

DEPARTMENT OF THE INTERIOR

FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

BULLETIN 636

SPIRIT LEVELING IN ARKANSAS

1896 TO 1915, INCLUSIVE

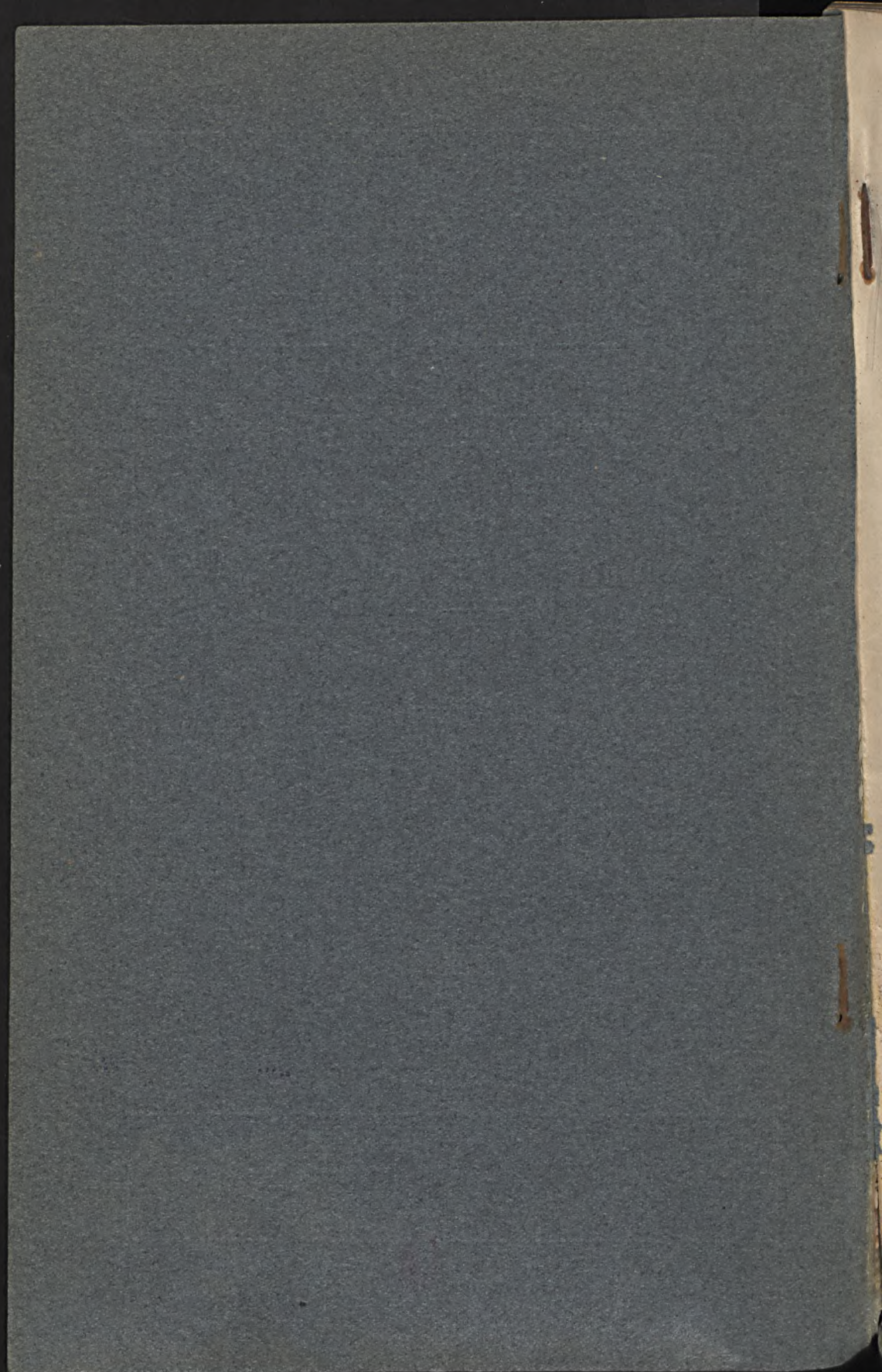
R. B. MARSHALL, CHIEF GEOGRAPHER



WASHINGTON

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Wpisano do inwentarza
ZAKŁADU GEOLOGJI

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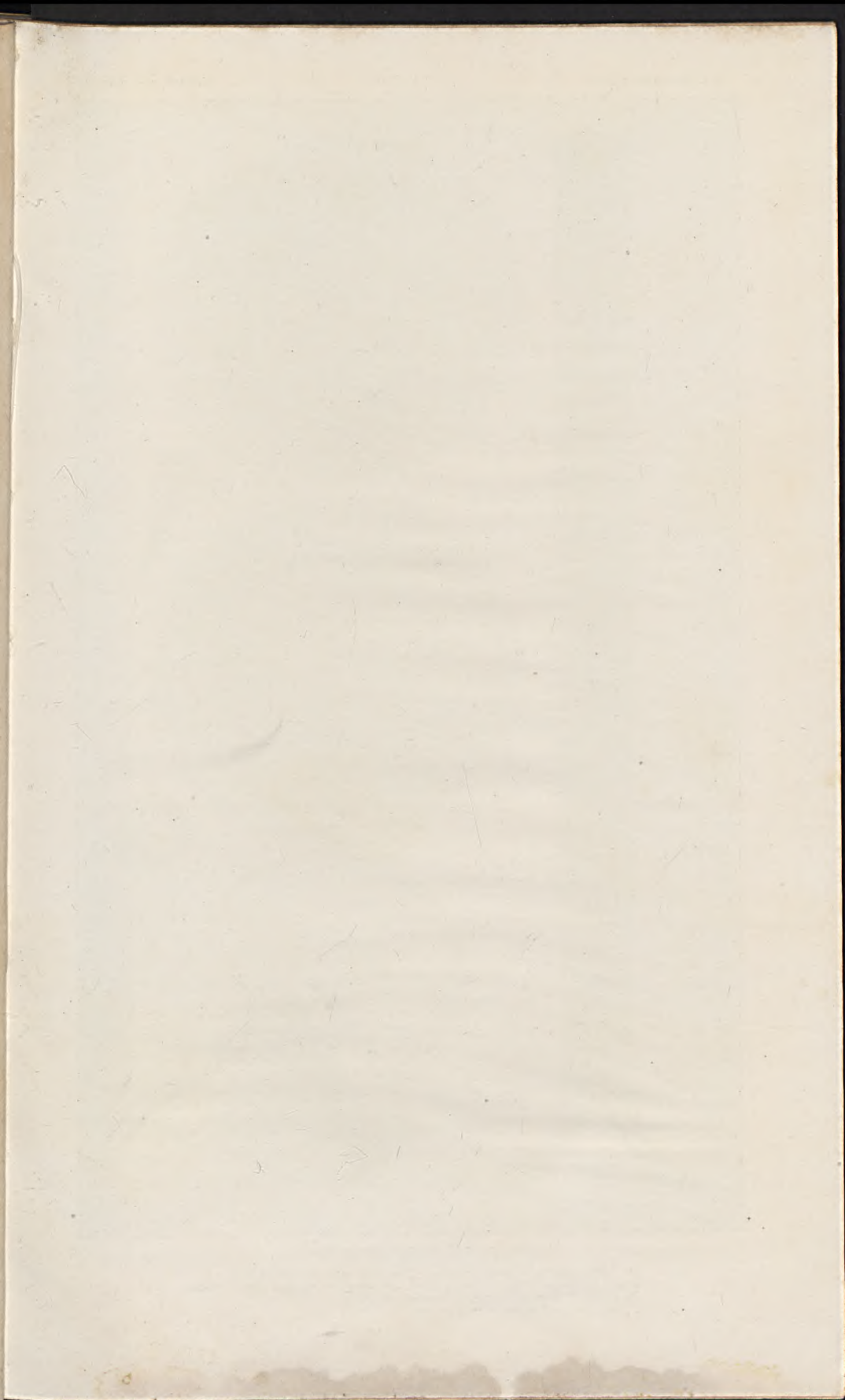
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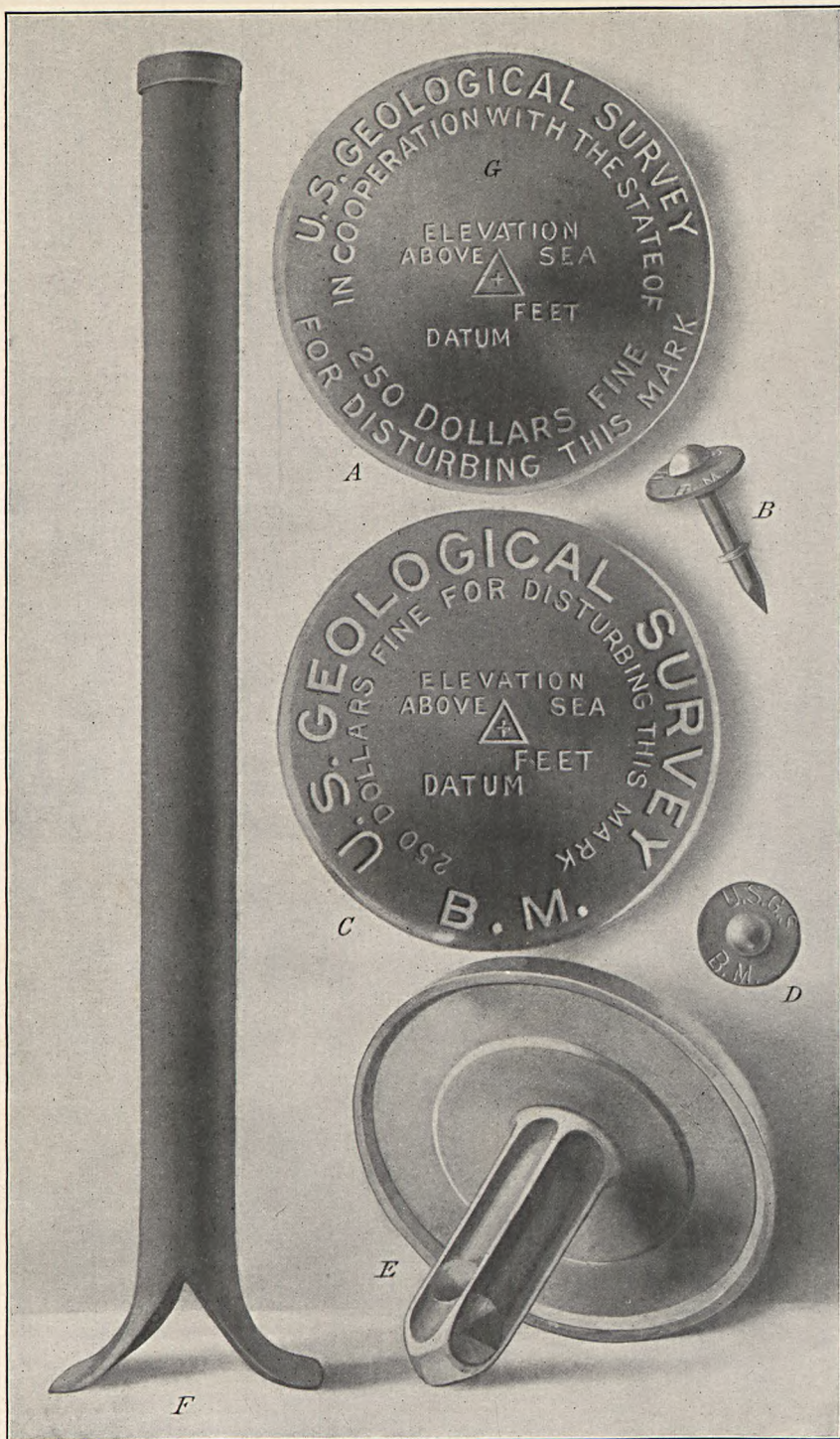
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GEOLOGICAL SURVEY BENCH MARKS.

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.

SPIRIT LEVELING IN ARKANSAS, 1896 TO 1915, INCLUSIVE.

R. B. MARSHALL, Chief Geographer.



INTRODUCTION.

Previous publication.—All results of spirit leveling in Arkansas published by the United States Geological Survey in Bulletin 458 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 Corps of Engineers, United States Army, as adjusted in 1912 by the Coast and Geodetic Survey, and are likely to be changed but slightly by any future adjustment.

Personnel.—The field work before 1903 was done under the general direction of J. H. Renshawe, geographer; that for 1903 to 1906, inclusive, under H. M. Wilson, geographer; and the later work under W. H. Herron, geographer, 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 Arkansas. For primary lines standard Y levels are used; lines are run in circuits or are close 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 elevations determined by the United States Geological Survey and the United States Coast and Geodetic Survey 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 seacoast is still uncertain, and this fact is indicated by the addition of a letter or word to the right of the word "datum" on tablets or posts. For such areas corrections for published results will be made from time to time as the precise-level lines of the United States Geological Survey, the United States

Coast and Geodetic Survey, or other Government organizations are extended.

Topographic maps.—Maps of the following quadrangles wholly or partly in Arkansas have been published by the United States Geological Survey up to May 1, 1916. They may be obtained for 10 cents each or \$3 for 50, on application to the Director of the Survey at Washington, D. C.

Atlanta (Tex.-Ark.-La.).	Little Rock.
Batesville.	Magazine Mountain.
Benton.	Marshall.
Caddo Gap.	Morrillton.
Camden.	Mountain Home (Ark.-Mo.).
Pardanelle.	Mountain View.
De Queen (Ark.-Okla.).	Mount Ida.
Eureka Springs (Ark.-Mo.).	Poteau Mountain (Ark.-Okla.)
Fayetteville (Ark.-Mo.).	Siloam Springs (Okla.-Ark.).
Fort Smith (Ark.-Okla.).	Tahlequah (Okla.-Ark.).
Gurdon.	Texarkana (Tex.-Ark.).
Harrison (Ark.-Mo.).	Winslow (Ark.-Okla.).
Hot Springs.	Yellville (Ark.-Mo.).
Hot Springs special.	

PRIMARY LEVELING.

Eureka Springs, Fayetteville, Harrison, Siloam Springs, and Winslow quadrangles.

BENTON, BOONE, CARROLL, CRAWFORD, MADISON, NEWTON, AND WASHINGTON COUNTIES.

The elevations in the following list were determined by primary leveling extended from the precise-level line of the Coast and Geodetic Survey along the St. Louis & San Francisco Railroad, which crosses the Fayetteville, Eureka Springs, and Winslow quadrangles.

The leveling was done in the Eureka Springs quadrangle in 1900 by J. A. Boyd, G. E. Diehl, J. E. Smith, and C. C. Curry, and in 1902 by Boyd and D. V. Vandiver; in the Fayetteville and Siloam Springs quadrangles in 1899 by Clifford Older; in the Harrison quadrangle in 1902 by Vandiver; and in the Winslow quadrangle in 1898 by Robert Coe.

FAYETTEVILLE QUADRANGLE.

[Latitude 36°-36° 30'; longitude 94°-94° 30'.]

From Fayetteville southeast along highway to Baldwin (single spur line).

Fayetteville, in front wall of bank, northwest corner of courthouse square; aluminum tablet stamped "1425 FTVL"-----	Feet.
Baldwin, sec. 20, T. 16 N., R. 29 W., southwest corner of section house yard; iron post stamped "1233 FTVL"-----	1,426.571
	1,234.809

From Fayetteville east to Haberton.

T. 17 N., R. 29 W., northwest corner of sec. 35; iron post stamped "1242 FTVL"-----	1,243.834
-------------------------------------------------------------------------------------	-----------

From Fayetteville west and north via Farmington to Robinson schoolhouse,
thence east to Springdale.

Farmington, sec. 26, T. 16 N., R. 31 W., opposite church; iron post stamped "1202 FTVL"-----	Feet. 1,203.216
T. 17 N., R. 32 N., NE. $\frac{1}{4}$ sec. 11, at Robinson schoolhouse; iron post stamped "1082 FTVL"-----	1,083.350
Elm Springs, near center of sec. 25, T. 18 N., R. 31 W.; iron post stamped "1167 FTVL"-----	1,168.528

From Springdale east along highway 5 miles (single spur line).

T. 18 N., R. 29 W., northwest corner of sec. 27, 250 feet west of church; iron post stamped "1399 FTVL"-----	1,400.539
--------------------------------------------------------------------------------------------------------------	-----------

From Robinson schoolhouse southeast along highway to Wheeler (single spur line).

Wheeler, near northwest corner of sec. 28, T. 17 N., R. 31 W.; iron post stamped "1274 FTVL"-----	1,275.310
---------------------------------------------------------------------------------------------------	-----------

From Robinson schoolhouse southwest along highway to Cincinnati, thence north via Siloam Springs along highway and railroad to Gravette, thence east to Rogers (portion of line).

Wedington Gap, NE. $\frac{1}{4}$ sec. 5, T. 16 N., R. 32 W.; iron post stamped "1366 FTVL"-----	1,367.567
Gravette, sec. 12, T. 20 N., R. 33 W., in northwest corner of stone building east of station; aluminum tablet stamped "1226 FTVL"-----	1,227.348
T. 20 N., R. 32 W., SW. $\frac{1}{4}$ sec. 2, Banks schoolhouse; iron post stamped "1287 FTVL"-----	1,287.821
Seba, in front of J. A. Corley's store; iron post stamped "1320 FTVL"-----	1,320.938
Bentonville, northwest corner of new office building of courthouse; aluminum tablet stamped "1303 FTVL"-----	1,304.689

From Gentry (Orchard) east along highway to Springtown (single spur line).

Orchard, near center of sec. 3, T. 18 N., R. 33 W., 1 block west of public well; iron post stamped "1237 FTVL"-----	1,238.449
Springtown, northwest corner of sec 8, T. 18 N., R. 32 W.; iron post stamped "1259 FTVL"-----	1,260.001

From Decatur east along highway to Eagle schoolhouse (single spur line).

Decatur, near northwest corner of sec. 13, T. 19 N., R. 33 W.; iron post stamped "1248 FTVL"-----	1,249.246
T. 19 N., R. 32 W., northwest corner of sec. 26, Eagle schoolhouse; iron post stamped "1415 FTVL"-----	1,416.320

From Gravette north along highway to Sulphur Springs (single spur line).

Sulphur Springs, sec. 23, T. 21 N., R. 33 W., in east wall of Joplin's store, 4 feet above ground; aluminum tablet stamped "929 FTVL"-----	930.163
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From Hiwassee north along highway to Gordon Hollow (single spur line).

Gordon Hollow, SE. $\frac{1}{4}$ sec. 25, T. 21 N., R. 32 W., at crossroads; iron post stamped "1083 FTVL"-----	1,084.482
-----------------------------------------------------------------------------------------------------------------	-----------

From Bentonville south along highway to Osage Mills (single spur line).

Osage Mills, sec. 34, T. 19 N., R. 31 W., southwest corner of Rous's store; iron post stamped "1334 FTVL"-----	1,335.632
----------------------------------------------------------------------------------------------------------------	-----------

From Bentonville north along highway to Pinon Hollow (single spur line).

	Feet.
Pinon Hollow, NE. $\frac{1}{4}$ sec. 26, T. 21 N., R. 31 W., forks of road near mouth of; iron post stamped "995 FTVL"-----	996.279

From Bentonville northeast along highway to Brightwater.

T. 21 N., R. 30 W., northwest corner of sec. 26; iron post stamped "1315 FTVL"-----	1,316.604
T. 21 N., R. 29 W., northwest corner of sec. 33; iron post stamped "1348 FTVL"-----	1,349.623

From Rogers east along highway to White River (single spur line).

T. 19 N., R. 29 W., east side of sec. 1, on bank of White River; iron post stamped "1064 FTVL"-----	1,065.207
-----------------------------------------------------------------------------------------------------	-----------

From Rogers southwest along highway 4.5 miles (single spur line).

T. 19 N., R. 30 W., northwest corner of sec. 22; iron post stamped "1301 FTVL"-----	1,301.919
-------------------------------------------------------------------------------------	-----------

SILOAM SPRINGS QUADRANGLE.

[Latitude 36°-36° 30'; longitude 94° 30'-95°.]

From Robinson schoolhouse southwest along highway to Cincinnati, thence north via Siloam Springs along highway and railroad to Gravette, thence east to Rogers (portion of line).

Cincinnati, northwest end of town, sec. 29, T. 16 N., R. 33 W., west side of main road; iron post stamped "1039 FTVL"-----	1,040.639
Siloam Springs, at railroad station, southwest corner of platform; iron post stamped "1148.6" (Indian Territory levels)-----	1,154.312

EUREKA SPRINGS QUADRANGLE.

[Latitude 36°-36° 30'; longitude 93° 30'-94°.]

From Seligman, Mo., south along Missouri & North Arkansas R. R. to Eureka Springs.

Missouri and Arkansas State line, 1.2 miles south of, 25 feet north of Berry switch on Missouri & North Arkansas R. R., in side of rock, 1 foot above ground; bronze tablet stamped "998 FTVL"-----	998.983
Beaver, sec. 20, T. 21 N., R. 26 W., 33 feet from east pier of bridge over White River, in south wall of the Narrows, 2.4 feet above ground; aluminum tablet stamped "929 FTVL"-----	930.408
Eureka Springs, on east side of Crescent Hotel, 9 feet from northeast corner of dining hall, 3.8 feet above ground; aluminum tablet stamped "1461 FTVL"-----	1,462.251

From Haberton east along railway via Hindsville to Huntsville.

Goshen, sec. 32, T. 17 N., R. 28 W., 700 feet northeast of flour mill, in south face of ledge of natural rock on northwest side of Goshen-Hindsville public road; aluminum tablet stamped "1181 FTVL"-----	1,182.673
Hindsville, center of N. $\frac{1}{2}$ sec. 16, T. 17 N., R. 27 W.; iron post stamped "1366 FTVL"-----	1,367.237

From Hindsville along highway north to Canuck, thence west to War Eagle, thence south via Spring Valley to Hindsville.

Clifty, NW. $\frac{1}{4}$ sec. 26, T. 18 N., R. 27 W., 1,300 feet north of Parker's ford over War Eagle Creek, in east face of natural ledge of granite on west side of Hindsville-Clifty road; bronze tablet stamped "1218 FTVL"-----	Feet. 1, 219. 371
Canuck, sec. 33, T. 19 N., R. 27 W., 10 feet east of building owned by Sam Cook, in south face of ledge of natural rock and southeast corner of post office; aluminum tablet stamped "1497 FTVL"-----	1, 498.915
War Eagle, near southeast corner of sec. 34, T. 19 N., R. 27 W., 180 feet north of post office, 40 feet east of old building, in west face of ledge of natural rock; bronze tablet stamped "1156 FTVL"-----	1, 157. 040
Spring Valley, sec. 2, T. 17 N., R. 28 W., 70 feet west of post office, 5 feet north of spring owned by A. Sanders, in south face of ledge of natural limestone rock; copper bolt stamped "1301 FTVL"-----	1, 302. 084

From Goshen southeast along highway via Wesley to Drakes Creek (single spur line).

Wesley, sec. 26, T. 16 N., R. 28 W., school district 56, second brick from bottom in southeast corner of brick schoolhouse; bronze tablet stamped "1273 FTVL"-----	1, 274. 977
Drakes Creek, sec. 32, T. 16 N., R. 27 W., 500 feet east of post office, in south face of natural ledge of rock on Aurora road, 300 feet east of junction with Huntsville road; aluminum tablet stamped "1284 FTVL"-----	1, 285. 971

From Huntsville southeast along highway to Wharton Creek (single spur line).

T. 16 N., R. 26 W., center of N. $\frac{1}{4}$ sec. 23, in top of projecting rock, on west side of and 150 yards from War Eagle Creek, on main Huntsville and Aurora road; bronze tablet stamped "1321 FTVL"-----	1, 322. 650
T. 16 N., R. 25 W., south side of sec. 20, about 200 yards south of Wharton Creek schoolhouse, near elm tree, in side of rock about 0.5 foot above ground; bronze tablet stamped "1352 FTVL"-----	1, 353. 519

From Huntsville north along highway to Eureka Springs.

Huntsville, sec. 34, T. 17 N., R. 26 W., in east side of southeast corner of foundation of courthouse; bronze tablet stamped "1451 FTVL"-----	1, 452. 570
T. 17 N., R. 26 W., sec. 10, north bank of War Eagle Creek, at ford, on Huntsville and Eureka Springs road, in top of rock; bronze tablet stamped "1222 FTVL"-----	1, 223. 585
T. 18 N., R. 26 W., east side of sec. 22, near old storehouse, at junction of road from Clifty with Huntsville and Eureka Springs road; iron post stamped "1602 FTVL"-----	1, 603. 519
T. 19 N., R. 26 W., southwest corner of sec. 33, on Huntsville and Eureka Springs road; iron post stamped "1568 FTVL"-----	1, 569. 449

From Eureka Springs west along highway to White River (single spur line).

White River, sec. 29, T. 20 N., R. 27 W., about 300 yards east of Knox Ferry and 11 feet west of large oak tree, in side of sandstone rock; bronze tablet stamped "1016 FTVL"-----	1, 017. 732
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From Eureka Springs east along highway to Berryville (mean of two lines).

	Feet.
Eureka Springs, 1.5 miles east of, on Berryville road, on ledge of rock in Mill Hollow; chiseled cross-----	1, 260. 78
T. 20 N., R. 25 W., sec. 20, 6.8 miles east of Eureka Springs, 6.8 miles west of Berryville, 100 feet west of west end of Kings River Bridge, 5 feet north of tollgate; iron post stamped "1066 FTVL"-----	1, 067. 768
Berryville, 2.2 miles west of, in front of E. H. Smith's residence, on north side of road, on top of first stone step to spring-----	1, 217. 32
Berryville, in public square, 10 feet south of west stile of park, 66 feet west of pump, under music stand; iron post stamped "1256 FTVL"-----	1, 255. 924

From Berryville south along highway to crossroads 2.5 miles east of Marble, thence west via Marble to Huntsville.

T. 19 N., R. 24 W., east side of sec. 28, on Kingston road, southwest corner of Wright's store, 5 feet southwest of; iron post stamped "1286 FTVL"-----	1,288. 340
T. 18 N., R. 24 W., sec. 15, 14 feet northeast of Cedar Valley school-house, on Kingston road, near mouth of Cedar Creek; iron post stamped "1365 FTVL"-----	1,367. 312
T. 17 N., R. 24 W., sec. 16, junction of Berryville-Kingston and Marble-Carrollton roads, 35 feet east of road, east of and near blacksmith shop; iron post stamped "1394 FTVL"-----	1, 395. 883
Marble, sec. 13, T. 17 N., R. 25 W., in northwest corner of yard to City Hotel; iron post stamped "1345 FTVL"-----	1, 346. 904

From point 2.5 miles east of Marble along highway south to Kingston (single spur line).

Kingston, sec. 15, T. 16 N., R. 24 W., in southwest corner of public square; iron post stamped "1365 FTVL"-----	1, 366. 826
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From Berryville south along highway to Pension Mountain (single spur line).

Pension Mountain, sec. 24, T. 19 N., R. 25 W., 5.8 miles southwest of Berryville, 200 yards from summit of mountain, on New Huntsville wagon road, in side of projecting rock; bronze tablet stamped "1565 FTVL"-----	1, 566. 520
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From Berryville north along highway to sec. 29, T. 21 N., R. 24 W., thence west to sec. 25, T. 21 N., R. 25 W.

T. 21 N., R. 24 W., S. $\frac{1}{2}$ sec. 29, junction of Eureka Springs and Viola roads; iron post stamped "1226 FTVL"-----	1,228. 086
Stony Point Church, 300 yards south of Summers Ford on Berryville-Cassville road, 11 feet south of southwest corner of church; iron post stamped "962 FTVL"-----	964. 377

HARRISON QUADRANGLE.

[Latitude 36°-36° 30'; longitude 93°-93° 30'.]

From Berryville east along highway to Green Forest, thence along railroad to

Alpena Pass, thence north along highway to Denver.¹

Green Forest, sec. 4, T. 19 N., R. 23 W., at southwest corner of Bank of Green Forest, in stone doorsill; aluminum tablet stamped "1349 FTVL"-----	1, 349. 039
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¹ Mean of three lines along highway and mean of two lines along railroad.

	Feet.
Green Forest, 5 miles east of, in milepost 45; spike-----	1, 112. 04
Alpena Pass, sec. 23, T. 19 N., R. 22 W., 27 feet west of station platform, 20 feet south of railroad track; iron post stamped "1139 FTVL"-----	1, 139 190
Denver, T. 20 N., R. 22 W., in Joe A. Young's yard, 6 feet east of east fence, 10 feet south of north fence, in top of stone post 6 by 12 by 30 inches, set in ground; bronze tablet stamped "1028 FTVL"-----	1, 028. 085
From Green Forest north along highway to Oak Grove, thence to Raum, thence south to Denver.	
Yocum, sec. 2, T. 20 N., R. 23 W., 300 yards east of creek crossing, on east side of mill, in stone foundation; bronze tablet stamped "1084 FTVL"-----	1, 084. 075
Oak Grove, sec. 28, T. 21 N., R. 23 W., in southeast corner of fence in yard of J. H. Evans, in top of stone post 6 by 22 by 36 inches; bronze tablet stamped "1347 FTVL"-----	1, 347. 329
Raum, sec. 20, T. 21 N., R. 22 W., at base of chimney of A. Winkle's residence, in coping; bronze tablet stamped "965 FTVL"-----	965, 121
From Alpena Pass southeast along railroad to Harrison (run twice).	
Batavia, sec. 33, T. 19 N., R. 21 W., 200 feet north of spring, 33 feet east of northeast corner of station platform; iron post stamped "1489 FTVL"-----	1, 488. 855
Harrison, in northwest corner of square; iron post stamped "1052 FTVL"-----	1, 052. 280
From Harrison northeast along highway to Oregon, thence northwest via Self to Lowry, thence west-southwest via Omaha to Denver.	
Oregon, sec. 17, T. 19 N., R. 19 W., 250 feet north of crossroads; iron post stamped "1324 FTVL"-----	1, 324. 102
T. 20 N., R. 19 W., sec. 18, on "Rushing Farm," 600 feet south of house, 16.3 miles northeast of Harrison, at fork of road, road west to Cheatmen, road east to Self; iron post stamped "1356 FTVL"-----	1, 355. 826
Self, sec. 3, T. 20 N., R. 20 W., 50 feet east of blacksmith shop; iron post stamped "811 FTVL"-----	810. 883
T. 21 N., R. 20 W., sec. 23, 1 mile north of Old Lowry, 100 feet southeast of Bluff Springs schoolhouse, district 36; iron post stamped "728 FTVL" (by short single spur line)-----	727. 638
Omaha, sec. 27, T. 21 N., R. 21 W., 45 feet east of post office, 45 feet west of road; iron post stamped "1354 FTVL"-----	1, 354. 114
Pruitt post office, sec. 20, T. 20 N., R. 21 W., in Mr. Moor's yard; 4 feet east of picket fence; iron post stamped "1483 FTVL"-----	1,482. 718
From Harrison north along highway to Self.	
T. 19 N., R. 20 W., sec. 9, 6.5 miles north of Harrison, fork of roads, running west to Burlington and north to Self post office, 2,000 feet south of blacksmith shop; iron post stamped "1386 FTVL"-----	1, 386. 221
From Green Forest south along highway via Rule and Osage to Boxley, thence northeast to Cecils Fork (Buffalo Creek), 12 miles, thence via Carrolton to Alpena Pass.	
T. 19 N., R. 23 W., SW. $\frac{1}{4}$ sec. 29, 200 yards south of J. W. McCallib's house, 50 feet east of blazed elm tree, in limestone outcrop; bronze tablet stamped "1245 FTVL"-----	1, 244. 765

	Feet.
Osage (Fairview), sec. 26, T. 18 N., R. 23 W., in stone front of W. S. Hittson's store; bronze tablet stamped "1331 FTVL"-----	1, 331. 579
T. 17 N., R. 23 W., sec. 27, 0.25 mile north of J. S. Alfred's place, 25 yards west of road forks, north side of road, in large sandstone boulder; bronze tablet stamped "1487 FTVL"-----	1, 486. 729
T. 16 N., R. 23 W., NE. $\frac{1}{4}$ sec. 22, northeast corner of crossroads, 100 yards north of cabin of J. C. Patty, 5 feet south of black oak tree, in stone 2.5 by 1 by 4 feet; bronze tablet stamped "2230 FTVL"-----	2, 230. 185
T. 16, N., R. 22 W., sec. 16, 100 yards west of Center Point school-house, 10 yards south of road, in limestone outcrop; bronze tablet stamped "959 FTVL"-----	958. 838
T. 17 N., R. 21 W., sec. 33, 75 yards northeast of road crossing, 5 yards south of 2-foot white oak tree, near W. J. Young's house, in limestone boulder; aluminum tablet stamped "896 FTVL"-----	895. 377
T. 17 N., R. 22 W., NE. $\frac{1}{4}$ sec. 13, 15 feet from township line, at road forks, on Harrison and Huntsville road, in front of H. S. Mallett's house, in stone; aluminum tablet stamped "2129 FTVL"-----	2, 128. 792
T. 18 N., R. 22 W., SW. $\frac{1}{4}$ sec. 25, 300 yards east of W. A. Hobbgood's residence, 20 yards west of road forks at foot of white oak, in rock; aluminum tablet stamped "2153 FTVL"-----	2, 152. 825

From Youngs crossroads south along highway to Jasper.

Jasper, sec. 27, T. 16 N., R. 21 W., at left of north front entrance of courthouse, 2.5 feet above ground, in stone facing; aluminum tablet stamped "857 FTVL"-----	857. 139
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From Jasper north along highway via Elmwood to Harrison.

T. 16 N., R. 21 W., SE. $\frac{1}{4}$ NE. $\frac{1}{4}$ sec. 24, 20 feet north of creek, in limestone ledge; aluminum tablet stamped "787 FTVL"-----	787. 054
T. 16 N., R. 20 W., sec. 8, 600 feet north of Buffalo, 600 feet west of Shaddock's, at corner of fence 7 feet east of road, in sandstone 6 by 8 by 4 feet; aluminum tablet stamped "796 FTVL"-----	795. 792
T. 17 N., R. 20 W., NE. $\frac{1}{4}$ sec. 33, 900 feet south of Mr. Erwin's house, at foot of Flat Rock Mountain, where road first strikes Flat Rock Creek, in sandstone; aluminum tablet stamped "968 FTVL"-----	968. 048
T. 17 N., R. 20 W., near northwest corner sec. 22, 3 feet from Boone-Newton county line, 100 feet north of L. L. Monday's house, in stone; aluminum tablet stamped "1348 FTVL"-----	1, 348. 437
T. 17 N., R. 20 W., NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ sec. 10, 125 feet east of forks in road, 100 feet east of A. H. Bryant's house, 4 feet south of red oak, in limestone post; aluminum tablet stamped "1218 FTVL"-----	1, 218. 151
T. 18 N., R. 20 W., near southwest corner of sec. 21, 100 feet south of J. B. Wilson's house, 10 feet east of road, 50 feet west of Crooked Creek, in limestone; aluminum tablet stamped "1086 FTVL"-----	1, 086. 680

WINSLOW QUADRANGLE.

[Latitude 35° 30'-36°; longitude 94°-94° 30'.]

From Rudy west along highway to Cedarville, thence northwest to Dutch Mills, thence northeast to Staunton.

Natural Dam post office, sec. 15, T. 11 N., R. 32 W.; iron post stamped "672 F S"-----	673. 428
Dutch Mills, sec. 21, T. 14 N., R. 33 W., on main street, in front of White, Reed & Co.'s store; iron post stamped "1027 F S"-----	1, 028. 795

Clyde, sec. 17, T. 14 N., R. 32 W., in front of schoolhouse; iron post stamped "1325 F S"-----	Feet. 1, 326. 268
T. 15 N., R. 32 W., sec. 27, top of hill south side of wagon road between Prairie Grove and Boonsboro; iron post stamped "1414 F S"-----	1, 415. 520
Prairie Grove, sec. 18, T. 15 N., R. 31 W., brick store southwest corner Mack and Buchanan streets; aluminum tablet stamped "1168 F S"-----	1, 169. 484
T. 15 N., R. 31 W., on line between secs. 15 and 16, Illinois Chapel; iron post stamped "1146 F S"-----	1, 147. 606
From Dutch Mills north along highway to Summers (spur line).	
T. 15 N., R. 33 W., southeast corner sec. 16, 0.5 mile southeast of Summers; iron post stamped "1192 F S"-----	1, 193. 983
From Cedarville south along highway to Stattler (spur line).	
Stattler post office, sec. 22, T. 10 N., R. 32 W.; iron post stamped "903 F S"-----	904. 744
From Natural Dam northeast along highway to Westfork.	
Lees Creek post office, quarter corner on south side of sec. 25, T. 12 N., R. 32 W.; iron post stamped "755 F S"-----	756. 799
T. 13 N., R. 32 W., southeast corner of sec. 35; iron post stamped "1727 F S"-----	1, 728. 784
Strickler, sec. 7, T. 13 N., R. 31 W., northwest corner of John Neal's fence; iron post stamped "1568 F S"-----	1, 569. 748
T. 14 N., R. 31 W., sec. 23, near Longview schoolhouse; iron post stamped "1900 F S"-----	1, 901. 920
From Lees Creek east along highway to Chester.	
T. 12 N., R. 31 W., quarter corner on east side of sec. 23; iron post stamped "1734 F S"-----	1, 735. 639
From sec. 32, T. 14 N., R. 30 W., southwest along highway to sec. 2, T. 14 N., R. 31 W. (spur line).	
T. 11 N., R. 31 W., near southeast corner of sec. 2; iron post stamped "1565 F S"-----	1, 566. 714
From sec. 4, T. 11 N., R. 29 W., north along highway to sec. 28, T. 12 N., R. 29 W. (spur line).	
T. 12 N., R. 29 W., southeast corner of sec. 28, near abandoned Sandpoint post office; iron post stamped "1606 F S"-----	1, 608. 276
From Winslow northeast along highways to Hazel Valley, thence northwest to sec. 21, T. 15 N., R. 29 W., thence west to Westfork.	
Winslow, southeast corner of Dunlap's drug store, on ledge of rock; aluminum tablet stamped "1742 F S"-----	1, 743. 728
T. 13 N., R. 29 W., sec. 1, Low Gap, crossroads in gap of Boston Mountains; iron post stamped "2042 F S"-----	2, 043. 818
T. 14 N., R. 29 W., sec. 10, 0.8 mile northwest of Arnett post office near main gate of cemetery; iron post stamped "1401 F S"-----	1, 403. 022

From sec. 21, T. 15 N., R. 29 W., north along highway to Sulphur City.

Sulphur City, sec. 22, T. 15 N., R. 29 W., foundation southwest corner of post office; aluminum tablet stamped "1364 F S"----- 1,366.156 Feet.

From sec. 15, T. 10 N., R. 31 W., northeast along highway to Belmont.

Belmont, abandoned post office, quarter corner on east side of sec. 9, T. 10 N., R. 30 W.; iron post stamped "873 F S"----- 874.668

From Mulberry north along highway 11 miles, thence southwest to Mountainburg.

T. 11 N., R. 29 W., east side of sec. 34, abandoned Plymouth post office; iron post stamped "794 F S"----- 795.828

Arkadelphia, Benton, Caddo Gap, Camden, Dalark, Gurdon, Hope, Hot Springs special, Little Rock, Lucky, and Malvern quadrangles.

CALHOUN, CLARK, DALLAS, GARLAND, HEMPSTEAD, HOT SPRINGS, HOWARD, MONTGOMERY, NEVADA, OUACHITA, PIKE, POLK, PULASKI, AND SALINE COUNTIES.

The elevations in the following list were determined by primary leveling extended from Little Rock. A double-rodged line of levels was run in 1896 from Little Rock along the St. Louis, Iron Mountain & Southern Railway to Hot Springs and continued in 1899 along the Chicago, Rock Island & Pacific Railway and the St. Louis, Iron Mountain & Southern Railway to Gurdon, connecting in 1900 with Camden by primary circuits. At Little Rock and Camden the work is adjusted to elevations of bench marks of the United States Army engineers' precise-level line. No intermediate connections were made.

The leveling from Little Rock to Hot Springs and in the Hot Springs special quadrangle was done in 1896 by H. L. Muldrow, and that along the railroads to Gurdon, Hope, and Buena Vista by Robert Coe in 1899-1900. The remaining work in the Gurdon quadrangle was done in 1899-1900 by D. C. Wray, and in the Camden quadrangle in 1900 by Guy E. Diehl. The leveling in the Caddo Gap quadrangle was partly done in 1901 by E. L. Shepard and J. A. Boyd, and was completed by 1902-3 by C. H. Birdseye. The leveling for the Hot Springs special and the Gurdon quadrangles has been copied with corrections from the Eighteenth and Twenty-first Annual Reports of the United States Geological Survey, respectively.

LITTLE ROCK QUADRANGLE.

[Latitude 34° 30'-35°; longitude 92°-92° 30'.]

At Little Rock.

Little Rock, in granite substructure of east face of customhouse and post office, beneath water-table course of masonry; center of cross about 13 $\frac{3}{4}$ inches north and about 5 $\frac{1}{2}$ inches above the upper corner of the north line of the basement window nearest to Second Street (Coast and Geodetic Survey bench mark A)----- 299.238 Feet.

BENTON QUADRANGLE.

[Latitude 34° 30'-35°; longitude 92° 30'-93°.]

At Benton.

Benton, in St. Louis, Iron Mountain & Southern Ry. station yard; iron post stamped "297"-----	Feet. 298.658
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HOT SPRINGS SPECIAL QUADRANGLE.

[Latitude 34° 22' 57"-34° 37' 57"; longitude 92° 55' 47"-93° 10' 47".]

From Hot Springs along Chicago, Rock Island & Pacific Ry. to Lawrence.

Hot Springs, in base of Hoke Smith post, entrance to United States reservation; bronze tablet marked "607 H. S."-----	608.375
Hot Springs, in stone window sill of Chicago, Rock Island & Pacific Ry. passenger station; copper bolt stamped "598"-----	598.692
Spring Lake, sec. 12, T. 3 S., R. 19 W., in front of Chicago, Rock Island & Pacific Ry. station; top of rail-----	335.7
Potash Sulphur Springs, sec. 17, T. 3 S., R. 18 W.; iron post stamped "388" (the above bench mark is on a single spur line)-----	388.634

Bench marks established along highways in south part of quadrangle.

T. 4 S., R. 18 W., 0.3 mile northeast of center sec. 5; copper bolt stamped "409"-----	409.822
T. 4 S., R. 19 W., 0.3 mile south-southwest of center of sec. 8; iron post stamped "482"-----	482.674
T. 4 S., R. 20 W., 0.2 mile northeast of center of sec. 3; iron post stamped "510"-----	510.065
T. 3 S., R. 20 W., sec. 2, at Bull Bayou bridge; iron post stamped "392"-----	393.085
T. 2 S., R. 20 W., west of center of sec. 21, at Clear Creek; iron post stamped "480"-----	480.979

Bench marks on single spur lines from main circuit in north part of quadrangle.
(Elevations unreliable.)

T. 1 S., R. 20 W., 0.3 mile northwest of center of sec. 32; copper bolt stamped "630"-----	631.326
Mountain Valley, west side sec. 20, T. 1 S., R. 19 W.; iron post stamped "783"-----	784.384
T. 1 S., R. 18 W., 0.2 mile southeast of center of sec. 32, north side of Saline River and road, between two near-by road forks; iron post stamped "523"-----	524.034
T. 2 S., R. 18 W., near northwest corner sec. 30, at Dipping Springs, south of road; iron post stamped "532"-----	533.004

MALVERN QUADRANGLE.

[Latitude 34° 15'-34° 30'; longitude 92° 45'-93°.]

From Hot Springs southeast along Chicago, Rock Island & Pacific Ry. to
Malvern, thence southwest along St. Louis, Iron Mountain & Southern Ry.
to Hope (double-rodged line; portion of line).

Malvern, near front entrance to Hot Springs County courthouse; iron post stamped "H. S. 310"-----	311.123
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Malvern, in monuments for meridian marks in courthouse yard; bronze tablets:	Feet.
North monument -----	311. 386
South monument -----	307. 151

ARKADELPHIA QUADRANGLE.

[Latitude 34°-34° 15'; longitude 93°-93° 15'.]

From Hot Springs southeast along Chicago, Rock Island & Pacific Ry. to Malvern, thence southwest along St. Louis, Iron Mountain & Southern Ry. to Hope (double-rodged line; portion of line).

Arkadelphia, at northwest corner of Clark County courthouse, under cornerstone, in north face of second stone above ground; bronze tablet stamped "H. S. 246" -----	246. 801
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GURDON QUADRANGLE.

[Latitude 33° 30'-34°; longitude 93°-93° 30'.]

From Hot Springs southeast along Chicago, Rock Island & Pacific Ry. to Malvern, thence southwest along St. Louis, Iron Mountain & Southern Ry. to Hope (double-rodged line; portion of line).

Curtis, 0.25 mile south of station, on east right of way line of St. Louis, Iron Mountain & Southern Ry. and on line between secs. 1 and 36, 0.8 mile west of township line; iron post stamped "H. S. 170" -----	171. 112
Gurdon, northwest corner of Main and West Front streets, in south face, near southeast corner, of brick building owned by A. W. Newton and used as a general store; aluminum tablet stamped "H. S. 209" -----	210. 127
Bierne, 880 feet northwest of railroad crossing north of, at quarter corner of secs. 1 and 12, on Dr. Kerston's property, 250 feet west of Methodist Church; iron post stamped "H. S. 237" -----	238. 457
Boughton, 130 feet north of railroad, inside fence at southwest corner of front yard of E. de Laughter's residence; iron post stamped "H. S. 234" -----	234. 646
Prescott, bronze tablets set in stone monuments in courthouse yard as meridian mark:	
North monument marked "H. S. 318" -----	319. 289
South monument -----	316. 700
Emmet, 130 feet west of center of station, 25 feet north of main line of St. Louis, Iron Mountain & Southern Ry., 5 feet west of mile-post 49, 260 feet east of county line post between Nevada and Hempstead counties; iron post stamped "H. S. 293" -----	293. 927

HOPE QUADRANGLE.

[Latitude 33° 30'-33° 45'; longitude 93° 30'-93° 45'.]

From Hot Springs southeast along Chicago, Rock Island & Pacific Ry. to Malvern, thence southwest along St. Louis, Iron Mountain & Southern Ry. to Hope (double-rodged line; portion of line).

Hope, at southwest corner of Main and East Second streets, in north face of large foundation stone at northeast corner of Hempstead County Bank; aluminum tablet stamped "H. S. 356" -----	357. 042
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CAMDEN QUADRANGLE.

[Latitude 33° 30'-34° ; longitude 92° 30'-93°.]

From Camden southwest along St. Louis Southwestern Ry. to Buena Vista.

Camden, Ouachita County courthouse, in west face of second stone above ground and from northwest corner; iron post stamped "H. S. 199"-----	Feet. 199. 859
Buena Vista, in front of station, 75 feet south of main track of St. Louis Southwestern Ry., in front of residence of Mrs. Martha E. Sifford; iron post stamped "H. S. 287"-----	288. 001

GURDON QUADRANGLE.

[Latitude 33° 30'-34° ; longitude 93°-93° 30'.]

From Gurdon southeast along St. Louis, Iron Mountain & Southern Ry. to Camden.

Whelen, 450 feet west of station and 30 feet south of corner to secs. 26, 27, 34, 35, T. 10 S., R. 20 W.; iron post stamped "H. S. 247"-----	247. 499
Chidester, about 180 feet northeast of station, 50 feet east of track; iron post stamped "H. S. 230"-----	231. 070
From Prescott south along highways to Bodcaw, thence west to Buena Vista.	
Laneburg, 0.5 mile north of, in sec. 9, T. 12 S., R. 22 W., southeast corner of; iron post stamped "H. S. 284"-----	284. 639
Bodcaw, 3 miles southeast of, 600 feet south of northeast corner sec. 16, north side of road; iron post stamped "H. S. 371"-----	372. 002
T. 14 S., R. 21 W., southeast corner sec. 16, 2 miles east of Willisville, junction of Rosston and College Hill road with Camden and Texarkana road; iron post stamped "H. S. 361"-----	362. 300
T. 14 S., R. 20 W., on line between secs. 14 and 23, 500 feet west of southeast corner of sec. 14, 1 mile southwest of Woodlawn, north side of road and east side of creek; iron post stamped "H. S. 254"-----	255. 407
T. 14 S., R. 19 W., 0.6 mile east of quarter corner of sec. 10, west side of, on property of H. L. Lusby, 30 feet north of Camden and Texarkana road; iron post stamped "H. S. 263"-----	263. 798

From Prescott west along highway 5 miles (single spur line).

T. 11 S., R. 23 W., near southeast corner of sec. 9, on line between Nevada and Hempstead counties and 50 feet north of Washington road; iron post stamped "H. S. 327"-----	327. 700
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From Bennetts crossroads west along highway to Centerville (single spur line).

T. 13 S., R. 22 W., 0.25 mile west of Bennett's, in southeast corner of sec. 16, 350 feet south of crossroads; iron post stamped "H. S. 372"-----	372. 925
Centerville, near quarter corner on east side of sec. 4, T. 13 S., R. 23 W., on line between Nevada and Hempstead counties, north side of Hope-Camden road and 300 feet west of road north to church; iron post stamped "H. S. 338"-----	338. 795

From Bodcaw west along highway 5.25 miles (single spur line).

T. 13 S., R. 23 W., southeast corner of sec. 33, on line between Nevada and Hempstead counties, east side of road, opposite road to west, 5.25 miles west of Bodcaw; iron post stamped "H. S. 331"-----	332. 388
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From Bennetts crossroads east along highway to Caney, thence northeast to Sayre.

	Feet.
T. 13 S., R. 21 W., at quarter corner on south side of sec. 21, southwest of crossroads to Rosston; iron post stamped "H. S. 378"-----	378. 939
Caney post office, 0.1 mile west of, quarter corner on east side of sec. 21, T. 13 S., R. 20 W., 80 feet north of road; iron post stamped "H. S. 324"-----	325. 039
T. 13 S., R. 19 W., sec. 7, 4 miles northeast of Caney, on north side of Camden road and 300 feet east of White Oak Creek; iron post stamped "H. S. 218" (on single spur line)-----	218. 914
Bluff City, 1.8 miles southwest of, quarter corner on south side of sec. 10, T. 12 S., R. 20 W., 75 feet west of road and 60 feet north of Spring Branch; iron post stamped "H. S. 283"-----	284. 513

From Zama west along highway to Morris (single spur line).

T. 12 S., R. 21 W., in NW. $\frac{1}{4}$ sec. 26, 0.25 mile north of Morris, at southwest corner of cemetery at Caney Church and schoolhouse, northeast of crossroads; iron post stamped "H. S. 264"-----	265. 180
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From Bluff City west-northwest along highway to Prescott.

T. 11 S., R. 20 W., on line between secs. 21 and 22, 0.25 mile south of corner, north side of Prescott and Bluff City road; iron post stamped "H. S. 173"-----	174. 518
T. 11 S., R. 21 W., near east corner of sec. 17, 6 miles east of Prescott, on south side of road and on west side of road to south; iron post stamped "H. S. 333"-----	334. 046

From Prescott north along highway to Okolona.

T. 10 S., R. 22 W., northeast corner sec. 20, at southwest corner of crossroads; iron post stamped "H. S. 376"-----	377. 002
T. 10 S., R. 23 W., on line between secs. 15 and 16, and on line between Nevada and Hempstead counties, south side of Washington road; iron post stamped "H. S. 346" (on single spur line west from preceding bench mark)-----	346. 527
Elkins Ford, on Little Missouri River, 1 mile north of, quarter corner on east side of sec. 21, T. 9 S., R. 22 W., 30 feet west of road; iron post stamped "H. S. 216"-----	217. 412

From Smithton west along railroad to Antoine, thence south 3 miles.

T. 9 S., R. 21 W., southeast corner sec. 15, 100 feet north of track and 30 feet west of road; iron post stamped "H. S. 319"-----	319. 541
Okolona, in southwest corner of high-school yard, sec. 34, T. 8 S., R. 22 W.; iron post stamped "H. S. 423"-----	423. 672
Antoine, 3 miles south of, in sec. 33, T. 8 S., R. 23 W., at west side of military road; iron post stamped "H. S. 324" (on single spur line from Okolona)-----	325. 212

From Smithton east along highway 4 miles (single spur line).

T. 9 S., R. 19 W., sec. 20, 4 miles east of Smithton, 60 feet south of old grade at log road and 60 feet west of end of lane to south, between two buildings on property of W. A. Young; iron post stamped "H. S. 176"-----	177. 176
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From single spur line north from Barham.

T. 11 S., R. 19 W., quarter corner on south side of sec. 26, 2 miles northeast of Barham post office, 150 east of road and 300 feet northeast of J. B. Benton's house; iron post stamped "H. S. 267"----- Feet. 267.623

From single spur line northeast from Whelen Springs.

T. 11 S., R. 19 W., on line between secs. 19 and 20, on north side of Gurdon-Camden road; iron post stamped "H. S. 198"----- 199.200

ARKADELPHIA QUADRANGLE.

[Latitude 34°-34° 15'; longitude 93°-93° 15'.]

From Arkadelphia south along Memphis, Dallas & Gulf R. R. to Dalark (portion of line).

Arkadelphia, 0.5 mile east of, on top of coping stone at north end of west abutment of steel bridge over Ouachita River----- 193.41

DELARK QUADRANGLE.

[Latitude 34°-34° 15'; longitude 92° 45'-93°.]

From Arkadelphia southeast along Memphis, Dallas & Gulf R. R. to Dalark (portion of line).

Dalark, northwest corner of sec. 13, T. 8 S., R. 18 W., on line between Dallas and Clark counties; iron post stamped "272 H. S."-- 272.731

CAMDEN QUADRANGLE.

[Latitude 33° 30'-34°; longitude 92° 30'-93°.]

From Dalark east along highway to Princeton, thence south to Bearden, thence along railroad southwest to Camden.

Nix, in E. $\frac{1}{2}$ SE. $\frac{1}{4}$ sec. 33, T. 8 S., R. 16 W., 230 feet east of post office; iron post stamped "227 H. S."----- 228.160

T. 9 S., R. 16 W., 450 feet west of southeast corner of sec. 5, on section line, east side of Tulip and Tate's road, at southeast corner of W. H. Dickenson's field; iron post stamped "296 H. S."----- 297.255

Princeton, on west side of entrance of Dallas County jail, between two bricks in eleventh row from bottom of steps, aluminum tablet stamped "287 H. S."----- 287.769

T. 9 S., R. 15 W., on line between secs. 14 and 15, at intersection of Princeton, Bearden, and Holly Springs roads; iron post stamped "300 H. S."----- 301.030

The following bench marks are on single spur lines from main circuit and elevations are unreliable:

T. 9 S., R. 14 W., at intersection of dirt roads, 120 feet south of Zion Church; iron post stamped "351 H. S."----- 352.341

T. 10 S., R. 14 W., at intersection of Fordyce and Princeton dirt road and Harlow Lumber Co.'s tram road, 420 feet east of old water tank; iron post stamped "222 H. S."----- 222.644

T. 10 S., R. 15 W., at northwest corner sec. 25, in mill creek bottom of William Marshall, sr.; iron post stamped "213 H. S."----- 213.482

T. 11 S., R. 15 W., at northwest corner sec. 35; iron post stamped "229 H. S."----- 230.149

Harlow, 450 feet southwest of station, 10 feet southwest of milepost 318, T. 11 S., R. 14 W.; iron post stamped "270 H. S."-----	Feet. 271. 369
T. 12 S., R. 14 W., northwest corner sec. 9, 380 feet north of Chambersville-Camden dirt road; iron post stamped "285 H. S."-----	285. 493
T. 12 S., R. 15 W., 19.7 feet east of northwest corner of sec. 23, on section line; iron post stamped "214 H. S."-----	215. 299
Onalaska, 600 feet southwest of station, 8 feet southwest of milepost 329, T. 12 S., R. 16 W.; iron post stamped "129 H. S."-----	130. 117
Van Duzer, 2.5 miles southwest of; railroad spike in milepost 334---	110. 64

From Camden north along public road to Dalark.¹

T. 12 S., R. 17 W., in southwest part of sec. 13, one-eighth mile north of section line, 12 feet southeast of old store building of James Dunn; iron post stamped "118 H. S."-----	119. 045
T. 11 S., R. 16 W., at northwest corner sec. 28, 1 mile east of corner of pasture, beside wire fence; iron post stamped "143 H. S."-----	144. 255
T. 11 S., R. 17 W., 35 feet west of quarter corner between secs. 22 and 23, 40 feet west of Mrs. Jestice's barn lot; iron post stamped "143 H. S."-----	143. 599
T. 10 S., R. 17 W., 800 feet southwest of northeast corner of sec. 22, at southeast corner of Ouachita Church property; iron post stamped "156 H. S."-----	156. 865
T. 10 S., R. 16 W., quarter corner on east side of sec. 16, 250 feet southeast of bridge over Whiteoak Creek, on south side of road; iron post stamped "155 H. S."-----	156. 272
T. 9 S., R. 17 W., on line between secs. 16 and 21, about 200 feet south of corner known as "Gray Rock," at fork of road; iron post stamped "191 H. S."-----	191. 568'

From Sparkman's Mills west along highway 8 miles (single spur line).

T. 9 S., R. 18 W., at sixteenth corner between secs. 33 and 34, 10 feet north of P. Bennett's new well; iron post stamped "204 H. S."-----	205. 257
T. 10 S., R. 18 W., 500 feet east of center of sec. 10, on west side of Ouachita River; iron post stamped "207 H. S."-----	208. 005

From Camden east along Hampton public road to Smead (single spur line).

T. 13 S., R. 16 W., in center of sec. 33, at corner of field where road forks; iron post stamped "107 H. S."-----	107. 564
T. 13 S., R. 15 W., at north quarter corner of sec. 26; iron post stamped "157 H. S."-----	158. 224
T. 13 S., R. 14 W., at northwest corner sec. 9; iron post stamped "215 H. S."-----	216. 002

From Camden west along highway 5.6 miles (single spur line).

T. 13 S., R. 18 W., sec. 25, at fork of Camden-Texarkana dirt road; iron post stamped "137 H. S."-----	137. 515
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From Chidester northeast along highway (single spur line).

T. 11 S., R. 18 W., Mrs. Allen's house, 800 feet south of, 800 feet south of intersection of Chidester-Wyloe dirt road with Arkansas Mill Co.'s tram road; iron post stamped "223 H. S."-----	224. 090
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¹The first five of the bench marks are on single spur lines.

At Lester and Finn on short single spur lines from main line along railroad.

Lester, sec. 36, T. 12 S., R. 18 W., 10 feet east of Lester Lumber Co.'s office and post office, 55 feet west of track of Gurdon branch, St. Louis, Iron Mountain & Southern Ry.; iron post stamped "120 H. S."-----	Feet. 120.440
Finn, T. 14 S., R. 17 W., 45 feet west of track, 140 feet north of railroad crossing; iron post stamped "143 H. S."-----	144.286

LUCKY QUADRANGLE.

[Latitude 34° 15'–34° 30'; longitude 93° 15'–93° 30'.]

From Hot Springs west along Dallas road to Black Springs (double-rodged line; portion of line).

Bull Bayou, at forks of road near bridge; iron post stamped "392"-----	392.218
Meyers, in blue granite rock front of J. A. Helm's mill and Wheatley Bros.' store, T. 3 S., R. 22 W.; aluminum tablet stamped "H. S. 566"-----	565.889
Alamo, 700 feet east of old post office, sec. 22, T. 3 S., R. 23 W., in large boulder north side of road, near middle of Narrows on Mazarn Creek; aluminum tablet stamped "H. S. 677"-----	677.279

CADDO GAP QUADRANGLE.

[Latitude 34°–34° 30'; longitude 93° 30'–94°.]

From Hot Springs west along Dallas road to Black Springs (double-rodged line; portion of line).

Plata, at southeast corner of post office, set in sandstone, T. 3 S., R. 24 W.; bronze tablet stamped "H. S. 793"-----	792.626
Black Springs, at northeast corner of post office, in sandstone, T. 3 S., R. 25 W.; bronze tablet stamped "H. S. 777"-----	777.019
From Black Springs along Dallas road to Big Forks (single spur line after 5 miles).	
Black Springs, 7.1 miles west of, 0.25 mile west of J. A. Irby's house, south side of road, in sandstone and flint boulder; bronze tablet stamped "H. S. 907"-----	907.278
Black Springs, 12 miles west of, 150 feet northwest of sign reading "Black Springs," between houses of Crawford and G. R. Cox, in ledge of black granite shale; bronze tablet stamped "H. S. 1086"-----	1,085.499
Big Fork, midway between post office and Shed schoolhouse, south side of road, in black granite boulder; bronze tablet stamped "H. S. 1098"-----	1,098.537
From point 6.5 miles east of Black Springs south along highway via Caddo Gap to Rock Creek, thence west to Langley, thence north via Fancy Hill to point 5 miles west of Black Springs.	
Caddo Gap, 1.5 miles north of, opposite Exall's store, in front yard of S. H. Hanna; iron post stamped "H. S. 640"-----	639.618
Rock Creek, 1,000 feet west of post office, edge of Rock Creek, in huge brown sandstone boulder; bronze tablet stamped "H. S. 536"-----	535.650
Wilson, front yard of post office, in blue-gray siliceous sandstone; aluminum tablet stamped "H. S. 804"-----	804.10

Lodi, 0.5 mile west of, in corner of field 750 feet northwest of temporary bench mark, on main road where sign reads "Free Will Church, 1½ miles," on section line, 0.25 mile south of section corner; iron post stamped "H. S. 870"-----	Feet. 869.652
Langley, 0.5 mile east of, 20 feet west of southwest corner of crossroads running through Fancy Hill and Star of the West; iron post stamped "H. S. 787"-----	787.333
Fancy Hill, 300 feet south of post office, at foot of lane; iron post stamped "H. S. 822"-----	821.525

From Caddo Gap west along highway 5 miles (single spur line).

Caddo Gap, 5 miles west of, 150 feet south of Park schoolhouse, district 30, in brown sandstone boulder, bronze tablet stamped "H. S. 703"-----	702.872
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From Wilson south along highway to Kirby.

Kirby, opposite post office, center of town, northeast corner of cross streets, in brown sandstone rock; aluminum tablet stamped "H. S. 666"-----	665.925
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From Gurdon northwest along St. Louis, Iron Mountain & Southern Ry. via Okolona to Kirby.

Pike City, northwest corner of platform of Frank Pennington's store; iron post stamped "H. S. 660"-----	659.047
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From Bobos switch along highway west via Murfreesboro, thence north along narrow-gage road to point 5 miles northwest of pike.

Wolf Creek post office; iron post set at fence corner 20 feet north of post-office building, stamped "516 H. S."-----	515.271
Murfreesboro, in east wall of courthouse; aluminum tablet stamped "H. S. 367"-----	366.608
Lissie, 2 miles southeast of, crossroads by log house, 0.25 mile south of log railway, northwest corner; iron post stamped "H. S. 542"---	541.202

From Murfreesboro west along highway to Center Point.

T. 8 S., R. 26 W., on quarter-section line 0.25 mile south of north boundary of sec. 21, 90 feet north of fence on north side of old military road; iron post stamped "H. S. 655"-----	654.429
T. 8 S., R. 27 W., southeast corner of SW. ¼ sec. 22, 62 feet east, in southwest corner of graveyard, just inside of fence; iron post stamped "671 H. S."-----	670.965
Center Point, southwest corner of sec. 25, T. 8 S., R. 28 W., 24 feet south of, along picket fence, 35 feet north of cotton gin; iron post stamped "H. S. 591"-----	590.469

From Center Point northeast along highway to Muddy Fork, thence west along private road to Baker Springs, thence south to Center Point.

Muddy Fork post office, 300 feet south of cotton gin, directly in front of new store, at corner of rail fence; iron post stamped "H. S. 564"-----	563.171
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On Baker Springs road, 9 miles north of Center Point, at southwest corner of picket fence in front of E. H. Zollett's house; iron post stamped "H. S. 670"-----	Feet. 669.372
From Muddy Fork east along highway to Nathan (direct and reverse spur line).	
Nathan, 1.5 miles northwest of, 300 feet south of John Cornish's house, 10 feet north of rail fence; iron post stamped "H. S. 503"---	502.698
From Baker City north along highway 4 miles, thence east via New Hope to Kirby.	
New Hope, 5 miles southwest of, at junction of Hot Springs and Lockesburg road with Center Point and Dallas road, 20 feet east of crossing; iron post stamped "H. S. 771"-----	770.17
Daisy, 30 feet southeast of Dr. Phillip's store; bronze tablet set in large bowlder, stamped "629 H. S."-----	628.776
From New Hope northwest along highway to Athens, thence east to Langley.	
Athens, quarter corner, middle of sec. 15, T. 5 S., R. 28 W., 300 feet east of schoolhouse; iron post stamped "H. S. 959"-----	958.429

De Queen and Lockesburg quadrangles.

HOWARD, POLK, AND SEVIER COUNTIES.

These elevations are based upon the 1912 adjustment of precise leveling and are connected with the precise-level line of the United States Army engineers from Little Rock to Camden through intervening work in the Caddo Gap and adjacent quadrangles. Checks obtained upon the Oklahoma levels were unsatisfactory, and one line could not be adjusted.

The leveling was done in 1908 by W. A. Gelbach.

DE QUEEN QUADRANGLE.

[Latitude 34°-34° 30'; longitude 94°-94° 30'.]

From Center Point west to Provo, thence south along De Queen & Eastern R. R. to point about 3 miles north of Lockesburg.	
Center Point, 2.5 miles west of, at corner of yard of negro house; iron post stamped "Prim. Trav. Sta. No. 4 1907 583 1908"-----	Feet. 582.180
Messer Creek, at top of hill east of, 240 feet south of house of Robert Hill, at turn of road, 40 feet south of large oak tree, in stone 8 by 10 by 28 inches, 26 inches in ground; aluminum tablet stamped "455 1908" (destroyed)-----	454.922
De Queen & Eastern R. R. bridge over Saline River, 0.25 mile south of, 150 yards east of Saline River ford, in front of T road north, in root of tree; notch-----	345.71
De Queen & Eastern R. R. bridge over Saline River, on southeast pier; painted square-----	353.15
Provo, 1 mile north of, 600 feet south of milepost 20, 40 feet east of railroad crossing, in stone 6 by 6 by 26 inches, 24 inches in ground; aluminum tablet stamped "351 1908"-----	350.883
Provo, in front of station; top of rail-----	390.2

Provo, 0.7 mile south of, at southeast corner of railroad crossing, top of post is deeply dented by hammering, on north edge of post on letters "B. M."; iron post stamped "Prim. Trav. Sta. No. 3 1907 375 1908"-----	Feet. 374.757									
Milepost 16, 0.1 mile north of, at dim road crossing, 40 feet east of track, 50 feet south of crossing, in stone 6 by 10 by 28 inches, 26 inches in ground; aluminum tablet stamped "426 1908"-----	425.573									
From Provo north to Rock Springs, thence north to Mineola, thence east to Athens.										
Dierks, 3 miles southwest of, east side of railroad at crossing, 100 feet north of milepost 24, 12 feet north of fence corner; iron post stamped "384 1908"-----	384.661									
Dierks, in front of station; top of rail-----	420.99									
Dierks, 1.8 miles north of, along old tramway now used as wagon road, at northwest corner of road crossing; iron post stamped "Prim. Trav. Sta. No. 5 1907 560 1908"-----	560.498									
Euclid post office, 4 miles northwest of Dierks, at north side of Hester's store; iron post stamped "595 1908"-----	594.902									
Burg post office, 3.3 miles south of Rock Springs, on Center Point road, 0.9 mile southeast of ford of Saline River, at southeast corner of T road south, in corner of field of Mrs. Wimms; iron post stamped "755 1908"-----	755.283									
Rock Springs (Burg post office), 150 feet east of cotton gin, on east side of road, on slope of hill; iron post stamped "748 1908"-----	748.012									
Umpire, 100 feet east of post office, 50 feet west of blacksmith shop, 40 feet northwest of small bridge, in stone 5 by 12 by 22 inches, 20 inches in ground; aluminum tablet stamped "839 1908"-----	839.161									
Mineola, south side of road, 50 feet east of spring, north of sawmill, in top of large granite boulder; aluminum tablet stamped "973 1908"-----	973.119									
Saline River ford, 1 mile west of Athens; surface of water, June, 1908.	847									
From Geneva along De Queen & Eastern R. R. to De Queen, thence north along Kansas City Southern Ry. to Gillham, thence east to Rock Springs.										
Geneva, at southeast corner of church; iron post stamped "Prim. Trav. Sta. No. 2 1907 360 1908"-----	359.969									
De Queen, 2 miles east of, 150 feet east of railroad crossing, 50 feet south of track, 1 foot west of wire fence, in stone 6 by 8 by 30 inches, 28 inches in ground; aluminum tablet stamped "377 1908"-----	376.821									
De Queen, in front of De Queen & Eastern R. R. station; top of rail--	370.1									
De Queen, in front of Kansas City Southern Ry. station; top of rail--	379.8									
De Queen, at southwest corner of courtyard, 3 feet west of fence and 7 feet north of corner fence post; concrete stone set level with ground and marked <table border="1" data-bbox="311 1355 371 1415" style="display: inline-table; vertical-align: middle;"> <tr><td>U</td><td>S</td><td>C</td></tr> <tr><td>1905</td><td></td><td></td></tr> <tr><td>&</td><td>G</td><td>S</td></tr> </table> on center of stone-----	U	S	C	1905			&	G	S	419.320
U	S	C								
1905										
&	G	S								
De Queen courthouse, in top of concrete railing to steps at east side of north doorway; aluminum tablet stamped "429 1908"-----	428.621									
Pullman, 50 feet west of signboard at station; iron post stamped "544 1908"-----	543.785									
King's spur, 30 feet north of Stewart's store; iron post stamped "633 1908"-----	632.653									

Gillham, 150 feet east of railway station, 10 feet north of public well; iron post stamped "751 1908"-----	Feet. 751. 414
Cossatot River ford, 0.8 mile west of, where Gillham-Antimony road reaches summit of ridge west of river, 20 feet north of road, 10 feet north of black oak 24 inches in diameter, blazed, with letters "U. S." cut in; in top of boulder; aluminum tablet stamped "597 1908"-----	597. 673
Antimony, 0.25 mile southeast of, 6 feet south of road, 50 feet east of road fork, in top of rock; aluminum tablet stamped "754 1908"-----	754. 309
Antimony, 3.8 miles northeast of where country road from Rock Springs joins "wire" road, at northwest corner of crossroads; iron post stamped "783 1908"-----	783. 558

From Gillham north via Grannis to Wicks, thence east to Mineola.

Moore's spur, 1.5 miles north of, 100 feet north of crossing, 50 feet west of track, 150 feet northeast of house of J. L. Beidelman; iron post stamped "768 1908"-----	768. 143
Grannis, in front of station; top of rail-----	920
Grannis, 50 feet east by 50 feet south of railway station, at northwest corner of porch of Elberta Hotel, 1 foot inside of fence; iron post stamped "921 1908"-----	921. 566
Wicks, 100 feet west of station, at board fence; iron post stamped "1028 1908"-----	1, 027. 961
Wicks, in front of station, top of rail-----	1, 025. 9
Wicks, 2.8 miles east of, on Baker Springs road, south side of road at dim road fork at corner of field; iron post stamped "984 1908"-----	982. 618
Wicks, 7.1 miles east of, at fork of roads to Baker Springs and to Center Point, about 600 feet west of schoolhouse, north side of road at small bridge; iron post stamped "871 1908"-----	871. 582
Baker Springs, 1.25 miles southeast of, on Center Point road, east side of road at fork of trail to west; iron post stamped "679 1908"-----	678. 673
Mineola, 4.25 miles west of, on Baker Springs road, 600 feet north of fork of road just east of Harris Creek ford, on east side of and 3 feet above road in top of rock ledge; aluminum tablet stamped "669 1908"-----	669. 648
Mineola, 0.4 mile west of, at forks of road; on root of tree-----	942. 30

From De Queen west via Ultima Thule to State line.

Chapel Hill, 0.5 mile southeast of, in fork of road, in top of sandstone; aluminum tablet stamped "Prim. Trav. Sta. No. 1. 1907 433 1908"-----	433. 649
Ultima Thule, 15 feet west of southwest corner of Scott's cotton gin, Arkansas-Oklahoma boundary post 92; stamped "353"-----	353. 339
Tps. 5 and 6 S., Rs. 26 and 27 E., 3.5 miles west of Ultima Thule; iron post stamped "487" ¹ -----	487. 457

From boundary post on State line about 1 mile southwest of Blanchard east to Gillham.

Blanchard, 1 mile southwest of, 200 feet west of house at Newcomb place, south side of road, Arkansas-Oklahoma boundary post 85, top of post-----	734. 867
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¹ Tie with Oklahoma levels; see Bull. 564, p. 49.

Blanchard, 1 mile southeast of, 15 feet south of road on top of hill, 400 feet east of farmhouse; iron post stamped "769 1908"-----	Feet. 767.373
Gillham, 4.5 miles west of, on Blanchard road, 40 feet south of road in front of old cabin; iron post stamped "562 1908"-----	559.874

From Grannis west to post 79 on the Arkansas-Oklahoma boundary.

Grannis, 4.8 miles west of, on Hochetown road, 1 mile east of Cross Creek, north side of road, 150 feet east of road fork; iron post stamped "952 1908"-----	951.781
Arkansas-Oklahoma boundary line post 79, about 700 feet south of, about 150 feet south of small stream, closing corner of T. 3 S., R. 27 E. (on border line) of Oklahoma land survey; iron post stamped "831 1908"-----	830.586
Tps. 3 and 4 S., Rs. 26 and 27 E., in Oklahoma; iron post ¹ -----	1,086.419

From Wicks to Janssen via Hatton.

Hatton, 0.7 mile south of, 250 feet south of railway water tank, at southeast corner of crossing 30 feet east of track; iron post stamped "1135 1908"-----	1,135.665
Janssen, in front of station; top of rail-----	1,074
Janssen, 40 feet south of station, 50 feet east of tracks; iron post stamped "1077 1908"-----	1,076.938

From Janssen via Hatfield along railroad, thence east and southeast along high-ways to bench-mark post 0.25 mile west of Little Brushy Creek, thence southwest to Janssen.

Cove, 30 feet north of station, 70 feet east of tracks; iron post stamped "1046 1908"-----	1,047.075
Hatfield, in front of station; top of rail-----	969.6
Hatfield, 1 mile east of, in front of T road west; iron post stamped "1043 1908"-----	1,043.371
Hatfield, 4.4 miles east of, on Camp Wilder road, 300 feet north of sawmill, 40 feet northeast of road, in sag of ground; iron post stamped "1185 1908"-----	1,185.702
T. 1 S., R. 31 W., near west quarter corner of sec. 36, at northeast cor- ner of T road north at south end of lane; iron post stamped "1179 1908"-----	1,179.510
Little Brushy Creek, 0.25 mile west of house of Jack Hicks, at fork of road where road leaves stream above fork of Big and Little Brushy creeks on south side of road at south end of field; iron post stamped "952 1908"-----	953.004
Janssen, 3.1 miles northeast of, 20 feet east of small stream, 5 feet north of road, 5 feet south of 8-inch white oak with notch and blaze, lettered "U. S. P. B. M." in top of rock; aluminum tablet stamped "1067 1908"-----	1,067.514

From Little Brushy east to Shady post office, thence east and south to Mineola.²

Big Brushy Creek, 3 miles northeast of fork of Big and Little Brushy, old Sutton place, 30 feet south of house near old fence; iron post stamped "1071 1908"-----	1,071.425
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¹ Tie with Oklahoma levels; see Bull. 564, p. 49.² An excessive error has been distributed in this line.

Eberson City (Shady post office), 2.6 miles north of, in fork of road, 70 feet west of crossing of small stream, west side of mountain where Mena-Lockesburg road crosses from Cossatot to Board Camp Valley; iron post stamped "1228 1908"-----	Feet. 1, 227. 954
Eberson City (Shady post office), 100 feet south of store of Capt. Hazlett, west side of road; iron post stamped "1068 1908"-----	1, 068. 258
Eberson City (Shady post office), 3.3 miles east of, on Sugar Creek road, at northeast corner of yard of William Walston; iron post stamped "1193 1908"-----	1, 194. 135
Eberson City (Shady post office), 6.8 miles east of, on Sugar Creek road, north side of road, 100 feet south of house of Mr. Aleshire; iron post stamped "1374 1908"-----	1, 374. 718
Blaylock Mountain, at top of, where old mail trail crosses, 20 feet north of black oak tree with letters "U. S. G. S." cut in west face, 10 feet east of trail, in top of stone; aluminum tablet stamped "1643 1908"-----	1, 644. 451
Mineola, 4 miles north of, at southwest corner of yard of J. H. Hardy; iron post stamped "Prim. Trav. Sta. No. 8 1907 1141 1908"-----	1, 142. 641
From Hatfield west to northwest corner of T. 1 S., R. 27 E., iron post on State line. ¹	
Hatfield, 0.7 mile west of, in fork of road at west end of lane; iron post stamped "Prim. Trav. Sta. No. 12 1907 966 1908"-----	965. 379
Mountain Fork bridge, on top of east concrete pillar on south side of approach to east end of bridge; painted square-----	§32. 30
T. 1 S., R. 27 E., at northwest corner of township, on State line; iron post stamped "940"-----	933. 509

LOCKESBURG QUADRANGLE.

[Latitude 33° 45'-34°; longitude 94°-94° 15'.]

From point about 3 miles north of Lockesburg south along De Queen & Eastern R. R. to Lockesburg, thence northwest along railroad to Geneva.

Lockesburg, in west face of brick pillar on west side of door of bank building; aluminum tablet stamped "437 1908"-----	437. 555
Lockesburg, in front of station; top of rail-----	406. 6

Atlanta and Texarkana quadrangles.

MILLER COUNTY.

The initial bench marks are on the Coast and Geodetic Survey precise-level line along Missouri, Kansas & Texas Railway at Jefferson and Pittsburg, Tex. (See Bulletin 637.)

The leveling was done by Chester Irvine in 1905.

ATLANTA QUADRANGLE.

[Latitude 33°-33° 15'; longitude 94°-94° 15'.]

From State line near Ravenna south 3.5 miles along Kansas City Southern Ry.

Ravenna station, 60 feet west of signboard; west of track, at telegraph pole; iron post stamped "250 Adj 1903"-----	Feet. 249. 514
Ravenna, 3.5 miles south of, 30 feet north of Arkansas-Louisiana State line, 50 feet northwest of road crossing, in fence corner; iron post stamped "227 Adj 1903"-----	227. 361

¹ This line unadjusted, elevations carried from Hatfield to Indian Territory bench mark, closing minus 8.724 feet.

TEXARKANA QUADRANGLE.

[Latitude 33° 15'–33° 30'; longitude 94°–94° 15'.]

At Texarkana.

Texarkana post office, in stone railing south front west of steps, 5 feet above sidewalk; bronze tablet stamped "332 Adj 1903"-----	Feet. 331.836
Texarkana, Miller County courthouse, at northeast corner of yard, United States Geological Survey meridian mark; bronze tablet stamped "337 Adj 1903 1905 Texarkana"-----	337.387

Memphis quadrangle.

CRITTENDEN COUNTY.

The elevations in the following list were determined by primary leveling and accord with the 1912 adjustment.

Elevations in Tennessee are given in another list.

The leveling was done in 1915 by H. S. Senseney.

MEMPHIS QUADRANGLE.¹

[Latitude 35°–35° 15'; longitude 90°–90° 15'.]

From Memphis, Tenn., southwest along Rock Island Ry. to Hulbert, thence along Frisco Cut-off to Marion, thence along highways east and south to Bridge Junction and Memphis.

Memphis, in water table of customhouse, at southwest corner about 2 feet north of corner of old part of building; head of copper bolt leaded horizontally (Bull. 441, p. 117)-----	Feet. 274.119
Memphis, opposite superintendent's office of Frisco freight depot, 7 feet east of fire hydrant, on stone wall; chiseled square marked "U. S. B. M. 282"-----	282.42
Memphis, northwest abutment of railroad bridge over Delaware Street; copper bolt (R. R. b. m.)-----	294.18
Bridge Junction, south side of station, in base of semaphore; bronze tablet stamped "230"-----	230.094
Bridge Junction, 0.6 mile west of, junction of Rock Island and Cotton Belt railroads; top of north rail-----	228.8
Bridge Junction, 1.1 miles southwest of, on trestle, south side of track; painted bolthead marked "U. S. B. M. 229"-----	228.68
Bridge Junction, 2.2 miles southwest of, southeast corner of road crossing, in signpost; spike marked "U. S. B. M. 227"-----	227.10
Bridge Junction, 4.1 miles southwest of, 60 feet east of levee, south side of track, in telephone pole; spike marked "U. S. B. M. 220"-----	219.56
Bridge Junction, 4.7 miles southwest of, 20 feet south of road crossing, in northwest corner of Adam Johnson's garden; iron post stamped "215"-----	215.167
Bridge Junction, 4.7 miles southwest of, southeast corner of road crossing, in signpost; spike marked "U. S. B. M. 219"-----	219.20
Bridge Junction, 5.4 miles southwest of, on trestle 85, south side of track; painted bolthead marked "U. S. B. M. 219"-----	218.64
Hulbert, 2.1 miles north of, east side of track, in telephone pole; spike marked "U. S. B. M. 211"-----	211.417
Trestle 4778, center of, top of east rail, marked "U. S. 220 W 203"-----	219.82
Hulbert, 3.2 miles north of, west side of track, at switch, in switch stand; copper nail with washer stamped "U. S. G. S. B. M." marked "U. S. B. M. 220"-----	219.698

¹ For bench marks of Mississippi River Commission in this quadrangle see Permanent marks, survey Mississippi River, by Mississippi River Commission, vol. 1, 1915.

	Feet.
Trestle 4766, center of, top of east rail, marked "U. S. 220 W-9"---	220. 4
Hulbert, 4.6 miles north of, 12 feet northwest of "Cotton Belt" crossing, in base of safety gate; chiseled square marked "U. S. B. M. 223"-----	222. 97
Hulbert, 4.4 miles north of, 900 feet south of "Cotton Belt" crossing, 15 feet south of road crossing, east side of track, on right-of-way line; iron post stamped "215"-----	215. 033
Trestle 4757, center of, top of east rail, marked "U. S. 222 W-9"----	221. 5
Hulbert, 5.8 miles north of, east side of track, in telephone pole; spike marked "U. S. B. M. 215"-----	215. 30
Trestle 4747, center of; top of east rail marked "U. S. 223 W-10"----	222. 5
Marion, front of station; top of east rail-----	226. 0
Marion, west side of entrance of post office, in step; bronze tablet stamped "223"-----	222. 753
Marion, 1.3 miles southeast of, north side of road, in root of tree; copper nail with washer stamped "U. S. G. S. B. M." marked "U. S. B. M. 223"-----	222. 62
Marion, 2.4 miles southeast of, north side of road, opposite Crews store, in root of tree; copper nail with washer marked "U. S. B. M. 219"-----	219. 38
Marion, 3.4 miles southeast of, north side of road, in front of Mound City schoolhouse, in root of tree; copper nail with washer marked "U. S. B. M. 223"-----	222. 76
Marion, 3.4 miles southeast of, at southeast corner of grounds of Mound City schoolhouse; iron post stamped "225"-----	224. 448
Mound City, 50 feet south of Gant's store, west side of road, in root of tree; copper nail with washer marked "U. S. B. M. 223"-----	222. 59
Mound City, 1.1 miles southeast of, north side of road, in root of tree; copper nail with washer marked "U. S. B. M. 217"-----	216. 52
Hopefield, 1.7 miles north of, east side of road, in root of tree; copper nail with washer marked "U. S. B. M. 221"-----	220. 86
Hopefield, 0.5 mile north of, west side of road, in root of tree; copper nail with washer marked "U. S. B. M. 219"-----	219. 25
Hopefield, about 400 feet west of ferry landing, in concrete pier; bronze tablet stamped "218" (C. & G. S. triangulation station)---	217. 951
From Hulbert southwest along highways to Mounds double spur line.	
Hulbert, west side of water tank, in concrete pier; bronze tablet stamped "216"-----	215. 257
Hulbert, front of station; top of south rail-----	217. 5
Hulbert, 1 mile west of, north side of track, in telephone pole; spike marked "U. S. B. M. 211"-----	210. 64
Riceville, front of signboard; top of north rail, marked "U. S. 218"-----	
Riceville, at northeast corner of W. T. Castle's store; iron post stamped "214"-----	214. 420
Riceville, 1.1 miles west of, south side of track, in signpost "Station 1 mile"; spike marked "U. S. B. M. 215"-----	214. 59
Riceville, 2.3 miles west of, south side of track, in telephone pole; spike marked "U. S. B. M. 210"-----	209. 10
Mounds, front of post office, at road crossing; top of south rail, marked "U. S. 213"-----	212. 8
Mounds, at southeast corner of post office; iron post stamped "Prim. Trav. Sta. No. 5, 1915, 211"-----	210, 392

APPENDIX A.

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

Arkadelphia, Arkansas City, Benton, Buckner, Buena Vista, Camden, Dalark, Dardanelle, Eureka Springs, Fayetteville, Felsenthal, Fort Smith, Frostville, Gurdon, Helena, Kress, Lake Village, Linder, Little Rock, Malvern, McGehee, Magazine, Mountain, Morobay, Morrilton, Noble Lake, Pastoria, Pine Bluff, Redfork, Smackover, Stephens, Traskwood, Varner, Wilmot, and Winslow quadrangles.

ASHLEY, BENTON, CHICOT, CLARK, CONWAY, CRAWFORD, DESHA, FALKNER, FRANKLIN, HOT SPRINGS, JEFFERSON, JOHNSON, LAFAYETTE, LINCOLN, OUACHITA, POPE, PULASKI, SALINE, UNION, AND WASHINGTON 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 established by the Coast and Geodetic Survey, and by the Corps of Engineers, United States Army, from precise leveling, and were included in the 1912 adjustment by the Coast and Geodetic Survey. The elevations are likely to be changed only slightly by any future adjustment. For bench marks of Mississippi River Commission along Mississippi River see Permanent marks, survey Mississippi River, by Mississippi River Commission, volume 1, 1915; also United States Geological Survey Bulletins 568, 634, and 639.

ARKADELPHIA QUADRANGLE.

[Latitude 34°-34° 15'; longitude 93°-93° 15'.]

From Gum Springs northeast along St. Louis, Iron Mountain & Southern Ry. to Daleville.

Gum Springs station is near southwest corner of St. Louis, Iron Mountain & Southern Ry. section house, in line with west wall of house (main part) and also in line with south wall of L; pipe-flange bench (U. S. C. E. p. b. m. Gum Springs)-----	Feet. 214.301
Arkadelphia, on pine knoll northwest of depot, 15 meters northeast of Maddox Street and 40 meters from foot of hill, measured along same street; witnessed by three triangular-blazed trees, as follows: 0.8-meter pine, east 2.2 meters; 0.7-meter pine, southwest 2.1 meters, and 0.7-meter pine, northwest 1.9 meters; pipe-flange bench (U. S. C. E. p. b. m. Arkadelphia II)-----	216.594
Arkadelphia, at west corner of small inclosure immediately northeast of depot at, top of rail projects 0.1 meter above ground and lower end is pierced by two bolts, which are embedded in cement; cross cut on top of section of iron rail (U. S. C. E. p. b. m. Arkadelphia I)-----	188.730

Arkadelphia, in running root of large gum about 20 meters back of middle section of gage and immediately below small ravine running past the section; root has the letter "B" marked on a small blaze on same root as bench mark and 0.2 meter back of it; nail (U. S. C. E. b. m. gage B. B. B. (Ewens 189-))-----	Feet. 186.588
Arkadelphia, near, at downstream end of pier and right-bank end of railway bridge over Ouachita River, 0.04 meter northwest of northwest edge of footplate of truss and 0.12 meter from northeast edge; cross cut on top of pedestal stone (U. S. C. E. p. b. m. Ouachita River)-----	195.298
Daleville, at north corner of chimney at northwest side of office building of Arkadelphia Lumber Co., building is 50 meters northeast of depot and 0.8 kilometer north of Ouachita River; on second footing course (from top) at base of chimney; cross cut (U. S. C. E. p. b. m. Daleville)-----	187.411

ARKANSAS CITY QUADRANGLE.

[Latitude 33° 30'–33° 37' 30"; longitude 91° 07' 30"–91° 15'.]

At Arkansas City.

Arkansas City, in the top of an 8 by 8 inch granite post set in the ground about 2 meters south of west corner of small house, which is occupied by the engineers of the St. Louis, Iron Mountain & Southern Ry.; this house is the first one southwest of the railroad station; bottom of a square cut lettered $\begin{matrix} U & S \\ \square & \\ B & M \end{matrix}$ (U. S. C. E. b. m. F.)-----	138.891
Arkansas City, north 79° 50' W., 420 meters from the railway shops below, 250 meters from edge of woods; top of stone post (M. R. C. stone $\frac{63}{3}$)-----	136.456

BENTON QUADRANGLE.

[Latitude 34° 30'–35°; longitude 92° 30'–93°.]

Saline River, at north end of west abutment of St. Louis, Iron Mountain & Southern Ry. bridge over, 0.012 meter east of footplate of truss, in prolongation of south edge; on top of stone pedestal block; cross cut (U. S. C. E. p. b. m. Saline River)-----	282.762
Benton, at northwest corner of small garden inclosure just east of depot, 3 meters east of east wall of depot and 3 meters north of north wall; on top of section of iron rail; cross cut (U. S. C. E. p. b. m. Benton)-----	298.802

BUCKNER QUADRANGLE.

[Latitude 33° 15'–33° 30'; longitude 93° 15'–93° 30'.]

From Waldo west along St. Louis Southwestern Ry. to Stamp.

Waldo, at south edge of the St. Louis Southwestern Ry. right of way, 48 meters from track, 60 meters from switch at end of siding, and 270 meters east from depot; pipestone bench (U. S. C. E. p. b. m. Waldo):	
Bolt in stone underground-----	352.424
Top of cap-----	356.492

Buckner, near, 20 meters south of track at a point 40 meters west of temporary bench mark 232, which is described as a boat spike in root of a 0.3-meter water oak, 35 meters north of track, 90 meters west of trestle over Bayou D'Orcheat, 70 meters west of sign reading "Station, 1 mile" (referring to Buckner); the letters U S are cut on tree above bench; a railroad spike in a 0.4-meter post oak (U. S. C. E. b. m. R. R. b. m.)-----	Feet. 247. 936
Stamps, in the northeast corner of lot inclosing offices and buildings of the Louisiana & Arkansas R. R., 38 meters north of main track of the St. Louis Southwestern Ry., and about 50 meters from depot; pipestone bench (U. S. C. E. p. b. m. Stamp) :	
Bolt in stone underground-----	267. 595
Top of cap-----	271. 663

BUENA VISTA QUADRANGLE.

[Latitude 33° 15'-33° 30'; longitude 92° 45'-93°.]

At Buena Vista.

Buena Vista, 35 meters west of the northwest corner of depot, and in corner formed by post-office building and fence around adjoining yard, a standard bench of the Geological Survey; about 75 feet south of main track of St. Louis Southwestern Ry., in front of residence of Mrs. Martha E. Sifford; iron post marked "H. S. 287"; 3-inch cap on iron pipe (U. S. C. E. b. m. H. S. 287)-----	288. 001
Buena Vista, 9 meters west of main track and 110 meters south of southeast corner of depot; pipestone bench (U. S. C. E. p. b. m. Buena Vista) :	
Copper bolt in stone under ground-----	282. 595
Top of cap-----	286. 663

CAMDEN QUADRANGLE.

[Latitude 33° 30'-34°; longitude 92° 30'-93°.]

From Frenchport northwest along Ouachita River to Camden, thence northwest along St. Louis, Iron Mountain & Southern Ry. to Lester.

Frenchport, about 125 meters back from river bank at, 100 meters south of old dwelling, on top of small knoll and midway between two pine trees having triangular blazes, pine to west of bench is 0.9 meter diameter and 2 meters distant; pine to east of bench is 0.7 meter diameter and 2 meters distant; pipe-flange bench (U. S. C. E. b. m. P. R. P. Frenchport II)-----	123. 376
Frenchport, 150 meters back from river bank, 1 meter north of north wall of old dwelling and 25 meters west of west wall, midway between two large triangular blazed gum trees, first is north and 1.2 meters diameter, 2 meters distant; second is south and 1 meter diameter; pipe-flange bench (U. S. C. E. b. m. P. R. P. Frenchport I)-----	114. 386
Elliott, at southwest corner north store building, in line with west or front wall of store and 0.13 meter from south wall; pine-flange bench (U. S. C. E. p. b. m. Elliott)-----	254. 429
Camden, north side of Main Street and about 75 meters east of Cotton Belt Ry. track, in granite sill of east door of George L. Ritchie's store; small cross (Gage b. m. a. (Ewens), 1890)-----	133. 891

Camden, under west end of north truss of St. Louis, Arkansas & Texas Ry. bridge over Ouachita River near, on stone cap to iron tubular pier, in line with west edge of rest plate and 344 millimeters north of north edge; cross cut marked	$\begin{array}{c} \text{U} \quad \text{S} \\ \times \\ \text{B} \quad \text{M} \end{array}$	(U. S. C. E.
p. b. m. Camden IV) -----		Feet. 115.433
Camden, bench mark of St. Louis, Arkansas & Texas Ry., 266 meters west of bridge and 10 meters west of track and 4 meters from foot of embankment, the small pipe is inside of 0.1-meter pipe which reaches 0.25 meter above smaller pipe; top of small pipe (p. b. m. Camden III, or P. R. P. Camden) -----		108.048
Camden, on south edge of second step from bottom of a flight of 8 stone steps leading to entrance on west side of courthouse, 0.08 meter from south end of steps and 0.15 meter from west edge; cross cut (U. S. C. E. p. b. m. Camden II) -----		199.704
Camden, in southwest corner of yard of Shiloh Methodist Church (colored), 0.5 meter from south fence of yard and 0.7 meter from west fence, 4 meters north from north end of cotton shed of Camden compress and 10 meters east of track to compress; pipe-flange bench (U. S. C. E. p. b. m. Camden I) -----		138.904
Lester station, 200 meters east of, 15 meters south of track, stands opposite milepost 452 in edge of clearing along railroad right of way; pipe-flange (U. S. C. E. p. b. m. Lester) -----		114.150

DALARK QUADRANGLE.

[Latitude 34°-34° 15'; longitude 92° 45'-93°.]

Donaldson, near southeast corner of depot, in line with south wall of depot and 2.5 meters from east wall, on top of section of iron rail; cross cut (U. S. C. E. p. b. m. Donaldson) -----	228.832
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DARDANELLE QUADRANGLE.

[Latitude 35°-35° 30'; longitude 93°-93° 30'.]

From Galla Creek northwest along St. Louis, Iron Mountain & Southern Ry. to Clarksville.

Galla Creek, in the northeast corner of the yard to the large frame house owned by J. Potts and T. H. Ragsdale; bottom of square cut on granite post. (The bottom of the square cut is not even and the rod was held at the lowest point, which is slightly below the general surface of the bottom) (U. S. C. & G. S. b. m. XV) -----	371.755	
Russellville, in the stone foundation to the main entrance to the courthouse, on the right of the entrance going into the building; bottom of a square cut, marked	$\begin{array}{c} \text{U} \quad \text{S} \\ \square \\ \text{B} \quad \text{M} \end{array}$	(U. S. C. & G. S. b. m.
XVI) -----	350.735	
Onita station, in the southwest corner of the yard to the dwelling attached to the Onita Coal Co.'s store near; bottom of square cut on top of granite post (U. S. C. & G. S. b. m. XVII) -----	356.298	

Illinois Creek, in the top of the stone abutment of the railroad bridge over, on the abutment on the west side of the creek and north of the track; bottom of a square cut, roughly marked \square	U S B M	Feet. 328. 040
(U. S. C. & G. S. b. m. XVIII) -----		
Mill Creek station, near, in the top of the stone abutment of the railroad bridge over Mill Creek, on the abutment on the west side of the creek and north of the track; bottom of a square cut, roughly	U S \square B M	329. 121
marked \square (U. S. C. & G. S. b. m. XIX) -----		
London, in the northeast corner of the yard to Mrs. Sarah Battenfield's house; bottom of square cut on top of granite post (U. S. C. & G. S. b. m. XX) -----		380. 301
Berlin post office (Piney station), about one-quarter mile west of, in the upper surface of the stone forming the top of the stone pier of the railroad bridge over Piney Creek, north of the track, and on the pier on the east bank of the creek; bottom of a	U S \square B M	338. 523
square cut about one-half inch deep, roughly marked \square		
(U. S. C. & G. S. b. m. XXI) -----		
Knoxville, on the west side of Dr. R. M. Osborn's residence at, in one of the stones forming the foundation to the chimney, 1 foot 10½ inches above the ground, 10½ inches from the outside face of the chimney, and on the side next to the railroad, on which the house fronts; the house is a small frame structure, and is west of the station house, near the railroad track; center of a cross cut,	U S + B M	395. 830
roughly marked + (U. S. C. & G. S. b. m. XXI) -----		
Lamar post office, in the south face of the brick chimney on the west side of the City Hotel; the bolt is in the third row of brick from the ground and in the second brick from the outside face of the chimney, the house is one of the oldest in the town, according to information given by a bystander; center of cross in end of a copper bolt (U. S. C. & G. S. b. m. XXIII) -----		411. 154
Clarksville, near, in the top of the stone pier of the railroad bridge over Spadia Creek, the pier is on the west bank of the creek, and the bench mark is north of the track, near the western face of the pier; bottom of a square cut in the top of the stone, roughly	U S \square B M	376. 210
marked \square (U. S. C. & G. S. XXIV) -----		
Clarksville, the north monument of the meridian line established in the courthouse yard at, by the State geological survey; this monument is a stone, roughly dressed at the top to 6 by 6 inches for 6 inches below the top, planted in the northeast corner of the yard; it has a hole in the center of the top, filled with lead, into which a small brass pin is driven, and the top of this pin is the bench mark (U. S. C. & G. S. b. m. XXV) -----		369. 858

Clarksville, the south monument of the meridian line established in the courthouse yard, by the State geological survey; this monument is a stone roughly dressed at the top to 6 by 6 inches for 6 inches below the top, planted near the southeast corner of the yard, just outside the iron fence; it has a hole in the center of the top, filled with lead, into which a small brass pin is driven, and the top of this pin is the bench mark (U. S. C. & G. S. b. m. XXVI) ----- Feet.
368. 608

EUREKA SPRINGS QUADRANGLE.

[Latitude 36°-36° 30'; longitude 93° 30'-94°.]

Garfield, in the southeast corner of the yard to the dwelling owned and occupied by Mrs. Martha Jackson, which is north of the track and about one-fourth of a mile west of the railroad station; bottom of a square cut in limestone post (C. & G. S. b. m. CXIV) ---- 1, 521. 001

FAYETTEVILLE QUADRANGLE.

[Latitude 36°-36° 30'; longitude 94°-94° 30'.]

From Fayetteville north along St. Louis & San Francisco R. R. to Brightwater.

Fayetteville, on the south side of the main entrance to the Arkansas State University building; the cross (+) is cut on the dressed surface of a large limestone about 2 feet above the ground; center of a cross cut, stone lettered as follows:

U S	C & + G S (C. & G. S. b. m. CXXI) -----	1, 454. 019
B M		

Johnson, in the front yard to the dwelling of Mr. R. M. Licklyter, the stone is near the front fence between the two gates, the dwelling is west of the track and a short distance south of the station platform; bottom of square cut in limestone post (C. & G. S. b. m. CXX) ----- 1, 194. 440

Springdale, in the front wall of the brick canning factory; the building faces the railroad and is about one-fourth of a mile north of the station, the bolt is in the first course above the stone foundation and in the third brick from the northeast corner; center of a cross in the center of a copper bolt (C. & G. S. b. m. CXIX) ---- 1, 329. 423

Lowell, in the southeast corner of the front yard to the residence of Dr. W. F. Greene, just north of the store which stands in the corner of the yard; bottom of square cut in limestone post (C. & G. S. b. m. CXVIII) ----- 1, 343. 439

Rogers, in the front wall of the brick engine house, or city hall; the building fronts on the railroad and the bolt is in the twelfth course above the ground and in the first brick from the southeast corner; center of a cross cut in the end of a copper bolt (C. & G. S. b. m. CXVII) ----- 1, 383. 062

Avoca, in the yard of the two-story frame dwelling owned by Andrew Lynch, which is east of the track, a short distance south of the railroad station; bottom of square cut in limestone post (C. & G. S. b. m. CXVI) ----- 1, 361. 789

Brightwater, in top of the stone abutment to the iron railway bridge over Sugar Creek, on the north abutment west of the track, and quite near the west edge of the abutment; bottom of a square cut, roughly marked "U S \square B M" (C. & G. S. b.m CXV)----- 1, 266. 339

FELSENTHAL QUADRANGLE.

[Latitude 33°-33° 15'; longitude 92°-92° 15'.]

From Lake Landing northwest along Ouachita River to Jacks Island.

Lake Landing, about 250 meters below, 16 meters east of east bank of Pooles Bayou, 80 meters southwest of west bank of river and about 250 meters southeast of boat channel connecting Lake St. Mary and Ouachita River; witnessed by three triangular blazed trees as follows: 0.6-meter post oak 104° 10', 15 meters; 0.3-meter post oak 213° 8' 9.5 meters; and 0.5-meter post oak, 285° 34', 4 meters:

Top of bolt in limestone (U. S. C. E. b.m. P. R. P. Lake)----- 59. 370
Top of cap on iron post----- 63. 438

Bayou Lapile, about 1.6 kilometers above mouth of, in the woods about 75 meters west of bank of river, and witnessed by three triangular blazed trees as follows: 0.5-meter post oak 203° 23', 9 meters; 0.3-meter post oak 247° 15', 5 meters; 0.7-meter post oak 341° 37', 7 meters:

Top of bolt in limestone (U. S. C. E. b.m. P. R. P. Lapile)----- 61. 739
Top of cap on iron post----- 65. 807

Ouachita Belle Landing, about 200 meters southwest of, in woods about 175 meters south of road leading back from river; witnessed by three triangular blazed trees as follows: 0.5-meter sweet gum 71° 47', 16 meters; 0.2-meter white oak, 164° 25', 5 meters; and 0.4-meter Spanish oak 273° 54', 4.5 meters:

Top of bolt set in limestone (U. S. C. E. b.m. P. R. P. Belle Point) ----- 64. 626
Top of cap on iron post----- 68. 694

Belle Point Landing, 200 meters southwest from, 5 meters from P. R. P. Belle Point, in root of a white-oak tree; boat spike (U. S. C. E. t. b. m. 39)-----

68. 222

Eutaw Shoals, about 550 meters below, in the woods about 60 meters west of west bank of river, on bank of small slough, 60 meters south of an old road and witnessed by three triangular blazed trees as follows: 0.5-meter sweet gum 29° 00'; 0.9-meter water oak 182° 40'; and 0.7-meter sweet gum 261° 21':

Top of bolt set in limestone (U. S. C. E. b.m. P. R. P. Eutaw) -- 72. 726
Top of cap on iron post----- 76. 794

Jacks Island, opposite, on east side of an old road 100 meters south of river bank and opposite lower end of gravel bar on lower end of Jacks Island; witnessed by three triangular blazed trees as follows: 0.5-meter gum 181° 00', 5 meters; 0.6-meter gum 286° 00', 6 meters; and 0.4-meter red oak 355° 00', 5 meters:

Top of bolt set in limestone (U. S. C. E. b.m. P. R. P. Jacks Island) ----- 78. 310
Top of cap on iron post----- 82. 378

FORT SMITH QUADRANGLE.

[Latitude 35°-35° 30'; longitude 94°-94° 30'.]

From Mulberry west along St. Louis, Iron Mountain & Southern Ry. to Fort Smith.

Mulberry, one-third of a mile west of the railroad station, in the top of the stone pier to the railroad bridge over Little Mulberry Creek, on the pier at the east bank of the creek and south of the track, inside the outer line of the superstructure of the bridge;

U S

bottom of a square cut, roughly marked (C. & G. S. b. m.

B M

No. XXXIV)-----		Feet.
Dyer, in the foundation to a stone chimney on the east side of a house belonging to W. W. Lane, which is opposite the cotton platform at this station and about 80 meters north of the track; the bench mark is only a few inches above the ground; bottom of a square cut (C. & G. S. b. m. XXXV)-----		385. 058
Alma, in the north wall of a brick store, belonging to Mr. L. C. Locke; the bolt is in the fifth brick from the northeast corner of the building and in the seventeenth course from the foundation; the building is opposite the railroad station and directly south of it; center of a cross in end of copper or brass bolt (one-half inch in diameter), (C. & G. S. b. m. XXXVI)-----		429. 609
Van Buren, in the south corner of the courthouse yard; "1889" was roughly cut on one side of the stone; bottom of square cut in stone post. (Reported in 1893 as destroyed.) (C. & G. S. b. m. XXXVII)-----		435. 482
Van Buren, in the west wall of the brick courthouse, the bolt is in the second course from the foundation and in the second brick from the south corner of the building, the brick cracked when the bolt was driven in; the center of a cross in end of copper bolt (C. & G. S. b. m. XXXVIII)-----		411. 298
Van Buren, in the stone abutment to the iron railroad bridge over the Arkansas River, it is east of the track and on that part of the abutment on which the end of the bridge rests, on the north bank		
	U S	
of the river; bottom of a square cut, marked <input type="checkbox"/> (C. & G. S.		
	B M	
b. m. XXXI)-----		414. 740
Van Buren, in the stone abutment to the iron railroad bridge over the Arkansas River, east of the track and on that portion of the abutment on which the end of the bridge rests, on the south bank		
	U S	
of the river; bottom of a square cut, marked <input type="checkbox"/> (U. S. C. &		
	B M	
G. S. b. m. XL)-----		414. 599
Fort Smith, in the west wall of the United States jail (brick), in the first course above the limestone base stone and about 1 meter above the ground, in the fifth brick from the jamb formed by the side of the building and the brick ventilator; the jail is a new pressed-brick addition, with stone trimmings, to the old United States building; the letters "U. S. B. M." were cut in the base stone immediately below the bolt; center of cross in end of copper bolt (C. & G. S. b. m. XLI)-----		448. 067

Near Lillie.

Lillie, one-half mile south of, on the south bank of Clear Water Creek under the railroad bridge, west of the track and about the center of the west capstone to the pier; bottom of a square cut in

	U S	
the top of the stone pier, roughly marked	□	(C. & G. S. b. m.
	B M	
XLIII) -----		Feet. 463.050

FROSTVILLE QUADRANGLE.

[Latitude 33°-33° 15'; longitude 93° 30'-93° 45'.]

From Canfield south along St. Louis Southwestern Ry. to Bradley.

Canfield, 2.7 meters from southwest corner of cattle pen, 19 meters west of main track, and 95 meters northwest of corner of depot of the St. Louis Southwestern Ry.; Pipestone bench (C. & G. S. p. b. m. Canfield):

Bolt in stone underground-----	259.032
Top of cap-----	263.100

Bradley, at northwest corner of depot, 13 meters west of main track of the St. Louis Southwestern Ry.; pipestone bench (C. & G. S. p. b. m. Bradley):

Bolt in stone underground-----	252.870
Top of cap-----	256.938

GURDON QUADRANGLE.

[Latitude 33° 30'-34°; longitude 93°-93° 30'.]

From Chidester north along St. Louis, Iron Mountain & Southern Ry. to Curtis.

Chidester station, 20 meters north of north wall of, 22 meters east of east wall, in southwest corner of yard of Dr. Tidwell, 1 meter north of south fence of yard, 0.2 meter east of west fence; witnessed by two triangular blazed trees, as follows: 0.3-meter oak, northwest 6 meters, and 0.2-meter white oak, east 5 meters; pipe-flange bench (U. S. C. E. p. b. m. Chidester)-----

230.751

Little Missouri River, on top of stone pier at north end (left bank) of Iron Mountain & Southern Ry. bridge over, midway between rails of track and 0.1 meter from south edge of capstone of pier; on edge of capstone is a V cut with vertex pointing to bench;

U S	
cross cut, marked X	(U. S. C. E. p. b. m. Little Missouri)-----
B M	166.177

Whelen, in line with north wall of depot, 30 meters east of east wall, 30 meters south of south wall of depot and 1 meter west of west wall, 1 meter west of fence around garden inclosure just south of store and 4 meters north of southwest corner of garden; pipe-flange bench (U. S. C. E. p. b. m. Whelen)-----

252.749

Gurdon, immediately west of depot, in northwest corner of small park inclosure, 25 meters west of west wall of depot and 3 meters north of north wall (U. S. C. E. p. b. m. Gurdon II)-----

208.730

Gurdon, in line with west wall of depot, and 20 meters south of south wall, and immediately in front of Hall Hotel; pipe-flange bench (U. S. C. E. p. b. m. Gurdon I)-----

209.228

Smithton, on right-hand side of track going to, 1.2 kilometers north-east of station, at edge of railway right of way and back of mile-post 423, 0.5 meter from fence along right of way; pipe-flange bench (U. S. C. E. p. b. m. Smithton)-----	Feet. 206.630
Curtis, at intersection of line of south wall of depot, with front line of stores standing northwest of depot, 25 meters west of west wall of depot and 15 meters south of south wall of nearest store to north; pipe-flange bench (U. S. C. E. b. m. Curtis)-----	185.498

HELENA QUADRANGLE.

[Latitude 34° 30'–34° 37' 30''; longitude 90° 30'–90° 37' 30''.]

At Helena.

Helena, on west side of Main Street, in east end of north wall of brick building, which is the second one south of York Street and is owned by Tenney & Cashman; in outer end of copper bolt, 1 centimeter in diameter, leaded horizontally into brick; center of hole (U. S. C. E. p. b. m. Helena I)-----	192.306
Helena, in northwest corner of Cherry and Rightor streets, in south wall of brick building, which is owned by H. S. & S. H. Horner and is occupied by McKenzie, Horner & Co., dealers in general merchandise; the bench mark is 216 centimeters west of southeast corner of building and 97 centimeters above the sidewalk, in outer end of copper bolt, 1 centimeter in diameter leaded horizontally into brick, letters "P. B. M." are cut in the wall; center of hole (U. S. C. E. p. b. m. Helena II)-----	192.329

KRESS QUADRANGLE.

[Latitude 33° 15'–33° 30'; longitude 93° 30'–93° 45'.]

From Lewisville along St. Louis Southwestern Ry. to Garland, thence along Red River to Jordan Landing.

New Lewisville, at east corner of cattle pen, 28 meters east of main track of St. Louis Southwestern Ry., 90 meters southwest from depot; pipestone bench (C. & G. S. p. b. m. Lewisville):	
Bolt in stone underground-----	260.246
Top of cap-----	264.314
Lewisville, on stone foundation pier for water tank at junction of Shreveport branch with main line of St. Louis Southwestern Ry., on pier next to main track and toward Lewisville and on the southwest corner of sheet-iron plate, on head of boiler rivet holding two sheets of sheet iron; cross chiseled (C. & G. S. t. b. m. 239)-----	275.196
Garland, on right bank of Red River, 100 meters northwest of pier approach to railway drawbridge, 24 meters west of main track and about 500 meters south of depot (C. & G. S. p. b. m. Garland):	
Bolt in stone underground-----	231.797
Top of cap-----	235.865
Garland, at northwest corner of St. Louis Southwestern Ry. section house, 2,020 feet from center pier of railway drawbridge and 70 feet north of track; pipestone bench (C. & G. S. b. m. 4; Red River survey):	
Bolt in stone underground-----	231.099
Top of cap-----	235.167

Jordan Ferry, about 150 meters east of left bank of Red River, at edge of road 3 meters south of Terrell Bayou and on Ward place; pipestone bench (C. & G. S. p. b. m. Jordan):	
Bolt in stone underground-----	Feet. 215.929
Top of cap-----	219.997
Jordan Landing, on left bank of Red River about 800 feet back of, 500 feet south of Terrell Bayou at angle in levee between the Terrell and Dixon plantations; pipestone bench (C. & G. S. b. m. p. r. p. 14; Red River survey):	
Bolt in stone underground-----	216.233
Top of cap-----	220.301

LAKE VILLAGE QUADRANGLE.

[Latitude 33° 15'–33° 30'; longitude 91° 15'–91° 30'.]

From Kidds spur north along St. Louis, Iron Mountain & Southern Ry. to Hudspeth.

Kidds spur, in northwest corner of P. L. McGrudy's yard and about 25 meters east of railway track; pipe-flange bench (U. S. C. E. p. b. m. Kidd)-----	124.652
Morrell, in the west corner of yard to section house and about 20 meters northwest of the railway track; pipe-flange bench (U. S. C. E. p. b. m. Morrell)-----	130.521
Hudspeth, in southeast corner of yard to section house and about 15 meters east of railway track; pipe-flange bench (U. S. C. E. p. b. m. Hudspeth)-----	133.359

LINDER QUADRANGLE.

[Latitude 35°–35° 15'; longitude 92° 15'–92° 30'.]

Near Conway.

Preston, in the west end of the yard owned by J. W. Austin, close to the line of the fence and on line with the north end of the building containing the post office and store; granite post (U. S. C. & G. S. b. m. V)-----	275.895
Conway, on top of the stone foundation at the southwest corner of the brick record vault of the courthouse; bottom of a square cut in a flat stone of the foundation and is roughly marked as follows: "U S B M" (U. S. C. & G. S. b. m. VI)-----	320.553
Conway, near, nearly opposite section house No. 5 on the St. Louis, Iron Mountain & Southern Ry., near the fence to yard in front of the house where the railroad section hands live; granite post (U. S. C. & G. S. b. m. VII)-----	330.652

LITTLE ROCK QUADRANGLE.

[Latitude 34° 30'–35°; longitude 92°–92° 30'.]

From Wrightsville northwest along St. Louis, Iron Mountain & Southern Ry. to Mayflower.

Wrightsville, near the southeast end of the platform at the St. Louis, Iron Mountain & Southern Ry. station, stone is just west of the flight of stairs leading up to the platform from the south; the top is beveled and is lettered U S bottom of a square cut in limestone block (U. S. C. S. b. m. C)-----	258.215
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Sweet Home and Wrightsville, between, in the top of the southwest block which supports the platform immediately in front of section house 2 of the railroad; this section house is between mileposts 106 and 107 and is the one occupied by the section foreman; the top of a brass nail almost in the center of an equilateral triangle formed by three copper nails (U. S. C. S. b. m. II)-----	Feet. 266.601
Little Rock, in the stone doorsill of the middle door, at the west end of it, of the brick building occupied by Whittemore & Gordon, pork brokers, at the foot of Commerce Street on the bank of the Arkansas River; bottom of a square cut (U. S. C. S. b. m. 1 or 3)-----	264.021
Little Rock, in the granite substructure of the east face of the United States customhouse and post office, beneath the water-table course of masonry, and its center is about 13 $\frac{3}{4}$ inches north and about 5 $\frac{1}{2}$ inches above the upper corner of the north line of the basement window nearest to Second Street; center of cross (U. S. C. S. b. m. A)-----	299.238
Little Rock, on the north side of the granite coping of wall inclosing the small sunken area immediately in front of the basement window referred to above; a rectangular cut, lettered U S B M (U. S. C. S. b. m. B)-----	297.916
Little Rock, near the main entrance of the State Capitol; this post is about 29 $\frac{1}{2}$ inches south and about 33 $\frac{1}{2}$ inches west of the southwest corner of the stone porch; bottom of a square cut in the top of a 6 by 6 inch granite post (U. S. C. S. b. m. O)-----	288.448
Argenta, near the east end of, on the north bank of the Arkansas River, on the extreme south end of the west monument of the United States Engineers' base line; square cut, marked "U. S." (U. S. C. S. b. m. West Base)-----	256.446
Little Rock, between mile posts 4 and 5 from, on the north side of the Little Rock & Fort Smith R. R., 4 meters from the track and 1.6 meters west of sixth telegraph pole west of trestle 12; granite post (U. S. C. S. b. m. I)-----	315.863
Marche, in the southwest corner of the yard in front of Mr. Charles Chonoski's residence at; this house joins the store and post office; granite post (U. S. C. S. b. m. II)-----	268.907
Palarm, in the west end of the yard owned by Daniel Chism, postmaster at, close to the line of the fence, about 10 meters north of the building containing the post office, also on a line with the south end of the platform of the railroad station; the surface in the center of square; granite post (U. S. C. & G. S. b. m. III)---	270.098
May Flower, in the southwest corner of the yard in front of a house belonging to Mr. J. R. Miller; this house is almost due east of the station; granite post (U. S. C. & G. S. b. m. IV)-----	287.375
From Alexander northeast along St. Louis, Iron Mountain & Southern Ry. to Little Rock.	
Alexander, at southeast corner of small garden inclosure just west of depot, 3 meters west of west wall of depot and 2.5 meters south of south wall; cross cut on top of section of iron rail (U. S. C. E. p. b. m. Alexander)-----	326.679

Mabelvale, at east side of inclosure around the public well, 80 meters east of Iron Mountain & Southern Ry. depot and 25 meters south of track; witnessed by three triangular blazed trees, as follows: 0.3 meter sweet gum, north 2 meters; 0.4 meter black oak, south 2 meters, and 0.6-meter pine, west 8 meters; cross cut on top of iron casting (U. S. C. E. p. b. m. Mabelvale)-----	Feet. 310. 482
Ensign, at east fence of yard around section house at, 10 meters east of east wall of house and in line with south wall; cross cut on top of iron rail (U. S. C. E. p. b. m. Ensign)-----	293. 726
Little Rock, 10 meters east of No. 1 (or 3), at, at southeast corner of Whittemore & Gordon building, top of water table (a bench of local engineers) (U. S. C. E. b. m. Whittemore)-----	263. 982
Little Rock, on northeast corner of Whittemore & Gordon building, on east wall and 0.1 meter north of Merrill's gage, 1.390 meters above projecting stone at bottom of wall used by Abert as a bench mark (1867); cross cut (a high-water mark of 1866) (U. S. C. E. b. m. Abert)-----	246. 916
Little Rock, foot of Commerce Street, in east wall of basement of Whittemore & Gordon building, window was 3 meters from northeast corner of store, is now filled in with stonework and the sill taken out; in connecting allowance was made for a 6-inch sill, the point used is not more than 0.1 meter in error; top of sill to window (U. S. C. E. b. m. Merrill)-----	256.220
Little Rock, the highest point of a 2-inch iron rod set solidly in the "Little Rock" about 30 meters east of south end of railroad bridge at, rod is 2.5 meters southwest of S. S. incline gage (U. S. C. E. S. S. gage b. m.)-----	249. 209
Little Rock, on northwest corner of lowest step to middle south entrance to statehouse (U. S. C. E. b. m. statehouse steps)-----	288. 457
Baring Cross Ry. bridge, on west portion of upstream cylinder of first pier from right bank of, about 6 feet below second nut (from top of pier) on side of cylinder; horizontal side of a triangle cut (gage b. m. A. Ewens)-----	242. 355
Baring Cross Ry. bridge, on west part of upstream cylinder of first pier from right bank of, vertically under gage bench mark A.; top of third nut (counting down) (U. S. C. E. b. m. 1 Evans, 1887)-----	236. 561
Baring Cross Ry. bridge, iron cylinder cap of downstream cylinder of third pier from right bank of; bottom surface (No. 6 gage b. m.)--	263. 116

McGEHEE QUADRANGLE.

[Latitude 33° 30'–33° 45'; longitude 91° 15'–91° 30'.]

Tillar, in a brick of the chimney at the back of H. L. Henry & Bros.' store, the brick is the eleventh one from the ground and third one east of side of house; the center of cross on head of copper bolt leaded horizontally (U. S. S. E. b. m. H)-----	153. 123
From Dermott along St. Louis, Iron Mountain & Southern Ry. to Trippe Junction.	
Dermott, in northwest corner of yard to section house and about 15 meters west of railway track; pipe-flange bench (U. S. C. E. p. b. m. Dermott)-----	140. 416

Baxter, in east corner of yard of S. A. Duke, about 30 meters south-west of track of Warren Branch of St. Louis, Iron Mountain & Southern Ry., and about 50 meters west of west end of bridge across Bayou Bartholomew; pipe-flange bench (U. S. C. E. p. b. m. Baxter)-----	Feet. 142.165
McGehee, in west corner of yard of cabin opposite the north end of switch and west of St. Louis, Iron Mountain & Southern Ry. track; pipe-flange bench (U. S. C. E. p. b. m. McGehee) -----	148.943
Trippe Junction, in south corner of R. D. Crenshaw's yard, north of Warren Branch of the St. Louis, Iron Mountain & Southern Ry. track; pipe-flange bench (U. S. C. E. p. b. m. Trippe)-----	144.954
Trippe Junction, on west slope of railway dump on west slope of levee and 100 meters from river; iron pipe (U. S. C. E. t. b. m. 117.=levee b. m.)-----	145.003

MAGAZINE MOUNTAIN QUADRANGLE.

[Latitude 35°-35° 30'; longitude 93° 30'-94°.]

From Spadra west along St. Louis, Iron Mountain & Southern Ry. to White Oak.

Spadra, in the southeast corner of the yard to J. Siegel's store, 22 meters east of the store, about 50 meters north of the railroad and 150 meters east of the railroad station; this stone has 1889 cut on one face, and the S on top is backward; stone post (U. S. C. & G. S. b. m. XXVII)-----	378.191
Hartman, on the east end of the house owned by John Durham; the house is about one-third of a mile west of the railroad station and the cross is on the side of the chimney facing the railroad and on the fourth stone from the ground; the house stands about 150 meters north of the railroad; center of a cross cut on the stone chimney, the stone is very hard, and the cross and letter are <div style="text-align: center; margin: 5px 0;"> U S + B M </div> (U. S. C. & G. S. b. m. XXVIII)-----	406.702
Coal Hill, in the stone foundation to the stone chimney of the kitchen to the Central Hotel; the hotel is quite near the railroad station and the kitchen is behind the main building and built as an extension to it; the bench mark is about the center of the outer east face of the chimney and 3 inches above the ground; <div style="text-align: center; margin: 5px 0;"> U S □ B M </div> bottom of a square cut roughly lettered (U. S. C. & G. S. b. m. XXIX)-----	474.632
Altus, in the brick chimney on south side (next to railroad) of the large boarding house just west of the railroad station; the house is owned by F. W. Hammond and is north of the track; the bolt is in the eighth course from the stone foundation and the third brick from the east side of chimney; center of a cross in end of copper <div style="text-align: center; margin: 5px 0;"> U S ⊕ B M </div> bolt, roughly lettered (U. S. C. & G. S. b. m. XXX)-----	543.044
Ozark, in the east side of the brick courthouse (near the southeast corner), the bolt is in the sixth row above the foundation and in the third brick from the southeast corner; center of a cross in end of copper bolt (U. S. C. & G. S. b. m. XXXI)-----	400.330

Poepping, in the stone foundation to the stone chimney on the east end of J. H. Bronte's house; this is the only house at the station, which is nothing more than a switch; the bench mark is only a few inches above the ground, at the northeast corner of the chimney; bottom of a small hole roughly cut (U. S. C. & G. S. b. m. XXXII) _____ Feet.
 383. 490

White Oak, in the stone foundation to the stone chimney on the east end of Dr. W. W. Rambo's house; the house is about 20 meters north of the railroad and a short distance west of the station sign; the doctor's office is in the corner of the yard, near the house; the bench mark is only a few inches above the ground; bottom of a square cut about one-half inch deep, roughly marked U S
 □ (U. S. C. & G. S. b. m. XXXIII) _____ 396. 788
 B M

MALVERN QUADRANGLE.

[Latitude 35°-35° 30'; longitude 92° 30'-93°.]

Malvern, in north end of stone sill to door at southeast corner of roundhouse, which stands about 20 meters west of Iron Mountain & Southern Ry. depot and 100 meters north of Iron Mountain & Southern Ry. track, and is the property of Malvern & Hot Springs Ry.; bottom of square recess marked U S
 □ (U. S. C. E. p. b. m. B M
 Malvern) _____ 217. 128

MOROBAY QUADRANGLE.

[Latitude 33° 15'-33° 30'; longitude 92° 15'-92° 30'.]

From Careyville northwest along Ouachita River to Champagnolle.

Careyville, on side of lane and about 65 meters from the end, 160 meters southeast of river, and 150 meters south of warehouse:
 Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Careyville) _____ 82. 369
 Top of cap on iron post _____ 86. 437

Pigeon Hill Landing, on hillside, 15 meters from foot of slope and about 75 meters south 15° W. from warehouse at landing; witnessed by three triangular blazed trees, as follows: 0.7-meter pine N. 45° E., 4 meters; 0.4-meter pine S. 30° E., 5 meters; and 0.5-meter pine S. 45° W., 4 meters:
 Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Pigeon Hill) _____ 91. 552
 Top of cap on iron post _____ 95. 620

Fletchers Landing, about 500 meters below, in edge of woods on east side of field and about 40 meters south of river; witnessed by three triangular blazed trees, as follows: 0.4-meter water oak, 208° 41', 14.5 meters; 0.6-meter white oak, 271° 30', 20.5 meters; and 0.7-meter hickory, 309° 00', 17.5 meters:
 Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Fletcher) _____ 84. 675
 Top of cap on iron post _____ 88. 743

Franklin Bayou, 250 meters northwest of mouth of, 120 meters southwest of river and 175 meters north of bayou at its nearest point and on first ridge above the bayou; witnessed by three triangular blazed trees, as follows: 0.5-meter water oak, 140° 45', 6 meters; 0.7-meter sweet gum, 97° 06', 12 meters; and 0.7-meter white oak, 258° 03', 4 meters:
 Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Franklin) _____ 74. 593
 Top of cap on iron post _____ 78. 661

Champagnolle, about 5.6 kilometers below, on south side of Bell's field (uncultivated), about 150 meters from west end and about halfway between road leading to Champagnolle and a neighborhood road, and 470 meters from river bank:

Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Bell field)_____	81. 224
Top of cap on iron post_____	85. 292

MORRILLTON QUADRANGLE.

[Latitude 35°-35° 30'; longitude 92° 30'-93°.]

From Fenifee west along St. Louis, Iron Mountain & Southern Ry. to Atkins.

Menifee, near, on the St. Louis, Iron Mountain & Southern Ry., in the top of the stone abutment to the railroad bridge over Cadron Creek, on the abutment on the east bank of the creek and north of the track; bottom of a square cut, roughly marked "U. S. □ B. M." (U. S. C. & G. S. b. m. VIII)_____	283. 786
Menifee, a few feet west of the storehouse used as a post office and on line with the front of this building; an old well is quite near the bench mark; granite post (U. S. C. & G. S. b. m. IX)_____	286. 306
Plumerville, in the southeast corner of the yard to the Sims Hotel; granite post (U. S. C. & G. S. b. m. X)_____	292. 650
Morrillton, in the top of the upper step (stone) to the west entrance of the courthouse, near the south end of the step; bottom of a square cut, marked $\begin{matrix} U & S \\ \square & \\ B & M \end{matrix}$ (U. S. C. & G. S. b. m. XI)_____	388. 342
Germantown, in the southeast corner of the yard to the section house 7; granite post (U. S. C. & G. S. b. m. XII)_____	306. 968
Blackville, in the southwest corner of the yard to W. R. Jones's house; granite post (U. S. C. & G. S. b. m. XIII)_____	325. 938
Atkins, in the southwest corner of the stone doorsill at southwest corner of the brick building owned by E. A. Darr; the building is at the northeast corner of Railroad Avenue and Dover Street; bottom of square cut, lettered "U S □ B. M." (XIV)_____	356. 410

NOBLE LAKE QUADRANGLE.

[Latitude 34°-34° 15'; longitude 91° 45'-92°.]

Noble Lake, in top of a 6 by 6 inch granite post set at the southeast corner of the north extension of the platform of the St. Louis, Iron Mountain & Southern Ry. station; bottom of a square cut, lettered $\begin{matrix} U & S \\ \square & \\ B & M \end{matrix}$ (U. S. C. S. b. m. K)_____

tered $\begin{matrix} U & S \\ \square & \\ B & M \end{matrix}$ (U. S. C. S. b. m. K)_____	202. 765
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PASTORIA QUADRANGLE.

[Latitude 34°-34° 15'; longitude 92°-92° 15'.]

Milepost 85, of the St. Louis, Iron Mountain & Southern Ry., in top of a granite post set about 6 meters west of the track, about 23 meters south of the second telegraph pole on the west side of the track south of milepost 85; the post is dressed down to 6 by 6 inches;

bottom of a square cavity, lettered $\begin{matrix} U & S \\ \square & \\ B & M \end{matrix}$ (U. S. C. S. b. m. E)_____	340. 449
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Redfield, in the northeast corner of a small front yard between J. Converse's blacksmith shop and store, the post projects about 4 inches above the ground; the bottom of a square cut in the top of a 6 by 6

	U S		Feet.
inch granite post, lettered	□	(U. S. C. S. b. m. D)	307. 926
	B M		

PINE BLUFF QUADRANGLE.

[Latitude 34°-34° 15'; longitude 92°-92° 15'.]

Pine Bluff, in top of a 6 by 6 inch granite post, which is set in the front yard, at the southeast corner, of a house belonging to Mr. John Bell, this house being at the intersection of Oak Street and West Fourth Avenue and is No. 803 on West Fourth Avenue; bottom

	U S		
of a square cut, lettered	□	(U. S. C. S. b. m. N)	224. 616
	B M		

Pine Bluff, in a brick on the south side of the State Branch Normal School; the brick is in the fourth course below the sill of the first window east of the piazza; the school is situated just west of the city limits; center of cross cut on head of copper bolt leaded horizontally (U. S. C. S. p. b. m. L)

234. 540

RED FORK QUADRANGLE.

[Latitude 33° 45'-34°; longitude 91° 15'-91° 30'.]

Walnut Lake, in a brick on the west side of the chimney on the north end of Mr. R. A. Picken's dwelling house; the brick is in the eighteenth course from the ground; the center of cross on a 2½-inch copper bolt leaded horizontally (U. S. C. S. b. m. I)

163. 858

SMACKOVER QUADRANGLE.

[Latitude 33° 15'-33° 30'; longitude 92° 30'-92° 45'.]

From Champagnolle northwest along Ouachita River to Walnut Hill.

Champagnolle Landing, between forks of small valley entering river immediately below store, about 150 meters back from river bank and 5 meters from foot of slope; witnessed by two triangular blazed trees, as follows: 0.5-meter black oak, N. 20° E., 4 meters; 0.5-meter black oak, N. 15° W., 5 meters:

Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Champagnolle)

97. 775

Top of cap on iron post

101. 843

El Dorado Landing, in west corner of yard of R. T. Goodwin in prolongation of south wall of dwelling and 7 meters west of west wall; witnessed by three trees, as follows: 0.3-meter chinaberry, N. 10° E., 3 meters; 0.1-meter cedar, S. 80° E., 8 meters, and 0.2-meter cedar, S. 10° W., 5 meters:

Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. El Dorado)

88. 304

Top of cap on iron post

92. 372

Smackover Creek, 25 meters below mouth of, on right bank of river, 20 meters back from edge of bank and 5 meters from head of slash leading back to swamp; witnessed by three blazed trees, as follows: 0.6-meter sweet gum, 196°, 6 meters; 0.9-meter sweet gum, 86°, 3 meters, and 0.8-meter sweet gum, 324°, 5 meters.

Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Smackover)

86. 863

Top of cap on iron post

90. 931

Leppards Camp, and 45 meters back from left bank of river, on line with upstream side of and 30 meters back from upper back corner of cabin; witnessed by four blazed trees, as follows: 1-meter sweet gum, 160°, 3 meters; 0.6-meter white oak, 258°, 4 meters; 0.8-meter sweet gum, 255°, 14 meters, and 0.4-meter forked holly, 101°, 10 meters:	
Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Leppard)_____	Feet. 90. 800
Top of cap on iron post_____	94. 868
Little Bay, at mouth of, on left top bank of river and left top bank of Little Bay, 4 meters back from edge of main bank, there is a second bank about 40 meters wide; witnessed by four blazed trees, as follows: 0.5-meter black gum, 99°, 3 meters; 0.5-meter sweet gum, 170°, 3½ meters; 0.4-meter holly, 278°, 11 meters, and 1.4-meter black oak, 308°, 17 meters:	
Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Little Bay)_____	90. 804
Top of cap on iron post_____	94. 872
Beech Hill, at foot of, about 60 meters northwest of where hills meet the river bank and 100 meters northwest of shanty on top of hill; witnessed by three blazed trees, as follows: 1.3-meter black gum, north 2½ meters; 0.7-meter beech, west 8 meters; 0.9-meter beech, southwest 13 meters:	
Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Beech Hill)_____	93. 336
Top of cap on iron post_____	97. 404
Walnut Hill, 25 meters from foot of, 25 meters south of right bank of bayou, and 225 meters west of where hills join river bank; witnessed by three triangular blazed trees, as follows: 1.5-meter tupelo gum, 5 meters; 0.25-meter hackberry, 13 meters, and 0.25-meter elm, 8 meters:	
Copper bolt set in limestone (U. S. C. E. b. m. P. R. P. Walnut Hill)_____	90. 656
Top of cap on iron post_____	94. 724
Walnut Hill, in root of 0.15-meter lime tree about 10 meters from right bank of river where Walnut Hills join river bank and 10 meters west of large gum tree; nail (U. S. C. E. t. b. m. 5)_____	104. 163

STEPHENS QUADRANGLE.

[Latitude 33° 15'–33° 30'; longitude 93°–93° 15'.]

From Ogamaw southwest along St. Louis Southwestern Ry. to McNeil.

Ogamaw, about 1 kilometer below, 130 meters south of trestle 853, on a 0.4-meter sweet gum, 20 meters west of track; the tree has the letters U S cut on it; the higher one of two spikes on the same tree (C. & G. S. R. R. b. m.)_____	189. 265
Stephens, in northeast corner of yard to hotel belonging to Mrs. S. Boggs, 25 meters west of St. Louis Southwestern Ry. track, 25 meters from corner of hotel, 24 meters from corner of gip, and 78 meters from corner of depot; pipestone bench (C. & G. S. p. b. m. Stephens):	
Bolt underground_____	236. 053
Top of cap_____	240. 121

Stephens, near, in root of a 0.4-meter holly 15 meters from left bank of Smackover Creek, 20 meters south of track, on a line even with beginning of trestle over creek; the letters U S are cut on tree; the higher one of two spikes on the same tree (C. & G. S. R. R. b. m.)-----	Feet. 184.553
McNeil, on east side of cattle pen at the northeast corner, 28 meters south from the main track of the St. Louis Southwestern Ry., $11\frac{1}{2}$ meters from the corner of transfer shed and about 170 meters from depot; pipestone bench (C. & G. S. p. b. m. McNeil):	
Bolt underground-----	322.693
Top of cap-----	326.761

TRASKWOOD QUADRANGLE.[Latitude $34^{\circ} 15' - 34^{\circ} 30'$; longitude $92^{\circ} 30' - 92^{\circ} 45'$.]

Traskwood, in front of G. W. Winter's hotel, at northeast corner of wooded lot, about 60 meters south of track and opposite west end of depot, on top section of iron rail; cross cut (U. S. C. E. p. b. m. Traskwood) -----	292.342
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VARNER QUADRANGLE.[Latitude $34^{\circ} - 34^{\circ} 15'$; longitude $91^{\circ} 30' - 91^{\circ} 45'$.]

Warner, in top of granite post set about 2 feet west of the extreme east corner of the front yard of Mr. R. R. Rice's residence; the house is a large white frame structure about 200 yards southeast of Varner station; bottom of a square cut, lettered U S <input type="checkbox"/> (U. S. B M)-----	179.412
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WILMOT QUADRANGLE.[Latitude $33^{\circ} - 33^{\circ} 15'$; longitude $91^{\circ} 30' - 91^{\circ} 45'$.]

From Wilmot north along St. Louis, Iron Mountain & Southern Ry. to Portland.	
Wilmot, in southeast corner of yard around Hotel Chesmett, about 50 meters northeast of depot and 30 meters west of track; pipe-flange bench (U. S. C. E. p. b. m. Wilmot)-----	114.770
Parkdale, in northeast corner of section-house yard and 6 meters west of railway track; pipe-flange bench (U. S. C. E. p. b. m. Parkdale)-----	116.827
Sunshine, in north corner of yard to cabin of Ed Honeycutt, about 15 meters east of track and two telegraph poles south of milepost 479; pipe-flange bench (U. S. C. E. p. b. m. Sunshine)-----	118.379
Portland, about 20 meters east of track and in southeast corner of section-house yard; pipe-flange bench (U. S. C. E. p. b. m. Portland)-----	127.861

WINSLOW QUADRANGLE.

[Latitude 35° 30'-36°; longitude 94°-94° 30'.]

From Rudy north along St. Louis & San Francisco R. R. to Greenland.

- Rudy, about 2 miles north of, in the top of a stone pier under the railroad bridge over Clear Water Creek, pier is at the south end of the iron part of the bridge and about 100 meters from south end of the trestle, about the center of the second capstone from the west end of the pier and is west of the track; bottom of a square cut in the top of a stone pier, roughly lettered $\begin{matrix} \text{U} & \text{S} \\ \square & \end{matrix}$ (C. & G. S. B M) -----
 b. m. XLIV) -----
 536. 807 Feet.
- Lancaster, about one-half mile south of, in the top of a stone pier under the railroad bridge over Clear Water Creek, west of the track on the third pier from south end of bridge and about the center of the second capstone from the west end of the pier; bottom of a square cut, roughly lettered $\begin{matrix} \text{U} & \text{S} \\ \square & \end{matrix}$ (C. & G. S. B M) -----
 b. m. XLV) -----
 608. 509
- Mountainburg, three-fourths mile south of, in the top of a stone pier under the railroad bridge over Clear Water Creek, on the second pier from south end of the bridge, east of the track, and about the middle of the triangular capstone at the east end of the pier; bottom of a square cut, roughly lettered $\begin{matrix} \text{U} & \text{S} \\ \square & \end{matrix}$ (C. & G. S. b. m. XLVI) -----
 694. 422
- Chester, 1 mile south of, in the top of the stone supporting the north end of the iron superstructure to the railroad bridge over Clear Water Creek, east of the track, two limestones are placed on top of the sandstone pier on the north bank of the creek and the bench mark is on the upper one; bottom of a square cut, roughly lettered $\begin{matrix} \text{U} & \text{S} \\ \square & \end{matrix}$ (C. & G. S. b. m. XLVII) -----
 B M -----
 819. 667
- Chester, in the front wall of the Chester Hotel, which is a two-story brick building facing the railroad station and is east of the track; the bolt is in the fourteenth course above the ground and in the second brick from the southwest corner of the hotel, in the front or west wall; center of a cross cut in the end of a copper bolt (C. & G. S. b. m. XLVIII) -----
 845. 153
- Chester, in the southwest corner of the yard at the south side of the Chester Hotel; bottom of a square cut in a marble post, 8 by 8 by 36 inches, buried 32 inches in the ground, top of post lettered C & $\begin{matrix} \text{U} & \text{S} \\ \square & \end{matrix}$ G S (XLIX) -----
 B M -----
 841. 428
- Porter, in the front yard to the dwelling of Mr. R. F. Kidd, stone is near the front fence on the right of the gate as you enter the yard, Mr. Kidd's house is west of the track and one-fourth mile south of the railroad station; bottom of square cut in limestone post (C. & G. S. b. m. CXXVIII) -----
 1, 086. 031

- Winslow, one-half mile south of, in the front yard to the Summit Hotel on top of the Moston Mountain, the stone is near the front fence and on the left of the gate as you enter the yard; limestone post; bottom of square cut (C. & G. S. b. m. CXXVII) ----- Feet. 1,876.706
- Winslow, one-half mile south of, in the top of the stone forming the first offset in the retaining wall to the entrance to the tunnel, at the north end of the tunnel and east of the track the retaining wall goes up in a series of steps or offsets, and the bench mark is on top of the first offset above the track; bottom of a square cut
 U S
 roughly lettered (C. & G. S. b.m. CXXVI) ----- 1,743.058
 B M
- Brentwood, in the yard to the railroad section house, near the front fence and on the left of the gate as you enter, the section house is west of the track and south of the railroad station; bottom of square cut in limestone post (C. & G. S. b. m. CXXV) -- 1,490.716
- Woolseys, about one-fourth mile south of, in the top of the stone pier to the iron railroad bridge over a branch of West Fork of White River, on the pier under the north end of the bridge and is east of the track, there is a trestle outside the bridge at
 U S
 each end; bottom of a square cut, lettered (C. & G. S. b. m. CXXIV) ----- 1,376.782
 B M
- West Fork, in the north side wall of the brick building, owned by J. B. Parks, occupied by Langston, Oldham & Co. as a general store, is west of the track, and faces it a short distance south of the station, side wall is on the street, the bolt is in the third course above the rock foundation and in the third brick from the stone under the northeast corner of the building; center of a cross in end of a copper bolt (C. & G. S. b. m. CXXIII) ----- 1,351.372
- Greenland, in the front yard to the dwelling of Mr. Linn Clive, near the front fence just to the left of the gate as you enter the yard; the yard adjoins the store and post office, which is east of the track and opposite the railroad-station platform; bottom of square cut in limestone post (C. & G. S. b. m. CXXII) ----- 1,249.099



APPENDIX B.

SECONDARY ELEVATIONS.

Secondary elevations from records and topographic maps of the United States Geological Survey, including vertical-angle determinations, altitudes of well-known summits, and other useful elevations are given below. These elevations are approximate only and should not be used for accurate work.

Place.	Quadrangle.	County.	Elevation.
			<i>Feet.</i>
Black Lick Mountain.....	Harrison.....	Carroll.....	1,826
Blue Mountain triangulation station (one of two highest points in State yet determined).	Poteau Mountain.....	Scott, Polk.....	2,800
Boat Mountain.....	Harrison.....	Newton.....	2,220
Buckeye Mountain.....	Dequeen.....	Howard.....	2,313
Caddo Gap.....	Caddo Gap.....	Montgomery.....	585
Caddo Mountains.....	do.....	do.....	1,906
Eagle Mountain.....	Dequeen.....	Howard.....	2,240
East Hanna Mountain.....	do.....	do.....	2,304
Fodderstock Mountain.....	Caddo Gap.....	Montgomery.....	1,626
Do.....	Dequeen.....	Howard.....	2,040
High Peak.....	Caddo Gap.....	Montgomery.....	1,834
Hightop Mountain.....	do.....	Pike.....	1,558
Hogpen Mountain.....	do.....	Pike.....	1,772
Hurricane Knob.....	do.....	Polk.....	2,178
Kennedy Mountain triangulation station.....	Harrison.....	Boone.....	2,085
Magazine Mountain triangulation station (one of two highest points in State yet determined).	Magazine Mountain.....	Logan.....	2,800
Markham Mountain.....	Caddo Gap.....	Pike.....	1,229
Missouri Mountain.....	do.....	Montgomery.....	2,212
Do.....	Dequeen.....	Howard.....	2,060
Nelson Mountain.....	Caddo Gap.....	Montgomery.....	1,490
Porter Mountain.....	Dequeen.....	Howard.....	1,910
Potato Hill.....	Harrison.....	Carroll.....	1,789
Raspberry Peak.....	Dequeen.....	Howard.....	2,360
Rattlesnake Mountain.....	do.....	do.....	1,857
Rich Mountain.....	Poteau Mountain.....	Polk.....	2,750
Round Mountain.....	Caddo Gap.....	Montgomery.....	1,819
Sharptop Mountain.....	do.....	do.....	1,730
Sherman Mountain.....	Harrison.....	Newton.....	2,250
Statehouse Mountain.....	Caddo Gap.....	Montgomery.....	2,127
Strawn Mountain.....	do.....	do.....	1,561
Sulphur Mountain.....	Harrison.....	Newton.....	2,210
Tall Peak.....	Dequeen.....	Howard.....	2,340
Tweedle Mountain.....	Caddo Gap.....	Montgomery, Pike.....	1,666
West Hanna Mountain.....	Dequeen.....	Howard.....	2,070
Whisky Peak.....	do.....	Polk.....	1,680
White Oak Mountain.....	Mount Ida.....	Scott.....	2,250
Wilson Mountain.....	Caddo Gap.....	Pike.....	1,452

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