From corner of secs. 14, 15, 22, and 23, T. 9 S., R. 20 E., south 1.5 miles, thence west 2.5 miles, thence north to sec. 17.

T. 9 S., R. 20 E., quarter corner between secs. 26 and 27, 5.2 feet from ground, near crotch in 20-inch elm tree at T road; 40-penny nail.....	997.60
T. 9 S., R. 20 E., quarter corner between secs. 27 and 28; iron post.....	1,048.408
T. 9 S., R. 20 E., quarter corner between secs. 28 and 29, cross corner, in telephone post; two 40-penny nails.....	1,065.24
T. 9 S., R. 20 E., center of sec. 29, 10 feet from corner fence post, 18 inches above ground, in brace of corner fence post; 40-penny nail.....	1,103.72

EASTON 15' (OSKALOOSA 30') QUADRANGLE.

[Latitude, 39° 15'–39° 30'; longitude, 95°–95° 15'.]

From point near Boling north to point near Hund.

Boling, near, in old ravine near where road crosses creek bed of west fork of Little Stranger Creek; stone marked "U. S. 913".....	912.18
Lansing, 5 miles west of, at intersection of roads, northeast corner of sec. 24, T. 9 S., R. 21 E., 50 feet west of bridge 92, south side of road; iron pipe with brass cap stamped "972".....	970.851
T. 9 S., R. 22 E., northwest corner of sec. 18, at crossroads near High Prairie schoolhouse, on limestone; chiseled square marked "1075".....	1,074.20
T. 9 S., R. 22 E., quarter corner on west side of sec. 7, south side of Compton road; marked "1066".....	1,065.62
T. 8 S., R. 22 E., southwest corner of sec. 31, at intersection of roads in Possum Hollow, in stone; aluminum tablet marked "924".....	924.690

From Hund west along Union Pacific R. R. to point 7 miles west of Easton.

T. 8 S., R. 21 E., near quarter corner on east side of sec. 13, on Union Pacific R. R., at road crossing; pole marked "U. S. 873".....	872.0
Pleasant Ridge, southwest corner of box-car station, in platform; 40-penny nail.....	1,049.75
Easton, main crossing; top of rail.....	903.1
Easton, intersection of Riley Street and main north-south road; on southwest corner of H. Boyle's place; iron post stamped "904".....	902.823
Easton, in stone step of Methodist Episcopal Church, 0.3 mile west of intersection of Riley Street with main north-south road, at end of Riley Street; aluminum tablet stamped "909".....	907.970
T. 8 S., R. 20 E., quarter corner between secs. 18 and 19; iron post.....	1,170.645

From Pleasant Ridge northeast to Oak Mills.

T. 8 S., R. 21 E., center of sec. 3, intersection of roads, in center of road, in limestone section corner at northeast corner of Squire's place; aluminum tablet stamped "1098." (Bench mark has been disturbed).....	Feet. 1,097.572
T. 7 S., R. 21 E., center of sec. 34, west side of road on piece of limestone; chiseled square marked "1086".....	1,085.22
T. 7 S., R. 21 E., quarter corner between secs. 23 and 24, northwest corner of Joe Adams's place, southeast corner of intersecting roads; iron post stamped "1008".....	1,007.203
Oak Mills, in John Davitz's front yard, 19 feet below his store and 2 feet inside of his tight board fence; iron pipe set 4 feet in ground, cap terminating in round knob taken as bench mark, stamped "Missouri River Commission P. B. M. No. 264-82-1".....	784.510

From Oak Mills west and south to Easton.

Oak Mills, 1.5 miles south and 1.5 miles west of, on half-section road at corner of Henry Paseway's place; large granite boulder marked "U. S. 1028".....	1,027.24
Oak Mills, 1.5 miles south and 3.5 miles west of, at crossroads, quarter corner on east side of sec. 21, R. 21 E., T. 7 S.; iron post stamped "1054".....	1,053.399
T. 7 S., R. 21 E., center of sec. 21, at intersection of roads; stone marked "U. S. 1054".....	1,053.62
Potter, 2 miles east of, southeast corner of NE. $\frac{1}{4}$ sec. 19, T. 7 S., R. 21 E., at crossroads; iron pipe stamped "1008".....	1,006.967
Easton, 3.5 miles north of, on west side of main pike, in front of Henry Seute's farm; center of large stone marked "997".....	996.61
Easton, 3 miles north of, 0.25 mile east of Melwood, at fork in road, near Max Blecher's mail box; iron post stamped "924".....	923.577
Easton, 1.5 miles north of, on bridge 158, northeast corner of, on railing; nail with white square, marked "906".....	905.70

From Easton south to point 1.5 miles south of Springdale.

Easton, 1 mile south of, southeast corner of bridge 179; bolt painted "U. S. 887".....	886.78
Springdale, 4 miles north of, at W. A. Hastey's place; southwest corner of front-door step, marked "U. S. 923".....	922.97
Easton, 3.3 miles south of, at base of telegraph pole; highest point on rock, painted "940".....	939.4
Easton, 4.6 miles south of, west of road, northwest of white house on east side of road, in root of tree; 40-penny nail.....	880.53
Springdale, on main east-west road, in front of John McQuillan's residence, on north side of road; iron pipe stamped "1048".....	1,045.553
Springdale, 1.5 miles south of, forks in road, northeast corner of Ezra Martz's place; stone marked "U. S. 979".....	977.4

From Springdale west 5.5 miles, thence north to point 1 mile north of Cummings, thence east and north to point near Parnell.

Springdale, 1 mile west of, in brace of corner fence post; 40-penny nail....	1,055.85
T. 9 S., R. 20 E., corner of secs. 14, 15, 22, and 23, in corner fence post; 40-penny nail.....	1,041.64
Edmunds Church corner, 50 feet from corner fence post, in root of elm tree 7 inches in diameter; 40-penny nail.....	1,063.03
T. 9 S., R. 20 E., 35 feet north and 15 feet east of quarter corner between secs. 18 and 19, on east side of north-south road; iron post stamped "Prim. Trav. Sta. No. 7, 1906".....	1,091.609

Feet.

T. 9 S., R. 20 E., quarter corner between secs. 7 and 18.....	1, 075.73
T. 9 S., R. 20 E., quarter corner between secs. 6 and 7, at crossroads, in corner fence post; 40-penny nail.....	1, 011.32
Tps. 8 and 9 S., R. 20 E., quarter corner between secs. 6 and 31; iron post..	1, 089.435
Tps. 8 and 9 S., Rs. 19 and 20 E., corner of secs. 1, 6, 31, and 36, at crossroads; top of corner stone.....	1, 099.54
T. 8 S., Rs. 19 and 20 E., corner of secs. 25, 30, 31, and 36; top of corner stone.	1, 122.74
T. 8 S., Rs. 19 and 20 E., quarter corner between secs. 30 and 25, in telephone post; three 40-penny nails.....	1, 091.58
T. 8 S., R. 20 E., center of sec. 30, at crossroads, in telephone post; three 40-penny nails.....	1, 123.68
T. 8 S., R. 20 E., quarter corner between secs. 18 and 19; iron post.....	1, 170.645
T. 8 S., R. 20 E., quarter corner between secs. 6 and 7, at crossroads, in telephone post; two 40-penny nails.....	1, 124.55
Corpus Christi Church, 0.5 mile west of, at crossroads, in corner fence post; three 40-penny nails.....	1, 119.82
Corpus Christi Church, 1 mile west of, Tps. 7 and 8 S., Rs. 19 and 20 E.; iron post stamped "Prim. Trav. Sta. No. 9, 1906".....	1, 091.538
T. 7 S., Rs. 19 and 20 E., quarter corner between secs. 30 and 25, at crossroads, in corner fence post; four 40-penny nails.....	1, 128.34
T. 7 S., Rs. 19 and 20 E., corner of secs. 19, 30, 24, and 25, T corner, in root of 8-inch locust tree; 40-penny nail.....	1, 045.32
T. 7 S., Rs. 19 and 20 E., corner of secs. 13, 18, 19, and 24, on southeast corner of east abutment of iron bridge; painted square.....	966.16
T. 7 S., R. 19 E., quarter corner between secs. 13 and 24, on east side of north-south road, 10 feet from corner fence post; iron post.....	991.168
T. 7 S., R. 19 E., quarter corner between secs. 12 and 13, in west root of tree; 40-penny nail.....	1, 086.36
T. 7 S., R. 19 E., center of sec. 12, in corner fence post at northwest corner of crossing; two 40-penny nails.....	1, 029.51
T. 7 S., R. 19 E., quarter corner between secs. 1 and 12, T corner, in telephone post near E. W. Kaufman's general store; three 40-penny nails...	983.45
Cummings, 1 mile north of Tps. 6 and 7 S., R. 19 E., quarter corner between secs. 1 and 36, in yard of house at end of T road; iron post.....	1, 063.106
Tps. 6 and 7 S., Rs. 19 and 20 E., township corner; top of section corner stone.....	984.53
Hawthorne, opposite station, in telephone pole east of tracks; three 40-penny nails.....	960.18
Bridge 13, northwest abutment of; painted square.....	968.44
Bridge 12, southwest abutment of; painted square.....	1, 009.98
From sec. 19, T. 7 S., R. 21 E., west to Potter, thence northwest along Atchison, Topeka & Santa Fe Ry. to Hawthorne.	
Potter, 1.8 miles east of, south of road; cross on stone.....	982.24
Potter, in front of station; top of rail.....	933.7
Mount Pleasant, northwest corner of station; top of rail.....	945.5
Mount Pleasant, 2 miles northwest of, at railroad culvert 5; top of south rail.....	963.1

ATCHISON 30' QUADRANGLE.

[Latitude, 39° 30'-40°; longitude, 95°-95° 30'.]

From Parnell northeast along Atchison, Topeka & Santa Fe Ry. to Atchison, thence south along Missouri Pacific Ry. to p. b. m. 267, Missouri River Commission.

	Feet.
Parnell, 35 feet west of general store and post office; iron post.....	1,053.827
Bridge 10, Atchison, Topeka & Santa Fe Ry., northwest corner of north abutment; painted square.....	954.13
Bridge 9, northwest corner of north abutment; painted square.....	929.11
Bridge 8, north side of east abutment; painted square.....	906.77
Parnell, 3 miles north of, near railroad crossing; iron post.....	907.079
Bridge 7, north end of east abutment; painted square.....	871.15
Bridge 6, north end of east abutment; painted square.....	859.95
Bridge 5, Atchison, Topeka & Santa Fe Ry., west abutment; painted square.....	849.31
Bridge 106, Missouri Pacific Ry., west end of north abutment; painted square.....	789.990
Atchison, 3 miles below Union Station, 130 feet below milepost 327, on side of track near bluff, 59 feet from center of track, 10 feet above grade, 16 feet toward river from wagon road, and 8 feet southeast of 10-inch crab-apple tree; copper bolt in regulation bench-mark stone 18 by 18 inches by 4 inches thick, 3.5 feet underground. Over and concentric with copper bolt is set an iron b. m. pipe 4 feet long with a cap at top terminating in a rounded knob, which is also taken as a permanent bench mark. The top surface of flat stone is marked "B. M."; copper bolt.....	795.701
Top of cap.....	799.762

Garden, Lakin, Syracuse, and Tribune quadrangles.

FINNEY, GRANT, HAMILTON, KEARNEY, AND STANTON COUNTIES.

The elevations in the following list are approximate and are based on the bronze tablet marked "2832," in the southwest corner of the courthouse at Garden, the accepted elevation of which is 2,832.034 feet above mean sea level. The initial height from which this bench mark is established is the top of the rail on the main track of the Atchison, Topeka & Santa Fe Ry., in front of the telegraph office at Garden, using the railroad company's elevation, 2,829 feet.

The leveling in this area was done by J. C. Barber in 1896, M. C. McFarlane in 1897, and F. C. French in 1898.

GARDEN QUADRANGLE.

[Latitude, 37° 30'-38°; longitude, 100° 30'-101°.]

From Garden along Atchison, Topeka & Santa Fe Ry. to sec. 7, T. 24 S., R. 33 W.

	Feet.
Garden, on Atchison, Topeka & Santa Fe Ry., in front of telegraph office; top of rail.....	2,829
Garden, southwest corner of courthouse; copper plate stamped "G. C. 2832".....	2,832.034
Garden, First National Bank, southwest side of main entrance; bronze tablet stamped "G. C. 2830".....	2,830.185
T. 24 S., R. 33 W., on north-south line through center of sec. 15, 48 feet south of Atchison, Topeka & Santa Fe Ry. track, between Garden and Sherlock; iron post stamped "G. C. 2853".....	2,853.022
T. 24 S., R. 33 W., 450 feet north and 70 feet west of east quarter corner of sec. 7, south side of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 2870".....	2,869.964

LAKIN QUADRANGLE.

[Latitude, 37° 30'–38°; longitude, 101°–101° 30'.]

Bench marks established near public-land corners.

	Feet.
T. 29 S., R. 37 W., southwest corner of sec. 18; iron post stamped "G. C. 3098"	3,098.008
T. 29 S., R. 37 W., southeast corner of sec. 13; iron post stamped "G. C. 2978"	2,977.752
T. 29 S., R. 36 W., southeast corner of sec. 16; iron post stamped "G. C. 3016"	3,015.693
T. 29 S., R. 36 W., southeast corner of sec. 13; iron post stamped "G. C. 3023"	3,022.951
T. 29 S., R. 35 W., southeast corner of sec. 16; iron post stamped "G. C. 3010"	3,010.008
T. 29 S., R. 35 W., southeast corner of sec. 13; iron post stamped "G. C. 3020"	3,020.262
T. 28 S., R. 38 W., southeast corner of sec. 36; iron post stamped "G. C. 3049"	3,049.049
T. 28 S., R. 38 W., southeast corner of sec. 33; iron post stamped "G. C. 3106"	3,106.486
T. 28 S., R. 37 W., southeast corner of sec. 9; iron post stamped "G. C. 3053"	3,053.185
T. 28 S., R. 37 W., southeast corner of sec. 29; iron post stamped "G. C. 3050"	3,049.598
T. 28 S., R. 36 W., southwest corner of sec. 34; iron post stamped "G. C. 3048"	3,047.667
T. 28 S., R. 36 W., southwest corner of sec. 31; iron post stamped "G. C. 3059"	3,059.232
T. 28 S., R. 35 W., southwest corner of sec. 34; iron post stamped "G. C. 3020"	3,020.412
T. 28 S., R. 35 W., southwest corner of sec. 31; iron post stamped "G. C. 3048"	3,047.640
T. 28 S., R. 34 W., southwest corner of sec. 34; iron post stamped "G. C. 2999"	2,999.367
T. 28 S., R. 34 W., southwest corner of sec. 31; iron post stamped "G. C. 3007"	3,006.790
T. 27 S., R. 38 W., southeast corner of sec. 33; iron post stamped "G. C. 3092"	3,091.805
T. 27 S., R. 38 W., southeast corner of sec. 36; iron post stamped "G. C. 3078"	3,078.245
T. 27 S., R. 37 W., southeast corner of sec. 16; iron post stamped "G. C. 3055"	3,054.867
T. 27 S., R. 37 W., southeast corner of sec. 33; iron post stamped "G. C. 3060"	3,060.400
T. 27 S., R. 36 W., southwest corner of sec. 34; iron post stamped "G. C. 3094"	3,093.825
T. 27 S., R. 36 W., southwest corner of sec. 31; iron post stamped "G. C. 3016"	3,016.146
T. 27 S., R. 35 W., southwest corner of sec. 34; iron post stamped "G. C. 3076"	3,076.041
T. 27 S., R. 35 W., southwest corner of sec. 31; iron post stamped "G. C. 3119"	3,118.557
T. 27 S., R. 34 W., southwest corner of sec. 34; iron post stamped "G. C. 3074"	3,073.887

	Feet.
T. 27 S., R. 34 W., southwest corner of sec. 31; iron post stamped "G. C. 3054".....	3, 054. 285
T. 26 S., R. 38 W., southeast corner of sec. 36; iron post stamped "G. C. 3089".....	3, 089. 083
T. 26 S., R. 38 W., southeast corner of sec. 33; iron post stamped "G. C. 3177".....	3, 177. 267
T. 26 S., R. 37 W., south side of sec. 16, 120 feet west of Hartland-Ulysses wagon road; iron post stamped "G. C. 3048".....	3, 048. 417
T. 26 S., R. 37 W., southeast corner of sec. 33; iron post stamped "G. C. 3069".....	3, 068. 838
T. 26 S., R. 36 W., southwest corner of sec. 33; iron post stamped "G. C. 3084".....	3, 083. 716
T. 26 S., R. 36 W., southwest corner of sec. 31; iron post stamped "G. C. 3080".....	3, 079. 725
T. 26 S., R. 35 W., southwest corner of sec. 34; iron post stamped "G. C. 3026".....	3, 026. 328
T. 26 S., R. 35 W., southwest corner of sec. 31; iron post stamped "G. C. 3098".....	3, 097. 876
T. 26 S., R. 34 W., southwest corner of sec. 34; iron post stamped "G. C. 2990".....	2, 990. 128
T. 26 S., R. 34 W., 620 feet east of southwest corner of sec. 31; iron post stamped "G. C. 3010".....	3, 009. 998
T. 25 S., R. 34 W., northwest corner of sec. 6; iron post stamped "G. C. 2967".....	2, 966. 901
T. 25 S., R. 35 W., northwest corner of sec. 3; iron post stamped "G. C. 2984".....	2, 984. 394
T. 25 S., R. 35 W., northwest corner of sec. 6; iron post stamped "G. C. 2975".....	2, 975. 357
T. 25 S., R. 37 W., near south side of township, west side of Hartland-Ulysses wagon road; iron post stamped "G. C. 3039".....	3, 038. 718
T. 25 S., R. 36 W., 40 feet southeast of northwest corner of sec. 2; iron post stamped "G. C. 2990".....	2, 989. 798
T. 25 S., R. 38 W., 650 feet west of east side of sec. 3, south of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 3112".....	3, 112. 044
T. 25 S., R. 37 W., line between secs. 7 and 8, north of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 3063".....	3, 063. 102
T. 25 S., R. 37 W., 600 feet north of southeast corner of sec. 10, north of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 3040".....	3, 039. 891
T. 25 S., R. 36 W., 1,050 feet south of northwest corner; iron post stamped "G. C. 3013".....	3, 012. 963
T. 24 S., R. 36 W., 60 feet east of line between secs. 26 and 27; south side of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 2991".....	2, 990. 914
T. 24 S., R. 35 W., 6 feet west of line between secs. 17 and 18, south of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 2969".....	2, 968. 966
Deerfield, 2,200 feet west of station; 6 feet west of line between secs. 10 and 11, T. 24 S., R. 35 W., south side of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 2940".....	2, 940. 104
T. 24 S., R. 34 W., 1,417 feet south of east quarter corner of sec. 6, south of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 2908".....	2, 908. 059
T. 24 S., R. 34 W., 1,100 feet south and slightly west of east quarter corner of sec. 3, south of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 2892".....	2, 892. 095
T. 24 S., R. 36 W., southeast corner of sec. 3; iron post stamped "G. C. 3125".....	3, 125. 493

T. 24 S., R. 37 W., northeast corner of sec. 21; iron post stamped "G. C. 3244".....	Feet. 3, 243. 950
T. 24 S., R. 38 W., southeast corner of sec. 13; iron post stamped "G. C. 3267".....	3, 267. 141
Hartland, 0.5 mile west of ; iron post stamped "G. C. 3040".....	3, 039. 891
T. 24 S., R. 37 W., near quarter corner on west side of sec. 34, triangulation station; iron post stamped "G. C. 3249"	3, 248. 939

SYRACUSE QUADRANGLE.

[Latitude, 37° 30'-38°; longitude, 101° 30'-102°.]

Bench marks established near public-land corners.

T. 29 S., R. 38 W., southwest corner of sec. 18; iron post stamped "G. C. 3139".....	3, 138. 822
T. 28 S., R. 41 W., quarter corner east side of sec 33; iron post stamped "G. C. 3375".....	3, 375. 345
T. 28 S., R. 42 W., southeast corner of sec. 36; iron post stamped "G. C. 3408".....	3, 407. 600
T. 28 S., R. 42 W., southeast corner of sec. 33; iron post stamped "G. C. 3446".....	3, 446. 344
T. 28 S., R. 41 W., southeast corner of sec. 36; iron post stamped "G. C. 3329".....	3, 328. 581
T. 28 S., R. 41 W., southwest corner of sec. 13; east side Syracuse-Johnson wagon road; iron post stamped "G. C. 3341".....	3, 341. 298
T. 28 S., R. 40 W., southeast corner of sec. 36; iron post stamped "G. C. 3222".....	3, 222. 096
T. 28 S., R. 40 W., southeast corner of sec. 33; iron post stamped "G. C. 3276".....	3, 275. 937
T. 28 S., R. 39 W., southeast corner of sec. 36; iron post stamped "G. C. 3117".....	3, 117. 370
T. 28 S., R. 39 W., southeast corner of sec. 33; iron post stamped "G. C. 3187".....	3, 186. 517
T. 27 S., R. 42 W., southeast corner of sec. 33; iron post stamped "G. C. 3477".....	3, 476. 965
T. 27 S., R. 42 W., southeast corner of sec. 36; iron post stamped "G. C. 3396".....	3, 396. 443
T. 27 S., R. 41 W., southeast corner of sec. 33; iron post stamped "G. C. 3351".....	3, 351. 435
T. 27 S., R. 41 W., southwest corner of sec. 36; iron post stamped "G. C. 3304".....	3, 304. 393
T. 27 S., R. 40 W., southeast corner of sec. 33; iron post stamped "G. C. 3264".....	3, 264. 377
T. 27 S., R. 40 W., southeast corner of sec. 36; iron post stamped "G. C. 3193".....	3, 192. 658
T. 27 S., R. 39 W., southeast corner of sec. 33; iron post stamped "G. C. 3164".....	3, 164. 082
T. 27 S., R. 39 W., southeast corner of sec. 36; iron post stamped "G. C. 3126".....	3, 126. 269
T. 27 S., R. 41 W., southwest corner of sec. 36, east of Syracuse-Johnson wagon road; iron post stamped "G. C. 3304".....	3, 304. 343
T. 27 S., R. 41 W., southwest corner of sec. 13, east of Syracuse-Johnson wagon road; iron post stamped "G. C. 3284".....	3, 283. 775
T. 26 S., R. 39 W., northwest corner of sec. 6; iron post stamped "G. C. 3409".....	3, 408. 531
T. 26 S., R. 39 W., quarter corner of east side of sec. 14; iron post stamped "G. C. 3322".....	3, 321. 580

T. 26 S., R. 40 W., northeast corner of sec. 6; iron post stamped "G. C. 3470"	Feet. 3, 470. 236
T. 26 S., R. 40 W., northeast corner of sec. 3; iron post stamped "G. C. 3437"	3, 436. 912
T. 26 S., R. 42 W., northeast corner of sec. 5; iron post stamped "G. C. 3434"	3, 433. 710
T. 26 S., R. 42 W., northeast corner of sec. 2; iron post stamped "G. C. 3430"	3, 430. 353
T. 26 S., R. 41 W., southwest corner of sec. 36, east of Syracuse-Johnson wagon road; iron post stamped "G. C. 3265"	3, 265. 164
T. 26 S., R. 41 W., 30 feet west and 30 feet south of northeast corner of sec. 23, on wagon road from Syracuse to Johnson; iron post stamped "G. C. 3362"	3, 362. 130
T. 25 S., R. 38 W., southwest corner of sec. 31; iron post stamped "G. C. 3254"	3, 254. 289
T. 25 S., R. 39 W., northeast corner of sec. 4; iron post stamped "G. C. 3176"	3, 175. 511
T. 25 S., R. 39 W., southeast corner of sec. 3; iron post stamped "G. C. 3381"	3, 381. 016
T. 25 S., R. 41 W., southeast corner of sec. 33; iron post stamped "G. C. 3430"	3, 430. 353
T. 25 S., R. 42 W., northeast corner of sec. 4; iron post stamped "G. C. 3489"	3, 489. 429
T. 25 S., R. 42 W., southeast corner of sec. 16; iron post stamped "G. C. 3522"	3, 522. 101
T. 25 S., R. 41 W., 30 feet west of Johnson wagon road; iron post stamped "G. C. 3392"	3, 392. 481
Syracuse, about 8 miles south of, triangulation station on west side of Johnson road; iron post stamped "G. C. 3508"	3, 507. 505
T. 25 S., R. 40 W., southwest corner of sec. 31; iron post stamped "G. C. 3489"	3, 488. 934
T. 25 S., R. 38 W., 70 feet southeast of northwest corner of sec. 6; iron post stamped "G. C. 3147"	3, 146. 576
T. 24 S., R. 41 W., near center of sec. 2; iron post stamped "G. C. 3247"	3, 246. 611
T. 24 S., R. 42 W., southeast corner of sec. 36; iron post stamped "G. C. 3435"	3, 435. 419
T. 24 S., R. 42 W., east side of sec. 1, at fence corner 50 feet south of Arkansas River; iron post stamped "G. C. 3267"	3, 266. 986
T. 24 S., R. 41 W., 10 feet east of fence between secs. 3 and 4, 47 feet south of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 3254"	3, 254. 315
T. 24 S., R. 40 W., 1,765 feet south and 30 feet east from northwest corner of sec. 7, 47.5 feet south of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3230"	3, 230. 315
T. 24 S., R. 40 W., 15 feet west of line between secs. 15 and 16, 46.5 feet south of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3198"	3, 198. 401
T. 24 S., R. 39 W., 15 feet east and 10 feet south of northwest corner of sec. 19, 46 feet south of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3175"	3, 175. 261
T. 24 S., R. 39 W., 12 feet west of line between secs. 22 and 21, south of Atchison, Topeka & Santa Fe Ry. track; iron post stamped "G. C. 3152"	3, 152. 234
T. 24 S., R. 38 W., 150 feet east of west side of sec. 30, north of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3123"	3, 122. 988

TRIBUNE QUADRANGLE.

[Latitude, 38°-38° 30'; longitude, 101° 30'-102°.]

Bench marks established near public-land corners.

T. 23 S., R. 42 W., 12 feet east of fence between secs. 31 and 36, 47 feet south of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3278".....	Feet. 3,277.882
T. 23 S., R. 42 W., 1,848 feet south of northwest corner of sec. 27, 48 feet south of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3303".....	3,302.939
T. 23 S., R. 42 W., 12 feet east of west side of sec. 19, 48 feet south of Atchison, Topeka & Santa Fe Ry. tracks, 1.8 miles east of Coolidge; iron post stamped "G. C. 3337".....	3,337.015
T. 23 S., R. 43 W., 423 feet south of northwest corner of sec. 22, 48 feet south of Atchison, Topeka & Santa Fe Ry. tracks; iron post stamped "G. C. 3353".....	3,352.684

Hiawatha quadrangle.

BROWN COUNTY.

The elevations in the following list were determined by primary leveling extended from precise leveling of the Missouri River Commission and accord with the 1912 adjustment.

The leveling was done in 1913 by R. R. Monbeck.

HIAWATHA QUADRANGLE.

[Latitude, 39° 30'-40°; longitude, 95° 30'-96°.]

From point near Preston, Nebr., west along State line road to point near Salem, Nebr. (partly in Nebraska).

Preston, 2.5 miles south by 1 mile west of, northwest corner of T road north; copper nail in base of telephone pole, painted "U. S. T. B. M. 938"....	Feet. 937.50
Preston, 2.5 miles south by 2 miles west of, northwest corner of T road north; copper nail in base of hedge post, painted "U. S. T. B. M. 973".....	971.79
Preston, 2.5 miles south by 2.5 miles west of; on State line; top of rail of Missouri Pacific Ry.....	893.8
Preston, 2.5 miles south by 3.3 miles west of, north side of State line road at T road south, beside telephone pole; copper nail in hedge post, painted "U. S. T. B. M. 940".....	939.71
Falls City, 4 miles south of, 800 feet west of T road north, 30 feet south of State line road, at Fred Zorn's residence, in base of limestone hitching post; bronze tablet stamped "1027 Prim. Trav. Sta. No. 21, Nebr., 1913".	1,025.978
Falls City, 4 miles south by 1 mile west of, at T road north, 50 feet south of State line road; chiseled cross on base of stone hitching post.....	1,031.09
Falls City, 4 miles south by 2 miles west of, 140 feet west of T road north, 20 feet south of State line road; copper nail in root of elm tree.....	935.47
Falls City, 4 miles south by 3 miles west of, 500 feet west of T road north, 150 feet southwest of William Boothe's residence, 30 feet north of State line road, in base of stone gatepost; bronze tablet stamped "999 Prim. Trav. Sta. No. 20, Nebr., 1913".....	998.158
Falls City, 4 miles south by 4 miles west of, northeast corner of T road north; copper nail in base of telephone pole.....	1,053.71
Salem, 5 miles south by 1.5 miles east of, at T road south, 10 feet north of State line road; copper nail in base of telephone pole.....	1,054.75

APPENDIX A.

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

Abilene, Anthony, Atchison, Caldwell, Cheney, Cheyenne Wells, Clay Center, Concordia, Ellis, Ellsworth, Hays, Hill, Hoxie, Hutchinson, Junction City, Kansas City, Kingman, Lawrence, Leavenworth, Mankato, Minneapolis, Oakley, Olathe, Oska-loosa, Russell, Russell Springs, Salina, Sharon Springs, Topeka, and Wamega quadrangles.

ATCHISON, CLAY, CLOUD, DICKINSON, DONIPHAN, DOUGLAS, ELLIS, ELLSWORTH, GEARY, GOVE, HARPER, JEFFERSON, JEWELL, JOHNSON, KINGMAN, LEAVEN-WORTH, LOGAN, McPHERSON, OTTAWA, POTTAWATOMIE, RENO, REPUBLIC, RILEY, RUSSELL, SALINE, SHAWNEE, SHERIDAN, SUMNER, TREGO, AND WALLACE COUNTIES.

The following descriptions and elevations are taken from reports of the Coast and Geodetic Survey and are republished by permission of the superintendent of that bureau. The bench marks were estab-lished by the Coast and Geodetic Survey, 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 only slightly by any future adjustment.

ABILENE QUADRANGLE.

[Latitude, 38° 30'–39°; longitude, 97°–97° 30'.]

From point near Chapman westerly along Union Pacific R. R. and Atchison, Topeka & Santa Fe Ry. to New Cambria.

Chapman, 0.5 mile east of, in top of west stone abutment to iron railroad bridge over Chapman Creek, south of track, on offset on which end of iron superstructure rests; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. Z).....	Feet. 1, 106. 967
Chapman, at east entrance in front or south side of county high school, in top of second stone step above ground, near its west end; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. A 1).....	1, 118. 495
Abilene, in stone doorsill to west entrance to courthouse, on upper surface and near north end of sill; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. B 1).....	1, 157. 281
Solomon, in face of dressed-stone water table of rough-stone railway station, on west end of building between two windows, about center of outer face of fourth stone from southwest corner of building; intersection of cross cut, marked "U. S. + B. M." (C. & G. S. b. m. C 1).....	1, 175. 743

From Solomon east along Atchison, Topeka & Santa Fe Ry. to Abilene.

Solomon, in small park in front of station, 4.6 meters south of track; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. W 2)....	1, 167. 747
Solomon, in east brick wall of Masonic lodge building on north side of Main Street, in fourteenth course above foundation, in seventh brick from southeast corner; copper bolt (C. & G. S. b. m. X 2).....	1, 172. 330

Abilene, on south side of east abutment of wagon bridge over Mud Creek, 0.5 mile west of Union Pacific R. R. station, 5.5 feet from bridge; copper bolt in sandstone coping (C. & G. S. b. m. Z 2).....	Feet. 1, 157.412
Abilene, in northwest angle made by crossing of Strong City branch of Atchison, Topeka & Santa Fe Ry. and Union Pacific R. R., 11.5 meters from Union Pacific track and 10.2 meters from Atchison, Topeka & Santa Fe track; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. Y 2).....	1, 149.824

ANTHONY QUADRANGLE.

[Latitude, 37°-37° 30'; longitude, 98°-98° 30'.]

From point near Basil southerly along Atchison, Topeka & Santa Fe Ry. to Anthony.

Basil, 29 paces west of center of side track, on property of N. J. Blake, in line with front line of his porch, 0.7 meter from northeast corner; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. Z 4).....	1, 598.940
Rago, 34 paces southeast of intersection of Englewood and Hutchinson & Southern branches of Atchison, Topeka & Santa Fe Ry., 18 paces directly south of Englewood branch, on northwest corner of property of Dave Stratton; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. A 5).....	1, 446.756
Duquoin, about 30 feet north of station, and 44 paces directly west of Atchison, Topeka & Santa Fe tracks, 3.18 meters northeast of northeast corner of Mr. Maxwell's general store; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. B 5).....	1, 584.013
Harper, in west face of building on northeast corner of Central Avenue and Main Street, controlled by Attorney Nashburn and occupied as a barber shop by M. E. Parker and as an implement store by Clarence Rogers, in sixteenth course of bricks above foundation and on third brick from north side of window in southwest corner of building; copper bolt (C. & G. S. b. m. C 5).....	1, 421.677
Ascot, on right of way, between switch and main track, 7.1 meters west of center of main track and 7.2 meters east of center of switch, in line with station sign at Ascot; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. D 5).....	1, 419.744
Anthony, 1 kilometer northwest of Anthony Southeast Base, along line of base and about 150 paces east of railroad tracks; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. E 5).....	1, 385.139
Anthony, 1.1 miles north of schoolhouse, at triangulation station Anthony Southeast Base, 89 meters east of Springfield Avenue, on north side of road, on property of R. R. Beam; bronze station mark in top of limestone block bedded in concrete (C. & G. S. b. m. Anthony S. E. B. \triangle).....	1, 376.453
Anthony and Harper, about equally distant from, at triangulation station Anthony Northwest Base, on land belonging to W. W. Millican of Thortown, Ind.; bronze station mark in top of limestone block embedded in concrete (C. & G. S. b. m. Anthony N. W. B. \triangle).....	1, 395.168
Anthony, on property of Poorman Milling Co., 3 paces north of their office, 21 paces from middle of road east of their office; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. F 5). (Probably destroyed).....	1, 344.197

ATCHISON 30' QUADRANGLE.

[Latitude, 39° 30'-40°; longitude, 95°-95° 30'.]

From point 5.5 miles below Atchison northerly near Missouri River to Atchison.

Atchison, 5.5 miles below, 30 feet below lower end of iron bridge across Walnut Creek, on bluff side of track, 68 feet from center and 45 feet north of t. b. m. 541; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 266=83-1), copper bolt.....	Feet. 784. 155
Cap on pipe.....	788. 181
Atchison, 4.25 miles below, 242 feet below milepost 326, 742 feet below south end of railroad bridge 103, on bluff side of track, 14 feet from center and 15 feet east of wagon road; highest point in square cut on embedded rock (U. S. C. E. t. b. m. 542).....	787. 610
Atchison, 3 miles below, at prominent point, 130 feet below milepost 327, on bluff side of track, 59 feet from center, 10 feet above grade, 16 feet toward river from wagon road, 8 feet southeast of 10-inch crab-apple tree; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 267), copper bolt.....	795. 701
Cap on pipe.....	799. 762
Atchison, 3 miles below, 985 feet above railroad bridge 104 over small creek, 108 feet below milepost 327, on bluff side of track, 15 feet from center; highest point in square cut on rock, marked "U □ S" (U. S. C. E. t. b. m. 543).....	789. 743
Atchison, 1.8 miles below station, 1,900 feet below bridge 106 over creek, just below ice house, on west side of track, 35 feet from center; horizontal furrow in copper bolt in natural ledge (U. S. C. E. p. b. m. 268 = old b. m. 287).....	798. 709
Atchison, on west side of Gillespie Street, 710 feet south of its intersection with Park Street, at foot of bluff, 35 feet west of bank of White Clay Creek; copper bolt in natural ledge about 4 feet below surface of ground and surmounted by an iron pipe (U. S. C. E. p. b. m. 269=84-1), copper bolt.....	797. 866
Cap on pipe.....	801. 888
Atchison, on Miller's Hotel, at southeast corner of Third and Commercial streets, on Commercial Street side, 15 inches back from Third Street side; highest point in square cut in water table, marked "U □ S" (U. S. C. E. t. b. m. 548=Atchison city b. m.).....	801. 147
Atchison, at northwest corner of Fifth and Santa Fe streets, in southwest corner of tower at south entrance of First Presbyterian Church; copper bolt in second course of stone from ground (U. S. C. E. p. b. m. 270)....	838. 873
Atchison, on northeast corner of Fifth and Santa Fe streets, 1 foot east of east building line; highest point in square cut in curbstone, marked "U □ S" (U. S. C. E. t. b. m. 549).....	836. 442
Atchison, on northeast corner of west abutment of Atchison Bridge; highest point in square formed on southwest angle of cross, thus \boxtimes (U. S. C. E. t. b. m. 550=old gage b. m.).....	790. 622
Atchison, in southeast corner of Burlington & Missouri River R. R. freight station, 41 inches west from corner and 2 inches from south face of water table; copper bolt (U. S. C. E. p. b. m. 271).....	798. 191
Atchison, in north end of east abutment of Atchison Bridge across Missouri River, in top course of masonry, northwest corner, 5 inches from either bevel edge of stone; copper bolt (U. S. C. E. p. b. m. 272).....	795. 769

CALDWELL QUADRANGLE.

[Latitude, 37°-37° 30'; longitude, 97° 30'-98°.]

At Spring.

Spring, 6 feet north of telegraph pole at station sign, on right of way of Atchison, Topeka & Santa Fe Ry.; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. G 5)..... 1, 367. 583

CHENEY QUADRANGLE.

[Latitude, 37° 30'-38°; longitude, 97° 30'-98°.]

From point near Darlow southerly along Atchison, Topeka & Santa Fe Ry. to point near Pretty Prairie.

Darlow, on right of way, 7.2 meters south of mail crane, 2.6 meters west of center of main track, 5.6 meters south of south wall of general store of Mrs. Ottir Umstat; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. Q 4)..... 1, 556. 745

Castleton, on right of way of railway, 5.7 meters east of center of main track, 2 meters north of north face of railroad station; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. R 4) 1, 466. 044

CHEYENNE WELLS QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 102°-102° 30'.]

On Kansas-Colorado State line.

Kansas-Colorado State line, north of track on railway right of way, at intersection of two lines cut in upper surface of pedestal to iron monument marking line, between round hole and southwest corner; surface of iron, marked "U. S. \square B. M." (C. & G. S. b. m. U 2)..... 3, 876. 016

CLAY CENTER QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 97°-97° 30'.]

From point near Talmage northerly along Atchison, Topeka & Santa Fe Ry. to point near Sulphur Springs.

Talmage, south of station, 70.2 meters south of north end of curve No. 73, 2.05 meters east of track; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. A 3) 1, 211. 254

Manchester, in town of, in southwest corner stone of abandoned foundation of pumping station, now (1899) used as a cellar, 0.25 meter from west and 0.075 meter from south face of stone; bottom of square cut (C. & G. S. b. m. B 3) 1, 294. 708

Longford, in foundation of building belonging to Salina Cement & Plaster Co., 0.21 meter north of doorway to boiler room and 0.34 meter below woodwork; copper bolt (C. & G. S. b. m. C 3) 1, 314. 712

Oak Hill, on right of way, between station and Santa Fe Hotel, in group of three trees and 1.2 meters from central one; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. D 3)..... 1, 269. 102

Catlin, in largest stone in southwest corner of stone house owned by J. W. Catlin, near south end of trestle 33 over Chapman Creek, 0.21 meter from corner and on west face of building; copper bolt (C. & G. S. b. m. E 3).. 1, 327. 868

Miltonvale, in northwesternmost of 21 cubical sandstone blocks supporting water tank; bottom of square cut (C. & G. S. b. m. F 3) 1, 376. 264

CONCORDIA QUADRANGLE.

[Latitude, 39° 30'-40°; longitude, 97° 30'-98°.]

From point near Huscher northerly along Atchison, Topeka & Santa Fe Ry. to point near Webber.

Huscher, east of track and opposite stock yards, 130 meters south of station, 0.3 meter west of east fence marking right of way; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. I 3).....	Feet. 1, 465. 640
Concordia, on limestone block forming north coping of west porch of courthouse; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. J 3)	1, 385. 686
Concordia, southwest end of fourth and top iron step at northwest corner of First National Bank building, surface of raised portion and 0.036 meter from iron casing and 0.12 meter from stonework (C. & G. S. b. m. Concordia City).....	1, 375. 607
Concordia, on northeast foundation stone of water tank belonging to railroad company, 0.25 mile north of station; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. K 3).....	1, 367. 690
Hannum switch, on capstone of small stone culvert under Missouri Pacific Ry., between second and third telegraph poles southeast of Hannum switch; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. L 3)	1, 363. 012
Oneonta, northeast of station, in limestone foundation of barn belonging to Mr. A. C. Nelson, in southwest face of barn, 1.29 meters north of southwest window; copper bolt (C. & G. S. b. m. M 3)	1, 396. 903
Kackley, in stone foundation of elevator leased by A. H. Poage, just southeast of station, on north face and top and eleventh stone from northwest corner; copper bolt (C. & G. S. b. m. N 3)	1, 513. 583
Courtland, in southwest angle formed by crossing of Atchison, Topeka & Santa Fe Ry. with Chicago, Rock Island & Pacific track, southwest of signal tower, 12.7 meters from Chicago, Rock Island & Pacific track, 13.9 meters from Santa Fe on right of way of former; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. O 3).....	1, 500. 611
Lovewell, 2 feet west of shed just west of station, 3 meters south of north siding; top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. P 3)	1, 545. 119

ELLIS QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 99° 30'-100°.]

From point near Ellis westerly along Union Pacific R. R. to point near Wakeeney.

Ellis, in east side of stone building used as a railroad station and hotel, in third course above sidewalk and in second stone to left (south) of door; copper bolt (C. & G. S. b. m. Z 1).....	2, 123. 624
Ellis, in front face of west side wall to one-story stone business building owned and occupied by Thomas Daly, in second course above foundation and about center of stone forming course; copper bolt (C. & G. S. b. m. A 2).....	2, 120. 695
Ellis, in front face of east side wall to two-story stone business building owned and occupied by R. McCloud, in second course above foundation and about middle of stone forming course; copper bolt (C. & G. S. b. m. B 2).....	2, 120. 317
Ogallah, in east front face of two-story stone building, owned by William Baldwin and used as a store and post office, in fourth course above foundation, in stone forming northeast corner; copper bolt (C. & G. S. b. m. C 2).....	2, 377. 078

ELLSWORTH QUADRANGLE.

[Latitude, 38° 30'–39°; longitude, 98°–98° 30'.]

From Kanopolis westerly along Union Pacific R. R. to point near Dorrance.

Kanopolis, on southwest corner of Ohio and Kansas avenues, in north wall of three-story brick hotel building, in fifth course above limestone foundation and in second brick from northeast corner of building; copper bolt (C. & G. S. b. m. L 1).....	Feet. 1, 585. 410
Ellsworth, in stone foundation to courthouse, in front (east) wall, in second course above ground and in third stone from southeast corner of building, 25 centimeters above top of basement window sill (stone); copper bolt (C. & G. S. b. m. M 1).....	1, 540. 341
Ellsworth, in yard of public school, in top of marble slab set in top of concrete pier marking telegraphic longitude station, edge of square hole is about 0.01 meter north of small round hole marking station, and square hole is not cut deep, two sandstone posts project from top of pier some distance above ground, posts are marked "U. S. Coast and Geodetic Survey"; bottom of square cut (C. & G. S. b. m. N 1).....	1, 540. 010
Ellsworth, small knob cut on root of box-elder tree at south end of iron road bridge over river, east of bridge, between stone abutment and river bank, two iron nails are driven in top of this knob and rods were held on top of north nail, 0.4 meter above ground; U. S. Geological Survey water-gage bench mark (C. & G. S. b. m. Water gage b. m.).....	1, 524. 098
Wilson, in front of two-story stone building (with iron front to first story), owned by J. F. Tampier and used as a general store, building fronts north, faces track, and is opposite railroad station; in top of stone window sill, east of door; bottom of square cut (C. & G. S. b. m. O 1), lettered "U. S. □ B. M.".....	1, 689. 908
Wilson, in iron front to two-story stone building, owned by J. F. Tampier, on column west of west window, between two square projections near bottom of column; intersection of cross cut (C. & G. S. b. m. P 1).	1, 691, 096

HAYS QUADRANGLE.

[Latitude, 38° 30'–39°; longitude, 99°–99° 30'.]

From point near Gorham westerly along Union Pacific R. R. to point near Ellis.

Gorham, in front (north) face of Union Hotel, a two-story stone building owned by J. W. Ginther, in sixth course above ground and in stone forming northwest corner about middle of its north face; copper bolt (C. & G. S. b. m. V 1).....	1, 916. 879
Walker, south of railroad track and east of station, in north wall of two-story stone building owned by Catholic Church, in sixth course above ground, in stone forming northwest corner; copper bolt (C. & G. S. b. m. W 1).....	1, 947. 148
Victoria, in front (north) wall of two-story stone railroad station, in second course above platform, in second stone from northeast corner of building; copper bolt (C. & G. S. b. m. X 1).....	1, 927. 644
Hays, at southeast corner of First National Bank building, at entrance, on left-hand end of lower step as you enter building, in upper surface of stone; bottom of square cut, lettered "U. S. □ B. M." (C. & G. S. b. m. Y 1).....	1, 998. 227

HILL QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 99° 30'-100°.]

At Wakeeney.

Wakeeney, in stone doorsill to courthouse, building fronts west and bench mark is at left or north side of door; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. D 2)..... 2, 464. 621 Feet.

HOXIE QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 100°-100° 30'.]

From point near Wakeeney westerly along Union Pacific R. R. to point near Grinnell.

Collyer, in front (west) face of stone pump house to railroad water tank, in fifth course above ground and in stone forming southwest corner; copper bolt lettered "U. S. \bigcirc B. M." (C. & G. S. b. m. E 2)..... 2, 582. 344

Quinter, 500 meters south of railroad, in north wall to two-story brick schoolhouse, in sixth course of brick above stone foundation and in second brick from northeast corner; copper bolt (C. & G. S. b. m. F 2)... 2, 679. 574

Buffalo Park, in east wall of stone pump house at west end of railroad station platform, in second course above platform and in stone forming southeast corner; copper bolt lettered "U. S. \bigcirc B. M." (C. & G. S. b. m. G 2)..... 2, 750. 719

Grainfield, in iron front to two-story brick building (called Opera House), fronts east and mark is near southeast corner; the maker's mark is on iron in raised letters and cross is placed as follows: "Mesker & Bros. St. +Louis, Mo.", the letters U. S. B. M. were cut in iron immediately below cross (C. & G. S. b. m. H 2)..... 2, 814. 217

HUTCHINSON QUADRANGLE.

[Latitude, 38°-38° 30'; longitude, 97° 30'-98°.]

From point near Johnstown southerly along Union Pacific R. R. and Chicago, Rock Island & Pacific Ry. to point near Darlow.

Johnstown, 4 meters directly east of station post, 8.2 meters east of center of railroad track, T. 19, R. 3 W.; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. E 4)..... 1, 392. 176

Hilton, on land of Peavey Elevator Co., between office and elevator, 4.7 meters north of north face of elevator, 3.3 meters south of south face of office, 13.7 meters east of center of main track, 4.6 meters east of center of switch, T. 19, R. 3 W.; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. F 4)..... 1, 518. 491

McPherson, on stone slab at south side of base of standpipe which supplies McPherson with water, 55 paces northwest of waterworks station, 54 paces east of center of main track; T. 19, R. 3 W.; bottom of square hole, marked "U. S. \square B. M." (C. & G. S. b. m. G 4)..... 1, 495. 804

McPherson, at main doorway on south side of McPherson Opera House, on east end of second stone step from bottom, about 0.3 meter from east stone column supporting archway over entrance; bottom of square hole, marked "U. S. \square B. M." (C. & G. S. b. m. H 4)..... 1, 496. 913

McPherson, 1.5 miles west of, on right of way of Chicago, Rock Island & Pacific Ry., at junction of that railroad and Missouri Pacific Ry., in southwest corner formed by intersection of two roads, 14 meters from center of Chicago, Rock Island & Pacific Ry. track and 16 meters from center of Missouri Pacific Ry. track; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. I 4)..... 1, 489. 242

Groveland, on property of Chicago, Rock Island & Pacific Ry., 1.6 meters south of their elevator office, 27.5 meters east of center of main track, 12.5 meters east of center of siding leading to their office; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. J 4).....	Feet. 1, 482. 155
Inman, on property of Henry Vogt, 0.7 meter north of northwest corner of his lumberyard office, 4.3 meters south of hydrant adjacent to office on north side, 250 feet east of main track of railroad, 185 feet east of center of siding; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. K 4).....	1, 518. 593
Medora, in northwest corner of lot owned by Benjamin Richard, upon which is a building used as a hotel, largest building in town, 62 paces southeast of southeast corner of railway station and 20 paces north of northwest corner of hotel; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. L 4)	1, 477. 054
Hutchinson, 1 mile east of, on State Reformatory, on north side of southwest pavilion, on sill of second window from northwest corner, 13 centimeters from east side of window and 1.06 meters from west side; bottom of square hole (C. & G. S. b. m. M 4).....	1, 534. 485
Hutchinson, at Sherman and Poplar streets, west entrance to First Presbyterian Church, north end of top step, in top of limestone post; bottom of square hole, marked "U. S. \square B. M." (C. & G. S. b. m. N 4).....	1, 532. 428
Hutchinson, at Second and Main streets, southwest entrance to Citizens' Bank, on northwest end of top step; bottom of square hole, marked "U. S. M \square B. M." (C. & G. S. b. m. O 4)	1, 529. 338
Fernie, a stock siding on (Hutchinson & Southern) Atchison, Topeka & Santa Fe Ry., in T. 22, R. 6 W., 4.7 meters south of south fence of stockyard, 13.4 meters east of center of main track; bottom of square hole in top of limestone post, marked "U. S. \square B. M." (C. & G. S. b. m. P 4)	1, 548. 005

JUNCTION CITY QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 96° 30'-97°.]

From point near Manhattan southwesterly along Union Pacific R. R. to point near Chapman.

Manhattan, iron railroad bridge over Big Blue River, north of track, on step in west abutment on which end of iron superstructure rests, on outer top stone; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. V).....	1, 006. 468
Ogden, on east (front) face of public school building, on east end of stone forming northeast corner, in fifth course above ground; intersection of cross, marked "U. S. + B. M." (C. & G. S. b. m. W)	1, 058. 410
Fort Riley, in smooth surface of water table of stone railroad station, on east end near southeast corner; intersection of cross cut, marked "U. S. + B. M." (C. & G. S. b. m. X).....	1, 069. 955
Junction City, on east end of railroad station, on eighth stone from northeast corner of building, in first course above brownstone foundation showing above platform, on right of door to express storeroom in this end of station; intersection of cross cut, marked "U. S. + B. M." (C. & G. S. b. m. Y) ...	1, 080. 270

KANSAS CITY 30' QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 94° 30'-95°.]

From Kansas City westerly along Atchison, Topeka & Santa Fe Ry. to point near Cedar Junction.

Kansas City, 2 miles west of, in top of east abutment to railroad bridge in Johnson County, Kans., about 0.5 mile east of first wagon bridge across Kansas River, above Kansas City, on east abutment, north of track; bottom of square hole cut in stone, lettered "U. S. \square B. M." (C. & G. S. b. m. LIX).....	Feet. 748. 696
Argentine, in top of stone foundation to one of the iron columns supporting viaduct over railroad yard, short distance west of railroad station, on foundation to first column south of main track on west side of bridge; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. LX)....	751. 662
Holliday, 0.5 mile east of, near southeast corner of stone culvert under railroad, south of track, in top of coping; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. LXI).....	760. 215
Holliday, 0.5 mile west of, stone pier under east end of iron railroad bridge over Mill Creek, north of track, in top and near northeast corner of pier; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. LXII).....	764. 100
Holliday, 0.5 mile west of, stone pier under west end of iron railroad bridge over Mill Creek, north of track, in top and near north end of pier; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. LXIII).....	764. 165
Holliday, 1 mile south of, Atchison, Topeka & Santa Fe Ry. (Emporia branch) bridge over Mill Creek, in top of stone abutment under north end of bridge, east of track, near southeast corner of highest portion of abutment; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. LXIV).....	779. 972

From Kansas City northeasterly near Missouri River to point near Leavenworth Junction.

Kansas City, on southeast corner of James Street and Lyon Avenue, in stone foundation of police station No. 2, on James Street face, 22½ inches from its northwest corner, in second course of stone from top, 3.5 feet above sidewalk; copper bolt (U. S. C. E. p. b. m. 234).....	753. 040
Kansas City, on southeast corner of James Street and Lyon Avenue, in front of police station No. 2, on east side of James Street, 23.5 feet south from northwest corner of sidewalk; highest point in square cut on curbstone, marked "U \square S" (U. S. C. E. t. b. m. 483).....	748. 890
Kaw River, Missouri Pacific Ry. bridge over, in west face of first pier east of west abutment, 7.2 feet south of north corner, in third course of masonry from ground, 2 feet below grade of Missouri Pacific Ry. track; copper bolt (U. S. C. E. p. b. m. 235).....	741. 458
Kaw River, on left bank of, at third bridge above mouth, over which cable cars cross, on first pier east of west abutment, on west face of pier at northwest corner; highest point in square cut on top of projection of second course of stone above ground, marked "U \square S" (U. S. C. E. t. b. m. 484) .	739. 713
Kansas City, northeast corner of Third Street and Wyandotte Avenue, on south face next to southwest corner of two-story brick building, on outer edge next to corner-stone pillar of iron doorsill (U. S. C. E. t. b. m. 485, same as old B. M. 248).....	777. 462
Kansas City, northwest corner of Third Street and Minnesota Avenue; top of north nut in rim of hydrant (U. S. C. E. t. b. m. 486, is also City b. m.) .	778. 332

Kansas City, between Missouri Pacific and Kansas City, Wyandotte & Northwestern R. R. tracks, 460 feet below their crossing, at southeast corner of old gas factory, on top of foundation; highest point in square (U. S. C. E. t. b. m. 487).....	Feet. 762. 443
Kansas City, at upper end of, 300 feet below K. T. brick works, opposite headblock of switch, 50 feet east from center of track, near right of way fence; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 236), copper bolt.....	749. 349
Cap on pipe.....	753. 411
Kansas City, west side of Wyandotte and Kansas City water-works pump house, between two windows, 1 foot north of south one, 14 feet south of northwest corner of wall, 4.3 feet above ground; copper bolt (U. S. C. E. p. b. m. 237).....	752. 177
Quindaro, 0.5 mile below old town, 2,295 feet above Kansas City and Wyandotte waterworks pump house, 285 feet below bridge 73½, on river side of track, 80 feet from center; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 238, same as 74-1), copper bolt.....	746. 514
Cap on pipe.....	750. 586
Quindaro, 738 feet above old town, 1.25 miles above Kansas City water works, 1,705 feet below bridge 74½, 900 feet above bridge 74, on bluff side of Missouri Pacific Ry. track, 7 feet from center; highest point in square cut on natural ledge (U. S. C. E. t. b. m. 492).....	772. 922
Nearman, 0.5 mile below, 1.8 miles above Quindaro, directly opposite Parkville, 275 feet below road crossing, on line with west side of road running north toward Parkville, 50 feet north of track center; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 239), copper bolt.....	746. 974
Cap on pipe.....	751. 012
Pomeroy, 2.25 miles below, at first small stream, 1,630 feet below water tank, 2,145 feet above road crossing, on southwest corner of east abutment of railroad bridge, a small wagon bridge spans the hollow a little higher up the bluff; copper bolt (U. S. C. E. p. b. m. 240).....	757. 731
Pomeroy, 2.25 miles below, on northwest corner of top stone of east abutment of railroad bridge; highest point in square marked "U □ S" (U. S. C. E. t. b. m. 495).....	757. 731
Pomeroy, 1.8 miles below, opposite center of water-tank, 25 feet north from center of track; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 241), copper bolt.....	755. 832
Cap on pipe.....	759. 890
Pomeroy, in foundation of F. H. Betton's house, the first residence on west side of street running south from station, in northeast face of foundation under bow window on east end of house, in center of stone in second course of masonry from top; copper bolt (U. S. C. E. p. b. m. 242).....	774. 802
Pomeroy, 195 feet south of station, in northeast corner of lot owned by I. C. Henderson, 18 feet south of southeast corner of old post-office building, 2 feet from angle of stone wall; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 243), copper bolt.....	753. 112
Cap on pipe.....	757. 157
Pomeroy, 0.6 mile above, 960 feet above east end of trestle over Marshall Creek, 125 feet from river, 75 feet south of railroad, 21 feet above grade of same; center of cavity in disintegrated rock ledge from which copper bolt has been extracted (U. S. C. E. p. b. m. 244, same as old b. m. 260).....	773. 801
Pomeroy, 0.6 mile above, 1,810 feet above milepost 296, 655 feet above end of railroad bridge over Marshall Creek, on bluff side of track, 8 feet from center; highest point in square cut on rock (U. S. C. E. t. b. m. 499)...	753. 643

Connor, 350 feet east of railroad station, on river side of track, 240 feet from center, in northwest corner of lot owned by Mr. Maxwell, 15 feet northeast from north corner of Eli Davis's house; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 245, same as 76-1), copper bolt.....	Feet. 754. 421
Cap on pipe.....	758. 496
Connor, in foundation wall at southeast corner of public schoolhouse, on its east face, 6 inches north from corner and 20 inches above ground; copper bolt (U. S. C. E. p. b. m. 246).....	771. 629
Connor, 2.5 miles above, 1,265 feet below first road crossing below Popes Siding, 1,315 feet below bridge No. 79, over small creek, 220 feet above center of small bridge where Gillman or bottom road turns east away from track (Mr. E. Piper and Mr. Tull live on this road about 0.5 mile east of track), 33 feet west of track center, on line of right of way; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 247), copper bolt.....	755. 428
Cap on pipe.....	759. 477
Popes station, 720 feet above milepost 302, 443 feet above Mr. Pope's house, 394 feet above upper head block of siding, on east end of upper abutment of small culvert; highest point in square marked "U □ S" (U. S. C. E. t. b. m. 506).....	761. 668

KINGMAN QUADRANGLE.

[Latitude, 37°-37° 30'; longitude, 98°-98° 30'.]

From point near Pretty Prairie southerly along Atchison, Topeka & Santa Fe Ry. to point near Basil.

Pretty Prairie, at northeast corner of property owned by Peter Kabiell, about 35 paces west of center of main track, 25 paces directly south of Hollingwood's granary; bottom of square hole in top of stone post, marked "U. S. □ B. M." (C. & G. S. b. m. S 4).....	1, 574. 849
Pretty Prairie, 0.25 mile south by 0.5 mile east of, at intersection of range and section line at northeast corner of sec. 24, T. 26 S., 0.5 mile northwest from triangulation station Pretty Prairie; bottom of square hole in top of stone post, marked "U. S. □ B. M." (C. & G. S. b. m. T 4)....	1, 578. 448
Varner, on right of way, in line with telegraph poles, 15 meters north of center of public road through Varner, 9.5 meters west of center of main track; bottom of square hole in top of stone post, marked "U. S. □ B. M." (C. & G. S. b. m. U 4).....	1, 519. 922
Lashmet, on right of way, directly north of station platform, 4 meters west of center of track, 34 meters north of center of public road at Lashmet, 37 paces northeast of northeast corner of house owned by John Lashmet; bottom of square hole in top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. V 4).....	1, 512. 057
Kingman, at west entrance to First National Bank, in foundation stone which forms top step, 0.16 meter south of main wall of building, 0.15 meter south of north end of stone step, 0.22 meter east of west edge; bottom of square hole, marked "U. S. □ B. M." (C. & G. S. b. m. W 4)..	1, 510. 142
Kingman, 2.25 miles west by 3.1 miles south of city hall, 35.6 meters northwest of schoolhouse, 350 paces directly east of windmill which marks triangulation station Kingman; bottom of square hole in top of stone post, marked "U. S. □ B. M." (C. & G. S. b. m. X 4) (A bolt with cross in top is leaded into north side of stone and intersection of cross lines is 0.4427 meter below bench mark).....	1, 656. 955
Carvel, on right of way, 1.15 meters northwest from northwest face of mill owned by D. N. Barnhill, 16.3 meters southwest from center of main track; bottom of square hole in top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. Y 4).....	1, 628. 520

LAWRENCE QUADRANGLE.

[Latitude, 38° 30'–39°; longitude, 95°–95° 20'.]

From point 0.5 mile east of Weaver westerly along Atchison, Topeka & Santa Fe Ry. to Lawrence.

Weaver, 0.5 mile east of, in east abutment to iron railroad bridge 29, in middle (near west end) of stone forming top of northwest corner of abutment; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. D).....	Feet. 799. 644
Eudora, 0.5 mile west of, in west abutment to iron railroad bridge over Wakarusa Creek, north of track, near middle and east end of stone forming top of northeast corner; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. E).....	810. 904
Lawrence, in east end of station, near south end of stone sill to door and near front edge, building is of brick, with stone trimmings; bottom of shallow square cut (C. & G. S. b. m. F).....	826. 212
Lawrence, at entrance of mill race, in top of rounded portion of stone retaining wall on shore side of race; bottom of square cut (C. & G. S. b. m. G).....	817. 295

LEAVENWORTH 15' QUADRANGLE.

[Latitude, 39° 15'–39° 30'; longitude, 94° 45'–95°.]

From point 2 miles below Leavenworth Junction northerly along Missouri River to Kickapoo.

Leavenworth Junction, 2 miles below, opposite foot of Spar Island, 970 feet above milepost 303, 1,610 feet above railroad trestle 81, on second bench of bluff from foot, 120 feet from Missouri Pacific Ry. track; top of copper bolt in bench-mark stone (U. S. C. E. p. b. m. 248=77-1), copper bolt.....	799. 283
Cap on pipe.....	803. 361
Leavenworth Junction, 93 feet above center of station, 100 feet above head block at junction, 18 feet east of center of track, 29.5 feet above lower head block of siding; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 249), copper bolt.....	756. 229
Cap on pipe.....	760. 294
Leavenworth, 2.8 miles below station, 230 feet above small coulee, 246 feet above bridge on bluff side of track; 12.5 feet from center; in flat piece of ledge about 2 feet below grade of track; highest point in square cut, marked "U \square S" (U. S. C. E. t. b. m. 513).....	763. 037
Leavenworth, 1.8 miles below station, 820 feet above coal mine, 39 feet below whistle post, on bluff side Missouri Pacific track, 8 feet from center, at foot of sidehill cut; highest point in square cut on embedded rock and marked "U \square S" (U. S. C. E. t. b. m. 514).....	770. 330
Leavenworth, 1.6 miles below station, on shelf of bluff, opposite East Leavenworth, on lower side of small ravine, 200 feet from river, 20 feet west from center of siding leading to coal mine; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 250=78-1), copper bolt.....	807. 679
Cap on pipe.....	811. 744
Leavenworth, 0.8 mile below station, 344 feet above runway to coal mine over tracks, on bluff side of Union Pacific track, 7 feet from center, at foot of sidehill cut; highest point in square cut in well-embedded rock (U. S. C. E. t. b. m. 515).....	767. 144

Leavenworth, on north side of Great Western Stove Co.'s brick building, one block south of Union Station, 3.4 feet west from northeast corner and 5 feet above ground; copper bolt leaded horizontally (U. S. C. E. p. b. m. 251)	Feet. 781. 681
Leavenworth, in brick building occupied by Rohlfling Bros., grocers, on southeast corner of Third and Cherokee streets, on west end of stone window sill, Cherokee Street side; copper bolt (U. S. C. E. p. b. m. 252)	786. 517
Leavenworth, at riverward foot of arch forming main entrance to north side of old Union Station; cross cut in top of water table (U. S. C. E. t. b. m. 516 equals old b. m. 270).....	768. 945
Leavenworth, in retaining wall at northwest corner of Main and Cherokee streets, 59 feet north of south end of wall, 78 feet south of south end of station; in fourth course of masonry above ground; copper bolt (U. S. C. E. p. b. m. 253).....	774. 792
Leavenworth, on east side of Union Station, on south end of doorstep to first door south of main entrance; highest point in square marked "U□S" (U. S. C. E. t. b. m. 517).....	771. 196
Leavenworth, 0.7 mile above station, 85 feet below milepost 310, 500 feet above coal mine, 8 feet below head block of switch on bluff side of track, 7 feet from center and on level with grade of same; highest point in square cut on embedded rock (U. S. C. E. t. b. m. 518).....	778. 273
Fort Leavenworth, 30 feet below south face of west abutment of bridge, 27 feet from center of Missouri Pacific Ry. track, 8 feet above grade; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 254 same as 79-1), copper bolt.....	787. 603
Cap on pipe.....	791. 691
Fort Leavenworth, west abutment of railroad bridge, in south side, 3.5 feet back from east face; in fourth course of masonry above ground at southeast corner; copper bolt (U. S. C. E. p. b. m. 255).....	788. 059
Fort Leavenworth, at southeast corner of west abutment of railroad bridge, 12 feet from center of Missouri Pacific Ry. track on same level; highest point on inclined rock and marked "U □ S" (U. S. C. E. t. b. m. 520)..	781. 659
Fort Leavenworth, on southeast corner of west abutment of Chicago, Rock Island & Pacific Ry. bridge, on second course of masonry from ground, 26 inches north of south face; bottom surface of notch cut in top of stone (U. S. C. E. t. b. m. 521 same as gage b. m.).....	785. 189
Fort Leavenworth, at northeast corner of Government stone ice house on river bank, 7 inches west from east face, 5.2 feet above ground; copper bolt (U. S. C. E. p. b. m. 256).....	775. 556
Fort Leavenworth, 0.8 mile above, 1.25 miles above Chicago, Rock Island & Pacific Ry. bridge across Missouri River, 525 feet below wagon-road crossing, 505 feet below center of bridge across small creek at lower edge of wagon road, 150 feet below point of bluff, on bluff side of track, 28 feet from center; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 257), copper bolt.....	772. 895
Cap on pipe.....	776. 960
Fort Leavenworth, 2.25 miles above Chicago, Rock Island & Pacific Ry. bridge, 350 feet above lower head block of Wade siding, on bluff side of track, 2 feet inside of right-of-way fence; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 258 same as 80-1), copper bolt.....	768. 735
Cap on pipe.....	772. 813
Wade siding, 613 feet above lower head block, 2.25 miles above Chicago, Rock Island & Pacific Ry. bridge at Fort Leavenworth, 262 feet above p. b. m. 258, on river side of track, 30 feet from center, at top of river bank; highest point in square cut on rock (U. S. C. E. t. b. m. 525).....	773. 283

Kickapoo, 1.8 miles below, 9 feet above upper end of bridge 95 over Salt Creek, on bluff side of Missouri Pacific Ry., 24 feet from center of track; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 259), copper bolt..	Feet. 773. 335
Cap on pipe.....	777. 393
Kickapoo, 0.25 mile below, 885 feet below trestle, 1,035 feet above milepost 316, 85 feet above upper end of small bridge over drain for cut, on bluff side of track, 9.7 feet from center and 2.5 feet above grade; copper bolt leaded horizontally into face of natural ledge (U. S. C. E. p. b. m. 260).	794. 037
Kickapoo, 912 feet below west end of trestle, on bluff side of track, 7.5 feet from center and 3.5 feet above grade, 10 feet above p. b. m. 260; copper bolt in northwest exposure of cut rock (U. S. C. E. p. b. m. 529 same as old b. m. 278).....	794. 444
Kickapoo, 0.25 mile below, 880 feet below lower end of trestle, 1,035 feet above milepost 316, 100 feet above small bridge, bluff side of track, 10 feet from center, on level with grade; highest point in square cut on natural ledge (U. S. C. E. t. b. m. 530).....	792. 571
Kickapoo, on upper side of small ravine, 30 feet from vertical bank of small stream, bluff side of track, 80 feet from center, George Sharp's house bears S. 88° W. (mag.), 130 feet distant; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 261 same as 81-1), copper bolt.....	800. 933
Cap on pipe.....	804. 995
Kickapoo, opposite upper end of bridge 96, Missouri Pacific Ry., bluff side of track, 15 feet from center and 4 feet below grade; highest point in square cut on natural ledge, letters U. S. cut on vertical face just below bench (U. S. C. E. t. b. m. 531).....	796. 590

MANKATO 30' QUADRANGLE.

[Latitude 39° 30'-40°; longitude 98°-98° 30'.]

From point near Webber northerly along Atchison, Topeka & Santa Fe Ry. to point 2 miles south of Superior, Nebr.

Webber, opposite north end of station platform, 8 paces west of siding; top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. Q 3).....	1, 667. 673
Superior, 2 miles south of, on receiving stone of central pier of railroad bridge over Republican River, 0.088 foot east of end pier of second span from north; bottom of square cut, marked "U. S. □ B. M." (C. & G. S. b. m. R 3).....	1, 550. 227

MINNEAPOLIS QUADRANGLE.

[Latitude 39°-39° 30'; longitude 97° 30'-98°.]

From point near Sulphur Springs northerly along Atchison, Topeka & Santa Fe Ry. to point near Huscher.

Sulphur Springs, near signpost of flag station, public road crosses track between bench mark and station sign, 14.5 meters north of sign and 4.6 meters east of track; top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. G 3).....	1, 573. 428
Aurora, just south of station, between second and third trees in park of railroad; top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. H 3).....	1, 481. 555

OAKLEY QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 100° 30'-101°.]

From point near Grinnell westerly along Union Pacific R. R. to point west of Page City.

Grinnell, in east wall of stone pump house to railroad water tank, in ninth course above foundation, in stone forming northeast corner of course; copper bolt (C. & G. S. b. m. I 2).....	2, 911. 123
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Oakley, in east wall of stone pump house to railroad water tank, in third course above ground, in stone forming southeast corner of course; copper bolt, marked "U. S. \square B. M." (C. & G. S. b. m. J 2)	Feet. 3,052.212
Monument, north of railroad and 800 meters east of station, in front (south) wall of stone basement to one-story frame dwelling house, in second course above ground, in stone forming west side of east window; copper bolt, lettered "U. S. \square B. M." (C. & G. S. b. m. K 2)	3,172.779

OLATHE QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 94° 30'-95°.]

From point 0.8 mile east of Cedar Junction westerly along Atchison, Topeka & Santa Fe Ry. to point 0.5 mile east of Weaver.

Cedar Junction, 0.8 mile east of, on west abutment to iron railroad bridge No. 19 over Cedar Creek, at northeast corner, about center of stone forming top; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. A)	781.927
Desoto, 0.25 mile east of, on top of east abutment to iron railroad bridge, near center of stone forming northwest corner; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. B)	790.084
Desoto, three-story brick flour mill owned by J. M. Hadley, in west (front) wall, in second course above stone foundation, in second brick from northwest corner; copper bolt (C. & G. S. b. m. C)	798.093

From point near Newington west and north along Kansas City, Clinton & Springfield Ry. to point north of Olathe.

Newington, 75 meters west of State line where it crosses railroad track, on top of west abutment to bridge over Big Blue Creek, between superstructure and north rail; bottom of square cut in stone, marked "U. S. \square B. M." (C. & G. S. b. m. LXIX)	870.205
Morse, in yard to residence of N. J. McKittrick, south of house and 5 feet from bay window, nearly opposite east side; top of stone post, marked "U. S. \square B. M." (C. & G. S. b. m. LXVIII)	1,094.128
Olathe, in front (east) wall of Avenue Hotel (three-story brick), hotel is across street west of courthouse, in fourteenth course above stone foundation, in fourth brick from northeast corner; copper bolt (C. & G. S. b. m. LXVII)	1,035.378
Olathe, on north side of courthouse, under north entrance, just east of stone wall supporting this entrance, in upper surface of stone coping to basement entrance; bottom of square cut, lettered "U. S. C. & \square G. S. B. M." (C. & G. S. b. m. LXVI)	1,035.785
Olathe, in northwest corner of courthouse yard, 10 paces from fence on north side and 2 paces from fence on west side; top of marble post, marked "U. S. \square B. M." (C. & G. S. b. m. LXV)	1,030.461

OSKALOOSA QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 95°-95° 30'.]

From point 0.5 mile east of Club House westerly along Atchison, Topeka & Santa Fe Ry. to point 0.5 mile east of Tecumseh.

Club House, 0.5 mile east of, in top of east abutment to iron railroad bridge over Mud Creek, near middle line and west end of stone forming top of northwest corner; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. H)	829.217
Lecompton, 0.5 mile east of, in top of west abutment to iron railroad bridge, near middle line and east end of stone forming top of northeast corner; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. I) ...	843.168

Lecompton, 1 mile west of, in top of west abutment to iron railroad bridge No. 47 over Coon Creek, near middle line and east end of stone forming top of southeast corner; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. J).....	Feet. 846. 216
Grover, 1.25 miles east of, in top of west abutment to railroad bridge No. 55, in middle (near east end) of stone forming top of southeast corner; bottom of square hole, lettered "U. S. \square B. M." (C. & G. S. b. m. K)	857. 459
From point 1.8 miles below Oak Mills northerly near Missouri River to point 5.5 miles below Atchison.	
Oak Mills, 1.8 miles below, 70 feet below center of railroad bridge over small creek coming out of valley, on bluff side of track, 3 feet east from wire fence directly opposite south point of bluff; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 262), copper bolt.....	774. 001
Cap on pipe.....	778. 040
Oak Mills, in northwest side, 8 inches from front face of stone building facing northeast, 65 feet southeast of John Davitz's store, 6 feet above ground; copper bolt (U. S. C. E. p. b. m. 263).....	789. 729
Oak Mills, in John Davitz's front yard, 19 feet below his store, 2 feet inside of tight board fence; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 264 same as 82-1), copper bolt.....	780. 441
Cap on pipe.....	784. 510
Oak Mills, 2.2 miles above, 0.8 mile above Little Walnut Creek, 180 feet below railroad bridge No. 99, 16 feet toward river from wagon road running parallel to river, near forks in road, on bluff side of track, 65 feet from center; copper bolt in bench-mark stone (U. S. C. E. p. b. m. 265), copper bolt.....	784. 907
Cap on pipe.....	788. 945
Oak Mills, 3 miles above, 413 feet below Joseph Silk's house, 16 feet above whistle post, on bluff side of track, 12 feet from center; highest point in square cut on embedded rock, marked "U \square S" (U. S. C. E. t. b. m. 540).....	785. 333

RUSSELL QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 98° 30'-99°.]

From point near Dorrance westerly along Union Pacific R. R. to point near Gorham.	
Dorrance, stone foundation under west one of two iron supports under north side of railroad water tank, on top stone north of iron support; bottom of square hole, marked "U. S. \square B. M." (C. & G. S. b. m. Q 1).....	1, 731. 745
Bunker Hill, in front (east) face of two-story stone Masonic Hall, in third course above stone sidewalk, in second stone from northeast corner of building; intersection of cross cut (C. & G. S. b. m. R 1), marked "U. S. + B. M.".....	1, 866. 180
Bunker Hill, in south portion of town, top of marble post marking Bunker Hill triangulation station; top of post is divided into four sections by two lines cut in top, intersecting at center; bench mark is surface of stone at southwest corner of northeast section (C. & G. S. b. m. S 1 or "Bunker Hill \triangle ").....	1, 870. 174
Homer, near; top of sandstone post marking station; top of post is divided into four sections by two lines cut in top, intersecting at center; bench mark is surface of stone at southwest corner of northeast quarter (C. & G. S. b. m. T 1 or Russell S. E. Base \triangle).....	1, 880. 216
Russell, in west end of stone railroad station, at southwest corner of building, in fourth course above platform; intersection of cross cut in stone, marked "U. S. + B. M." (C. & G. S. b. m. U 1).....	1, 833. 096

Russell, 2 miles east of, NW. $\frac{1}{4}$ sec. 25, T. 13, R. 14, in pasture belonging to Mr. Long; drill hole in top of sandstone post 1.5 feet long by 4 inches square. (C. & G. S. b. m. "Russell N. W. Base")..... Feet.
1, 839. 734

RUSSELL SPRINGS QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 101°-101° 30'.]

From point west of Page City westerly along Union Pacific R. R. to point near Wallace.

Page City, 2.5 kilometers west of, north of track, in upper surface of pedestal to iron monument marking end of bonded portion of Union Pacific Ry., at southeast corner; surface of iron at intersection of cross, marked "U. S. + B. M." (C. & G. S. b. m. L 2)..... 3, 227. 014

Winona, in upper surface of stone foundation supporting one of iron columns under railroad water tank, in southeast stone of four supporting central group of columns and on its south sloping face; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. M 2)..... 3, 324. 990

McAllaster, between railroad track and switch, near southeast corner of platform around railroad station; square cut in top of granite post, marked "U. S. \square B. M." (C. & G. S. b. m. N 2)..... 3, 155. 617

Turkey Creek, on railway right of way between track and telegraph pole used as the 414 milepost; square cut in top of granite post, marked "U. S. \square B. M." (C. & G. S. b. m. O 2)..... 3, 231. 611

SALINA QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 97° 30'-98°.]

From point near New Cambria westerly along Union Pacific R. R. to Kanopolis.

New Cambria, store and railway station, near west end of stone sill to east door in front of building, which is owned by S. P. Dowmyer; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. D 1)..... 1, 199. 860

New Cambria, 0.5 mile west of, iron railroad bridge over Smoky Hill River, west of river, north of track, on top of small stone pier under end of wooden trestlework of bridge; small pier is built on top of larger pier which supports iron bridge; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. E 1)..... 1, 198. 731

New Cambria, 1 mile west of, on land owned by Mrs. Mary Marlin, of Salina, 35.05 feet north of second telegraph pole along Union Pacific R. R. west of gate entrance to Marlin's farm, in limestone block 30 inches square and 15 inches high, set in concrete, which marks station at surface; top of copper bolt, lettered "U. S. C. & G. 18 \bigcirc 96 Survey" (C. & G. S. b. m. Salina East Base \triangle)..... 1, 200. 017

Salina, in northeast part of, east of tanks of Standard Oil Co., 42.75 feet north of line of telegraph poles which parallel on north side the Union Pacific R. R. track, 10 feet east of north-south fence bounding land of Standard Oil Co., in limestone block 30 inches square and 15 inches high, set in concrete, which is surface mark of station; top of copper bolt, lettered "U. S. C. & G. 18 \bigcirc 96 Survey" (C. & G. S. b. m. Salina West Base \triangle)..... 1, 220. 008

Salina, Missouri Pacific Ry. station, which is constructed of rough stone, under window in west side of bow window in front of building, in face of stone window sill; intersection of two lines forming a cross, marked "U. S. C. & + G. S. B. M." (C. & G. S. b. m. F 1)..... 1, 224. 506

Salina, brick building owned and occupied by H. T. Lee Mercantile Co., at left side of steps to main entrance on Santa Fe Street, in upper surface of stone coping to vestibule; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. G 1)..... 1, 225, 828

Salina, brick public-school building on Elm Street, 1 block west of Santa Fe Street, in east wall and near southeast corner of building, in outer face of dressed-stone coping to stone foundation; intersection of two lines forming a cross, lettered "U. S. C. & + G. S. B. M." (C. & G. S. b. m. H 1).	Feet. 1, 225. 972
Bavaria, stone railroad station, in outer face of limestone sill to window in east end of building; intersection of cross cut, marked "U. S. + B. M." (C. & G. S. b. m. I 1).	1, 274. 685
Brookville, stone public-school building, on east (front) side of building, 1.4 meters from northeast corner, in outer face of limestone coping to foundation; intersection of cross cut, lettered "U. S. + B. M." (C. & G. S. b. m. J 1).	1, 359. 239
Terra Cotta switch, 1 mile east of, in upper surface of stone foundation to west one of two iron supports under north side of railroad water tank; bottom of square cut, marked "U. S. □ B. M." (C. & G. S. b. m. K 1).	1, 446. 526

From Salina southerly along Union Pacific R. R. to point near Johnstown.

Mentor, on right of way, 3.5 meters north of station sign, 11.1 meters north of public road, in T. 15, R. 2 W.; bottom of square hole in top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. A 4).	1, 265. 440
Assaria, on right of way, 16.8 meters north of station, 3.8 meters north of first telegraph pole north of station, in line with telegraph poles, 9.3 meters west of railroad, 10 meters east of public road in T. 16, R. 3 W.; bottom of square hole in top of limestone post, marked "U. S. □ B. M." (C. & G. S. b. m. B 4).	1, 282. 110
Bridgeport, on right of way, nearly at intersection of north and west platforms of station, 2.8 meters north of north face of station, 5.4 meters east of center of tracks; bottom of square hole in top of limestone post marked "U. S. □ B. M." (C. & G. S. b. m. C 4).	1, 301. 487
Lindsborg, 25 paces west of railroad, on east face of large three-story brick gristmill, owned by Lindsborg Milling & Elevator Co. (Inc.), 1.82 meters south of northeast corner of mill, 3.05 meters north of north side of large doorway to mill, on east side; copper bolt (C. & G. S. b. m. D 4).	1, 336. 126

SHARON SPRINGS QUADRANGLE.

[Latitude, 38° 30'-39°; longitude, 101° 30'-102°.]

From point near Wallace westerly along Union Pacific R. R. to point near Kansas-Colorado State line.

Wallace, in northeast corner of inclosure east of stone house formerly used as office of division superintendent of Union Pacific R. R., in top of sandstone post forming west support of transit at telegraph longitude station; bottom of square cut, marked "U. S. □ B. M." (C. & G. S. b. m. P 2).	3, 314. 291
Wallace, 3.5 miles west of, in upper surface of stone foundation under one of iron columns supporting railroad water tank, in southwest stone of four supporting central group of columns, near its south side; bottom of square cut, marked "U. S. □ B. M." (C. & G. S. b. m. Q 2).	3, 339. 816
Sharon Springs, in stone foundation under east front wall of one-story business building at, on west side of Main Street and owned by Col. Woodhouse, in stone forming southeast corner of foundation and projects a little outside the stone; copper bolt (C. & G. S. b. m. R 2).	3, 454. 478
Monotony, 10 feet south of station sign, on railway right of way; bottom of square cut in top of granite post, marked "U. S. □ B. M." (C. & G. S. b. m. S 2).	3, 779. 992
Weskan, in front (east) wall of stone pump house to railway water tank, in second course below top of wooden door casing, in third stone from southeast corner of building; copper bolt (C. & G. S. b. m. T 2).	3, 829. 500

TOPEKA QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 95° 30'-96°.]

From point 0.5 mile east of Tecumseh westerly along Atchison, Topeka & Santa Fe Ry. to Topeka, thence westerly along Union Pacific R. R. to St. Marys.

Tecumseh, 0.5 mile east of, in top of west abutment to iron railroad bridge, north of track, near middle line and east end of stone forming northeast corner of top; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. L).....	Feet. 865. 798
Topeka, repair shops of railway, in upper surface of stone projecting from south wall of paint shop, near southwest corner of building, in slight recess formed by two offsets from wall running up from stone on which bench mark is cut, one of these offsets forms southwest corner of building; bottom of square cut (C. & G. S. b. m. M).....	888. 181
Topeka, in top of stone supporting south end of iron bridge of Atchison, Topeka & Santa Fe Ry., over Kansas River, east of track, on south side of street which goes under bridge, near northeast corner of stone; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. N).....	882. 922
Topeka, Columbian Building, on Sixth Street between Kansas Avenue and Jackson Street, on west end of stone forming third step above pavement at entrance, close to wall, the surface of stone at south end of cross is bench mark; cross (C. & G. S. b. m. Jennings).....	928. 535
Topeka, Columbian Building, Sixth Street between Kansas Avenue and Jackson Street, on face of second stone (sandstone) above pavement on west side of entrance, a V-shaped line is nicely cut horizontally across this space, bottom of cut forming this line at its middle point was used as bench mark, and was established by owner of building; lettered "945 B. M. feet above sea level" (C. & G. S. b. m. O).....	932. 937
Silver Lake, brick building used as post office (owned by P. H. Butler), south of track, nearly opposite railroad station, on south side of Main Street and on northwest corner of block, middle of stone sill of west window in front (north face) of building, in top of sill; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. P).....	914. 762
Rossville, 0.25 mile west of, in top of east abutment to iron railroad bridge, north of track and about middle of exposed part of stone supporting end of bridge; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. Q).....	929. 500

WAMEGO QUADRANGLE.

[Latitude, 39°-39° 30'; longitude, 96°-96° 30'.]

From St. Marys westerly along Union Pacific R. R. to point near Manhattan.

St. Marys, brick building used as an infirmary at St. Mary's College (Jesuit), west face of building, on stone coping of foundation, on third stone from southwest corner, about under center of space between second and third windows from southwest corner; intersection of two lines forming a cross, lettered "U. S. + B. M." (C. & G. S. b. m. R).....	965. 539
Belvue, 2 miles west of, in top of west abutment to iron railroad bridge over Vermilion River, north of track, about center of exposed part of stone supporting end of bridge; bottom of square cut, marked "U. S. \square B. M." (C. & G. S. b. m. S).....	961. 317
Wamego, at northwest corner of Lincoln Avenue and Third Street, two-story stone building owned by Hecker Bros. and used as a dry goods store, in top of stone sill of show window on left of entrance in vestibule at corner (Third Street side); bottom of square cut, marked "U. S. C. & \square G. S. B. M." (C. & G. S. b. m. T).....	991. 029
St. George, brick store owned by J. D. Robertson, on stone sill to east window in front (south) end of building; bottom of square cut, lettered "U. S. \square B. M." (C. & G. S. b. m. U).....	1, 003. 400

APPENDIX B.

ELEVATIONS OF STONE-LINE BENCH MARKS ALONG THE MISSOURI RIVER ESTABLISHED BY THE MISSOURI RIVER COMMISSION FROM PRIMARY LEVELING.

Atchison, Dearborn, Leavenworth, and St. Joseph quadrangles.

ATCHISON, DONIPHAN, AND LEAVENWORTH COUNTIES.

The following descriptions and elevations of bench marks from Fort Leavenworth to St. Cloud, Kans., were taken from the report of the Chief of Engineers, United States Army, for 1891, part 6, pages 3810 and 3811, and are republished by permission of the Chief of Engineers, United States Army. The elevations have been corrected to agree with the 1912 adjustment of the Coast and Geodetic Survey.

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

The bench marks were set on lines running across the valley, the lines being usually about 5 miles apart by the river distances, and 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 with a 4-inch iron post 4 feet long, upon which an iron cap is bolted.

ATCHISON QUADRANGLE.

[Latitude, 39° 30'–40°; longitude, 95°–95° 30'.]

From point 1 mile south of Sugar Lake station north along Missouri River to Palermo.

Doniphan, 2.5 miles below, 1,460 feet above residence of Mrs. Scott, 67 feet west of railroad track, at foot of bluff; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 85-1), copper bolt.....	Feet. 789. 98
Cap on pipe.....	793. 98
Geary City, 2 miles below, at foot of bluff on west side of wagon road, 155 feet S. 80° W. (mag.) from schoolhouse, southeast corner of NE. $\frac{1}{4}$ sec. 3 bears N. 85 $\frac{1}{2}$ ° E. (mag.), 1,650 feet distant; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 86-1), copper bolt.....	801. 50
Cap on pipe.....	805. 50
Geary City, 2.25 miles along bluff above, near north line of sec. 30, T. 4 S., R. 22 E., 600 feet west of north quarterpost of section, 87 feet northwest of small road bridge at foot of bluff; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 87-1), copper bolt.....	820. 19
Cap on pipe.....	824. 19

From point 2.5 miles west of Nodaway north along Missouri River to point near White Cloud.

Mount Vernon landing, at lower point of bluff where it turns up valley, 60 feet from river bank, 500 feet above mouth of Mosquito Creek; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 94-1), copper bolt.	Feet. 844. 76
Cap on pipe.....	848. 76
Wolf Creek, 0.8 mile below mouth of, at foot of bluff, NE. $\frac{1}{4}$ sec. 9, T. 2 S., R. 20 E., approximately 1,000 feet west of east line and 600 feet south of north line of section; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 95-1), copper bolt.....	839. 34
Cap on pipe.....	843. 34
Iowa Point, at northwest corner of Main and Commercial streets; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 96-1), copper bolt.....	853. 93
Cap on pipe.....	857. 93
White Cloud, in northwest corner of dooryard of Charles Osgood, on south side of Main Street, 150 feet west of west line of Second Street; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 97-1), copper bolt.	883. 81
Cap on pipe.....	887. 81

DEARBORN QUADRANGLE.

[Latitude, 39° 30'-39° 45'; longitude, 94° 45'-95°.]

From Palermo northerly along Missouri River to Wathena.

Palermo, 98 feet northeast of house of Dr. Harrington; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 88-1), copper bolt.....	816. 02
Cap on pipe.....	820. 02

LEAVENWORTH QUADRANGLE.

[Latitude, 39° 15'-39° 30'; longitude, 94° 45'-95°.]

From point near Fort Leavenworth northerly near Missouri River to Oak Mills.

Fort Leavenworth, 2.5 miles along bluff above Chicago, Rock Island & Pacific Ry. bridge, at south fence of right of way Missouri Pacific Ry., 350 feet west of headblock of siding; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 80-1), copper bolt.....	768. 735
Cap on pipe.....	772. 813
Kickapoo Island, 510 feet west of southwest corner of sec. 36, on land owned by Mr. Anderson; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 80-2), copper bolt.....	764. 49
Cap on pipe.....	768. 49
Kickapoo, 40 feet west from small stream in ravine, 86 feet south of Missouri Pacific Ry. trestle bridge; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 81-1), copper bolt.....	800. 933
Cap on pipe.....	804. 995

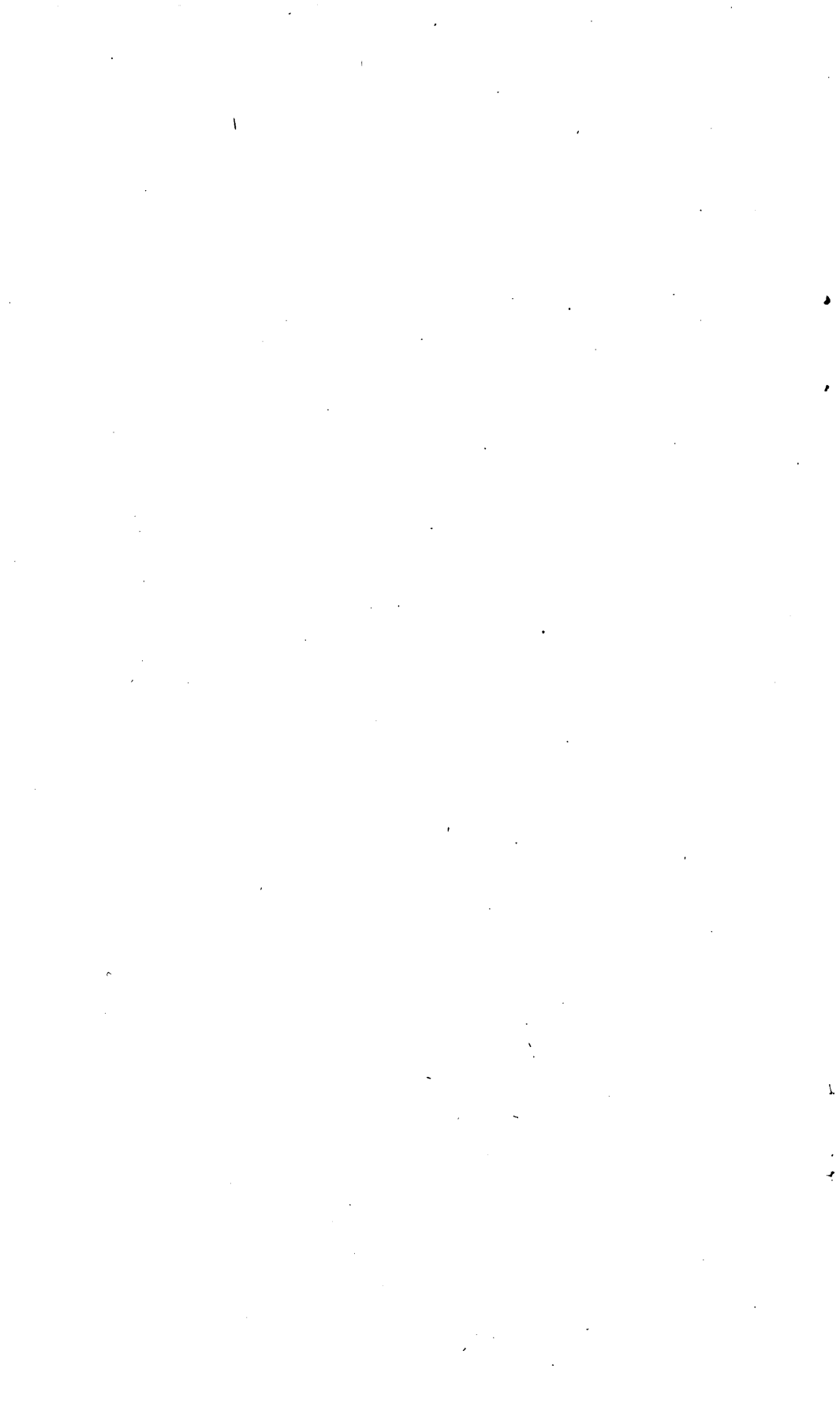
ST. JOSEPH QUADRANGLE.

[Latitude, 39° 45'-40°; longitude, 94° 45'-95°.]

From Wathena northerly along Missouri River to point near Nodaway.

Wathena, on west line of Bryant Street at intersection with alley south of St. Joseph Street; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 89-1), copper bolt.....	822. 01
Cap on pipe.....	826. 01

Wathena, 2.5 miles east of, on right bank, on north side of wagon road, at corner of secs. 25, 26, 35, and 36, T. 3 S., R. 22 E.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 89-2), copper bolt.....	Feet. 811. 29
Cap on pipe.....	815. 29
Belmont, 3 miles above, at foot of bluff, 1,225 feet south of house of Lucas Fedder, near corner of secs. 2, 3, 10, and 11, T. 3 S., R. 22 E.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 90-1), copper bolt.....	820. 68
Cap on pipe.....	824. 68
Cummings landing, on south side of section-line road, 430 feet southeast from house of Nathan Miller, 128 feet west of southeast corner of SW. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 21, T. 2 S., R. 22 E.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 91-1), copper bolt.....	854. 94
Cap on pipe.....	858. 94
Charleston City, 2 miles below, at foot of bluff, 50 feet east of small ravine, 12 feet in elevation higher than the bottom land, in SW. $\frac{1}{4}$ sec. 24, T. 2 S., R. 21 E.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 93-1), copper bolt.....	835. 07
Cap on pipe.....	839. 07
Charleston City, 1.25 miles below, on north side of wagon road, in edge of small orchard, 140 feet southeast of house of E. S. Jennings, 860 feet west of center of sec. 13, T. 2 S., R. 21 E.; copper bolt in tile surmounted by iron pipe (U. S. C. E. b. m. 93-2), copper bolt.....	831. 39
Cap on pipe.....	835. 39



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