

DEPARTMENT OF THE INTERIOR  
UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, DIRECTOR

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BULLETIN 464

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RESULTS OF SPIRIT LEVELING  
IN NEW MEXICO

1902 TO 1909, INCLUSIVE

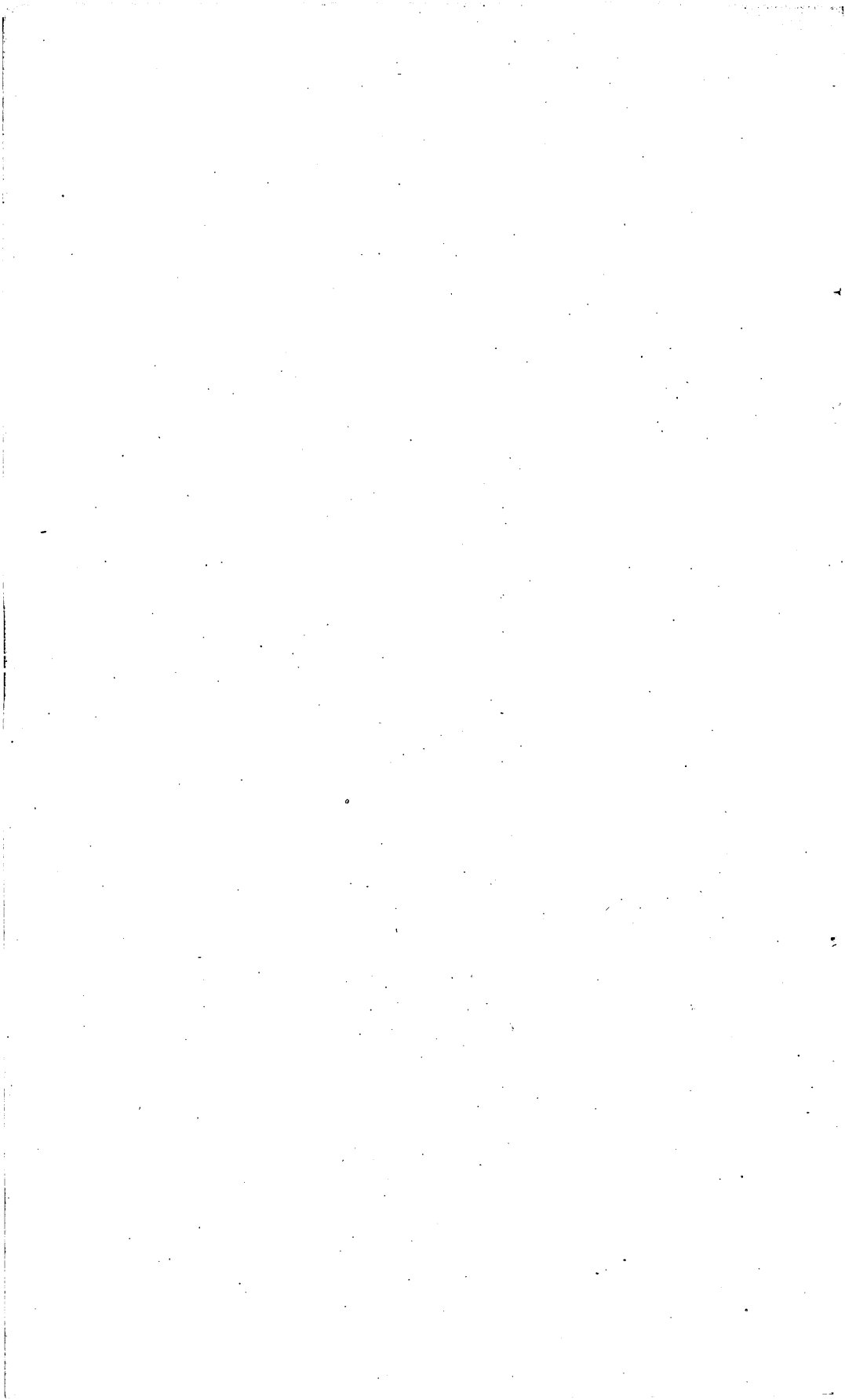
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R. B. MARSHALL, CHIEF GEOGRAPHER

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GEOLOGICAL SURVEY BENCH MARKS.

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

# RESULTS OF SPIRIT LEVELING IN NEW MEXICO, 1902 TO 1909, INCLUSIVE.

R. B. MARSHALL, Chief Geographer.

## INTRODUCTION.

*Scope of the work.*—All results of spirit leveling in New Mexico by the United States Geological Survey are included in this report, arranged by quadrangles. All elevations are based on preliminary heights of bench marks along the precise-level line of the Coast and Geodetic Survey from San Diego, Cal., via Mellen and Flagstaff, Ariz., to Albuquerque, N. Mex., and on the precise line of the United States Geological Survey from the Arizona-New Mexico boundary line via Rincon and Albuquerque to Cuba, N. Mex.

*Personnel.*—The field work from 1902 to 1906, inclusive, was done under E. M. Douglas, geographer, and the later work under E. C. Barnard, geographer, under the general direction of R. B. Marshall, chief geographer. The names of the various levelmen are given in the introduction to each list. The office work of computation, adjustment, and preparation of lists was done mainly by S. S. Gannett, geographer, and D. H. Baldwin, topographer, and since 1907 under the general direction of E. M. Douglas, geographer.

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

*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 cap is riveted over the top of the post, which is set about 3 feet in the ground. A third style of bench mark with abbreviated lettering (*B* and *D*, Pl. I) is used for unimportant points. This consists of a special copper nail  $1\frac{1}{2}$  inches in length driven through a copper washer seven-eighths inch in diameter. The tablets, as well as the caps on the iron posts, are appropriately lettered, and cooperation by States is indicated by the addition of the State name (*G*, Pl. I).

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

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

*Topographic maps.*—Maps of the following quadrangles wholly or partly in New Mexico have been published by the United States Geological Survey up to May 1, 1911. They may be obtained, except as noted, for 5 cents each or \$3 a hundred, on application to the Director of the Survey at Washington, D. C.

Albuquerque.	Las Cruces.
Bernal.	Las Vegas.
Canyon de Chelly (Ariz.-N. Mex.).	Mount Taylor.
Chaco.	St. Johns (Ariz.-N. Mex.).
Corazón.	San Pedro.
Deming.	Santa Clara.
Fort Bayard, special (10 cents).	Santa Fe.
Fort Defiance (Ariz.-N. Mex.).	Santa Rita, special.
Gallina.	Silver City.
Jemez.	Socorro.
Lamy.	Watrous.
Largo.	Wingate.

### PRECISE LEVELING.

Albuquerque, Engle, Las Cruces, Lajoya, Los Lunas, Rincon, San Marcial, Socorro, and Tonuco Quadrangles.

#### BERNALILLO, DONA ANA, SIERRA, SOCORRO, AND VALENCIA COUNTIES.

The following are the results for the New Mexico portion of a precise level line run in 1905 by M. S. Bright along the Atchison, Topeka & Santa Fe Railway from Albuquerque, N. Mex., south to El Paso, Tex. The elevations are in accord with the height of a bench mark at Rincon determined by precise leveling from Yuma, and adjusted to the preliminary heights of bench marks near Albuquerque determined by the precise level line of the Coast and Geodetic Survey in 1909. By applying the orthometric correction to the elevations between Rincon and Albuquerque, a close agreement was obtained with the Coast and Geodetic Survey preliminary elevations near Albuquerque.

#### ALBUQUERQUE QUADRANGLE.

Albuquerque south along Atchison, Topeka & Santa Fe Ry. to San Marcial  
(portion of line).

Albuquerque, corner of Railroad Avenue and First Street, at northwest corner of Alvarado Hotel grounds, in cement; iron post Feet.  
(Coast and Geodetic Survey, unadjusted value 1910)----- 4,952.241



	Feet.
Albuquerque, in front of station; top of rail.....	4, 952. 9
Albuquerque, southwest corner of Coal and Second Streets, 90 feet west of west end of viaduct over Atchison, Topeka & Santa Fe Ry. tracks, set in cement; iron post (Coast and Geodetic Survey unadjusted value 1910).....	4, 949. 904
Albuquerque, southeast corner of foundation of first pier west of main line of Atchison, Topeka & Santa Fe Ry. under south side of viaduct; cross.....	4, 952. 72
Albuquerque, 3.2 miles south of, 60 feet west of track, at third telegraph pole north of gate; iron post (Coast and Geodetic Survey, unadjusted value 1910).....	4, 930. 488

## LOS LUNAS QUADRANGLE.

Albuquerque south along Atchison, Topeka & Santa Fe Ry. to San Marcial (portion of line).

Albuquerque, 6.3 miles south of, 900 feet south of milepost 909, 55 feet east of tracks, 18 feet south of gate; iron post (Coast and Geodetic Survey, unadjusted value 1910).....	4, 927. 064
Barr, in front of signboard; top of rail.....	4, 911. 7
Isleta, 3 miles north of, west of track, 100 feet northwest of milepost 912, at southeast corner of tool house; top of bolt.....	4, 901. 31
Isleta, 3 miles north of, 450 feet north of milepost 912, 600 feet north of section house, 100 feet east of track; iron post (Coast and Geodetic Survey, unadjusted value 1910).....	4, 903. 010
Isleta, 2 miles north of, on north pier of bridge over Rio Grande River east of track; chiseled square.....	4, 900. 72
Isleta, in front of station; top of rail.....	4, 896. 3
Isleta, 0.2 mile southwest of station, 50 feet west of El Paso line track, 200 feet east of transcontinental line track, 5 feet north of stone post, in cement; iron post (Coast and Geodetic Survey, unadjusted value 1910).....	4, 890. 036
Isleta, 2 miles south of, 500 feet south of milepost 917, on southwest cap of bridge 823; top of bolt.....	4, 871. 44
Isleta, 3.5 miles south of, 100 feet north of road crossing, 50 feet west of track; iron post.....	4, 869. 532
Los Lunas, 700 feet north of station, 60 feet west of track at road crossing, at northeast corner of Solomon Lunas's yard fence; iron post.....	4, 851. 396
Los Lunas, in front of station; top of rail.....	4, 851. 8
Los Lunas, 3 miles south of, 50 feet east of track, 10 feet north of gate; iron post.....	4, 832. 960
Los Lunas, 5.7 miles south of, 45 feet west of track, at road crossing; iron post.....	4, 821. 117
Belen, 1.2 miles north of, 50 feet east of track at road crossing; iron post.....	4, 808. 271
Belen, in front of station; top of rail.....	4, 804. 0
Belen, 1.7 miles south of, 50 feet west of junction with Belen cut-off, 260 feet south of milepost 934; iron post.....	4, 793. 130
Belen, 4.8 miles south of, 220 feet south of milepost 937, 50 feet west of track, 8 feet north of gate; iron post.....	4, 793. 673

## LAJOYA QUADRANGLE.

Albuquerque south along Atchison, Topeka & Santa Fe Ry. to San Marcial  
(portion of line).

Sabinal, 1.5 miles north of, 300 feet north of Valencia-Socorro	Feet.
County line, 50 feet west of track, 12 feet north of gate; iron post	4, 768. 757
Sabinal, in front of signboard; top of rail	4, 761. 7
Sabinal, 0.5 mile south of, 400 feet south of milepost 943, 45 feet west of track, 6 feet north of gate; iron post	4, 761. 294
Sabinal, 3.5 miles south of, 500 feet south of milepost 946, 50 feet west of track, 7 feet south of gate; iron post	4, 741. 941
Sabinal, 6.5 miles south of, 300 feet south of milepost 949, 50 feet east of road crossing at fence corner; iron post	4, 739. 189
Lajoya, 1.5 miles north of, 3 feet west of milepost 952, 50 feet east of track; iron post	4, 718. 800
Lajoya, in front of station; top of rail	4, 713. 0
Lajoya, 4.7 miles south of, 50 feet west of track, at fence line; iron post	4, 689. 864
Alamillo, 4.2 miles north of, 180 feet west of bridge 886, 50 feet north of track; iron post	4, 697. 298
Alamillo, 3.5 miles north of, north end of steel bridge 889, 8 feet east of track, at corner of retaining wall; aluminum tablet	4, 694. 598
Alamillo, 1.8 miles north of, at north end of west guardrail of bridge 989-A; top of bolt	4, 670. 91

## SOCORRO QUADRANGLE.

Albuquerque south along Atchison, Topeka & Santa Fe Ry. to San Marcial  
(portion of line).

Alamillo, in front of signboard; top of rail	4, 664. 0
Alamillo, 60 feet south of milepost 965, at northeast corner of fence at section house; iron post	4, 652. 029
Alamillo, 2.1 miles south of, north end of west guardrail of bridge "898-A"; top of bolt	4, 649. 0
Alamillo, 3.7 miles south of, 50 feet east of track, at dike; iron post	4, 633. 630
Lemitar, in front of signboard; top of rail	4, 624. 3
Socorro, 1.5 miles north of, 800 feet north of milepost 976, 50 feet west of track; iron post	4, 596. 585
Socorro, in front of station; top of rail	4, 587. 35
Socorro, in front of Windsor Hotel, in line with curb; iron post	4, 592. 300
Socorro, 2.5 miles south of, 100 feet north of milepost 980, 50 feet west of track, in fence corner; iron post stamped "SOCR 4568"	4, 573. 252

## SAN MARCIAL QUADRANGLE.

Albuquerque south along Atchison, Topeka & Santa Fe Ry. to San Marcial  
(portion of line).

Socorro, 5.5 miles south of, 1,000 feet south of milepost 983, 60 feet west of track, 125 feet east of adobe house, 3 feet north of gate; iron post	4, 565. 034
Socorro, 8.7 miles south of, 1,300 feet south of milepost 986, 50 feet west of track, 2 feet north of gate; iron post	4, 547. 490

	Feet.
San Antonio, in front of station; top of rail.....	4, 544. 5
San Antonio, 150 feet west of track, 6 feet south of southeast corner of Solomon B. Chavez's house; iron post.....	4, 538. 585
San Antonio, 2.5 miles south of, 27 feet west of track, at north end of base line, 15 feet north of signal; iron post.....	4, 531. 846
San Antonio, 6 miles south of, 60 feet west of track, 4 feet south of milepost 994; iron post.....	4, 508. 480
Elmendorf; top of rail.....	4, 507. 7
Elmendorf, 1.4 miles south of, in cement under signal at south end of base line; iron post.....	4, 497. 784
San Marcial, 6 miles north of, in north end of west guardrail of bridge 938; top of bolt.....	4, 491. 95
San Marcial, 5 miles north of, 300 feet south of milepost 1000, 50 feet west of track, at wire fence; iron post.....	4, 488. 400
San Marcial, 2.2 miles north of, 1,300 feet north of milepost 1003, 50 feet west of track, 2 feet north of gate; iron post.....	4, 471. 536
San Marcial, in front of station; top of rail.....	4, 459. 1
San Marcial, northwest corner of railroad park, 3 feet west of north- west gate, set in cement; iron post.....	4, 457. 686
San Marcial, northwest corner of railroad park, 3 feet west of north- west gate, set in cement; aluminum tablet.....	4, 457. 098
San Marcial, 0.75 mile south of, north end of railroad bridge over Rio Grande River, 4 feet east of rail, in coping stone; aluminum tablet stamped "107".....	4, 462. 130
San Marcial, 4 miles south of, east of track, 60 feet east of road cross- ing, 10 feet north of wagon road; iron post stamped "110".....	4, 498. 640
Pope, 36 feet east of main line, in line with telegraph poles; iron post stamped "113".....	4, 581. 064
Pope, in front of signboard; top of rail.....	4, 589. 6

## ENGLE QUADRANGLE.

San Marcial south along Atchison, Topeka & Santa Fe Ry. to Rincon (portion  
of line.)

Pope, 2.5 miles south of, south of telegraph pole, north of milepost 1015, 40 feet west of track, in line with telegraph poles; iron post stamped "116".....	4, 642. 539
Pope, 5.75 miles south of, one telegraph pole south of milepost 1018, 50 feet west of track, in line with telegraph poles; iron post stamped "119".....	4, 720. 000
Lava, 0.25 mile north of station, 700 feet south of milepost 1021, 50 feet east of track, in line with telegraph poles; iron post stamped "122".....	4, 720. 850
Lava, in front of station; top of rail.....	4, 725. 7
Lava, 0.5 mile south of station, on small flat surrounded by volcanic rock and lava, 14 rails south of milepost 1022, 8 rails north of point of curve, 106 feet west of track, under mound of volcanic rock flush with ground, in cement; iron post stamped "123".....	4, 710. 766
Lava, 3.5 miles south of, 45 feet west of track, 5 feet south of mile- post 1025; iron post stamped "126".....	4, 682. 845
Lava, 6.5 miles south of, 45 feet west of track, 6 feet south of mile- post 1028; iron post stamped "129".....	4, 650. 965

Lava, 9.5 miles south of, 45 feet west of track, 6 feet south of mile-post 1031; iron post stamped "132"-----	Feet. 4,724.069
Crocker, in front of signboard; top of rail-----	4,730.0
Crocker, 2 miles south of, 40 feet west of track, south of mile-post 1034; iron post stamped "135"-----	4,785.520
Crocker, 5 miles south of, 40 feet west of track, 6 feet south of mile-post 1037; iron post stamped "138"-----	4,842.820
Crocker, 8 miles south of, 45 feet west of track, 5 feet south of mile-post 1040; iron post stamped "141"-----	4,785.490
Engle, 150 feet north of, between main line and side track of Atchison, Topeka & Santa Fe Ry.; iron post stamped "4727." (Set by Reclamation Service)-----	4,769.507
Engle, in front of station; top of rail-----	4,769.7
Engle, 3 miles south of, 45 feet west of track, 5 feet south of mile-post 1046; iron post stamped "147"-----	4,746.082
Engle, 6.25 miles south of, 0.25 mile south of milepost 1049, 700 feet south of lake, 135 feet south of cattle guard, 55 feet east of track, 5 feet south of telegraph pole; iron post in cement stamped "150"-----	4,693.098
Engle, 6.25 miles south of bench 150, 4 inches west of; aluminum tablet set in cement stamped "150½"-----	4,692.377
Cutter, in front of signboard; top of rail-----	4,710.0
Cutter, 0.75 mile south of, 45 feet west of track, 6 feet south of mile-post 1052; iron post stamped "153"-----	4,714.658
Cutter, 3.75 mile south of, 45 feet west of track, 5 feet south of mile-post 1055; iron post stamped "156"-----	4,684.968

## RINCON QUADRANGLE.

San Marcial south along Atchison, Topeka & Santa Fe Railway to Rincon  
(portion of line).

Aleman, in front of signboard; top of rail-----	4,667.8
Aleman, 1.75 miles south of, 45 feet west of track, 6 feet north of milepost 1058; iron post stamped "159"-----	4,642.644
Aleman, 4.75 miles south of, 45 feet west of track, 6 feet north of milepost 1061; iron post stamped "162"-----	4,597.430
Upham, in front of station; top of rail-----	4,560.0
Upham, 0.75 mile south of, 45 feet west of track, 6 feet north of milepost 1064; iron post stamped "165"-----	4,548.175
Upham, 3.75 miles south of, 45 feet west of track, 5 feet south of milepost 1067; iron post stamped "168"-----	4,490.977
Upham, 6.75 miles south of, 45 feet west of track, 5 feet north of milepost 1070; iron post stamped "171"-----	4,427.527
Upham, 9.25 miles south of, 45 feet west of track, 5 feet south of milepost 1073; iron post stamped "174"-----	4,361.990
Gramma, in front of signboard; top of rail-----	4,348.0
Gramma, 2.25 miles south of, 175 feet south of road crossing, 70 feet west of track, 25 feet west of milepost 1076; iron post stamped "177"-----	4,261.091
Rincon, 0.75 mile north of, at north end of bridge 1035, 5 feet east of rail, in concrete abutment; aluminum tablet stamped "180"-----	4,107.701
Rincon, in front of station; top of rail-----	4,057.91

Rincon south along Atchison, Topeka & Santa Fe Railway to La Tuna (portion of line).

Rincon, at northwest corner of Kingman Street and Railroad Avenue, 10 feet south of L. F. Elliott's storehouse and post office, in cement; iron post stamped "283-B-1905"-----	Feet. 4, 062. 593
Rincon, east side of, aluminum tablet in cement; stamped "283 $\frac{1}{2}$ -B-1905"-----	4, 061. 990
Rincon, 3 miles southeast of, midway between milepost 1082 and 1083, 40 feet southwest of track, 5 feet west of gate, on fence line; iron post stamped "286-B-1905"-----	4, 023. 843
Detroit, in front of station; top of rail-----	4, 011. 9

#### TONUCO QUADRANGLE.

Rincon south along Atchison, Topeka & Santa Fe Railway to La Tuna (portion of line).

Detroit, 0.5 mile south of, 45 feet southwest of public road crossing, by wire fence, about 300 feet south of milepost 1086; iron post stamped "290-B-1905"-----	4, 011. 212
Tonuco, in front of signboard; top of rail-----	4, 002. 77
Tonuco, 1.5 miles south of, 100 feet east of track at foot of bluff, 45 feet east of milepost 1089; iron post stamped "293-B-1905"-----	3, 992. 251
Tonuco, 4.5 miles south of, north side of canyon, 45 feet east of track, 100 feet east of river, 80 feet northeast of bridge 55; iron post stamped "296-B-1905"-----	3, 988. 292

#### LAS CRUCES QUADRANGLE.

Rincon south along Atchison, Topeka & Santa Fe Railway to La Tuna (portion of line).

Tonuco, 7.5 miles south of, about 0.75 mile north of Selden, 100 feet east of track, 45 feet east of milepost 1905, by wire fence; iron post stamped "299-B-1905"-----	3, 967. 683
Selden, in front of signboard; top of rail-----	3, 966. 0
Selden, 1 mile south of, about 1 mile north of old Fort Selden, in rock which projects about 40 feet out into river; aluminum tablet stamped "3932" (Reclamation Service bench mark)-----	3, 971. 858
Selden, 3.75 miles south of, on fence line midway between old and new railroad grade about 200 feet north of the intersection of the two grades; iron post stamped "303-B-1905"-----	3, 955. 934
Stewart ranch, 900 feet south of house, 95 feet northeast of public road crossing, 5 feet west of fence corner, on west side of wagon road; iron post stamped "306-B-1905"-----	3, 968. 736
Stewart ranch, 2.5 miles south of, 400 feet south of milepost 1105, 40 feet west of road crossing, 7 feet south of gate, on fence line; iron post stamped "309-B-1905"-----	3, 931. 313
Dona Ana, in front of station; top of rail-----	3, 919. 89
Dona Ana, 1 mile south of, about 500 feet south of milepost 1108, 700 feet northeast of two-story brick house, north side of lane, 45 feet east of road crossing, 6 feet west of fence corner; iron post stamped "312-B-1905"-----	3, 912. 409

Dona Ana, 4 miles south of, 300 feet north of milepost 1111, 45 feet east of road crossing, 6 feet north of fence corner; iron post stamped "315-B-1905"	Feet. 3, 899. 575
Las Cruces, in front of station; top of rail	3, 894. 99
Las Cruces, 180 feet south of station, 15 feet west of main track, 12 feet north of water tank, in center of driveway; iron post stamped "3855" (set by Reclamation Service)	3, 895. 175
Las Cruces, 130 feet southwest of Dona Ana County courthouse, 30 feet east of fence corner; iron post stamped "3855" (set by Reclamation Service)	3, 895. 263
Las Cruces, City Park, 5 feet west of southeast corner of entrance, set in cement; iron post stamped "318-B-1905"	3, 893. 034
Mesilla Park, in front of station; top of rail	3, 877. 422
Mesilla Park, 450 feet south of station, midway between main track and side track; iron post stamped "3837"	3, 877. 304
Mesilla Park, 2.75 miles south of, 200 feet southeast of milepost 1118, 45 feet west of road crossing, 4 feet east of fence corner; iron post stamped "323-B-1905"	3, 865. 300
Mesilla Park, 4.75 miles south of, 40 feet east of track, 10 feet north-west of milepost 1120; iron post stamped "3813"	3, 853. 404
Mesilla Park, 7.75 miles south of, 60 feet east of track, 15 feet east of milepost 1123; iron post stamped "328-B-1905"	3, 842. 539
Mesquite, in front of signboard; top of rail	3, 839. 09
Mesquite, 38 feet east of main line, 7 feet north of milepost 1124; iron post stamped "3794"	3, 834. 547
Mesquite, 3 miles south of, 100 feet northeast of milepost 1127, 90 feet east of road crossing, 6 feet south of gate; iron post stamped "332-B-1905"	3, 822. 785
Vado, in front of station; top of rail	3, 824. 91
Vado, 100 feet south of station, in southeast corner of foundation stone under water tank; aluminum tablet stamped "3782"	3, 822. 720
Berino, 0.25 mile south of milepost 1131, 100 feet east of main line, at west end of lane, 6 feet south of fence corner; iron post stamped "336-B-1905"	3, 801. 986
Berino, in front of signboard; top of rail	3, 798. 21
Berino, 0.75 mile south of, 45 feet east of track, 10 feet north of milepost 1132; iron post stamped "3760"	3, 800. 736
Berino, 3.25 miles south of, 100 feet west of road crossing, 6 feet east of fence corner; iron post stamped "340-B-1905"	3, 793. 577
La Tuna, in front of signboard; top of rail	3, 793. 79
La Tuna, 33 feet west of main line, about 4 feet north of line between New Mexico and Texas; iron post stamped "3780"	3, 791. 743

#### Deming, Rincon, Separ, and Silver City Quadrangles.

#### DONA ANA, GRANT, AND LUNA COUNTIES.

The following are the unadjusted results of a line of precise levels along the Atchison, Topeka & Santa Fe Railway from Rincon west to Deming, thence northwest to Silver City. The elevations are based on precise leveling of 1905, 1906, and 1907, from Yuma, Ariz., to Deming, N. Mex.

The leveling was done in 1905 by M. S. Bright.

## RINCON QUADRANGLE.

Rincon west along Atchison, Topeka & Santa Fe Railway to Deming, thence northwest to Silver City (portion of line).

Rincon, 2.25 miles southwest of, 45 feet west of track at public road crossing, 4 feet south of milepost 1082; iron post stamped "183"-----	Feet. 4,038.171
Hatch, in front of station; top of rail-----	4,053.03
Hatch, 320 feet southwest of station, 95 feet southwest of track, at fence corner; iron post stamped "186"-----	4,050.973
Hatch, 3 miles southwest of, 100 feet east of milepost 1088, 40 feet east of track; iron post stamped "189"-----	4,212.735
Hatch, 6 miles south of, 45 feet west of track, 3 feet west of milepost 1091; iron post stamped "192"-----	4,366.648
Hockett, 50 feet west of track, 5 feet south of milepost 1094, in front of section house; iron post stamped "195"-----	4,512.278
Hockett, 3 miles south of, 45 feet west of track, 5 feet north of milepost 1097; iron post stamped "198"-----	4,483.521
Hockett, 6 miles south of, 40 feet east of track, opposite milepost 1100; iron post stamped "201"-----	4,491.682
Easley, in front of sign board; top of rail-----	4,516.13
Easley, 2 miles west of, 75 feet north of track, 30 feet east of milepost 1103; iron post stamped "204"-----	4,607.728
Nutt, 260 feet south of station, 234 feet south of south rail in main line, 40 feet east of gate near wire fence, in concrete; iron post stamped "206"-----	4,718.486
Nutt, 260 feet south of station, 234 feet south of south rail on main line, 40 feet east of gate near wire fence, set in cement 4 inches from above bench mark; aluminum tablet stamped "206"-----	4,717.963
Nutt, 3 miles south of, 165 feet south of milepost 1108, 45 feet west of track, 6 feet north of telegraph pole; iron post stamped "208"-----	4,652.021

## DEMING QUADRANGLE.

Rincon west along Atchison, Topeka & Santa Fe Railway to Deming, thence northwest to Silver City (portion of line).

Nutt, 6 miles south of, 45 feet west of track, 4 feet south of milepost 1111; iron post stamped "211"-----	4,610.256
Nutt, 9 miles south of, 45 feet west of track, 6 feet north of milepost 1114; iron post stamped "214"-----	4,583.268
Nutt, 12 miles south of, 45 feet west of track, 6 feet north of milepost 1117; iron post stamped "217"-----	4,523.648
Florida, in front of signboard, top of rail-----	4,505.32
Florida, 2 miles south of, 45 feet west of track, 6 feet north of milepost 1120; iron post stamped "220"-----	4,482.705
Florida, 5.2 miles south of, about 0.25 mile south of milepost 1123, at north end of cut, 80 feet east of track, 12 feet west of wagon road, near wire fence; iron post stamped "223"-----	4,411.703
Mirage siding; top of rail-----	4,377.53
Mirage siding, 3 miles south of, 45 feet west of track, 6 feet north of milepost 1129; iron post stamped "229"-----	4,332.711
Deming, 210 feet north of second switch block in station, Topeka & Santa Fe Railway yards, then 100 feet east of main line, 200 feet southeast of milepost 1132, at fence corner; iron post stamped "232"-----	4,325.157

Deming, in front of Atchison, Topeka & Santa Fe Railway station; top of rail-----	Feet. 4, 335. 553
Deming, in front of Southern Pacific Railroad station; top of rail--	4, 335. 81
Deming, at southwest corner of Silverton and Railroad Avenues, at corner of concrete sidewalk, in concrete; iron post stamped "233"--	4, 334. 928
Deming, city water works, 222 feet south of Southern Pacific Railroad track, in northwest corner of foundation stone; aluminum tablet stamped "234"-----	4, 345. 802
Deming, 3 miles northwest of, 45 feet north of track, 6 feet east of milepost 1136; iron post stamped "236"-----	4, 376. 552
Deming, 6 miles northwest of, 90 feet northeast of track, 50 feet northeast of wagon road, 30 feet northeast of milepost 1139; iron post stamped "239"-----	4, 451. 165
Deming, 9 miles northwest of, 75 feet northeast of track, 35 feet northeast of milepost 1142 and wagon road; iron post stamped "242"-----	4, 530. 022
Deming, 12 miles northwest of, 90 feet northeast of track, 45 feet northeast of milepost 1145 and wagon road; iron post stamped "245"-----	4, 610. 191
Deming, 15 miles northwest of, five telegraph poles west of milepost 1148, 80 feet north of bridge 4, at fence corner; iron post stamped "248"-----	4, 672. 429
Crawford, in front of signboard; top of rail-----	4, 728. 01
Crawford, 0.5 mile northwest of, 75 feet north of track, 30 feet north of milepost 1151; iron post stamped "251"-----	4, 738. 973

## SEPAR QUADRANGLE.

Rincon west along Atchison, Topeka & Santa Fe Ry. to Deming, thence north-west to Silver City (portion of line).

Crawford, 3.5 miles northwest of, 45 feet north of milepost 1154, 5 feet north of wagon road; iron post stamped "254"-----	4, 806. 387
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## SILVER CITY QUADRANGLE.

Rincon west along Atchison, Topeka & Santa Fe Ry. to Deming, thence north-west to Silver City (portion of line).

Faywood, 340 feet east of station, 45 feet north of road crossing, 7 telegraph poles west of milepost 1157; iron post stamped "257"--	4, 910. 751
Faywood, in front of station; top of rail-----	4, 914. 47
Faywood, 3 miles west of, 95 feet south of milepost 1160, 55 feet south of track, 30 feet north of wagon road; iron post stamped "260"-----	5, 000. 982
Faywood, 6 miles west of, 110 feet south of milepost 1163, 70 feet south of track, 1 mile east of White Water, 18 feet north of wagon road; iron post stamped "163"-----	5, 128. 36
White Water, in front of station at milepost 1164; top of rail-----	5, 156. 77
White Water, 700 feet northwest of station, 85 feet south of junction of Silver City-Deming and White Water-Hanover roads, 21 feet south of wagon roads, in limestone rock, aluminum tablet stamped "264-B-1905"-----	5, 157. 825
White Water, 3 miles northwest of, 500 feet east of milepost 1167, 65 feet north of bridge 23, on point of ridge; iron post stamped "267-B-1905"-----	5, 210. 045



White Water, 6 miles northwest of, opposite milepost 1170, 75 feet south of track, 17 feet south of wagon road, near wire fence; iron post stamped "270-B-1905"-----	Feet. 5,319.618
White Water, 9 miles northwest of, 150 feet west of milepost 1173, 80 feet south of track; iron post stamped "273-B-1905"-----	5,477.339
White Water, 12 miles west of, 210 feet east of steel railroad bridge 38, 65 feet north of track, on hillside; iron post stamped "276-B-1905"-----	5,611.782
Hawkins, in front of signboard; top of rail-----	5,703.87
Silver City, 1 mile south of Atchison, Topeka & Santa Fe Ry. station, 475 feet north of steel bridge 40, 45 feet east of track, 45 feet north of milepost 1179; iron post stamped "279-B-1905"-----	5,766.390
Silver City, in front of Atchison, Topeka & Santa Fe Ry. station; top of rail-----	5,866.97
Silver City, in south end of first stone step at front entrance to Silver City National Bank; aluminum tablet stamped "281-B-1905"-----	5,879.185
Silver City, Grant County courthouse, in northeast corner of base stone; aluminum tablet stamped "5932-PHNX-1902"-----	5,931.378

#### Deming, Lordsburg, Separ, and San Simon Quadrangles.

##### GRANT AND LUNA COUNTIES.

The following are the unadjusted results of a line of precise levels along the Southern Pacific Railroad from Deming west to the Arizona-New Mexico boundary line. The elevations are based upon precise leveling in Arizona brought from Yuma.

The leveling was done in the winter of 1906-1907 by A. R. Carver and W. A. E. Hult.

##### DEMING QUADRANGLE.

Deming west along Southern Pacific R. R. to Arizona-New Mexico line (portion of line).

Milepost 1203, 100 feet south of, 20 feet north of wagon road; iron post stamped "4-C-1906"-----	Feet. 4,382.608
Parma, opposite milepost 1202; top of rail-----	4,393.4
Parma, 2 miles west of, 100 feet south of milepost 1200, 50 feet north of wagon road; iron post stamped "7-C-1906"-----	4,410.588
Tunis, in front of signboard; top of rail-----	4,423.8
Tunis, 1.25 miles west of, 100 feet south of milepost 1197, 15 feet north of wagon road; iron post stamped "10-C-1906"-----	4,434.155
Tunis, 4.25 miles west of, 20 feet north of wagon road, 75 feet south of milepost 1194; iron post stamped "13-C-1906"-----	4,422.177

##### SEPAR QUADRANGLE.

Deming west along Southern Pacific R. R. to Arizona-New Mexico line (portion of line).

Mongola, in front of signboard; top of rail-----	4,430.2
Mongola, 0.9 mile west of, 100 feet south of track, 15 feet north of wagon road, 75 feet south of milepost 1191; iron post stamped "16-C-1906"-----	4,435.946

Gage, 1 mile east of, 110 feet south of track, 15 feet north of road,	Feet.
75 feet south of milepost 1188; iron post stamped "19-C-1906"-----	4, 479. 401
Gage, in front of; top of rail-----	4, 489. 2
Gage, 2 miles west of, 100 feet south of track, 30 feet north of wagon road at grade crossing; iron post stamped "22-C-1906"-----	4, 530. 170
Aitkin, in front of signboard; top of rail-----	4, 563. 8
Aitkin, 40 feet north of wagon road, 75 feet south of milepost 1182; iron post stamped "25-C-1906"-----	4, 560. 536
Wilna, 0.8 mile east of, 75 feet south of milepost 1179, 30 feet north of wagon road; iron post stamped "28-C-1906"-----	4, 557. 126
Wilna, in front of signboard; top of rail-----	4, 559. 7
Wilna, 2 miles west of, 75 feet south of milepost 1176, 30 feet north of wagon road; iron post stamped "31-C-1906"-----	4, 579. 753
Continental Divide; top of rail-----	4, 586. 5
Wilna, 5 miles west of, 75 feet south of milepost 1173, 30 feet north of road; iron post stamped "34-C-1906"-----	4, 550. 750
Ladim, in front of signboard; top of rail-----	4, 553. 5
Ladim, 2.5 miles west of, 100 feet south of track, 15 feet north of wagon road, 75 feet south of milepost 1170, at fence corner; iron post stamped "37-C-1906"-----	4, 506. 439
Separ, 90 feet south of track, in southeast corner of station yard; iron post stamped "40-C-1906"-----	4, 504. 866
Separ, in front of station; top of rail-----	4, 505. 5
Separ, 2.8 miles west of, 100 feet south of track, 15 feet north of wagon road, 75 feet south of milepost 1164; iron post stamped "43-C-1906"-----	4, 468. 301
Hawkins, in front of signboard; top of rail-----	4, 457. 6

## LORDSBURG QUADRANGLE.

Deming west along Southern Pacific Railroad to Arizona-New Mexico line (portion of line).

Hawkins, 2 miles west of, 100 feet south of track, 75 feet south of milepost 1161, 15 feet north of wagon road; iron post stamped "46-C-1906"-----	4, 393. 384
Lisbon, 0.5 mile east of, 100 feet south of track, 40 feet north of wagon road, 75 feet south of milepost 1158; iron post stamped "49-C-1906"-----	4, 290. 733
Lisbon, in front of signboard; top of rail-----	4, 280. 8
Lisbon, 2.5 miles west of, 100 feet south of track, 75 feet north of road, 75 feet south of milepost 1155; iron post stamped "52-C-1906"-----	4, 235. 105
Ulmoris, 0.5 mile east of, 100 feet south of track, 15 feet south of road, 75 feet south of milepost 1152; iron post stamped "55-C-1906"-----	4, 209. 237
Ulmoris, in front of signboard; top of rail-----	4, 207. 9
Lordsburg, 2 miles east of, 100 feet south of track, 75 feet north of wagon road, 75 feet south of milepost 1149; iron post stamped "58-C-1906"-----	4, 218. 912
Lordsburg, midway between stores of Charley Lee and Roberts & Leahy Co.; iron post stamped "67-C-1906"-----	4, 249. 781
Lordsburg, in front of station; top of rail-----	4, 247. 1
Lordsburg, junction with Arizona & New Mexico Ry.; top of rail-----	4, 260. 0

Lordsburg, 3 miles west of, 75 feet south of milepost 1144, 20 feet north of road; iron post stamped "63-H-1907"-----	Feet. 4, 266.421
Pyra, in front of signboard; top of rail-----	4, 302.2
Pyra, 1.5 miles west of, 75 feet south of milepost 1141, 10 feet south of road; iron post stamped "66-H-1907"-----	4, 282.214
Gary siding; top of rail-----	4, 222.6
Gary siding, 1.5 miles west of, 75 feet south of milepost 1138, 15 feet north of road; iron post stamped "69-H-1907"-----	4, 153.961
Conrad, in front of signboard; top of rail-----	4, 149.9
Conrad, 1.1 miles west of, 75 feet south of milepost 1134, 1,000 feet north of wagon road; iron post stamped "73-H-1907"-----	4, 148.069
Mondel, in front of signboard; top of rail-----	4, 155.7
Mondel, 0.25 mile west of, 75 feet south of milepost 1131, 10 feet south of road; iron post stamped "76-H-1907"-----	4, 155.576
Steins Pass, at northwest corner of William Charles's store, iron post stamped "80-H-1907"-----	4, 346.485
Steins Pass, in front of station; top of rail-----	4, 351.5

#### SAN SIMON QUADRANGLE.

Deming west along Southern Pacific Railroad to Arizona-New Mexico line (portion of line).

Steins Pass, 3.5 miles west of, 75 feet south of milepost 1124; iron post stamped "84- $\frac{1}{2}$ -H-1907"-----	4, 115.301
Cavot siding, on Arizona and New Mexico line; top of rail-----	4, 099.3

Abiquiu, Albuquerque, Cabezón, Gallina, Jemez, and Laguna Quadrangles.

#### BERNALILLO, RIO ARRIBA, AND SANDOVAL COUNTIES.

The following are the unadjusted results of precise leveling from Albuquerque to Cuba and from a point near Coyote to Espanola. These two lines are connected between Cuba and Coyote by primary circuits in the Gallina quadrangle, given in another list. The elevations are based upon preliminary results of precise leveling of the Coast and Geodetic Survey, near Albuquerque.

The leveling was done in 1905 by M. S. Bright.

#### ALBUQUERQUE QUADRANGLE.

Albuquerque along highway northwest to Cabezón, thence northeast to Cuba (portion of line).

Albuquerque, at southwest corner of Coal and Second streets, 90 feet west of west end of viaduct over Atchison, Topeka & Santa Fe Ry. tracks, in cement; iron post stamped "1" (unadjusted value Coast and Geodetic Survey 1910)-----	Feet. 4, 949.904
Albuquerque, in west root of first cottonwood tree east of bridge over Rio Grande; nail-----	4, 941.70
Albuquerque, 2 miles west of, at west end of lane, 40 feet south of fence corner, in north root of 18-inch cottonwood tree; nail-----	4, 942.77
Albuquerque, 3 miles west of, 160 feet southwest of bridge over canal, in south side of 8-inch cottonwood tree on fence line spike-----	4, 942.46

Albuquerque, 3 miles west of, 100 feet southwest of bridge over canal, near wire fence, on south side of road; iron post stamped "4½"	Feet. 4, 943. 222
Albuquerque, 3.5 miles west of, 100 feet east of foothills, on east side of road, in west root of 20-inch cottonwood tree; spike	4, 946. 29
Albuquerque, 6.5 miles west of, in west forks of crossroads; iron post stamped "8½"	5, 219. 221
Albuquerque, 9.2 miles west of, 100 feet south of road in small draw, on black boulder outcrop; paint point in circle	5, 632. 18
Albuquerque, 9.8 miles west of, in road forks; iron post stamped "12½"	5, 751. 754
Albuquerque, 11.8 miles northwest of, 13 feet west of road, on open flat; iron post stamped "14"	5, 808. 607
Albuquerque, 15.25 miles northwest of, 45 feet north of old east and west road, 15 feet west of main north and south road, on north side of draw; iron post stamped "18"	5, 854. 985
Albuquerque, 17.8 miles northwest of, 40 feet south of road, on north edge of draw, in west root of scrub cedar tree; nail	5, 900. 36
Albuquerque, 18.25 miles northwest of, 60 feet west of draw, 15 feet west of road; iron post stamped "21"	5, 959. 520
Albuquerque, 21.75 miles northwest of, on north side of draw, 10 feet west of cedar tree, on east side of road; iron post stamped "24"	6, 227. 948
Albuquerque, 23.25 miles northwest of, 10 feet west of road, 30 feet east of cedar tree; iron post stamped "26"	6, 284. 800
Albuquerque, 25.8 miles northwest of, 60 feet west of forks of five roads; iron post stamped "29"	6, 351. 568
Albuquerque, 26.25 miles northwest of, in flat wash, on north edge of road, in south side of 20-inch scrub cedar tree; nail	6, 270. 22
Cottonwood Spring, about 0.4 mile northwest of, on ridge, 100 feet north of road; iron post stamped "33"	6, 030. 000
Cottonwood Spring, 3.8 miles west of, 400 feet northeast of sandstone bluffs, 10 feet south of road; iron post stamped "36"	5, 672. 558

## LAGUNA QUADRANGLE.

Albuquerque along highway northwest to Cabezon, thence northeast to Cuba (portion of line).

Navajo Springs, 3 miles west of, 60 feet north of road forks in sandstone outcrop; aluminum tablet stamped "40"	5, 577. 313
Navajo Springs, 5.25 miles northwest of, about 800 feet northeast of old rock dam, 25 feet south of road, on southwest end of ridge; iron post stamped "42"	5, 617. 040
Navajo Springs, 6.8 miles northwest of, 15 feet northeast of road, on top of sandstone ridge; chiseled point in center of painted circle	5, 649. 93
Navajo Springs, 8.25 miles northwest of, 15 feet north of road, on sandy flat; iron post stamped "46"	5, 661. 819
Navajo Springs, 11.25 miles northwest of, 12 feet west of road, on west spur of hill; iron post stamped "49"	5, 708. 349
Navajo Springs, 14.8 miles northwest of, 30 feet east of road, on east edge of river bottom, 100 feet west of old rock corral, on point of ridge; iron post stamped "53"	5, 753. 503
Casa Salazar, 0.2 mile east of, in forks of road leading to Casa Salazar and Cabezon, about 900 feet east of ford; iron post stamped "55"	5, 791. 547

## CABEZON QUADRANGLE.

Albuquerque along highway northwest to Cabezón, thence northeast to Cuba  
(portion of line).

Casa Salazar, 2.8 miles north of, 800 feet south of small corral, 12 feet west of road, on south side of slight slope; iron post stamped "58"-----	Feet. 5, 838. 427
Casa Salazar, 5.5 miles north of, east side of road, at point where road leaves canyon and turns right angle to east, in sandstone ledge; aluminum tablet stamped "61"-----	5, 934. 500
Casa Salazar, 7.5 miles north of, 20 feet west of road forks, on west spur of ridge; iron post stamped "64"-----	6, 202. 887
Casa Salazar, 10.25 miles north of, 25 feet east of road, on west spur of ridge, east side of draw; iron post stamped "67"-----	6, 193. 448
Cabezón, 1 mile north of, top of flat ridge in road forks; iron post stamped "70"-----	6, 153. 323
Cabezón, 3.8 miles north of, 250 feet east of road forks, west toe of knoll; iron post stamped "73"-----	6, 194. 460
Cabezón, 7.25 miles north of, 150 feet east of river, 50 feet east of road, on west point of ridge; iron post stamped "76"-----	6, 271. 894
Cabezón, 11 miles north of, 15 feet west of road, on rock ridge; iron post stamped "79½"-----	6, 359. 431
Cabezón, 14 miles north of, 8 feet east of old road, in gap 500 feet east of new road; iron post stamped "82"-----	6, 580. 943

## JEMEZ QUADRANGLE.

Albuquerque along highway northwest to Cabezón, thence northeast to Cuba  
(portion of line).

Cabezón, 17.25 miles north of, 1,000 feet north of road forks, 20 feet east of road, at foot of sandstone bluff; iron post stamped "85"-----	6, 537. 504
Cabezón, 20.25 miles north of, 150 feet east of river, 6 feet west of road, in sandstone rock about 3 feet square; aluminum tablet stamped "88"-----	6, 583. 369
Cabezón, 23.5 miles north of, on west point of small hill between two flat draws, 10 feet east of road, at a point where road makes angle from east to northwest; iron post stamped "91"-----	6, 760. 987
Cabezón, 24.8 miles north of, 15 feet east of road, on ridge, in north root of 8-inch pinyon tree; nail-----	6, 801. 88
Cabezón, 26.8 miles north of, on flat ridge, in road forks; iron post stamped "94"-----	6, 716. 627
Cabezón, 27.8 miles north of, 60 feet north of road, about 400 feet east of house, in west root of 20-inch double cedar tree; nail-----	6, 743. 37
Little Lake, at top of ridge, 14 feet east of road, 200 feet west of house; iron post stamped "97"-----	6, 800. 180
Little Lake, 1.5 miles north of, 30 feet east of road forks, on point of ridge, in west root of 22-inch pine tree; nail-----	6, 841. 20
Little Lake, 2.8 miles north of, 60 feet below dam, on east side of draw, in top of 18-inch cottonwood stump; nail-----	6, 863. 98

## GALLINA QUADRANGLE.

Point 9 miles northeast of Coyote southeast along highway to Espanola (portion of line).

Gallezos ranch, about 4.5 miles southeast of, northeast side of cross-roads, mound on north and pit on east; aluminum tablet stamped "198 $\frac{1}{2}$ "	Feet. 6, 528. 719
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## ABIQUIU QUADRANGLE.

Point 9 miles northeast of Coyote southeast along highway to Espanola.

Canjilon Creek, 3.2 miles west of, 55 feet west of Coyote and Abiquiu wagon road, on top of flat ridge, in volcanic rock; aluminum tablet stamped "214"	6, 502. 541
Canjilon Creek, 150 feet east of, south side of Chama River, on south edge of wagon road and railroad grade, in sandstone rock; aluminum tablet stamped "218"	6, 065. 689
Canjilon Creek, 0.5 mile east of, south side of Chama River, south edge of road, on sandstone rock; center of paint circle	6, 068. 13
Canjilon Creek, 3 miles east of, about 600 feet south of adobe house, 200 feet south of railroad grade, 16 feet north of wagon road, in sandstone rock; aluminum tablet stamped "221"	6, 025. 248
San Francisco, 1.8 miles east of, north side of river, about 400 feet north of old adobe ruins, in road forks, set in sandstone rock; aluminum tablet stamped "224"	6, 018. 673
Abiquiu, 1.5 miles east of, 125 feet west of old adobe ruins, 12 feet south of road, set in sandstone; aluminum tablet stamped "227," mound of rock around tablet	5, 972. 587
Miller ranch house, 500 feet southwest of, 70 feet southwest of fence corner 30 feet south of road, in volcanic boulder; aluminum tablet stamped "230"	5, 919. 563
Tierra Azul, 1 mile east of, 150 feet west of wash, south side of road, in volcanic rock; aluminum tablet stamped "233"	5, 871. 602
Tierra Azul, 3.8 miles east of, south side of road, 150 feet east of forks, in scrub cedar tree; nail	5, 858. 13
Tierra Azul, 4.5 miles southeast of, 150 feet east of wash, 12 feet west of road, at foot of rocky hills, set in boulder outcrop; aluminum tablet stamped "237"	5, 817. 699
Tierra Azul, 5.8 miles southeast of, on edge of river bottom, 115 feet north of railroad grade and road forks, in west side of 30-inch cottonwood tree; nail	5, 765. 84
J. D. Herrera ranch, 120 feet west of house, 60 feet west of road, 60 feet north of new foundation for house, at foot of hills, in sandstone rock; aluminum tablet stamped "240"	5, 749. 772
Herrera ranch, 1 mile southeast of, at head of lane, 70 feet west of road forks, in west side of 16-inch cottonwood tree; nail	5, 718. 91
Gallegos ranch, 35 feet west of house, on east side of road, at fence corner, in sandstone rock; aluminum tablet stamped "243"	5, 695. 430
B. Salazar ranch, 160 feet south of house, 20 feet east of road, at fence corner, in volcanic boulder; aluminum tablet stamped "247"	5, 641. 541
Espanola, in northeast corner foundation stone of Bond & Bros.' warehouse; aluminum tablet stamped "251"	5, 582. 813
Espanola, in front of station; top of rail	5, 584. 5
C. L. Pallard's storehouse and post office, 60 feet east of, 10 feet south of fence corner, in volcanic rock; aluminum tablet stamped "252"	5, 582. 398

## PRIMARY LEVELING.

Silver City Quadrangle, including Fort Bayard Special Quadrangle.

## GRANT COUNTY.

The elevations in the following list are based on a line of precise levels run in 1905 from San Marcial to Silver City, traversing this quadrangle. For additional elevations in this quadrangle refer to the list for precise leveling, page 15.

Most of the leveling was done in 1902 and 1903 by Chester Irvine, and in 1907 by Victor Mindeleff, jr. The leveling in the Fort Bayard Military Reservation was done in 1908 by Stuart T. Penick.

## SILVER CITY QUADRANGLE.

Mouth of Fleming Canyon southeast to Silver City.

T. 17 S., R. 16 W., sec. 35, mouth of Fleming Canyon, 15 feet south of road; iron post stamped "4980 PHNX"-----	Feet. 4, 978. 991
T. 18 S., R. 15 W., sec. 6, 2.5 miles east of Culberson ranch, 60 feet south of junction of roads, on summit of ridge; bronze tablet stamped "5326 PHNX"-----	5, 325. 351
T. 18 S., R. 15 W., sec. 11, 6 miles west of Silver City, 20 feet north of junction of roads at "Cut-of-troughs"; bronze tablet stamped "5878 PHNX 1902"-----	5, 877. 482

Small circuit east to Silver City and return.

T. 18 S., R. 14 W., sec. 7, 4 miles west of Silver City, summit of Continental Divide, 10 feet north of road; bronze tablet stamped "6219 PHNX 1902"-----	6, 218. 340
T. 18 S., R. 14 W., sec. 10, 0.8 mile south of Silver City, 20 feet east of road, on Iron Hill; bronze tablet stamped "6052 PHNX 1902"-----	6, 051. 092
Silver City, T. 18 S., R. 14 W., sec. 3, northeast corner of courthouse, stone foundation; aluminum tablet stamped "5932 PHNX 1902"-----	5, 931. 378
Road junction 6 miles west of Silver City southwest via Wind Canyon to Foraker ranch (main line continued). <sup>1</sup>	

T. 18 S., R. 15 W., sec. 8, 3 miles northeast of McMillan upper ranch, north side of and in bend of Wind Canyon, large boulder; bronze tablet stamped "5431 PHNX 1902"-----	5, 431. 227
T. 18 S., R. 16 W., sec. 24, 400 feet south of McMillan upper ranch, 40 feet south of road, on slope of ridge; bronze tablet stamped "5166 PHNX 1902"-----	5, 166. 415
T. 18 S., R. 16 W., sec. 35, 300 feet east of corral, Foraker ranch, 30 feet east of road, on small rocky knoll; bronze tablet stamped "5773 PHNX 1902"-----	5, 772. 983

Silver City northeast and north via Pinos Altos to Sapello Creek.

T. 17 S., R. 14 W., sec. 35, 2.05 miles north of Silver City, junction of Silver City-Pinos Altos and Silver City-Santa Rita roads; iron post stamped "6080 PHNX"-----	6, 078. 871
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<sup>1</sup> An adjustment of 1 foot thrown in this line to satisfy 1907 work.

T. 17 S., R. 14 W., sec. 13, 5.48 miles north of Silver City, 20 feet north of road on summit of ridge southwest of drains; bronze tablet stamped "6582 PHNX"-----	Feet. 6,580.517
T. 17 S., R. 13 W., sec. 6, Pinos Altos, east side of road, southwest corner of Oglesby's residence lot; iron post stamped "7041 PHNX"-----	7,039.877
T. 16 S., R. 14 W., sec. 25, 0.25 mile northeast of Mountain K mill, forks of road at mouth of Little Cherry Creek, 40 feet west of sawmill road, north bank of Cherry Creek; bronze tablet stamped "6569 PHNX"-----	6,568.096
T. 16 S., R. 13 W., sec. 8, 3.85 miles northeast of Mountain K mill, mouth of small creek, forks of road, north side of Cherry Creek; aluminum tablet stamped "6959 PHNX"-----	6,957.798
T. 15 S., R. 13 W., sec. 32, 2 miles north of Scott's old mill stand, 40 feet west of road, south side of saddle, limestone ledge leaning east and west; aluminum tablet stamped "7431 PHNX"-----	7,429.554
T. 15 S., R. 13 W., sec. 20, 2 miles north of Trout Creek mill, east side of road on ridge, stone monument, 3 by 3½; bronze tablet stamped "7211 PHNX"-----	7,209.531

McMillan upper ranch south to Allen ranch, thence east to White Water (mean of direct and reverse lines).

T. 18 S., R. 15 W., sec. 32, 2.73 miles south of White Hill Wells, 600 feet east of "76" corral, 50 feet east of road, in boulder; aluminum tablet stamped "5342"-----	5,342.537
T. 19 S., R. 15 W., sec. 10, 0.4 mile south of Bell ranch, in forks of road; iron post stamped "5654"-----	5,654.920
Leopold, T. 19 S., R. 15 W., sec. 22, midway between company store and hotel, 5 feet east of road; iron post stamped "6141"-----	6,142.033
Brown's store, sec. 34, T. 19 S., R. 15 W., 375 feet south of store, in road forks, in boulder; aluminum tablet stamped "6275"-----	6,275.655
T. 19 S., R. 14 W., sec. 31, 4.59 miles north of Allen ranch, 400 feet east of road, on ridge, at north and south fence line, in boulder; aluminum tablet stamped "6015"-----	6,016.586
T. 20 S., R. 15 W., sec. 12, 2.70 miles north of Allen ranch, 200 feet south of arroyo, 100 feet west of road, in limestone outcrop; aluminum tablet stamped "6054"-----	6,054.997
T. 20 S., R. 14 W., southwest corner of sec. 16, 4.57 miles east of Allen ranch, 25 feet north of road, southwest corner of school section; iron post stamped "5762"-----	5,762.544
T. 20 S., R. 14 W., sec. 23, 7.87 miles west of White Water, 300 feet west of road crossing, 100 feet north of road, in boulder; aluminum tablet stamped "5591"-----	5,591.945
T. 20 S., R. 13 W., sec. 20, 4.84 miles west of White Water, 10 feet north of road, in boulder; aluminum tablet stamped "5382"-----	5,382.865
T. 20 S., R. 13 W., sec. 15, 2.91 miles west of White Water, top of ridge just east of Cherry Creek, 15 feet south of road, in boulder; aluminum tablet stamped "5257"-----	5,258.108

Allen ranch west 6 miles and return.

T. 20 S., R. 15 W., sec. 22, 600 feet west of Allen ranch house, 50 feet north of road; iron post stamped "6028"-----	6,029.073
T. 20 S., R. 15 W., sec. 20, 3.19 miles west of Allen ranch, 75 feet north of road forks, in boulder; aluminum tablet-----	6,273.611



T. 20 S., R. 16 W., sec. 36, 5.95 miles west of Allen ranch, in road forks, 75 feet west of east road, 150 feet east of west road, 500 feet south of forks, in boulder; aluminum tablet----- Feet. 6,180.480

**Silver City along highway east to Fort Bayard, thence south to Central, thence east to Hanover Junction.**

T. 17 S., R. 13 W., sec. 32, 5.07 miles northeast of Silver City, 50 feet west of junction of Silver City—Fort Bayard road and Silver City—Central roads, in boulder; iron post stamped "6110"----- 6,110.372  
 Fort Bayard astronomical station, sec. 26, T. 17 S., R. 13 W., in monument; aluminum tablet stamped "6165"----- 6,164.757  
 T. 17 S., R. 12 W., sec. 31, 1.34 miles east of Central, 60 feet north of road, 150 feet east of arroyo, on small knoll, in boulder; aluminum tablet stamped "6068"----- 6,068.015

**White Water north along Atchison, Topeka & Santa Fe Ry. to Fierro, thence north 1 mile and return to Hanover.**

T. 19 S., R. 13 W., sec. 25, 1.37 miles south of Apache Tejo, 62.5 feet south of milepost 1167, 215 feet east of track, in boulder; aluminum tablet stamped "5302"----- 5,302.356  
 T. 19 S., R. 12 W., sec. 7, 1.82 miles north of Apache Tejo (Old Fort McLane), 400 feet north of milepost 1170, 10 feet west of track, in boulder; aluminum tablet stamped "5510"----- 5,510.073  
 Hurley, sec. 25, T. 18 S., R. 13 W., 100 feet south of derail target, 50 feet east of track, in boulder; aluminum tablet stamped "5748"----- 5,747.748  
 T. 18 S., R. 13 W., sec. 13, 1.10 miles south of Bayard, 150 feet west of railroad trestle 5, 75 feet south of road to Central, in boulder; aluminum tablet stamped "5748"----- 5,748.299  
 Bayard, opposite waiting room entrance; top of rail----- 5,824.2  
 Hanover Junction, sec. 32, T. 17 S., R. 12 W., 450 feet east of junction of rails midway between rails, 15 feet north of wagon road, in boulder; aluminum tablet stamped "5959"----- 5,959.075  
 Hanover, 125 feet north of station, T. 17 S., R. 12 W., sec. 21, 30 feet east of track, 5 feet west of wagon road, 100 feet south of arroyo at road crossing, in boulder; aluminum tablet stamped "6367"----- 6,366.866  
 Hanover, in front of station; top of rail----- 6,361.3  
 Fierro station, opposite office door; top of rail----- 6,672.3  
 Fierro, 1.16 miles north of, sec. 3, T. 17 S., R. 12 W., south slope of ridge between two branches of same road, 100 feet east of west road, 50 feet west of east road, 300 feet north of forks, in boulder; aluminum tablet stamped "6931"----- 6,931.538

**Hanover Junction east along Atchison, Topeka & Santa Fe Ry. to Santa Rita, thence west along highway to Hanover.**

Cobre, in front of station sign; top of rail----- 6,084.1  
 T. 17 S., R. 12 W., in cornerstone of sections 26, 27, 34, and 35, 450 feet northeast of Santa Rita Church, 5 feet north of road; aluminum tablet stamped "6331"----- 6,331.289  
 Santa Rita; opposite entrance of station; rail joint----- 6,336.9

## FORT BAYARD SPECIAL QUADRANGLE.

## Bench marks near Fort Bayard.

Fort Bayard, on rise of ground 150 feet west of south end of driveway running back of officer's line, in stone monument; aluminum tablet (Astronomical station) -----	Feet. 6, 164. 757
Fort Bayard, 0.75 mile south of, 200 feet west of Fort Bayard-Central road, 80 feet north of small creek, 12 feet east of angle in west fence; aluminum tablet stamped "6033" -----	6, 033. 117
Central triangulation signal, large stone at base of cairn; chisel mark -----	6, 121. 36
Fort Bayard, 1 mile southwest of, 300 feet west of large drain, 40 feet west of Fort Bayard-Silver City road where road enters valley, on stone; chisel mark -----	6, 055. 76
Fort Bayard, 1 mile southwest of, 200 feet east of Twin Sisters Creek, 40 feet west of Fort Bayard-Silver City road, on side of ridge in solid rock; aluminum tablet stamped "6060" -----	6, 059. 845
Twin Sisters Canyon, 200 feet west of, 10 feet north of old Pinos Altos-Fort Bayard road, in lane; aluminum tablet stamped "6290" -----	6, 290. 079
Fort Bayard, 0.75 mile north of, 200 feet north of road forks, 200 feet west of Cameron Creek, 10 feet west of road up west bank of creek, in large stone; aluminum tablet stamped "6162.6" -----	6, 162. 650
Fort Bayard, 2.5 miles north of, where lane turns west at road forks, 75 feet north of road forks, 30 feet west of gate, in base of large cedar stump; spike -----	6, 416. 00
Comanche Spring, in abutment of reservoir; aluminum tablet stamped "6807.6" -----	6, 807. 587
Fort Bayard, 3 miles north of, 400 feet north of where road turns off to Cornell's ranch, 50 feet west of Cameron Creek, 50 feet south of signboard, 2 feet west of road to Cornell ranch; aluminum tablet stamped "6389" -----	6, 388. 762
Forest nursery, 75 feet southwest of house, in large stone; aluminum tablet stamped "6473.5" -----	6, 473. 358

Boyles, Camp Vincent, Duncan, Mogollon, and Steeplerock Quadrangles.

## GRANT AND SOCORRO COUNTIES.

The elevations in the following list were originally based on an aluminum tablet marked "1090" in the north front of the Maricopa County courthouse at Phoenix, Ariz., and the permanent bench marks are therefore stamped "PHNX". Recent leveling by the United States Geological Survey and preliminary elevations by the Coast and Geodetic Survey have enabled a connection to be made with mean sea datum at San Diego, Cal., and the elevations listed herein have been reduced to that datum by subtracting 1 foot from the previous values.

The leveling was done in 1902 and 1903 by Chester Irvine.

## MOGOLLON QUADRANGLE.

Point 11.5 miles north of Steeplerock along highway via Pina Cienaga north-west 6.6 miles, then southwest to Big Lue ranch.

	Feet.
Steeplerock, 11.5 miles north of, 50 feet southeast of ranch house on stone; chiseled square-----	6,309.09
Pina Cienaga, 1.3 miles south of, summit of divide, west side of road; in root of oak tree; nail-----	6,517.45
Pina Cienaga, south end of, 100 feet north of northwest corner of Pitt ranch fence, 400 feet northwest of house and of forks of road; iron post stamped "6254 PHNX"-----	6,253.173
Pina Cienaga, 1 mile northwest of, at road crossing; summit of divide-----	6,306
Pina Cienaga, 1.3 miles northwest of, 50 feet northeast of forks of road at old ranch, in juniper stump; wire nail-----	6,266.24
Pina Cienaga, 3.6 miles northwest of, 10 feet south of road, at bend in mill creek; iron post stamped "5936 PHNX"-----	5,935.155
Pina Cienaga, 5.1 miles northwest of, west side of road, 200 feet southeast of frame house, on bowlder; chisel mark-----	5,804.24
Pina Cienaga, 6.6 miles northwest of, 40 feet north of road, on divide; iron post stamped "6199 PHNX"-----	6,197.781
Big Lue ranch, 9.8 miles northeast of, west side of road, foot of long hill, on bowlder; chiseled square-----	5,722.75
Big Lue ranch, 8.7 miles northeast of, 10 feet west of road, at junction of creeks; iron post stamped "5720 PHNX"-----	5,719.108
Big Lue ranch, 6.9 miles northeast of, west side of road, on divide, in stump; nail-----	6,136.57
Big Lue ranch, 5.2 miles northeast of, 100 feet north of old saw mill, 4 feet east of road, at junction of creeks; aluminum tablet stamped "5806 PHNX"-----	5,804.953
Big Lue ranch, 1.9 miles northeast of, west side of road, foot of hill, on bowlder; chiseled square-----	5,793.07
Welch ranch, 11.1 miles east of, 100 feet south of old cabin, 100 feet north of road, in sycamore tree; nail-----	4,250.01
Welch ranch, 12.6 miles east of, 150 feet north of river, 100 feet north of road, one-fourth mile west of deserted ranch, under small cliff; iron post stamped "4289 PHNX"-----	4,288.201
Mule Creek, 1 mile west of mouth of, 30 feet west of river, 20 feet west of road, in root of leaning sycamore tree; nail-----	4,318.36
Mule Creek, 0.3 mile east of, 200 feet south of San Francisco River, 30 feet south of road; aluminum tablet stamped "4347 PHNX"-----	4,346.575
Mule Creek, 2.3 miles east of, 100 feet north of river, 10 feet south of road, bowlder; chiseled square-----	4,388.26
Mule Creek, 3.3 miles east of, 100 feet north of river, 30 feet north of road; aluminum tablet stamped "4411 PHNX"-----	4,410.030
Mule Creek, 5 miles east of, 100 feet south of river on south side of road, bowlder; chiseled square-----	4,448.32
Big Dry Creek, 1.5 miles west of, 100 feet north of road, 150 feet north of river, under cliff, 40 feet high; iron post stamped "4483 PHNX"-----	4,482.041
Big Dry Creek, mouth of, 40 feet east of road, in root of sycamore tree; nail-----	4,514.61

Pleasanton, 2.3 miles south of, 200 feet east of river, 30 feet east of road, 60 feet west of cliff, detached boulder; aluminum tablet stamped "4545 PHNX"-----	Feet. 4,544.380
Pleasanton, 0.5 mile south of, 30 feet east of road, in root of cottonwood tree; nail-----	4,567.87
Pleasanton, 150 feet east of Goddard house, 10 feet west of road; iron post stamped "4635 PHNX"-----	4,634.063

## Pleasanton north to Graham and return.

Graham, 0.3 mile south of, 200 feet southwest of Johnson house, 30 feet east of road; iron post stamped "5102 PHNX"-----	5,101.173
Graham, 4 miles south of, at intersection of Alma and Graham roads; aluminum tablet stamped "4746 PHNX"-----	4,745.168

## Pleasanton south via Meader and Wilson ranches to Pina Cienaga.

Pleasanton, 3.2 miles south of, on divide between Pleasanton and Big Dry Creeks, 30 feet north of road; iron post stamped "5052 PHNX"-----	5,051.056
Wilson ranch, 1 mile northwest of, 60 feet north of old road, on flat, in root of lone tree; spike-----	4,978.70
Meader ranch, 30 feet northeast of house; aluminum tablet stamped "4884 PHNX"-----	4,882.680
Meader ranch, 3.2 miles south of, 40 feet north of road, in saddle; iron post stamped "5235 PHNX"-----	5,234.245
Meader ranch, 6.3 miles south of, on divide, 30 feet north of road; iron post stamped "5289 PHNX"-----	5,287.973
L. C. tank, 0.5 mile southwest of, 0.5 mile southwest of junction of Pina Cienaga-Graham road, 300 feet south of old rock house on hill; bronze tablet stamped "5148 PHNX"-----	5,146.876
L. C. tank, 2 miles southwest of, 140 feet east of road, in root of oak tree; nail-----	5,317.21
L. C. tank, 3 miles southwest of, 10 feet east of forks of road, at monument on flat, on stone; chiseled square-----	5,431.66
High Lonesome ranch, southeast corner of house; aluminum tablet stamped "5513 PHNX"-----	5,512.590
High Lonesome ranch, 1 mile south of, 300 feet south of gate, boulder; chisel mark-----	5,545.35
High Lonesome ranch, 3.6 miles southwest of, east bank of Cienaga Creek, 50 feet west of road; aluminum tablet stamped "5337 PHNX"-----	5,336.145
Wilson ranch in Mill Creek, 100 feet north of house, in stump; nail-----	5,419.43
Wilson ranch, 1.9 miles south of, 50 feet south of road, on divide; bronze tablet stamped "5747 PHNX"-----	5,746.455
Wilson ranch, 3.5 miles southeast of, 40 feet south of fence corner, 3 feet west of road, on boulder; chiseled square-----	5,909.44
Pina Cienaga, 2.5 miles north of, 20 feet east of road, on stone; chisel mark-----	6,352.24
Pina Cienaga, 2 miles north of junction of Graham-Silver City roads; bronze tablet stamped "6365 PHNX"-----	6,364.590

Alexander ranch east along highway via Raines ranch to Howard Cienaga, thence northwest along stage road via White House to L. C. tank.

Oldham ranch, 300 feet south of, 30 feet north of gate in yard; chisel mark-----	Feet. 5, 727. 65
Oldham ranch, 1.6 miles east of, at foot of big hill, and at forks of road, on bowlder; chisel mark-----	5, 607. 60
beside monument of stone 3 feet high; aluminum tablet stamped Oldham ranch, 2.6 miles east of, 10 feet north of road on ridge, "6107 PHNX"-----	6, 106. 240
Oldham ranch, 4.9 miles northeast of, 20 feet east of road on summit of divide; aluminum tablet stamped "6411 PHNX"-----	6, 410. 387
Raines ranch, 0.3 mile east of, on small hill in basin, 300 feet north of road, black stone monument; aluminum tablet stamped "5914 PHNX"-----	5, 913. 454
Raines ranch, 2.5 miles east of, hillside 50 feet east of road, on bowlder; chisel mark-----	6, 111. 13
Raines ranch, 5 miles east of, 10 feet east of road, on summit of ridge; iron post stamped "6310 PHNX"-----	6, 309. 597
Raines ranch, 9 miles east of, 30 feet west of road at point where it begins steep descent, bowlder; chiseled square-----	6, 184. 83
White House, about 3 miles south of, 20 feet south of road, at rocky, point, 0.25 mile east of foot of big hill; bronze tablet stamped "5000 PHNX"-----	4, 999. 613
Cliff, 3 miles northwest of, Howard Cienaga, junction of Graham and Blue Creek Roads; iron post stamped "4596 PHNX"-----	4, 595. 330
Cliff, 6 miles northwest of, 30 feet north of road on rocky point along side stone monument, on embedded bowlder; chiseled square-----	4, 754. 33
White House, 1 mile east of, 30 feet south of fence corner, on north side of road, in root of juniper tree; nail-----	4, 662. 20
White House, 100 feet northwest of, at fence corner, on top of embedded bowlder; bronze tablet stamped "4716 PHNX"-----	4, 714. 661
White House, 4 miles west of, 40 feet west of road, bowlder beside stone monument; chiseled square-----	4, 882. 15
White House, 6.5 miles west of, 12 feet south of road, at rocky point, in top of bowlder; aluminum tablet stamped "4981 PHNX"-----	4, 980. 276

#### At Howard Ranch.

Howard ranch, 2 miles north of, end of concrete ridge, 40 feet east of road, east side of Gila River; bronze tablet stamped "4700 PHNX 1903"-----	4, 698. 919
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Howard Cienaga southeast to Cliff, thence north and west up Gila River and Mogollon Creek via Box N and Rice ranches and L. C. pasture to Graham road, 3 miles northwest of L. C. tank.

Bell ranch, 100 yards south of, on edge of mesa, at forks of road; aluminum tablet stamped "4626 PHNX"-----	4, 625. 319
Doyle farm, 60 feet west of house, in root of tree; nail-----	4, 577. 18
Winkler ranch, 1,000 feet west of, 40 feet northwest of fence corner; 10 feet north of road; aluminum tablet stamped "4611 PHNX"-----	4, 610. 433
Mogollon Creek, mouth of, 5 feet east of Russell cabin, on north bank; aluminum tablet stamped "4650 PHNX"-----	4, 649. 455

Russell ranch, 3 miles west of, 20 feet north of road in Mogollon Creek, alongside stone monument; aluminum tablet stamped "4806 PHNX"-----	Feet. 4,805.541
Shelly ranch, 200 feet north of house, in stump; nail-----	5,000.28
Box N ranch, 900 feet south of, south bank of Mogollon Creek, 40 feet above creek bed, 30 feet east of road; aluminum tablet stamped "5099 PHNX"-----	5,098.625
Box N ranch, 3 miles west of, 30 feet north of road, beside stone monument; aluminum tablet stamped "5722 PHNX"-----	5,721.440
Rice ranch, 1.8 miles east of, at northwest corner of Bell's pasture fence, 5 feet north of junction of roads; aluminum tablet stamped "6041 PHNX"-----	6,040.382
Rice ranch, 1.4 miles west of, at junction of roads, 300 feet east of gate to Lyon & Campbell's pasture; aluminum tablet marked "5847 PHNX"-----	5,846.531
Rice ranch, 4.4 miles west of, south side of road, at west gate to Lyon & Campbell's pasture; aluminum tablet stamped "5697 PHNX"-----	5,696.287

## BOYLES QUADRANGLE.

Big Lue ranch along highways up San Francisco River to Pleasanton.

Big Lue ranch, 0.5 mile northeast of, on divide, at intersection of roads; iron post stamped "6101 PHNX"-----	6,099.641
Welch ranch, 8.3 miles north of, 80 feet south of river, 20 feet east of road, in root of cottonwood tree; wire nail-----	4,182.43
Welch ranch, 9.1 miles northeast of, 200 feet south of river, 40 feet south of road, 3 feet south of large boulder under cliff; iron post stamped "4213 PHNX"-----	4,212.078

## STEEPLEROCK QUADRANGLE.

Point 3.3 miles southwest of Steeplerock northeast along highway via Steeplerock and Alexander ranch.

Steeplerock, 3.3 miles southwest of, 550 feet southwest of Imperial mine, 12 feet south of ruins of rock house, 30 feet east of road, 10 feet above creek bed; aluminum tablet stamped "4714 PHNX"-----	4,712.870
Steeplerock, 2 miles south of, third post south of gate to Powell cabin, at junction of drains; spike driven close to ground-----	4,837.70
Steeplerock, northwest corner of store building; aluminum tablet stamped "5133 PHNX"-----	5,132.314
Steeplerock, 0.3 mile east of, 20 feet east of stamp mill, in southwest corner of crown plate of air shaft; spike-----	5,238.28
Steeplerock, 2.2 miles north of, foot of round-topped mountain, west bank of creek, west of and 3 feet above wagon road; aluminum tablet stamped "5439 PHNX"-----	5,438.311
Steeplerock, 3.9 miles north of, summit of Cherry Mountains, west side of road, on rock; chiseled square-----	5,876.11
Steeplerock, 4.3 miles north of, junction of drains, boulder at angle of road; chiseled square-----	5,682.49
Steeplerock, 5.1 miles north of, southeast of ruins of old house, 20 feet south of road; iron post stamped "5787 PHNX"-----	5,786.051

Steeplerock, 6.1 miles north of, 1.5 miles south of Alexander ranch, summit of Bluewater Mountains, at road crossing, stone 4 feet west of road; chiseled square-----	Feet. 6, 184. 38
Steeplerock, 7.4 miles north of, 900 feet south of Alexander ranch house, at intersection of wagon roads; iron post stamped "5868 PHNX"-----	5, 867. 474
Steeplerock, 11 miles north of, 0.8 mile east of Deer Lick Cienaga, 500 feet west of forks of road, on summit of ridge; iron post stamped "6339 PHNX"-----	6, 338. 388

**Mangas Valley west along highway to Duncan.**

Foraker ranch, 3 miles south of, 30 feet west of road, on divide of Burro Mountains; bronze tablet stamped "6350 PHNX 1902"-----	6, 350. 066
Knox ranch, 30 feet south of fence corner, on bowlder; chiseled square-----	5, 946. 384
Knox ranch, 2 miles south of, 100 feet east of road at rocky point; bronze tablet marked "5608 PHNX 1902"-----	5, 607. 884
Brock ranch, 2.8 miles west of, 40 feet east of junction of Gila River and Duncan roads; aluminum tablet stamped "5376 PHNX 1902"-----	5, 375. 812
Brock ranch, 5.5 miles west of, 5 feet north of road crossing; bronze tablet stamped "5006 PHNX 1902"-----	5, 005. 804
Brock ranch, 8.8 miles west of, 10 feet west of road, at trail crossing; aluminum tablet stamped "4698 PHNX 1902"-----	4, 697. 950
Brock ranch, 12.3 miles west of, at road crossing; iron post stamped "4424 PHNX 1902"-----	4, 423. 795
Brock ranch, 15.2 miles west of, junction of old and new Silver City-Duncan roads; iron post stamped "4382 PHNX"-----	4, 381. 566
24 ranch, 7 miles east of, on south bank of drain, 20 feet south of road; iron post stamped "4149 PHNX"-----	4, 148. 284
24 ranch, 4.2 miles east of, 0.3 mile south of two black buttes, on summit of divide, 10 feet south of road; iron post stamped "4130 PHNX"-----	4, 129. 300
24 ranch, 2.5 miles east of, at junction of Lordsburg and Silver City roads, in drain; iron post stamped "4011 PHNX"-----	4, 010. 934
Duncan, 12 miles east of, 40 feet southwest of Catholic Church, 15 feet east of road; iron post stamped "3800 PHNX 1902"-----	3, 799. 774
Wilson ranch, 200 yards south of, end of gravel ridge, 30 feet east of road; iron post stamped "3765 PHNX"-----	3, 764. 465

**Howard Cienaga southeast to Cliff, thence northeast up Gila River.**

Cliff, 1.5 miles north of, 30 feet east of road; at Warm Springs, in root of willow tree; nail-----	4, 540. 13
Cliff, 0.3 mile north of post office, 30 feet west of forks of road, beside stone monument, on top of embedded bowlder; bronze tablet stamped "4522 PHNX"-----	4, 520. 637
Bell ranch, 100 yards south of, on edge of mesa, at forks of road; aluminum tablet stamped "4626 PHNX"-----	4, 625. 319

**Cliff southeast along stage road toward Silver City.**

Gila Hotel, 400 feet south of, at gate, west side of road; iron post stamped "4470 PHNX"-----	4, 469. 043
Gila Hotel, 1 mile south of, at forks of road, bowlder; chiseled square-----	4, 458. 00

Gila Hotel, 2.5 miles east of, forks of Red Barn and Cliff roads, 15 feet north of road, on side of ridge; iron post stamped "4554 PHNX"	Feet. 4, 453. 089
Jones ranch, 600 feet north of house, boulder; chisel mark	4, 692. 03
Metcalf ranch, 3 miles north of, on summit of divide, 15 feet west of road; iron post stamped "4901 PHNX"	4, 900. 038
Menton house, 1,000 feet northwest of, 100 feet south of road; iron post stamped "4771 PHNX"	4, 762. 093

## CAMP VINCENT QUADRANGLE.

Sapello northwest to Gila Forks, thence down Gila River to Mogollon Creek.

Sapello Creek, north bank of, 40 feet south of lower G. O. S. ranch; iron post stamped "5834 PHNX"	5, 832. 934
Brannen ranch, southeast corner of house, south side of Sapello Creek; iron post stamped "5993 PHNX"	5, 991. 884
Hill ranch, on Sapello Creek, 300 yards north of, 10 feet east of road to Hot Springs; iron post stamped "6126 PHNX 1903"	6, 124. 761
Hill ranch, 3 miles north of, 10 feet east of road, near saddle on ridge, beside stone monument; aluminum tablet stamped "7487 PHNX 1903"	7, 486. 109
Hill ranch, 6 miles northwest of, 10 feet south of road, in saddle of ridge; bronze tablet stamped "7382 PHNX 1903"	7, 380. 693
Hill ranch, 10 miles north of, forks of wagon road, north side of saddle; aluminum tablet stamped "7390 PHNX 1903"	7, 389. 015
Gila Hot Springs, 2.5 miles south of, 15 feet east of road on round knob, 60 feet east of section corner marked 111 on east, 1111 on west; aluminum tablet stamped "6484 PHNX 1903"	6, 482. 469
Gila River, forks of, 50 feet west of road on hillside, south bank of east fork; aluminum tablet stamped "5567 PHNX 1903"	5, 565. 365
Gila Forks, 3.25 miles south of, yellow sandstone ledge on west bank of Gila River, opposite deserted ranch house; aluminum tablet stamped "5466 PHNX 1903"	5, 464. 428
Gila Forks, 6.58 miles south of, projection of ledge 30 feet south of road, west side of Gila River; aluminum tablet stamped "5386 PHNX 1903"	5, 384. 578
Gila Forks, 9.39 miles south of, projection of ledge 40 feet north of corral, 50 feet south of road, on east bank of Gila River; bronze tablet stamped "5312 PHNX 1903"	5, 310. 746
Gila Forks, 12.62 miles south of, 250 feet east of log cabin on flat, east side of Gila River; aluminum tablet stamped "5225 PHNX 1903"	5, 223. 784
Sapello Creek, 1 mile west of, detached boulder at foot of hill, 30 feet west of road, west side of Gila River; aluminum tablet stamped "5149 PHNX 1903"	5, 147. 981
Sapello Creek, 4 miles west of, 10 feet south of group of detached boulders, 40 feet east of road on east side of Gila River; bronze tablet stamped "5086 PHNX 1903"	5, 084. 609
Sapello Creek, 8 miles south of, 40 feet east of road, east side of Gila River, large white sandstone boulder; bronze tablet stamped "4991 PHNX 1903"	4, 989. 547
Sapello Creek, 11 miles south of, large sandstone boulder at foot of cliff, north side of road, west side of Gila River; bronze tablet stamped "4914 PHNX 1903"	4, 912. 745



Sapello Creek, 14 miles south of, bench 4 feet above ground, on stone bluff, 30 feet north of road, west side of Gila River; bronze tablet stamped "4835 PHNX 1903"-----	Feet. 4, 833. 546
Turkey Creek, 0.25 mile south of, 40 feet west of road, near rock bluff, west side of Gila River; bronze tablet stamped "4770 PHNX 1903"-----	4, 768. 875

### Chiricahua and San Simon Quadrangles.

#### GRANT COUNTY.

The elevations in the following list are based upon the precise level line along the Southern Pacific Railroad. For additional elevations on these quadrangles refer to level lists in Arizona.

The leveling was done in 1907 by T. A. Green.

#### SAN SIMON QUADRANGLE.

Cienaga north to Paramores ranch.

Cienaga, 250 feet west of, in southeast corner of pasture lot of J. A. Chenoweth's ranch, just northwest of crossroads, in large rock; aluminum tablet stamped "3911 1907"-----	Feet. 3, 921. 732
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Cienaga south 5 miles.

Rodeo, 13 miles north of, Ed Hill ranch, 0.54 mile north of, 10 feet west of road; iron post stamped "3935 1907"-----	3, 945. 700.
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#### CHIRICAHUA QUADRANGLE.

Rodeo north 9.7 miles to bench mark 5 miles south of Cienaga.

Rodeo, 200 feet southeast of station, 230 feet south of track, west side of store and post office kept by A. D. Wallace; iron post stamped "4115 1907"-----	4, 126. 201
Rodeo, 3.77 miles north of, in southeast corner of fence around windmill and water tank; iron post stamped "4052 1907"-----	4, 063. 402
Rodeo, 6.13 miles north of, 40 feet west of road, midway between two trees; iron post stamped "4042 1907"-----	4, 052. 456
Cienaga, 5 miles south of, east side of road, 50 feet west of house occupied by G. W. Shipman, 8 feet west of fence; iron post stamped "4004 1907"-----	4, 014. 964

Alamogordo, Avis, Gypsum Hills, Las Cruces, and Orogrande Quadrangles.

#### DONA ANA AND OTERO COUNTIES.

The elevations in the following list were determined by primary leveling extended from El Paso, Tex., based on an elevation determined by precise leveling. The elevations on line from a point near Newman ranch to Anthony, in the Orogrande and Las Cruces quadrangles, part of a closed circuit, are adjusted. The line along the El Paso & Southwestern Railroad to Alamogordo and along high-

way 10 miles east of Alamogordo in the Alamogordo, Orogrande, and Gypsum Hills quadrangles is a single unchecked line. A circuit was extended from the latter point to Pinon, but on account of an excessive closure error it has not been adjusted. Additional elevations in the Las Cruces quadrangle are given in a list for precise leveling.

The leveling in the Orogrande and Las Cruces quadrangles was done in 1907 by Fred McLaughlin, and that in the Alamogordo, Avis, Orogrande, and Gypsum Hills quadrangles in 1909 by K. W. Trimble.

#### OROGRANDE QUADRANGLE.

State line northeast along El Paso & Southwestern R. R. to point 3.8 miles northeast of Turquoise (part of a single unchecked line from El Paso, Tex., via Alamogordo to point 10 miles southeast of Alamogordo).

	Feet.
Texas-New Mexico boundary line; top of rail opposite line post.....	3,999.7
Newman, in south side of concrete base of water tank; chisel mark, marked "3997.95 B. M.".....	3,997.95
Newman, 2 miles northeast of, at milepost 21, 50 feet west of railroad; iron post stamped "3981".....	3,980.733
Hueco, 0.8 mile southwest of, at milepost 24, 50 feet west of railroad; iron post stamped "4053".....	4,052.642
Hueco, opposite stock pens; top of rail.....	4,072.66
Hueco, 2.2 miles northeast of, at milepost 27, 50 feet west of railroad; iron post stamped "4101".....	4,101.109
Alvarado, opposite signboard; top of rail.....	4,100.7
Alvarado, 0.5 mile northeast of, at milepost 30, 50 feet west of railroad; iron post stamped "4099".....	4,098.963
Desert, 2.5 miles southwest of, at milepost 33, 50 feet west of railroad; iron post stamped "4078".....	4,078.014
Desert, opposite signboard "Desert;" top of rail.....	4,085.2
Desert, 0.7 mile northeast of, at milepost 36, 50 feet west of railroad; iron post stamped "4077".....	4,077.113
Desert, 3.7 miles northeast of, at milepost 39, 50 feet west of railroad; iron post stamped "4085".....	4,085.002
Elwood, 0.5 mile southwest of, at milepost 42, 50 feet west of railroad; iron post stamped "4089".....	4,088.641
Orogrande, 3.2 miles southwest of, at milepost 45, 50 feet west of railroad; iron post stamped "4104".....	4,104.003
Orogrande, in front of station; top of rail.....	4,179.0
Orogrande, 200 feet west of station; iron post stamped "4180".....	4,179.557
Orogrande, 2.8 miles northeast of, at milepost 51, 50 feet west of railroad; iron post stamped "4173".....	4,173.322
Orogrande, 5.8 miles northeast of, at milepost 54, 50 feet west of railroad; iron post stamped "4119".....	4,119.368
Turquoise, 2.8 miles northeast of, at milepost 57, 50 feet west of railroad; iron post stamped "4058".....	4,057.965

Newman ranch northwest along highway to Anthony Pass.

Newman ranch, 1.8 miles west of, 15 feet west of road forks; iron post stamped "4092".....	4,103.237
Newman ranch, 4.8 miles west of, 10 feet south of road; iron post stamped "4301".....	4,313.153

## LAS CRUCES QUADRANGLE.

Anthony Gap west along highways to La Tuna (Anthony post office).

Anthony, 3.7 miles east of, 10 feet north of road, 30 feet north of creek; iron post stamped "4155"-----	Feet. 4, 166. 603
La Tuna (Anthony post office), 33 feet west of track, 4 feet north of Texas-New Mexico line; iron post stamped "3780"-----	3, 791. 743

## GYPSUM HILLS QUADRANGLE.

Point 3.8 miles northeast of Turquoise northeast along El Paso & Southwestern R. R. to point 4 miles northeast of Escondido (part of a single unchecked line from El Paso, Tex., via Alamogordo to point 10 miles southeast of Alamogordo).

Turquoise, 5.8 miles northeast of, at milepost 60, 50 feet west of El Paso & Southwestern R. R.; iron post stamped "4018"-----	4, 017. 504
Escondido, 2 miles southwest of, at milepost 63, 50 feet west of railroad; iron post stamped "4034"-----	4, 033. 979
Escondido, 1 mile northeast of, at milepost 66, 50 feet west of railroad; iron post stamped "4020"-----	4, 019. 788
Escondido, 4 miles northeast of, at milepost 69, 50 feet west of railroad; iron post stamped "4004"-----	4, 004. 193

## ALAMOGORDO QUADRANGLE.

Point 4 miles northeast of Escondido northeast along El Paso & Southwestern R. R. to Alamogordo (part of a single unchecked line from El Paso, Tex., via Alamogordo to point 10 miles southeast of Alamogordo).

Dog Canyon, 3.2 miles southwest of, at milepost 72, 50 feet west of railroad; iron post stamped "4004"-----	4, 004. 118
Dog Canyon, in front of station; top of rail-----	4, 035. 6
Dog Canyon, 150 feet west of station; iron post stamped "4034"-----	4, 033. 588
Dog Canyon, 1.7 miles northeast of, at milepost 78, 50 feet west of railroad; iron post stamped "4072"-----	4, 072. 179
Omlee, opposite signboard; top of rail-----	4, 184. 8
Omlee, 50 feet west of signboard; iron post stamped "4183"-----	4, 182. 926
Alamogordo, 2 miles southwest of, at milepost 84, 50 feet west of railroad; iron post stamped "4295"-----	4, 295. 424
Alamogordo, in front of station; top of rail-----	4, 333. 9
Alamogordo, courthouse, south end of lower stone step of west approach to south entrance; aluminum tablet stamped "4342"-----	4, 341. 810

## Near Alamogordo.

Alamogordo, 1 mile north of, on west end of top stone step of south approach to east entrance of basement of Institute for the Blind; chisel mark-----	4, 363. 61
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Alamogordo southeast via Woods and Atkinson ranches to Alamo lumber camp on Penasco Creek (single, unchecked line).

Alamogordo, 3.5 miles southeast of, on Alamo Canyon road, 50 feet southeast of road fork, on limestone rock; chisel mark, marked "4744.78"-----	4, 744. 78
Alamogordo, 3.7 miles southeast of, at mouth of Alamo Canyon, in north end of east concrete abutment of Alamo Creek conduit; aluminum tablet stamped "4805"-----	4, 804. 522

Alamogordo, 4.7 miles east of, 20 feet south of Alamo Canyon trail, on limestone ledge; chisel mark, marked "5008 B. M."-----	Feet. 5, 008. 02
Alamogordo, 5.6 miles east of, 50 feet east of junction of Alamo and Cabellero canyons, on limestone ledge; chisel mark, marked "5200.73 B. M."-----	5, 200. 73
Alamogordo, 7 miles east of, 10 feet south of Alamo Creek, in Alamo Canyon, in limestone ledge; aluminum tablet stamped "5592"-----	5, 591. 735
Alamogordo, 9 miles east of, 3 feet east of Alamo trail at junction of Gordon Gulch and Alamo Canyon, in limestone ledge; chisel mark, marked "6210.36 B. M."-----	6, 210. 36
Alamogordo, 10.2 miles east of, 100 feet north of Woods ranch house, in sandstone rock; aluminum tablet stamped "7050"-----	7, 049. 680
Alamogordo, 11.1 miles east of, south side of Woods-Atkinson trail, in root of pine tree; nail, marked "7397.8 B. M."-----	7, 397. 82
Atkinson ranch, 0.5 mile west of, on Woods-Atkinson trail at summit of Sacramento Mountain, in root of pine tree; nail, marked "8995.56"-----	8, 995. 56
Alamo Lumber Co. camp on Penasco Creek, 75 feet southeast of stables, in limestone ledge; aluminum tablet stamped "S786"-----	8, 786. 099

Alamo Lumber Co. camp southeast via Rice Canyon, Sacramento River road, and Carissa ranger station to Stephens Lake.

NOTE.—Part of this circuit has an error of 1.9 feet, which has not been adjusted.

Rice Canyon, 1 mile west of mouth, on Rice Canyon road, 15 feet north of road fork, on sandstone rock; chisel mark, marked "8845.65 B. M."-----	8, 845. 65
Alamo Lumber Co. camp, 4 miles southeast of, on Sacramento River road at summit of mountain, 20 feet south of road fork, in limestone rock; aluminum tablet stamped "9498"-----	9, 497. 523
Verdon ranch house, 3.2 miles northwest of, 10 feet north of Sacramento River road, in root of aspen tree; nail, marked "8891.8 B. M."-----	8, 891. 84
Verdon ranch house, 0.4 mile west of, 60 feet northeast of junction of Sacramento River and Wills Canyon roads, in limestone ledge; aluminum tablet stamped "8432"-----	8, 431. 749
Bishop ranch house, 1.1 miles northwest of, 10 feet south of Sacramento River road, in sandstone rock; chisel mark, marked "8089.3 B. M."-----	8, 089. 31
Bishop ranch house, 50 feet west of, 10 feet north of Sacramento River road, in limestone ledge; aluminum tablet stamped "7934"-----	7, 933. 745
Spiller ranch house, 0.2 mile east of, 15 feet north of Sacramento River road, in sandstone rock; aluminum tablet stamped "7426"-----	7, 423. 149
O. M. Lee ranch house, 0.5 mile east of, 100 feet west of mouth of Graveyard Canyon, 20 feet north of Sacramento River road, in sandstone rock; aluminum tablet stamped "7071"-----	7, 071. 138
Key ranch house, 600 feet northeast of, 30 feet north of Sacramento River road, in limestone ledge; chisel mark, marked "6816.45 B. M."-----	6, 816. 45
Carissa ranger station, 200 feet west of, 25 feet south of Sacramento River bed, in limestone ledge; aluminum tablet stamped "6685"-----	6, 685. 268
Fleming ranch house, 0.2 mile east of, 10 feet north of Sacramento River bed, in root of blazed pine tree; nail, marked "6578 B. M."-----	6, 577. 85

Fleming ranch house, 2.5 miles east of, 10 feet south of Sacramento River bed, in limestone ledge; aluminum tablet stamped "6359"---	Feet. 6, 358. 901
Fleming ranch house, 4.6 miles east of, on south side of Sacramento River road, 5 feet south of Sacramento River bed, in limestone; chisel mark, marked "6164.3 B. M."-----	6, 164. 25
Daugherty ranch house, 0.6 mile north of, 100 feet north of Sacramento River road and 150 feet north of Daugherty's tank, in limestone ledge; aluminum tablet stamped "6039"-----	6, 038. 900
Stephens Lake, 3.2 miles west of, 25 feet north of Surveyor Canyon road, in sandstone; chisel mark, marked "6194.2 B. M."-----	6, 194. 16
Stephens Lake, 2.1 miles west of, 70 feet south of Surveyor Canyon road, 25 feet south of Surveyor Canyon Creek, in limestone ledge; aluminum tablet stamped "6352"-----	6, 352. 108
Stephens Lake, 0.8 mile west of, 60 feet south of Surveyor Canyon road, in root of blazed pine tree; nail, marked "6518 O. B. M."---	6, 518. 05

Weed west along highway to Alamo Lumber Co. camp on Penasco Creek.

NOTE.—Part of the circuit has an error of 1.9 feet, which has not been adjusted.

Weed, 4.2 miles west of, 600 feet northwest of junction of Aqua Chiquita and Cloudcroft roads, 20 feet east of Cloudcroft road, in limestone ledge; aluminum tablet stamped "7391"-----	7, 390. 541
Weed, 6.6 miles northwest of, 15 feet north of Weed-Cloudcroft road, on sandstone rock; chisel mark, marked "7857.3 B. M."-----	7, 857. 30
Weed, 7.2 miles northwest of, summit between Aqua Chiquita and Bear canyons, 50 feet west of Weed-Cloudcroft road, in limestone ledge; aluminum tablet stamped "8162"-----	8, 161. 880
Weem's ranch house, 200 feet north of Bear Canyon, 15 feet east of Weed-Cloudcroft road, in root of blazed oak tree; nail, marked "7623 B. M."-----	7, 622. 99
Weed, 9.2 miles northwest of, top of divide between Bear Canyon and Penasco Creek, 25 feet east of Weed-Cloudcroft road; chisel mark on limestone rock; blazed pine tree, marked "7868.3"-----	7, 868. 313
Cox Canyon, 0.2 mile west of mouth, 5 feet north of Penasco Creek road, in limestone ledge; aluminum tablet stamped "7135"-----	7, 135. 286
Alamo Lumber Co. camp, 8.1 miles east of, 15 feet north of Panasco Creek road, in limestone ledge; aluminum tablet stamped "7639"---	7, 638. 979
Alamo Lumber Co. camp, 8.1 miles east of, 15 feet north of Penasco Creek road, in root of blazed pine tree; nail, marked "7786 B. M."---	7, 786. 02
Alamo Lumber Co. camp, 3.9 miles east of, 20 feet north of Penasco Creek road, in limestone ledge; aluminum tablet stamped "8104"---	8, 103. 534
Alamo Lumber Co. camp, on Penasco Creek, 75 feet southeast of stables, in limestone ledge; aluminum tablet stamped "8786"-----	8, 788. 043
Elevation from northwest-----	8, 786. 099

Closure error-----	1. 944
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#### AVIS QUADRANGLE.

Stephens Lake northeast along highway to Pinon, thence northwest to Weed.

Worthington ranch house, 0.3 mile southeast of, 50 feet south of Sacramento-Pinon road, in limestone ledge; aluminum tablet stamped "6520"-----	6, 519. 707
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McElrath ranch, 0.5 mile west of, 10 feet south of Sacramento-Pinon road, in root of blazed pinon tree; nail, marked "6471.7 B. M."----	Feet. 6, 471. 74
McElrath ranch house, 1 mile east of, 30 feet south of Sacramento-Pinon road, in root of blazed pinon tree; nail, marked "6273.1 B. M."-----	6, 273. 11
Wright's ranch house, 300 feet west of, 50 feet south of Sacramento-Pinon road, in limestone rock; aluminum tablet stamped "6164"---	6, 163. 944
Pinon, 0.9 mile west of, 25 feet north of Sacramento-Pinon road, in limestone rock; chisel mark, marked "6031.6 B. M."-----	6, 031. 57
Pinon, 1.4 miles north of, 50 feet east of Pinon-Weed road, in limestone rock; aluminum tablet stamped "6102"-----	6, 101. 856
Pinon, 3.6 miles north of, 5 feet west of Pinon-Weed road, on limestone ledge; chisel mark, marked "6460.5 B. M."-----	6, 460. 48
Pinon, 4.6 miles north of, 10 feet south of Pinon-Weed road, in limestone rock; aluminum tablet stamped "6664"-----	6, 664. 157
Avis, 1.2 miles east of, 15 feet north of Pinon-Weed road, on limestone rock; chisel mark, marked "6684 B. M."-----	6, 684. 07
Avis, 0.2 mile east of, 40 feet north of Pinon-Weed road, in limestone ledge; aluminum tablet stamped "6767"-----	6, 766. 697
Avis, 1.3 miles northwest of, 20 feet south of Pinon-Weed road, in limestone ledge; aluminum tablet stamped "6937"-----	6, 937. 085
Avis, 2.9 miles northwest of, 10 feet east of Pinon-Weed road, on limestone ledge; chisel mark, marked "6870.3 B. M."-----	6, 870. 31
Avis, 3.6 miles northwest of, 20 feet west of Blue Water Canyon road fork, on limestone rock; chisel mark, marked "6814.5 B. M."---	6, 814. 46
Avis, 5.5 miles northwest of, 40 feet south of Pinon-Weed road, at top of divide between Blue Water and Perk canyons, in limestone ledge; aluminum tablet stamped "7290"-----	7, 290. 186
Weed, 3.6 miles southeast of, 30 feet west of Pinon-Weed road, in root of oak tree; nail, marked "6980.1 B. M."-----	6, 980. 10
Weed, 300 feet northeast of post office, 30 feet east of road, in limestone ledge; aluminum tablet stamped "7043"-----	7, 042. 601

**Magdalena, San Marcial, and Socorro quadrangles.**

**SOCORRO COUNTY.**

The elevations in this list are determined by primary leveling connected with the precise-level line over the Atchison, Topeka & Santa Fe Railway, which crosses the San Marcial and Socorro quadrangles.

Leveling in all three quadrangles was done by Chester Irvine in 1904. Additional leveling was done in the Magdalena quadrangle by F. A. Nussle and in the San Marcial quadrangle by B. D. Stewart in 1905.

**SAN MARCIAL QUADRANGLE.**

**Near Socorro.**

Luis Lopez, 4.5 miles south of Socorro, at southwest corner of church; iron post stamped "4575-SOCR-1904"-----	Feet. 4, 580. 227
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## SOCORRO QUADRANGLE.

## Socorro north over Atchison, Topeka &amp; Santa Fe Ry. to Lemitar.

Socorro, 2 miles south of, 40 feet southwest of railroad crossing; iron post stamped "4568-SOCR-1904"-----	Feet. 4, 573. 252
Socorro, in front of station; top of rail-----	4, 587. 4
Socorro, 3 miles north of, 90 feet east of Escondido Church; iron post stamped "4624-SOCR-1904"-----	4, 629. 264
Lemitar, 50 feet southeast of signboard at station; iron post stamped "4618-SOCR-1904"-----	4, 623. 677
Lemitar, 3 miles north of, 40 feet east of railroad crossing; iron post stamped "4636-SOCR-1904"-----	4, 641. 046

## Luis Lopez northwest along road to Socorro Canyon.

Luis Lopez, 1.6 miles northwest of, 5 feet from road, on end of ridge, north side of drain; aluminum tablet stamped "4820-SOCR"-----	4, 825. 414
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## Socorro south and west via Magdalena Branch.

Socorro, 3.5 miles southwest of, 50 feet west of road crossing, near dam in arroyo; iron post stamped "4919-SOCR-1904"-----	4, 924. 766
Socorro, 5 miles southwest of, at southeast corner of old section house; iron post stamped "5159-SOCR-1904"-----	5, 164. 423
Socorro, 7.8 miles southwest of, 30 feet north of, railroad, on flat bench; iron post stamped "5497-SOCR-1904"-----	5, 502. 523

## Socorro north and west along road toward Snake Ranch.

Socorro, in northwest corner of courthouse; aluminum tablet stamped "4610-SOCR-1904"-----	4, 615. 479
New Mexico School of Mines, southeast corner of building; aluminum tablet stamped "4616-SOCR-1904"-----	4, 621. 534
New Mexico School of Mines, 3.5 miles north of, 5 feet south of road, south bank of Nogah Canyon; iron post stamped "4806-SOCR-1904"-----	4, 810. 527
New Mexico School of Mines, 6 miles northwest of, 10 feet south of road on end of ridge; iron post stamped "5115-SOCR-1904"-----	5, 120. 435

## Lemitar west along road toward Polvadera Mountain.

Lemitar, 3 miles west of, 20 feet north of road, 0.8 mile east of foot of mountain; iron post stamped "5101-SOCR-1904"-----	5, 106. 329
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## Escondido east to Ojo de la Parida, thence north 9 miles, thence west to Alamillo.

Publito, 2 miles east of, 10 feet north of wagon road, 150 feet north of drain; iron post stamped "4878-SOCR-1904"-----	4, 883. 376
Ojo de la Parida ranch, 1.5 miles west of, 120 feet east of road forks, end of high ridge; iron post stamped "5188-SOCR-1904"-----	5, 193. 337
Ojo de la Parida, 2.5 miles north of, 50 feet west of road, by mesquite tree on flat; iron post stamped "5118-SOCR-1904"-----	5, 123. 564
Ojo de la Parida, 6 miles northeast of, 10 feet east of ranch, 0.5 mile east of middle one of three hills on flat; iron post stamped "5116-SOCR-1904"-----	5, 121. 513

Ojo de la Parida, 8.5 miles northwest of, 40 feet north of trail, in saddle, south foot of rock butte; aluminum tablet stamped "5184-SOCR-1904" -----	Feet. 5,189.514
Alamillo, 3.5 miles northeast of, alongside blazed cedar tree, on sand mesa; aluminum tablet stamped "4972-SOCR-1904" -----	4,977.284

**Polvadera northwest to San Lorenzo Arroyo.**

Polvadera, 2.2 miles northwest of, 20 feet south of point where road crosses divide to San Lorenzo Arroyo; iron post stamped "4926-SOCR-1905" -----	4,931.127
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**Jaral Largo east to Ojo de las Canas, thence north to Ojo de la Parida.**

Jaral Largo, 0.7 mile northeast of, 150 feet north of Arroyo de las Canas at road crossing of arroyo, about 17 feet above arroyo bed, on point of hill; iron post stamped "4650-SOCR-1905" -----	4,655.400
Ojo de las Canas, 150 feet northwest of spring, 5 feet east of small rock house, in large limestone boulder; aluminum tablet stamped "5050-SOCR-1905" -----	5,055.970
Ojo de las Canas, 4.8 miles north of, 100 feet northeast of township corner T. 2 S., R. 1 E., in rock outcrop; aluminum tablet stamped "5190-SOCR-1905" -----	5,195.955

**MAGDALENA QUADRANGLE.**

**Magdalena Branch of Atchison, Topeka & Santa Fe Railway to Snake ranch.**

Cactus Flat ranch, 2.5 miles west of, 40 feet south of railroad, west foot of small white hill; iron post stamped "5762-SOCR-1904" --	5,767.597
Snake ranch, 800 feet west of, 10 feet south of road from ranch to Magdalena; iron post stamped "5747-SOCR-1904" -----	5,752.611

**Socorro north and west to Snake ranch.**

Snake ranch, 1.6 miles northeast of, 50 feet north of road, summit of high ridge, north foot of Strawberry Peak; aluminum tablet stamped "5921-SOCR-1904" -----	5,925.851
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**Up San Lorenzo Arroyo to San Lorenzo Spring.**

San Lorenzo Spring, 100 feet west of, 10 feet above bottom of wash, 6.1 feet north of northwest corner of adobe ruin; iron post stamped "5438-SOCR-1905" -----	5,442.817
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**San Lorenzo Spring south along road to Snake ranch.**

San Lorenzo Spring, 3.7 miles southwest of, 20 feet east of road, on summit of low ridge; aluminum tablet stamped "5905-SOCR-1905" -----	5,910.395
Snake ranch, 4.4 miles west of north of, 10 feet east of road, on top of low ridge; iron post stamped "6067-SOCR-1905" -----	6,071.818

**Forks of road 1 mile south of San Lorenzo Spring south toward Snake ranch.**

San Lorenzo Spring, 4 miles southwest of, 20 feet south of road, top of main divide, 500 feet south of southeast corner of Sander's fence; iron post stamped "5949-SOCR-1905" -----	5,954.097
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Cactus Flat ranch northwest along railroad to Magdalena, thence southeast via smelter railroad and wagon road to Kelly.

Cactus Flat ranch, 2.5 miles west of, 40 feet south of railroad, about 300 feet north of wagon road, west foot of small white hill; iron post stamped "5762 SOCR 1904"-----	Feet. 5, 767. 597
Cactus Flat ranch, 6.8 miles west of, at southwest corner of section-house fence, 50 feet north of track; iron post stamped "6004 SOCR"-----	6, 009. 287
Water Canyon, 1.8 miles west of, 50 feet north of wagon road, at milepost 995; iron post stamped "5982 SOCR"-----	5, 988. 175
Water Canyon, 4.7 miles west of, at first telegraph pole east of milepost 998, 200 feet north of wagon road; iron post stamped "6034 SOCR"-----	6, 039. 410
Water Canyon, 7.8 miles west of, at crossing of road to Sanders ranch and to Polvadera, near warning post, 1,500 feet north of main road, 6-inch telegraph pole west of milepost 1001; iron post stamped "6267 SOCR"-----	6, 272. 481
NOTE.—The remainder of this line is a spur run direct and reverse.	
Magdalena, at road crossing, set near first telegraph pole east of station; iron post stamped "6556 SOCR"-----	6, 561. 282
Magdalena, 2 miles south of, 1,000 feet north of smelter, near telephone pole, 70 feet east of railroad, 70 feet north of wagon road, near road crossing; iron post stamped "6883 SOCR"-----	6, 887. 990
Kelly, 60 feet north of road, at right turn in road at west side of town, 100 feet west of shed at fence corner, in flat limestone rock 15 feet west of juniper tree; aluminum tablet stamped "7437 SOCR"-----	7, 442. 500
Kelly mine (Tri-Bullion Mining & Development Co.), 300 feet north of office building, 250 feet northwest of mouth of mine, on bank of arroyo near path, in gray porphyry rock ledge; aluminum tablet stamped "7688 SOCR"-----	7, 693.314

Bench mark at road crossing northeast 7.7 miles to La Gencia triangulation station, near Sanders ranch, thence to bench mark on divide on Magdalena-Polvadera Road.

Sanders ranch, 3 miles north of road crossing, at gate to Sanders pasture, 10 feet east of gate; iron post stamped "6014"-----	6, 019. 762
Sanders ranch, about 0.5 mile east of, 8 miles north of road crossing, La Gencia, Triangulation station, at foot of juniper tree, in rock; aluminum tablet stamped "5785 SOCR"-----	5, 790. 661
Sanders ranch, about 4 miles east of, at gate on Water Canyon road, 10 feet north of gate; iron post stamped "5843 SOCR"-----	5, 848. 257
San Lorenzo Spring, 4 miles southwest of, top of main divide, 500 feet south of northeast corner of Sanders ranch fence; iron post stamped "5949 SOCR 1905 No. 3"-----	5, 954. 097

#### Gallina and Jemez Quadrangles.

#### RIO ARRIBA AND SANDOVAL COUNTIES.

The heights in the following list are based on an elevation at Cuba derived by precise leveling from preliminary values of the Coast and Geodetic Survey bench marks at Albuquerque.

The leveling in the Jemez quadrangle was done by M. S. Bright in 1905. That in the Gallina quadrangle was done by Bright in 1905, by A. R. Carver in 1906, and by F. A. Nussle in 1907.

**JEMEZ QUADRANGLE.**

The Divide west via Senorito post office to point 2.5 miles southeast of Cuba.

The Divide, 2 miles southwest of, west side of stream, 80 feet east of corral, 8 feet west of road, in outcrop of limestone rock; aluminum tablet stamped "147"-----	Feet. 8, 480. 501
The Divide, 3 miles southwest of, 6 feet west of road summit, in south root of 28-inch pine tree; nail-----	8, 462. 10
The Divide, 4 miles southwest of, in south root of 26-inch pine tree; nail-----	8, 368. 71
The Divide, 5.25 miles southwest of, about 100 feet south of road, 250 feet north of creek, 25 feet north of old road, in granite outcrop; aluminum tablet stamped "150"-----	8, 167. 333
The Divide, 7.25 miles southwest of, 50 feet north of road, in south root of 28-inch leaning pine tree; nail-----	8, 468. 34
Copper City Gap, 8 feet south of road summit, in north root of 14-inch cottonwood tree; nail-----	8, 733. 81
Copper City Gap, 0.25 mile west of, in canyon, 4 feet south of road, in sandstone outcrop; aluminum tablet stamped "154"-----	8, 664. 779
Copper City Gap, 2.8 miles southwest of, west side of canyon, 8 feet east of road, in west root of 50-inch pine tree; nail-----	7, 583. 74
Senorito post office (Copper City), 25 feet north of north edge of road, in sandstone outcrop; aluminum tablet stamped "157"-----	7, 317. 950
Copper City, 2.5 miles west of, at top of ridge, 150 feet west of road forks; iron post stamped "159"-----	7, 210. 196

**GALLINA QUADRANGLE.**

Cuba southeast 2.5 miles.

Cuba, northeast corner of yard fence around E. A. Miera's residence; iron post stamped "100"-----	6, 898. 051
Cuba north to Gallina, thence southeast 7 miles, thence south to the divide near Penas Negras.	
Cuba, 3.25 miles north of, about 0.25 mile north of road on hillside, south side of ridge, 120 feet east of road, in sandstone outcrop; aluminum tablet stamped "103"-----	7, 163. 150
La Jara, 0.25 mile west of, 150 feet north of lake, at top of slight ridge, 30 feet south of road; iron post stamped "106"-----	7, 119. 163
La Jara, 2.25 miles northwest of, on ridge 10 feet west of road summit, in east root of 28-inch pine tree; nail-----	7, 233. 600
La Jara, 3.25 miles north of, about 700 feet south of road forks, on north slope of hill, 8 feet east of road; iron post stamped "109"-----	7, 220. 713
La Jara, 4.5 miles north of, 25 feet east of road forks, in west side of 30-inch pine tree; nail-----	7, 257. 06
La Jara, 7 miles north of, on spur of ridge 10 feet west of road, 200 feet south of road forks; iron post stamped "112"-----	7, 427. 546
La Jara, 9.25 miles north of, at top of divide, 15 feet east of road, in west root of 22-inch piñon tree; nail-----	7, 565. 81

	Feet.
La Jara, 10.8 miles north of, on ridge, east side of road forks at summit; iron post stamped "115"-----	7, 559. 099
Gallina, 2.3 miles west of, sec. 7, T. 23 N., R. 1 E., on ridge 6 feet south of summit; iron post stamped "118"-----	7, 414. 626
Gallina, 1.2 miles west of, 60 feet southeast of road forks, at south edge of bottom, in north root of 15-inch dead piñon tree; nail-----	7, 291. 37
Gallina, 1 mile east of, sec. 15, T. 23 N., R. 1 E., in lane, 700 feet north of ranch house, 50 feet north of road fork, 8 feet south of fence, in sandstone outcrop; aluminum tablet stamped "121"-----	7, 581. 41
Gallina, 2.25 miles east of, 20 feet north of road, 400 feet west of house, south side of canyon, in north root of 24-inch pine tree; nail-----	7, 617. 79
Gallina, 3.25 miles east of, 300 feet east of road forks, 10 feet south of road, in north side of 30-inch dead pine tree; nail-----	7, 708. 15
Gallina, 4.5 miles east of, at a point where road enters timber, 110 feet east of road forks, 18 feet south of road, in sandstone boulder; aluminum tablet stamped "124"-----	7, 835. 029
Gallina, 7.5 miles east of, in road fork, in sandstone outcrop; aluminum tablet stamped "127"-----	7, 766. 834
Agua Sacra, 1.8 miles south of, 16 feet east of road, north side of canyon, in west root of 24-inch pine tree; nail-----	8, 016. 62
T. 22 N., R. 2 E., sec. 9, 2.5 miles south of Agua Sacra, 430 feet north of canyon, 40 feet west of road, in sandstone outcrop; aluminum tablet stamped "130"-----	8, 150. 214
Rio Paleo Ford, 300 feet east of, in road forks, in east root of 36-inch pine tree; nail-----	7, 970. 62
T. 22 N., R. 2 E., sec. 22, 1.25 miles south of Rio Paleo, 6 feet west of road summit, in gap, set in sandstone rock; aluminum tablet stamped "133"-----	8, 397. 296
Rio Puerco Ford, 1 mile east of, on west side of canyon, 4 feet west of road on south side of river, in east root of 30-inch pine tree; nail-----	8, 183. 89
T. 22 N., R. 2 E., south side of section 35, 2 miles southeast of Rio Puerco Ford, west side of Bonito Canyon, 10 feet west of road, in sandstone outcrop; aluminum tablet stamped "136"-----	8, 182. 354
T. 21 N., R. 2 E., sec. 13, 6 miles south of Rio Puerco Ford, west side of draw, 35 feet west of road at foot of sandstone bluff, 600 feet north of hay field, in sandstone outcrop; aluminum tablet stamped "140"-----	8, 595. 816
Rio Puerco Ford, 7.8 miles south of, in gap on west side of road summit, in east root of 38-inch pine tree; nail-----	8, 954. 69
T. 21 N., R. 2 E., sec. 27, 160 feet east of Penas Negras ranch house, 10 feet west of road, in west side of canyon, in limestone outcrop; aluminum tablet stamped "143"-----	8, 702. 186
The Divide, in gap at top of, 45 feet west of road summit, at base of 30-inch pine tree, on limestone boulder; center of paint circle-----	9, 027. 20
Gallina north to point 3 miles north of Ferran ranch, thence east to mouth of Rio Puerco, thence southeast and southwest to Coyote, thence west to point 7.5 miles east of Gallina.	
Rock Hut, 150 feet west of, 35 feet west of road, 160 feet north of forks, 200 feet east of river, on granite boulder; center of paint circle-----	7, 219. 04
Leon Belarde ranch house, 1 mile northeast of, 900 feet north of road forks, east toe of hill, 10 feet west of road; iron post stamped "165"-----	7, 161. 229

Ferran ranch house, 0.25 mile south of, west toe of hill, north side of road, 165 feet north of forks, set in sandstone outcrop; aluminum tablet stamped "168"-----	Fect. 6,980.399
Ferran ranch, 3 miles north of, on west side of river in road forks; iron post stamped "171"-----	6,883.324
Head of canyon on Gallina River, 1 mile east of, on south side of canyon 60 feet south of river, in willow grove; iron post stamped "174"-----	6,782.014
Head of canyon on Gallina River, 2.8 miles east of, 60 feet north of road, on north side of river, about 0.5 mile west of ranch house, in east side of 14-inch leaning cottonwood tree; nail-----	6,740.78
Chupadero ranch, 1.25 miles east of, about 200 feet north of wall of canyon, 70 feet south of river, between two cottonwood trees; iron post stamped "177"-----	6,644.993
Chupadero ranch, 4.25 miles east of, about 500 feet east of old gate and fence, 150 feet west of Sagebrush Flat, 300 feet south of river, 5 feet north of 14-inch leaning piñon tree, 6 feet south of road; iron post stamped "180"-----	6,499.569
Mouth of Gallina River, 1.25 miles southeast of, 60 feet east of road, 75 feet east of pole hut on west bank of Chama River, in west root of 14-inch double post-oak tree; nail-----	6,419.31
Mouth of Gallina River, 1.8 miles southeast of, in timber on hill-side 60 feet south of edge of bluff, 10 feet south of road; iron post stamped "183"-----	6,449.658
Burns ranch, 0.6 mile west of, 5 miles east of mouth of Gallina River, 125 feet south of flume, 50 feet south of road, 8 feet north of wire fence, on east bank of wash, on sandstone; center of cross-----	6,392.80
Burns ranch, 0.6 mile west of, 5 miles east of mouth of Gallina River, 125 feet south of flume, 50 feet south of road, 9 feet north of wire fence, in east bank of wash, in sandstone 6 inches east of cross; aluminum tablet stamped "187½"-----	6,392.918
Burns ranch house, 0.8 mile southeast of, 20 feet east of gate at south entrance to farm, in west root of 24-inch cottonwood tree; nail-----	6,303.88
Burns ranch, 2.8 miles east of, 200 feet north of river, 75 feet north of road, at foot of hills, in limestone rock 6 inches west of painted circle; aluminum tablet stamped "190½"-----	6,269.290
Burns ranch, 7 miles southeast of, 250 feet east of cut, on south edge of railroad grade, in sandstone outcrop at foot of bluffs, 6 inches south of painted circle; aluminum tablet stamped "194½"-----	6,175.725
Mouth of Rio Puerco, 0.8 mile south of, east of river, 60 feet south of old house, in sandstone outcrop 6 inches west of painted circle; aluminum tablet stamped "196½"-----	6,208.783
Gallegos ranch, about 4.5 miles southeast of, northeast side of cross-roads, mound on north and pit on east, in sandstone; aluminum tablet stamped "198½"-----	6,528.719
Gallegos ranch, 7.8 miles southeast of, in forks of Coyote and Abiquiu and Coyote and Amarilla Roads, in volcanic rock 2 inches west of paint circle; aluminum tablet stamped "201½"-----	6,847.643
Rito, 0.8 mile southwest of, 200 feet south of road, 100 feet west of stream, in east root of 14-inch post-oak tree; nail-----	6,712.29
Rito, 2 miles southwest of, 40 feet west of road, west side of ridge, in sandstone boulder 12 feet north of volcanic boulder; aluminum tablet stamped "204½"-----	6,652.977

Coyote, 1.25 miles southwest of, 25 feet north of road, in sandstone outcrop 1 foot north of paint circle; aluminum tablet stamped "207½"-----	Feet. 6, 771. 946
Coyote, 4.8 miles west of, south edge of road, 12 feet northeast of leaning piñon tree 14 inches in diameter; in sandstone boulder; aluminum tablet stamped "210½"-----	7, 290. 395
Coyote, 6.8 miles west of, 30 feet north of road, in west root of 18-inch piñon tree; nail-----	7, 760. 64

Point 3 miles north of Ferran ranch north 9 miles along Elvado Road.

Ferran ranch, 3 miles north of, in road forks; iron post-----	6, 883. 324
Ferran ranch, 5.7 miles north of, 300 feet east of Little Gallina Arroyo, in road forks west of point of ridge; iron post stamped "6941"-----	6, 950. 118
Ferran ranch, 8.4 miles north of, 500 feet east of sandstone bluff, 75 feet south of summit, in road forks; iron post stamped "7289"-----	7, 298. 320
Ferran ranch, 11.2 miles north of, 10 feet east of road, 20 feet southwest of blazed piñon tree, on top of ridge; iron post stamped "9"-----	7, 153. 147

Point 3 miles north of Ferran ranch north 10 miles along Stinking Lakes Road.

Ferran ranch, 5.6 miles north of, 20 feet east of road, 30 feet southeast of blazed cedar tree, in top of sandstone outcrop; aluminum tablet stamped "114"-----	7, 035. 647
Ferran ranch, 8.1 miles north of, 100 feet east of road, on top of ridge, 20 feet east of blazed cedar tree, in top of sandstone boulder; aluminum tablet stamped "112"-----	7, 159. 714
Ferran ranch, 11 miles north of, 10 feet west of road, on top of ridge, 30 feet southwest of blazed piñon tree, in top of limestone outcrop; aluminum tablet stamped "109"-----	7, 318. 150

Dulce, Flora Vista, Monero, Stony Butte, and Turley Quadrangles.

RIO ARRIBA AND SAN JUAN COUNTIES.

The elevations in the following list are based on an elevation at Cuba determined by precise leveling from Yuma, checked by and adjusted to preliminary heights of bench marks near Albuquerque determined by precise leveling of the Coast and Geodetic Survey in 1909-10, through primary levels in the Gallina quadrangle. Several yard errors occurred during the progress of this work, most of which have been rectified upon final computation and by the rerunning of certain portions by Nussle, but there still remains an uncertainty of 3 feet in the elevations given in part of this list, which can not be corrected unless further field work is done.

Most of the leveling was done in 1906 by A. R. Carver. A part of that in the Monero and Dulce quadrangles was done in 1907 by Fred A. Nussle.

## MONERO QUADRANGLE.

Point 12 miles north of Ferran ranch north to Elvado, thence west around Middle Stinking Lake and south to point 11 miles north of Ferran ranch.

Ferran ranch, 15.3 miles north of, 10 feet east of road on top of small summit, 500 feet east of sandstone bluff; iron post-----	Feet. 6, 935. 918
Elvado, 3.1 miles south of, 10 feet east of road on top of ridge, 20 feet west of dead piñon tree; iron post-----	7, 248. 601
Elvado, railroad crossing; top of east rail-----	6, 794. 68
Elvado, Burns & Biggs Lumber Co.'s store, at northwest corner; iron post-----	6, 807. 665
Horse Lake Junction, 3.6 miles south of, 60 feet east of track, 75 feet south of arroyo; iron post stamped "86"-----	6, 857. 702
Ferran ranch, 28 miles north of, 75 feet north of road, 75 feet south of foot of sandstone bluff; iron post stamped "B. M. 90"-----	7, 068. 867
Middle Stinking Lake; surface of water, Aug. 26, 1906-----	7, 093
Stinking Lake, 1,000 feet west of, at foot of sandstone bluff, 5 feet east of road, in top of sandstone boulder; aluminum tablet stamped "93"-----	7, 120. 750
Stinking Lake, 3 miles west of, 15 feet north of road, top of ridge, in top of sandstone boulder; aluminum tablet stamped "96"-----	7, 137. 101
Stinking Lake, 5 miles west of, 10 feet west of road, on top of ridge; nail in east root of 18-inch cedar tree, marked "B. M.-98"-----	7, 170. 66
Stinking Lake, 6 miles west of, 75 feet north of road, on side of ridge, in top of granite boulder; aluminum tablet stamped "99½"-----	7, 161. 400
Stinking Lake, 7 miles southwest of, 10 feet east of road; nail in east root of 12-inch pine tree, marked "B. M. 100"-----	7, 231. 05
Stinking Lake, 9 miles southwest of, 60 feet west of road, at south-east end of ridge, in base of large sandstone boulder; aluminum tablet stamped "102"-----	7, 117. 730
Stinking Lake, 12 miles southwest of, 12 feet west of road, 100 feet west of corral, 100 feet north of ridge, in top of sandstone outcrop; aluminum tablet stamped "106"-----	7, 002. 887
Stinking Lake, 3.1 miles west of, 100 feet north of road, on side of hill, in top of sandstone boulder; aluminum tablet stamped "119"-----	7, 201. 896

Elvado north to Lumberton, thence northwest to Dulce, thence south to Elvado.

Gurule ranch, 1.2 miles north of, 9 feet west of road, 15 feet south of bridge over arroyo, on top of small hill; iron post stamped "22"-----	6, 918. 829
Gurule ranch, 2.8 miles north of, 10 feet north of road at summit, 5 feet south of blazed piñon tree, 0.8 mile west of road forks; top of stake-----	7, 042. 99
Gurule ranch, 4.4 miles north of, 12 feet west of road, 10 feet east of arroyo, 1 mile north of railroad; iron post 25-----	7, 050. 902
Gurule ranch, 7.5 miles north of, 42 feet east of railroad track, 10 feet east of road; iron post-----	7, 288. 272
Gurule ranch, 10.7 miles north of, at summit, 10 feet west of road, in east root of 22-inch pine stump; nail-----	7, 459. 86
Gurule ranch, 11.3 miles north of, 12 feet east of road, 21 feet south of scrub white oaks, 100 feet west of black butte; iron post--	7, 543. 173

Gurule ranch, 13.3 miles north of, 6 feet east of road on side of small ridge, in west root of 22-inch dead pine tree; nail-----	Feet. 7,625.92
Horse Lake, 500 feet south of, in road forks; iron post 35-----	7,684.933
Horse Lake, surface of water, August 11, 1906-----	7,669.36
Horse Lake, 2.4 miles north of, at summit, 12 feet east of road; iron post 38-----	7,631.759
Horse Lake, 3.4 miles north of, 30 feet east of road, on side of ridge, in west root of 22-inch pine tree; nail-----	7,598.63
Horse Lake, 4.4 miles north of, 50 feet east of road, 300 feet east of log cabin, 50 feet west of corral, in east root of 22-inch pine tree; nail-----	7,523.64
Horse Lake, 5.3 miles north of, in road forks, at summit; iron post 41-----	7,699.976
Monero, 66 feet west of Denver & Rio Grande Ry. track, 15 feet east of Rio Arriba Coal Co.'s store, 6 feet northeast of steps; iron post 44-----	7,246.866
Monero, in front of station; top of rail-----	7,245.03
Monero, 3.4 miles northwest of, 0.1 mile south of milepost D-367, opposite Amargo signboard, 75 feet west of track, in line of telegraph poles; iron post 48-----	7,000.055
Amargo, in front of signboard; top of rail-----	7,003.20
Lumberton, in front of station; top of rail-----	6,849.15
Lumberton, at northwest corner of Archuleta Mercantile Co. store; iron post 51-----	6,847.102
Lumberton, 50 feet north of station; United States Geological Survey astronomical station; bronze tablet stamped "L 36-55-48, L 106-56-15, 1897"-----	6,849.917
Lumberton, 0.4 mile west of, United States Geological Survey triangulation station west base, 60 feet south of track; iron post-----	6,840.711
Dulce, 3.5 miles southeast of, at summit, 10 feet east of road, 30 feet northwest of pine tree; iron post 59-----	7,198.890
Dulce, 4.5 miles southeast of, 6 feet east of road, in flat draw, in top of 10-inch pine stump; nail-----	7,205.19
Dulce, 6.7 miles southeast of, 30 feet east of road, 60 feet east of Burns-Biggs Lumber Co.'s track, on side of knoll; iron post-----	7,277.877
Dulce, 10 miles southeast of, 50 feet east of track, 25 feet east of trail, on side of ridge; iron post stamped "65"-----	7,603.812
Dulce, 12.9 miles southeast of, 30 feet west of track, at summit; iron post stamped "68"-----	7,671.946
Dulce, 16 miles southeast of, 50 feet east of track, on side of ridge; iron post stamped "71"-----	7,577.700
Dulce, 19.2 miles southeast of, 50 feet east of track, 1,000 feet south of sandstone bluff, on grade; iron post stamped "74"-----	7,262.777
Dulce, 23.4 miles south of, 50 feet east of track, 10 feet south of arroyo at summit; iron post stamped "78"-----	7,149.805
Horse Lake Junction, 75 feet west of track, 30 feet east of road; iron post stamped "82"-----	6,989.654

## Lumberton north to Edith.

Edith, northwest corner of New Mexico Lumber Co.'s commissary building, in top of sandstone post; aluminum tablet stamped "314"-----	7,037.456
Edith, 3.8 miles south of, in road forks, 75 feet west of track, in top of sandstone post; tablet stamped "317"-----	6,966.414

## DULCE QUADRANGLE.

Dulce northwest along railroad to Colorado line.

Dulce, at northwest corner of Jicarilla Apache Indian agency; iron post-----	Feet. 6, 769. 086
Navajo River, surface of water, July 19, 1907-----	6, 570
Navajo, pump house, 150 feet north of track, 50 feet north of road; 125 feet northwest of signboard "Navajo," in sandstone boulder; aluminum tablet-----	6, 582. 809
Milepost 384, 250 feet southeast of, 30 feet north of track, in sandstone boulder; aluminum tablet-----	6, 414. 815

Point 4 miles west of Stinking Lakes west along road to point 40 miles west of Stinking Lakes.

Stinking Lakes, 5 miles west of, 100 feet south of road, in north root of 20-inch pine tree; nail, marked "B.M. 121"-----	7, 303. 54
Stinking Lakes, 5.8 miles west of, 75 feet north of road, in top of sandstone boulder; aluminum tablet stamped "122"-----	7, 337. 534
Stinking Lakes, 7 miles west of, 10 feet south of road, near top of Continental Divide, in root of 36-inch pine tree; nail, marked "B.M. 123"-----	7, 481. 77
Stinking Lakes, 9 miles west of, 15 feet south of road, on side of hill, in top of sandstone outcrop; aluminum tablet stamped "125"-----	7, 248. 525
Stinking Lakes, 12 miles west of, 15 feet south of road, on top of ridge, 30 feet northeast of dead pine tree, in top of sandstone outcrop; aluminum tablet stamped "128"-----	7, 132. 637
Stinking Lakes, 15.8 miles west of, 18 feet north of road, in gap, in top of sandstone outcrop; aluminum tablet stamped "131"-----	7, 062. 747
Stinking Lakes, 17.8 miles west of, 30 feet north of road, 0.5 mile west of top of divide, in root of 16-inch pine tree; nail, marked "B.M. 133"-----	7, 267. 09
Stinking Lakes, 18.8 miles west of, 75 feet north of road, on side of hill, 1,000 feet west of road forks, in top of sandstone boulder; aluminum tablet stamped "134"-----	7, 198. 070
Stinking Lakes, 19.9 miles west of, 30 feet south of road; in base of 16-inch pine tree; spike marked "B.M. 135"-----	7, 238. 34
Stinking Lakes, 20.2 miles west of, 15 feet south of road, 200 feet west of road forks, 30 feet northeast of blazed pine tree, in top of sandstone outcrop; aluminum tablet stamped "136"-----	7, 224. 699
Stinking Lakes, 21.2 miles west of, 15 feet south of road, in south root of 24-inch pine tree; nail, marked "137"-----	7, 222. 00
Stinking Lakes, 23.3 miles west of, 10 feet east of road, on top of divide, in west root of 16-inch pine tree; nail, marked "B.M. 139"-----	7, 515. 35
Stinking Lakes, 24.4 miles west of, 10 feet east of road, on side of ridge, in top of large sandstone outcrop; aluminum tablet stamped "140"-----	7, 497. 076
Stinking Lakes, 27.6 miles west of, 15 feet north of ridge, 30 feet north of arroyo, in Munyon's Canyon, in top of sandstone boulder; aluminum tablet stamped "143"-----	6, 782. 754
Stinking Lakes, 30.9 miles west of, 10 feet north of road, on side of ridge, in top of large sandstone outcrop; aluminum tablet stamped "146"-----	6, 780. 831
Stinking Lakes, 34.6 miles west of, 30 feet north of road, 80 feet north of small lake, in top of sandstone outcrop; aluminum tablet stamped "150"-----	6, 479. 142



Stinking Lakes, 38.2 miles west of, 15 feet south of road, on toe of ridge, in top of sandstone boulder; aluminum tablet stamped "153" -----	Feet. 6, 348. 356
Stinking Lakes, 40.5 miles west of, 30 feet south of road, at base of sandstone bluff, in top of sandstone outcrop; aluminum tablet stamped "156" -----	6, 272. 242

## TURLEY QUADRANGLE.

Point 44 miles west of Stinking Lakes northwest to Archulite ranch, thence southwest to point 7 miles southwest of Blanco, thence north via Aztec to Colorado line.

Stinking Lakes, 43.7 miles west of, 10 feet north of road forks at base of sandstone cliff, in top of sandstone boulder; aluminum tablet stamped "159" -----	6, 211. 469
Lake Gomez, 90 feet east of, 50 feet east of road, 90 feet west of corral, 150 feet west of hut, in top of sandstone boulder; aluminum tablet stamped "162" -----	6, 114. 913

NOTE.—Arbitrary adjustment of 3 feet was placed here on account of color discrepancy.

Lake Gomez, 3 miles west of, 75 feet north of road, at base of sandstone cliff, where road comes out of arroyo, in top of sandstone boulder; aluminum table stamped "164" -----	5, 966. 609
Lake Gomez, 6 miles west of, 10 feet south of road, on top of ridge, in top of sandstone outcrop; aluminum tablet stamped "167" -----	5, 848. 264
Archulite ranch, 150 feet east of house, 200 feet south of corral, on small knoll, in top of sandstone outcrop; aluminum tablet stamped "169" -----	5, 667. 669
Archulite ranch, 2.9 miles west of, top of mesa, in top of sandstone outcrop; aluminum tablet stamped "171" -----	5, 715. 448
Adobe house, 600 feet west of, in road forks, in top of sandstone outcrop; aluminum tablet stamped "174" -----	5, 631. 394
Blanco, at southeast corner of F. T. Amiot's store, in top of sandstone outcrop; aluminum tablet stamped "178" -----	5, 561. 000
Blanco, 3.1 miles south of, 20 feet north of road, on west bank of arroyo, in top of large sandstone boulder; aluminum tablet stamped "181" -----	5, 552. 024
Blanco, 6.9 miles southwest of, in crossroads, 100 feet south of old foundation, in sandstone outcrop in top; aluminum tablet stamped "184" -----	5, 510. 473
Aztec, 5.5 miles south of, 10 feet north of road, 75 feet east of arroyo, in top of sandstone outcrop; aluminum tablet stamped "188" -----	5, 698. 534
Aztec, 5.8 miles northeast of, in road forks, 100 feet west of milepost D-476; iron post stamped "199" -----	5, 786. 939
Aztec, 5.8 miles northeast of, 50 feet west of milepost D-473, in line of telegraph poles; iron post stamped "202" -----	5, 831. 633
Aztec, 11.9 miles northeast of, 6 feet south of fourth telegraph pole north of milepost D-470; aluminum tablet stamped "205" -----	5, 897. 205

Colorado-New Mexico line near La Boca, Colo., south to Archulite ranch.

La Boca, 2.6 miles south of, 15 feet east of road in river bottom, in base of dead cottonwood tree; spike, marked "B. M. 337" -----	6, 090. 55
Louis F. Welmar ranch, in road forks; iron post stamped "338" -----	6, 062. 496

Welmar ranch, 3.2 miles south of, 10 feet west of road, in base of cottonwood tree; spike, marked "B. M. 340"-----	Feet. 5,981.42
Welmar ranch, 4.4 miles south of, 15 feet west of road, in base of cottonwood tree; spike, marked "B. M. 341"-----	5,949.26
Welmar ranch, 6.3 miles south of, 20 feet east of road; iron post stamped "343"-----	5,901.278
Lopez ranch, 1.7 miles south of, 10 feet west of road, in top of south point of large sandstone bowlder; aluminum tablet stamped "346"-----	5,821.195
Pine River and San Juan River, forks of, 4 feet north of Walter Von Buddenbrock ranch house; iron post stamped "348"-----	5,769.655
Von Buddenbrock ranch, 3.2 miles southwest of, 20 feet north of road, at base of sandstone bluff, opposite fence corner, in top of sandstone bowlder; aluminum tablet stamped "350"-----	5,737.386
Von Buddenbrock ranch, 4.8 miles west of, 10 feet west of road, near top of ridge, in small piñon tree; 8-penny nail, marked "B. M. 351"-----	5,780.56
Von Buddenbrock ranch, 6.1 miles west of, at base of hill at fence corner, in top of large sandstone bowlder; aluminum tablet stamped "352"-----	5,724.635

## FLORA VISTA QUADRANGLE.

Point 2.2 miles south of Aztec north via Aztec to point 3.4 miles northeast of Aztec.

Aztec, 2.2 miles south of, 75 feet east of road forks, on side of ridge, in top of sandstone outcrop; aluminum tablet stamped "191"-----	5,756.817
Blanco, 15.7 miles west of, 60 feet west of track, near road forks, in ground at base of telephone pole, hub; marked "B.M. 5643.84" (railway bench mark)-----	5,634.87
Aztec, northwest corner of courthouse; iron post stamped "193"-----	5,647.739
Aztec, 1.9 miles north of, on east guard rail on bridge, 500 feet north of milepost "D-480," top of south bolthead; marked "B.M. 195"-----	5,699.20
Aztec, 3.4 miles northeast of, in line of telegraph poles, 0.4 mile north of milepost D-479; iron post stamped "196"-----	5,753.462

Point 7 miles southwest of Blanco west to Farmington, thence northeast to Aztec.

Bloomfield, 1 mile west of, 15 feet north of road, 50 feet north of fence corner; iron post stamped "358"-----	5,427.092
Bloomfield, 5.3 miles west of, 10 feet north of road, on top of ridge; iron post stamped "362"-----	5,575.525
Farmington, 5.1 miles east of, 15 feet north of road, at base of ridge; iron post stamped "365"-----	5,317.938
Farmington, 2.5 miles east of, in road forks, at fence corner; iron post stamped "367"-----	5,371.800
Farmington, 0.4 mile east of, 20 feet south of railway, in base of cottonwood stump; tenpenny nail, marked "5286.83" (railroad bench mark)-----	5,289.66
Farmington, 12 feet north of city hall; iron post stamped "370"-----	5,308.988
Farmington, in cement door sill of the Pierce Mercantile Co. store; aluminum tablet stamped "371"-----	5,309.914
Farmington, 3.1 miles north of, 20 feet west of milepost D-493, 15 feet east of wagon road; iron post stamped "374"-----	5,364.105

Farmington, 4.1 miles north of, 10 feet west of milepost D-492, in base of telegraph pole; spike, marked "5385.80" (railroad bench mark)-----	Feet. 5, 375. 48
Farmington, 6.1 miles north of, 75 feet west of wagon road, 50 feet east of railroad at milepost D-490; iron post stamped "377"-----	5, 457. 345
Flora Vista, at northeast corner of Mullarky's general store; iron post stamped "380"-----	5, 507. 099
Flora Vista, 1.5 miles north of, at milepost D-486, in base of telegraph pole; spike, marked "5525.18" (railroad bench mark)-----	5, 514. 70
Flora Vista, 3.5 miles north of, 15 feet west of wagon road, 50 feet east of railroad track, at fence corner; iron post stamped "384"-----	5, 590. 277

Point 3 miles west of Bloomfield south to Simpson's trading station, thence southwest to triangulation station, thence north to Farmington (azimuth).

Bloomfield, 3 miles west by 3 miles south of, 20 feet west of road, on top of ridge; iron post stamped "387"-----	5, 494. 040
Bloomfield, 3 miles west by 7 miles south of, 15 feet east of road, on top of ridge; iron post stamped "391"-----	5, 831. 870
Bloomfield, 3 miles west by 10 miles south of, 15 feet east of road, top of small ridge; iron post stamped "394"-----	5, 770. 590
Simpson's trading post, 20 feet southeast of store; iron post stamped "396"-----	5, 734. 488
Simpson's, 3.2 miles southwest of, 1,000 feet northeast of road forks, 20 feet north of road; iron post stamped "399"-----	5, 985. 638
Simpson's, 6.9 miles south of, 20 feet west of road, on small ridge; iron post stamped "402"-----	6, 267. 650
Farmington, 21.53 miles south of, 20 feet east of road, at foot of large sand hill; iron post stamped "408"-----	6, 268. 082
Azimuth triangulation station, 18.43 miles southwest of Farmington, 0.6 mile east of Liznizsin Road, in top of sandstone boulder; aluminum tablet stamped "411"-----	6, 218. 402
Farmington, 14.8 miles southwest of, 20 feet east of road, on small ridge; iron post stamped "415"-----	5, 962. 722
Farmington, 11.6 miles southwest of, 20 feet east of road; iron post stamped "418"-----	5, 790. 079
Dune triangulation station, 8.2 miles southwest of Farmington, 1 mile southeast of road forks of Simpson and Gallup Roads, 70 feet south of Simpson Road; iron post stamped "421"-----	6, 078. 897
Farmington, 7.2 miles southwest of, in road forks of Simpson and Gallup Road forks; iron post stamped "422"-----	5, 982. 742
Farmington, 6 miles southwest of, top of long hill, 10 feet south of road, in top of rim rock; aluminum tablet stamped "423"-----	5, 763. 950
Farmington, 2.7 miles west of, at road forks, 30 feet west of fence; iron post stamped "426"-----	5, 244. 298
Farmington, 2.5 miles west of, 60 feet south of road, near road forks of La Plata and Gallup Roads, in stump of cottonwood tree; spike, marked "5265.06" (old railway bench mark)-----	5, 268. 31

#### STONY BUTTE QUADRANGLE.

Bench mark near Simpson triangulation station (portion of circuit—Bloomfield to Farmington).

Simpson triangulation station, 9.9 miles south of Simpson's, 150 feet north of road, on edge of high mesa; iron post stamped "405"-----	6, 582. 8
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