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PRECISE LEVELING FROM RENO TO LAS VEGAS, NEV. AND FROM TONOPAH JUNCTION, NEV. TO LAWS, CAL.

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Special Publication No. 39

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PRECISE LEVELING FROM RENO TO LAS VEGAS, NEV., AND FROM TONOPAH JUNCTION, NEV., TO LAWS, CAL.*

By H. G. Avers, Computer, and G. D. Cowie, Assistant,
United States Coast and Geodetic Survey.

GENERAL STATEMENT.

This publication gives the results of a line of levels between Reno and Las Vegas, Nev., and a spur line between Tonopah Junction, Nev., and Laws, Cal., run by a party of this Survey under the charge of Assistant George D. Cowie during the season of 1915. The line was run over the tracks of the Virginia & Truckee Railway from Reno to Mound House, Nev.; the Southern Pacific Railway from Mound House, Nev., to Laws, Cal.; the Tonopah & Goldfield Railroad from Tonopah Junction to Goldfield, Nev.; the Las Vegas & Tonopah Railway from Goldfield to Wagner, Nev.; the Bullfrog & Goldfield Railroad from Wagner to Beatty, Nev.; and the Las Vegas & Tonopah Railway from Beatty to Las Vegas, Nev. The line from Reno to Las Vegas, Nev., has a length, including spur lines, of 472 miles (760 kilometers) and fixes the elevations of 197 permanent bench marks. The spur line from Tonopah Junction, Nev., to Laws, Cal., has a length of 75 miles (120 kilometers) and fixes the elevations of 31 permanent bench marks.

The engineer who wishes only to obtain the standard elevations of the bench marks and their descriptions may find the desired data on pages 28 to 44. At the back of this volume there is given an index which enables one to find easily the pages on which are the elevations and descriptions of marks at any particular place.

STANDARD ELEVATIONS.

There have been four general adjustments of the precise levels of the United States, each succeeding one having been made necessary by important additions to the net. The last adjustment showed the net to be sufficiently strong to serve without change (except for disturbed local areas) for giving fixed or standard elevations to the

* For other elevations in California and Nevada see United States Coast and Geodetic Survey Special Publications Nos. 18 and 22 and United States Geological Survey Bulletins Nos. 342, 481, and 488.

public. To this net, as fixed by the 1912 adjustment (the results of which are shown in Special Publication No. 18, of the Coast and Geodetic Survey), will be adjusted the separate lines as they may be run in the future.

The line from Reno to Las Vegas, Nev., has been fitted in or adjusted to the standard elevation of bench mark H_9 at Reno, Nev., and the standard elevation of bench mark P at Las Vegas, Nev. As the line from Tonopah Junction, Nev., to Laws, Cal., is not part of a loop, the elevations on it are based upon the elevation of bench mark U_{12} at Tonopah Junction as determined by the line from Reno to Las Vegas, Nev.

The elevations given on pages 28 to 44 of this publication are considered as standard or fixed.

From time to time in the future, general adjustments of the level net will no doubt be made in order to obtain the theoretically best elevations of the junction points, but such adjustments will not disturb the standard elevations, unless they are found to be greatly in error on account of blunders in the leveling or due to the rising or settling of the bench marks from earthquake disturbances or the operations of man. Occasionally the elevations of bench marks are changed by mining operations, drainage, and other local agencies.

ORTHOMETRIC CORRECTION.

The orthometric correction was applied to the observed differences in elevation shown on pages 8 to 24 before they were adjusted between the Reno and Las Vegas elevations. This correction eliminates from the observed results the effect of the convergence of level surfaces as the poles of the earth are approached, and the elevations obtained represent the vertical distances of the points above mean sea level. (See p. 49, Special Publication No. 18.)

The orthometric correction on the line Reno to Las Vegas, Nev., is +0.3779 meter; on the line Tonopah Junction, Nev., to Laws, Cal., it is +0.1233 meter.

DETAILED STATEMENT OF RESULTS.

Work was begun at Reno, Nev., on May 19, 1915, and continued on the Reno-Las Vegas line until July 27, when the party had reached Rock Hill, Nev. The line from Tonopah, Nev., to Laws, Cal., was run between July 29 and August 20, after which work was resumed on the Reno-Las Vegas line at Rock Hill and was completed at Las Vegas on October 30.

Precise level No. 11 was used. This instrument is like the adopted model, which is described in detail on pages 200 to 211 of Appendix 3 of the Report for 1903.

Rods AA and BB were used the entire season. They are the regular type of self-reading rods and are described on pages 415 and 416 of Appendix 8 of the Report for 1899.

In the standardization of the rods a change from former practices has been made. Formerly the rods were measured by the instrument division of this Survey at the beginning and the end of the work. The behavior of the rods during the season was watched by means of a steel tape especially designed for that purpose. The measurements in the field were sufficiently exact to indicate whether the rods maintained their lengths or actually changed and the amount of the change, if any. If the length of the rods underwent only small changes, a mean length of the rods for the season was adopted from the office measurements.

The rods are now measured accurately, at frequent intervals, in the field and the resulting lengths are used in the office computation

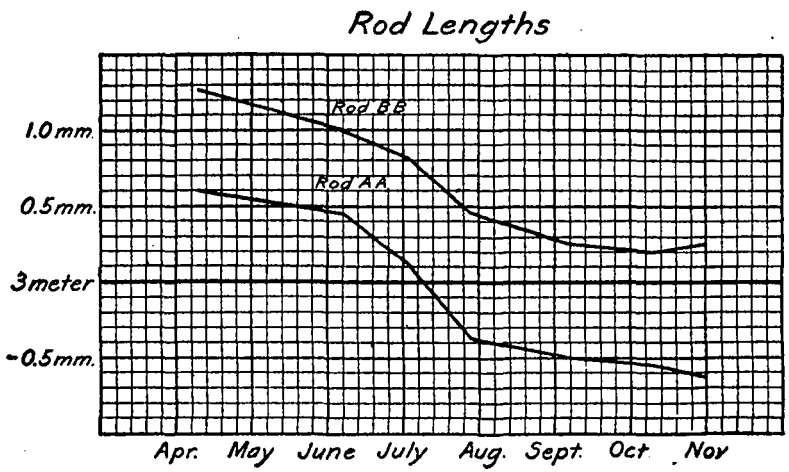

FIG. 1.—*Curves showing changes in rod lengths.*

of the lines. The lengths of the meter intervals are transferred by means of a beam compass to a standard meter bar. Three such transfers of each meter space constitute one measurement.

The standard meter bar is a strip of invar metal 7 millimeters wide by 0.5 millimeter thick and a little more than 1 meter long, having near one end of it a small conical hole and about 1 meter from it, at the other end of the bar, a series of fine-line graduations. To protect it from injury the entire strip is set into a dovetailed groove in a brass bar 1 inch wide by ¼ inch thick and about 3½ feet long. The invar strip is fastened to the brass bar at only one end so as to allow free longitudinal expansion. Standard meter bar No. 2 was used. This bar has a length of 0.999984 meter at 0° C., and has a temperature coefficient of 0.0000004 per degree centigrade.

The figure on page 7 gives graphically the lengths of the rods obtained from the field measurements. The results show that the rods decreased in length in proportion to the length of time they were used.

In the computations various lengths of the rods adopted from the field measurements of the rods were used. The index correction of rod AA was −0.4 millimeter; of rod BB −0.6 millimeter.

At Reno, Nev., two bench marks and at Las Vegas, Nev., four bench marks were recovered. The new determination of the differences of elevation between these bench marks showed that they had not been disturbed since their establishment.

The elevations in the following table depend on the standard elevation of bench mark H_9 at Reno, 1370.224 meters:

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.

RENO TO LAS VEGAS, NEV.

Date.	From B. M. to B. M.	Distance.	Difference of elevation.			Discrepancy.		Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
			Forward line.	Backward line.	Mean.	Partial.	Total accumulated.			
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
May 19–19	*M_9–H_9 (City B. M.).*	*0.484*	*+ 1.7767*	*− 1.7798*	*+ 1.7782*	.....	.....	*H_9*	*0.000*	*1370.224*
Do	*H_9–(1)*	.....	*+ 3.2346*	*− 3.2331*	*+ 3.2338*	.....	.....	.....	.....	.....
Do	*(1)–I_9*	.....	*+15.5735*	*−15.5722*	*+15.5728*	.....	.....	*I_9*	.....	*1389.031*
May 19–20	H_9 (City B. M.)–M_9.	0.484	− 1.7798	+ 1.7767	− 1.7782	+ 3.1	+ 3.1	M_9	0.484	1368.4458
May 19–22	M_9–1	1.113	− 5.5175	+ 5.5185	− 5.5180	− 1.0	+ 2.1	1	1.597	1362.9278
May 22	*1–R. S. B. M.*	*0.500*	*+ 2.5035*	.....	*+ 2.5035*	.....	.....	*R. S. B. M.*	.....	*1365.4313*
Do	1–2	0.995	− 5.5559	+ 5.5592	− 5.5576	− 3.3	− 1.2	2	2.592	1357.3702
May 19–21	2–3	1.092	− 3.0708	+ 3.0694	− 3.0701	+ 1.4	+ 0.2	3	3.684	1354.3001
Do	3–N_9	1.016	− 0.8529	+ 0.8540	− 0.8534	− 1.1	− 0.9	N_9	4.700	1353.4467
May 20–21	N_9–4	1.020	+ 5.0127	− 5.0101	+ 5.0114	− 2.6	− 3.5	4	5.720	1358.4581
Do	4–5	1.093	+ 1.0451	− 1.0455	+ 1.0453	+ 0.4	− 3.1	5	6.813	1359.5034
Do	5–6	1.094	− 2.0051	+ 2.0094	− 2.0072	− 4.3	− 7.4	6	7.907	1357.4962
Do	6–O_9	0.374	+ 0.4961	− 0.4977	+ 0.4969	+ 1.6	− 5.8	O_9	8.281	1357.9931
Do	O_9–7	1.118	+ 8.7641	− 8.7592	+ 8.7622	− 3.6	− 9.4	7	9.399	1360.7553
May 22–22	.....	.....	+ 8.7638	− 8.7617	.....	.....	.....	.....	.....	.....
May 20–21	7–P_9	0.983	+ 6.3967	− 6.3957	+ 6.3962	− 1.0	− 10.4	P_9	10.382	1373.1515
Do	P_9–8	1.154	+ 3.1101	− 3.1118	+ 3.1110	+ 1.7	− 8.7	8	11.536	1376.2625
Do	8–9	0.989	+ 3.4527	− 3.4569	+ 3.4548	+ 4.2	− 4.5	9	12.525	1379.7173
Do	9–10	1.029	+ 1.5347	− 1.5316	+ 1.5332	− 3.1	− 7.6	10	13.554	1381.2505
Do	10–Q_9	1.018	+ 3.5689	− 3.5641	+ 3.5662	− 3.1	− 10.7	Q_9	14.572	1384.8167
May 22–22	.....	.....	+ 3.5666	− 3.5653	.....	.....	.....	.....	.....	.....
May 20–21	Q_9–11	1.171	+ 8.2619	− 8.2612	+ 8.2616	− 0.7	− 11.4	11	15.743	1393.0783
Do	11–12	1.137	− 0.0511	+ 0.0523	− 0.0517	− 1.2	− 12.6	12	16.880	1393.0266
May 22–25	12–13	1.064	+ 7.9584	− 7.9541	+ 7.9562	− 4.3	− 16.9	13	17.944	1400.9828
Do	13–R_9	0.305	+ 1.3424	− 1.3415	+ 1.3420	− 0.9	− 17.8	R_9	18.249	1402.3248
Do	*13–R. S. B. M.*	*0.306*	*+ 1.3494*	*− 1.3484*	*+ 1.3489*	.....	.....	*R. S. B. M.*	.....	*1402.3317*
Do	R_9–14	1.029	+ 9.1023	− 9.0993	+ 9.1008	− 3.0	− 20.8	14	19.278	1411.4256
Do	14–S_9	1.073	+11.7144	−11.7108	+11.7126	− 3.6	− 24.4	S_9	20.351	1423.1382
May 26–25	S_9–15	0.585	+ 9.3204	− 9.3197	+ 9.3200	− 0.7	− 25.1	15	20.936	1432.4582
Do	15–16	1.126	+25.5822	−25.5791	+25.5806	− 3.1	− 28.2	16	22.062	1458.0388
Do	16–17	1.235	+21.7297	−21.7264	+21.7280	− 3.3	− 31.5	17	23.297	1479.7668
Do	17–T_9	1.147	+21.0041	−21.0031	+21.0036	− 1.0	− 32.5	T_9	24.444	1500.7704
Do	T_9–18	0.999	+16.0656	−16.0653	+16.0654	− 0.3	− 32.8	18	25.443	1516.8358
May 26–27	18–U_9	0.940	+14.9407	−14.9417	+14.9412	+ 1.0	− 31.8	U_9	26.383	1531.7770
Do	U_9–V_9	0.234	+ 3.8198	− 3.8198	+ 3.8198	0.0	− 31.8	V_9	26.617	1535.5968
Do	V_9–W_9	0.194	+ 0.5029	− 0.5032	+ 0.5030	+ 0.3	− 31.5	W_9	26.811	1530.0998
Do	W_9–19	1.078	+ 3.7914	− 3.7916	+ 3.7915	+ 0.2	− 31.3	19	27.889	1539.8913
May 28–27	19–20	0.104	− 0.4607	+ 0.4612	− 0.4610	− 0.5	− 31.8	20	27.993	1539.4303
Do	20–21	1.153	− 1.3148	+ 1.3165	− 1.3156	− 1.7	− 33.5	21	29.146	1538.1147
Do	21–22	1.153	− 1.8110	+ 1.8110	− 1.8110	0.0	− 33.5	22	30.299	1536.3037
Do	22–X_9	1.122	+ 8.7412	− 8.7372	+ 8.7392	− 4.0	− 37.5	X_9	31.421	1545.0429

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Backward line.	Mean.	Discrepancy. Partial.	Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		km.	m.	m.	m.	mm.	mm.		km.	m.
May 28-27	X_9-23	0.287	− 0.4285	+ 0.4278	− 0.4282	+ 0.7	− 36.8	23	31.708	1544.6147
Do	23-24	1.129	− 8.0681	+ 8.0735	− 8.0711	− 4.2	− 41.0	24	32.837	1536.5436
May 28-28			− 8.0699	+ 8.0729						
May 28-27	24-Y_9	1.148	+ 3.9141	− 3.9112	+ 3.9126	− 2.9	− 43.9	Y_9	33.985	1540.4562
Do	Y_9-25	0.673	− 2.3648	+ 2.3649	− 2.3648	− 0.1	− 44.0	25	34.658	1538.0914
June 1-May 27	25-26	1.065	+ 4.5942	− 4.5974	+ 4.5958	+ 3.2	− 40.8	26	35.723	1542.6872
Do	26-27	1.139	+ 3.8467	− 3.8465	+ 3.8466	− 0.2	− 41.0	27	36.862	1546.5338
Do	27-Z_9	1.181	− 6.0044	+ 6.0059	− 6.0052	− 1.5	− 42.5	Z_9	38.043	1540.5286
June 1-1	Z_9-28	0.329	+ 0.5319	− 0.5315	+ 0.5317	− 0.4	− 42.9	28	38.372	1541.0603
Do	28-29	1.153	+ 1.4126	− 1.4097	+ 1.4112	− 2.9	− 45.8	29	39.525	1542.4715
Do	29-30	1.161	+14.5787	−14.5812	+14.5800	+ 2.5	− 43.3	30	40.686	1557.0515
Do	30-31	1.099	+11.9744	−11.9716	+11.9730	− 2.8	− 46.1	31	41.785	1569.0245
June 1-May 29	31-A_{10}	0.592	− 7.0021	+ 7.0016	− 7.0018	+ 0.5	− 45.6	A_{10}	42.377	1562.0227
Do	A_{10}-32	1.236	−25.6336	+25.6338	−25.6337	− 0.2	− 45.8	32	43.613	1536.3890
Do	32-B_{10}	1.093	−19.8555	+19.8601	−19.8578	− 4.6	− 50.4	B_{10}	44.706	1516.5312
Do	B_{10}-33	1.070	−21.0450	+21.0465	−21.0458	− 1.5	− 51.9	33	45.776	1495.4854
Do	33-C_{10}	1.106	−21.6625	+21.6617	−21.6621	+ 0.8	− 51.1	C_{10}	46.882	1473.8233
June 2-May 29	C_{10}-34	0.319	− 3.2560	+ 3.2555	− 3.2558	+ 0.5	− 50.6	34	47.201	1470.5675
Do	34-D_{10}	1.060	−21.0292	+21.0311	−21.0302	− 1.9	− 52.5	D_{10}	48.261	1449.5373
Do	D_{10}-35	1.324	−21.4036	+21.4040	−21.4038	− 0.4	− 52.9	35	49.585	1428.1335
June 2-3	35-E_{10}	0.275	+ 0.2205	− 0.2213	+ 0.2209	+ 0.8	− 52.1	E_{10}	49.860	1428.3544
Do	E_{10}-F_{10}	0.283	− 2.6756	+ 2.6766	− 2.6761	− 1.0	− 53.1	F_{10}	50.143	1425.6783
Do	F_{10}-G_{10}	0.272	+ 1.1815	− 1.1827	+ 1.1821	+ 1.2	− 51.9	G_{10}	50.415	1426.8604
Do	G_{10}-36	0.396	− 0.0332	+ 0.0323	− 0.0328	+ 0.9	− 51.0	36	50.811	1426.8276
Do	*G_{10}-Carson City*	*0.365*	*+ 0.4866*	*− 0.4877*	*+ 0.4872*			*Rail*		*1427.3476*
June 2-4	36-H_{10}	0.456	− 4.1017	+ 4.1033	− 4.1025	− 1.6	− 52.6	H_{10}	51.267	1422.7251
Do	H_{10}-37	1.063	− 8.0046	+ 8.0075	− 8.0060	− 2.9	− 55.5	37	52.330	1414.7191
Do	37-38	0.725	− 2.9002	+ 2.8970	− 2.8986	+ 3.2	− 52.3	38	53.055	1411.8205
June 4-4	38-I_{10}	0.024	+ 0.0427	− 0.0427	+ 0.0427	0.0	− 52.3	I_{10}	53.079	1411.8632
Do	I_{10}-39	0.023	+ 0.0113	− 0.0110	+ 0.0112	− 0.3	− 52.6	39	53.102	1411.8744
June 2-4	39-40	1.139	+ 0.7362	− 0.7394	+ 0.7378	+ 3.2	− 49.4	40	54.241	1412.6122
Do	40-41	1.121	− 6.3275	+ 6.3277	− 6.3276	− 0.2	− 49.6	41	55.362	1406.2846
Do	41-42	1.087	− 2.6892	+ 2.6907	− 2.6900	− 1.5	− 51.1	42	56.449	1403.5946
Do	*41-Empire*	*0.760*	*− 2.7208*	*+ 2.7216*	*− 2.7212*			*Rail*		*1403.5634*
June 3-4	42-J_{10}	0.552	+ 2.0146	− 2.0161	+ 2.0154	+ 1.5	− 49.6	J_{10}	57.001	1405.6100
Do	J_{10}-43	1.197	− 3.3127	+ 3.3103	− 3.3115	+ 2.4	− 47.2	43	58.198	1402.2985
Do	43-K_{10}	0.681	− 7.5348	+ 7.5362	− 7.5355	− 1.4	− 48.6	K_{10}	58.879	1394.7630
Do	K_{10}-44	1.096	− 6.6889	+ 6.6943	− 6.6912	− 4.9	− 53.5	44	59.975	1388.0718
June 7-7			− 6.6897	+ 6.6931						
June 3-4	44-45	1.056	− 4.1868	+ 4.1836	− 4.1852	+ 3.2	− 50.3	45	61.031	1383.8866
Do	45-46	1.074	+17.0410	−17.0420	+17.0415	+ 1.0	− 49.3	46	62.105	1400.9281
Do	46-L_{10}	1.165	+26.3998	−*26.2900	+26.3978	− 4.5	− 53.8	L_{10}	63.270	1427.3259
June 7-7			+26.4030	−26.3936						
Do			+26.4016	−*26.3814						
June 8-8			+26.3961	−26.3977						
June 3-4	L_{10}-47	1.121	+23.6946	−23.6891	+23.6940	− 4.0	− 57.8	47	64.391	1451.0199
June 7-7			+23.6974	−23.6949						
June 3-4	47-48	1.132	+24.8159	−24.8087	+24.8141	− 4.6	− 62.4	48	65.523	1475.8340
June 7-7			+24.8170	−24.8150						
June 3-4	48-49	1.181	+27.9597	−27.9505	+27.9581	− 3.2	− 65.6	49	66.704	1503.7921
Do	49-M_{10}	0.331	+ 8.0902	− 8.0891	+ 8.0896	− 1.1	− 66.7	M_{10}	67.035	1511.8817
Do	*49-Mound House.*	*0.172*	*+ 2.8180*	*− 2.8090*	*+ 2.8135*			*Rail.*		*1506.6056*
June 4-4	M_{10}-N_{10}	0.259	− 7.4886	+ 7.4902	− 7.4894	− 1.6	− 68.3	N_{10}	67.294	1504-3923
June 9-8	N_{10}-49	0.883	−19.0527	+19.0514	−19.0520	+ 1.3	− 67.0	49	68.177	1485.3403
Do	49-50	1.044	−17.9143	+17.9140	−17.9142	+ 0.3	− 66.7	50	69.221	1467.4261
Do	50-51	1.204	−24.7856	+24.7885	−24.7870	− 2.9	− 69.6	51	70.425	1442.6391
Do	51-52	1.106	−20.1677	+20.1689	−20.1683	− 1.2	− 70.8	52	71.531	1422.4708
Do	52-53	1.103	−25.9111	+25.9071	−25.9090	+ 2.9	− 67.9	53	72.724	1396.5618
June 9-9			−25.9099	+25.9082						
Do	53-O_{10}	0.020	− 0.0943	+ 0.0940	− 0.0942	+ 0.3	− 67.6	O_{10}	72.744	1396.4676
Do	O_{10}-54	0.020	+ 0.1450	− 0.1450	+ 0.1450	0.0	− 67.6	54	72.764	1396.6126
June 9-8	54-55	0.546	−13.0085	+13.0113	−13.0099	− 2.8	− 70.4	55	73.310	1383.6027
Do	55-56	1.103	−25.5827	+25.5886	−25.5848	− 1.7	− 72.1	56	74.473	1358.0179
June 9-9			−25.5851	+25.5827						
June 9-8	56-57	1.082	−25.2508	+25.2505	−25.2506	+ 0.3	− 71.8	57	75.555	1332.7673
Do	57-P_{10}	1.122	− 5.7198	+ 5.7206	− 5.7202	− 0.8	− 72.6	P_{10}	76.677	1327.0471
June 10-10	P_{10}-58	*0.437*	*+ 0.8840*	*− 0.8838*	*+ 0.8839*	− 0.2	− 72.8	58	77.114	1327.9310
Do	*58-Dayton*	*0.107*	*− 0.5411*		*− 0.5411*			*Rail.*		*1327.3899*

* Rejected.

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
June 10-11	58-Q_{10}	0.220	+ 4.6172	− 4.6147	+ 4.6158	− 1.3	− 74.1	Q_{10}	77.334	1332.5468
June 12-12			+ 4.6158	− 4.6158						
June 10-11	Q_{10}-59	1.013	+ 2.2041	− 2.2054	+ 2.2048	+ 1.3	− 72.8	59	78.347	1334.7516
Do	59-60	1.041	− 4.4201	+ 4.4169	− 4.4185	+ 3.2	− 69.6	60	79.388	1330.3331
Do	60-61	1.039	− 1.8086	+ 1.8084	− 1.8085	+ 0.2	− 69.4	61	80.427	1328.5246
Do	61-62	1.166	− 1.6591	+ 1.6613	− 1.6602	− 2.2	− 71.6	62	81.593	1326.8644
Do	*61-Randall*	*0.372*	*+ 0.0512*	*− 0.0296*	*+ 0.0504*			*Rail.*		*1328.5550*
Do	62-R_{10}	1.086	− 0.8030	+ 0.8035	− 0.8032	− 0.5	− 72.1	R_{10}	82.679	1326.0612
Do	R_{10}-S_{10}	0.021	− 0.5272	+ 0.5265	− 0.5268	+ 0.7	− 71.4	S_{10}	82.700	1325.5344
Do	S_{10}-63	1.101	− 0.9343	+ 0.9346	− 0.9344	− 0.3	− 71.7	63	83.801	1324.6000
Do	63-64	1.064	− 1.4666	+ 1.4684	− 1.4675	− 1.8	− 73.5	64	84.865	1321.3125
Do	64-65	1.070	− 4.8465	+ 4.8429	− 4.8447	+ 3.6	− 69.9	65	85.944	1318.2878
Do	65-66	1.033	− 8.9987	+ 8.9989	− 8.9988	− 0.2	− 70.1	66	86.977	1309.2890
Do	*66-Canty*	*0.278*	*− 0.6665*	*+ 0.6561*	*− 0.6613*			*Rail.*		*1308.6277*
Do	66-67	1.248	− 1.4329	+ 1.4262	− 1.4278	+ 2.4	− 67.7	67	88.225	1307.8612
June 12-12			− 1.4250	+ 1.4269						
June 10-11	67-T_{10}	0.870	+ 0.1280	− 0.1277	+ 0.1278	− 0.3	− 68.0	T_{10}	89.101	1307.9890
Do	T_{10}-68	1.187	− 0.9607	+ 0.9647	− 0.9627	− 4.0	− 72.0	68	90.288	1307.0263
June 12-11	68-69	0.334	+ 0.1042	− 0.1034	+ 0.1038	− 0.8	− 72.8	69	90.622	1307.1301
Do	69-70	1.152	− 2.1505	+ 2.1475	− 2.1490	+ 3.0	− 69.8	70	91.774	1304.9811
June 11	*70-R. R. B. M.-10 A.*	*0.087*	*+ 1.2785*		*+ 1.2785*			*R. R. B. M. 10 A.*		*1306.2596*
June 12-11	70-71	1.173	− 2.7513	+ 2.7527	− 2.7520	− 1.4	− 71.2	71	92.947	1302.2291
Do	71-U_{10}	1.103	+ 0.4205	− 0.4218	+ 0.4212	+ 1.3	− 69.9	U_{10}	94.050	1302.6503
Do	*U_{10}-R. R. B. M.-9 A.*	*0.104*	*+ 1.1624*	*− 1.1645*	*+ 1.1634*			*R. R. B. M. 9 A.*		*1303.8137*
June 12-14	U_{10}-72	1.082	+ 0.1616	− 0.1679	+ 0.1664	+ 5.2	− 64.7	72	95.132	1302.8167
June 15-15			+ 0.1660	− 0.1702						
June 12-14	72-73	1.228	− 2.0191	+ 2.0204	− 2.0198	− 1.3	− 66.0	73	96.360	1300.7969
June 14	*73-Clifton*	*0.626*	*+ 0.6804*		*+ 0.6804*			*Rail.*		*1301.4773*
June 12-14	73-74	1.148	− 4.1446	+ 4.1412	− 4.1429	+ 3.4	− 62.6	74	97.508	1296.6540
Do	74-V_{10}	1.161	− 0.4834	+ 0.4818	− 0.4826	+ 1.6	− 61.0	V_{10}	98.669	1296.1714
Do	V_{10}-75	1.091	− 0.3388	+ 0.3393	− 0.3390	− 0.5	− 61.5	75	99.760	1295.8324
Do	75-76	1.138	− 3.1427	+ 3.1439	− 3.1433	− 1.2	− 62.7	76	100.898	1292.6891
Do	76-77	1.344	−*1.5438	+ 1.5526	− 1.5545	+ 0.6	− 62.1	77	102.242	1291.1346
June 15-15			− 1.5548	+ 1.5558						
June 12-14	77-78	1.195	+ 0.8332	− 0.8353	+ 0.8342	+ 2.1	− 60.0	78	103.437	1291.9688
Do	*77-Tugele*	*0.234*	*+ 0.1916*	*− 0.1922*	*+ 0.1918*			*Rail.*		*1291.3264*
Do	78-W_{10}	0.130	+ 0.0699	− 0.0721	+ 0.0706	+ 0.7	− 59.3	W_{10}	103.567	1292.0394
June 15-15			+ 0.0704	− 0.0697						
June 15-14	W_{10}-79	0.465	− 0.8468	+ 0.8464	− 0.8466	+ 0.4	− 58.9	79	104.032	1291.1928
Do	79-80	1.100	+ 1.0477	− 1.0480	+ 1.0478	+ 0.3	− 58.6	80	105.132	1292.2406
Do	80-81	1.104	− 4.8357	+*4.8465	− 4.8368	+ 1.0	− 57.6	81	106.236	1287.4038
June 16-16			− 4.8389	+ 4.8363						
June 15-14	81-82	1.163	+ 3.1469	− 3.1485	+ 3.1477	+ 1.6	− 56.0	82	107.399	1290.5515
June 16-14	82-X_{10}	1.096	− 4.8790	+ 4.8791	− 4.8790	− 0.1	− 56.1	X_{10}	108.495	1285.6725
June 16-16	X_{10}-83	0.554	− 2.6254	+ 2.6238	− 2.6246	+ 1.6	− 54.5	83	109.049	1283.0479
Do	83-Y_{10}	0.286	− 0.5352	+ 0.5368	− 0.5360	− 1.6	− 56.1	Y_{10}	109.335	1282.5119
Do	Y_{10}-Z_{10}	0.012	+ 0.6312	− 0.6312	+ 0.6312	0.0	− 56.1	Z_{10}	109.347	1283.1431
June 17-16	Z_{10}-A_{11}	0.902	+ 1.2345	− 1.2335	+ 1.2340	− 1.0	− 57.1	A_{11}	110.249	1284.3771
Do	A_{11}-84	0.714	+ 1.5695	− 1.5658	+ 1.5676	− 3.7	− 60.8	84	110.963	1285.9447
Do	*A_{11}-Churchill*	*0.210*	*− 0.0042*	*+ 0.0020*	*− 0.0031*			*Rail.*		*1284.3740*
Do	84-85	1.166	+ 4.1285	− 4.1268	+ 4.1276	− 1.7	− 62.5	85	112.129	1290.0723
Do	85-86	1.175	+ 7.7723	− 7.7716	+ 7.7720	− 0.7	− 63.2	86	113.304	1297.8443
Do	86-87	1.165	+ 0.2811	− 0.2820	+ 0.2816	+ 0.9	− 62.3	87	114.469	1298.1259
Do	87-B_{11}	1.091	+ 9.7826	− 9.7841	+ 9.7834	+ 1.5	− 60.8	B_{11}	115.560	1307.9093
June 17-17	B_{11}-88	1.102	− 5.2781	+ 5.2781	− 5.2781	0.0	− 60.8	88	116.662	1302.6312
June 17-18	88-89	1.067	− 0.8180	+ 0.8156	− 0.8168	+ 2.4	− 58.4	89	117.729	1301.8144
Do	89-90	1.175	+ 0.6156	− 0.6176	+ 0.6166	+ 2.0	− 56.4	90	118.904	1302.4310
Do	90-C_{11}	0.373	+ 0.4109	− 0.4092	+ 0.4100	− 1.7	− 58.1	C_{11}	119.277	1302.8410
Do	C_{11}-91	1.171	+ 2.1453	− 2.1461	+ 2.1457	+ 0.8	− 57.3	91	120.448	1304.9867
Do	91-92	1.119	+ 1.1078	− 1.1061	+ 1.1070	− 1.7	− 59.0	92	121.567	1306.0937
Do	92-93	1.118	+ 1.1856	− 1.1852	+ 1.1854	− 0.4	− 59.4	93	122.685	1307.2791
Do	93-94	1.084	+ 1.1698	− 1.1678	+ 1.1688	− 2.0	− 61.4	94	123.769	1308.4479
Do	94-D_{11}	0.318	+ 0.2969	− 0.2954	+ 0.2962	− 1.5	− 62.9	D_{11}	124.087	1308.7441
June 18-18	D_{11}-95	1.274	− 0.2629	+ 0.2632	− 0.2630	− 0.3	− 63.2	95	125.361	1308.4811
Do	95-96	1.221	+ 0.6985	− 0.7016	+ 0.7000	+ 3.1	− 60.1	96	126.582	1309.1811
Do	96-97	1.115	+ 0.2940	− 0.2921	+ 0.2930	− 1.9	− 62.0	97	127.697	1309.4741
Do	97-E_{11}	1.183	+ 0.8089	− 0.8086	+ 0.8088	− 0.3	− 62.3	E_{11}	128.880	1310.2829

* Rejected.

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Backward line.	Mean.	Discrepancy. Partial.	Total accumulated.	Designation of B.M.	Distance from B. M. H_0.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
June 18-18	*E_{11}—Rail water tank. Wabuska, U. S. G. S.*		+ *0.3433*	− *0.3401*	+ *0.3417*			*Rail.*		*1310.6246*
June 18	*E_{11}-Wabuska*	*0.033*	− *0.3621*		− *0.3621*			*Rail.*		*1309.9208*
June 19-19	E_{11}-F_{11}	0.233	+ 0.0486	− 0.0519	+ 0.0504	+ 1.9	− 60.4	F_{11}	129.113	1310.3333
June 21-21			+ 0.0503	− 0.0507						
June 19-19	F_{11}-98	1.053	+ 0.1214	− 0.1224	+ 0.1219	+ 1.0	− 59.4	98	130.166	1310.4552
Do	98-99	1.124	+ 0.0462	− 0.0504	+ 0.0483	+ 4.2	− 55.2	99	131.290	1310.5035
Do	99-100	1.112	+ 0.7198	− 0.7206	+ 0.7202	+ 0.8	− 54.4	100	132.402	1311.2237
Do	100-101	1.077	+ 0.8885	− 0.8897	+ 0.8891	+ 1.2	− 53.2	101	133.479	1312.1128
Do	101-102	1.172	− 0.9059	+ 0.9106	− 0.9096	− 2.4	− 55.6	102	134.651	1311.2032
June 21-21			− 0.9109	+ 0.9111						
June 19-19	102-G_{11}	1.089	+ 1.8960	− 1.8963	+ 1.8962	+ 0.3	− 55.3	G_{11}	135.740	1313.0994
Do	G_{11}-103	1.088	+ 1.5447	− 1.5435	+ 1.5441	− 1.2	− 56.5	103	136.828	1314.6435
Do	103-104	1.273	− 0.8704	+ 0.8708	− 0.8706	− 0.4	− 56.9	104	138.101	1313.7729
June 21-22	104-105	1.196	+ 0.8589	− 0.8593	+ 0.8591	+ 0.4	− 56.5	105	139.297	1314.6320
Do	105-106	1.097	+ 2.9826	− 2.9854	+ 2.9840	+ 2.8	− 53.7	106	140.394	1317.6160
Do	*106-Moquist*	*0.620*	+ *2.4126*	− *2.4143*	+ *2.4134*			*Rail.*		*1317.0454*
Do	106-107	1.051	− 1.6649	+ 1.6652	− 1.6650	− 0.3	− 54.0	107	141.445	1315.9510
Do	107-108	1.118	− 1.1317	+ 1.1368	− 1.1357	− 3.4	− 57.4	108	142.563	1314.8153
June 23-23			− 1.1363	+ 1.1380						
June 21-22	108-109	1.195	− 1.0800	+ 1.0844	− 1.0822	− 4.4	− 61.8	109	143.758	1313.7331
June 22-22	109-H_{11}	0.020	+ 0.0040	− 0.0040	+ 0.0040	0.0	− 61.8	H_{11}	143.778	1313.7371
Do	H_{11}-110	0.020	− 0.0553	+ 0.0560	− 0.0556	− 0.7	− 62.5	110	143.798	1313.6815
June 21-22	110-111	1.113	+ 1.8012	− 1.7970	+ 1.7991	− 4.2	− 66.7	111	144.911	1315.4806
Do	111-112	1.164	−10.5013	+10.5013	−10.5013	0.0	− 66.7	112	146.075	1304.9793
Do	112-113	1.073	− 2.2975	+ 2.3014	− 2.2994	− 3.9	− 70.6	113	147.148	1302.6799
June 22-22	113-I_{11}	0.014	+ 0.0210	− 0.0206	+ 0.0208	− 0.4	− 71.0	I_{11}	147.162	1302.7007
Do	I_{11}-114	0.014	− 0.0956	+ 0.0956	− 0.0956	0.0	− 71.0	114	147.176	1302.6051
June 21-22	114-115	1.089	+ 0.0387	− 0.0403	+ 0.0395	+ 1.6	− 69.4	115	148.265	1302.6446
Do	115-116	1.098	− 0.3729	+ 0.3735	− 0.3732	− 0.6	− 70.0	116	149.363	1302.2714
Do	116-117	1.108	− 0.1468	+ 0.1516	− 0.1488	− 3.2	− 73.2	117	150.471	1302.1226
June 23-23			− 0.1475	+ 0.1491						
June 21-22	117-118	1.072	+ 4.5452	− 4.5428	+ 4.5440	− 2.4	− 75.6	118	151.543	1306.6666
Do	118-119	1.112	+ 2.4064	− 2.4067	+ 2.4066	+ 0.3	− 75.3	119	152.655	1309.0732
June 23-22	119-J_{11}	0.016	+ 0.0420	− 0.0427	+ 0.0424	+ 0.7	− 74.6	J_{11}	152.671	1309.1156
June 23-24	J_{11}-120	1.114	+ 8.5728	− 8.5741	+ 8.5734	+ 1.3	− 73.3	120	153.785	1317.6890
Do	120-121	1.062	+ 6.3367	− 6.3400	+ 6.3384	+ 3.3	− 70.0	121	154.847	1324.0274
Do	*120-Rio Vista*	*0.856*	+ *3.9985*	− *4.0005*	+ *3.9994*			*Rail.*		*1321.6884*
Do	121-122	1.088	+ 8.5887	− 8.5889	+ 8.5888	+ 0.2	− 69.8	122	155.935	1332.6162
Do	122-123	1.081	+ 3.8126	− 3.8190	+ 3.8155	+ 5.0	− 64.8	123	157.016	1336.4317
June 25-25			+ 3.8135	− 3.8171						
June 23-24	123-K_{11}	1.279	− 4.4385	+ 4.4339	− 4.4362	+ 4.6	− 60.2	K_{11}	158.295	1331.9955
Do	K_{11}-124	1.097	− 0.6915	+ 0.6929	− 0.6922	− 1.4	− 61.6	124	159.392	1331.3033
Do	124-125	1.124	+14.7214	−14.7175	+14.7194	− 3.9	− 65.5	125	160.516	1346.0227
June 25-24	125-126	0.400	+ 0.8893	− 0.8919	+ 0.8906	+ 2.6	− 62.9	126	160.916	1346.9133
Do	*126-Reservation*	*0.116*	− *1.7464*	+ *1.7536*	− *1.7500*			*Rail.*		*1345.1633*
Do	126-127	1.121	−15.8084	+15.8092	−15.8088	− 0.8	− 63.7	127	162.037	1331.1045
Do	127-L_{11}	1.135	−12.5729	+12.5687	−12.5708	+ 4.2	− 59.5	L_{11}	163.172	1318.5337
Do	L_{11}-128	0.378	− 5.5504	+ 5.5485	− 5.5494	+ 1.9	− 57.6	128	163.550	1312.9843
Do	128-129	1.046	−14.9933	+14.9889	−14.9908	+ 0.8	− 56.8	129	164.596	1297.9935
June 26-26			−14.9890	+14.9920						
June 25-24	129-130	1.142	−16.5392	+16.5404	−16.5398	− 1.2	− 58.0	130	165.738	1281.4537
Do	130-131	1.156	−18.3908	+18.3904	−18.3906	+ 0.4	− 57.6	131	166.894	1263.0631
Do	131-M_{11}	1.105	− 2.3632	+ 2.3666	− 2.3649	− 3.4	− 61.0	M_{11}	167.999	1260.6982
June 25-26	M_{11}-132	1.205	− 2.1423	+ 2.1420	− 2.1422	+ 0.3	− 60.7	132	169.204	1258.5560
Do	132-N_{11}	1.089	+ 0.7339	− 0.7350	+ 0.7344	+ 1.1	− 59.6	N_{11}	170.293	1259.2904
Do	N_{11}-O_{11}	1.126	− 2.8322	+ 2.8335	− 2.8328	− 1.3	− 60.9	O_{11}	171.419	1256.4576
June 26-26	*O_{11}-P_{11}*	*0.947*	+ *0.0064*	− *0.0081*	+ *0.0072*	+ *1.7*	− *59.2*	*P_{11}*	*172.366*	*1256.4648*
June 26-28	O_{11}-Q_{11}	0.118	+ 0.1880	− 0.1880	+ 0.1880	0.0	− 60.9	Q_{11}	171.537	1256.6456
June 26	*O_{11}-Schurz*	*0.050*	+ *0.0448*		+ *0.0448*			*Rail.*		*1256.5018*
June 26-28	Q_{11}-R_{11}	0.787	− 1.1284	+ 1.1279	− 1.1282	+ 0.5	− 60.4	R_{11}	172.324	1255.5174
Do	R_{11}-133	1.088	− 0.3682	+ 0.3687	− 0.3684	− 0.5	− 60.9	133	173.412	1255.1490
Do	133-134	1.055	− 0.7915	+ 0.7877	− 0.7896	+ 3.8	− 57.1	134	174.467	1254.3594
Do	*134-U.S.B.M.*	*0.081*	+ *0.2020*	− *0.2027*	+ *0.2024*			*U.S. B. M.*		*1254.5618*
Do	134-S_{11}	0.805	− 0.0543	+ 0.0543	− 0.0543	0.0	− 57.1	S_{11}	175.272	1254.3051
Do	S_{11}-135	1.061	− 1.6995	+ 1.7020	− 1.7008	− 2.5	− 59.6	135	176.333	1252.6043
Do	135-T_{11}	1.291	− 0.5672	+ 0.5646	− 0.5659	+ 2.6	− 57.0	T_{11}	177.624	1252.0384

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		km.	m.	m.	m.	mm.	mm.		km.	m.
June 29-28	T_{11}-136	1.114	+ 0.2987	− 0.2935	+ 0.2952	− 2.3	− 59.3	136	178.738	1252.3336
June 30-30			+ 0.2940	− 0.2947						
June 29-28	136-137	1.175	− 0.4598	+ 0.4601	− 0.4600	− 0.3	− 59.6	137	179.913	1251.8736
Do	137-U_{11}	1.072	− 0.3372	+ 0.3399	− 0.3386	− 2.7	− 62.3	U_{11}	180.985	1251.5350
Do	U_{11}-138	0.805	+ 0.5616	− 0.5616	+ 0.5616	0.0	− 62.3	138	181.790	1252.0966
Do	138-139	1.123	− 0.4485	+ 0.4475	− 0.4480	+ 1.0	− 61.3	139	182.913	1251.6486
Do	*139-Modoc*	*0.266*	*+ 0.9474*	*− 0.9462*	*+ 0.9468*			*Rail*		*1252.5954*
Do	139-V_{11}	1.123	+ 3.0307	− 3.0317	+ 3.0312	+ 1.0	− 60.3	V_{11}	184.036	1254.6798
Do	V_{11}-140	0.257	+ 2.9960	− 2.9955	+ 2.9958	− 0.5	− 60.8	140	184.293	1257.6756
Do	140-141	1.413	+ 9.6685	− 9.6687	+ 9.6686	+ 0.2	− 60.6	141	185.706	1267.3442
Do	141-142	1.075	+ 1.3594	− 1.3614	+ 1.3604	+ 2.0	− 58.6	142	186.781	1268.7046
Do	142-143	1.086	− 2.8315	+ 2.8322	− 2.8318	− 0.7	− 59.3	143	187.867	1265.8728
Do	143-W_{11}	1.131	+ 4.6902	− 4.6888	+ 4.6895	− 1.4	− 60.7	W_{11}	188.998	1270.5623
June 29-July 6	W_{11}-144	1.078	− 3.6039	+ 3.6040	− 3.6040	− 0.1	− 60.8	144	190.076	1266.9583
Do	144-145	1.079	+ 1.6083	− 1.6115	+ 1.6099	+ 3.2	− 57.6	145	191.155	1268.5682
Do	145-146	1.135	− 1.2627	+ 1.2649	− 1.2638	− 2.2	− 59.8	146	192.290	1267.3044
Do	*146-Gillis*	*0.408*	*+ 2.6488*	*− 2.6459*	*+ 2.6474*			*Rail*		*1269.9518*
Do	146-X_{11}	1.116	+ 1.4231	− 1.4258	+ 1.4244	+ 2.7	− 57.1	X_{11}	193.406	1268.7288
July 6-6	X_{11}-147	1.095	− 3.7829	+ 3.7862	− 3.7846	− 3.3	− 60.4	147	194.501	1264.9442
Do	147-148	1.105	+ 5.2118	− 5.2133	+ 5.2126	+ 1.5	− 58.9	148	195.606	1270.1568
Do	148-149	1.080	− 1.9318	+ 1.9376	− 1.9336	− 1.2	− 60.1	149	196.686	1268.2232
July 6-7			− 1.9341	+ 1.9309						
July 6-6	149-Y_{11}	0.324	− 1.6451	+ 1.6447	− 1.6449	+ 0.4	− 59.7	Y_{11}	197.010	1266.5783
Do	Y_{11}-150	1.167	− 8.6695	+ 8.6699	− 8.6697	− 0.4	− 60.1	150	198.177	1257.9086
July 7-8	150-151	1.125	− 5.5729	+ 5.5743	− 5.5736	− 1.4	− 61.5	151	199.302	1252.3350
Do	151-152	1.097	+ 0.0357	− 0.0367	+ 0.0362	+ 1.0	− 60.5	152	200.399	1252.3712
Do	152-153	1.100	− 0.7455	+ 0.7479	− 0.7467	− 2.4	− 62.9	153	201.499	1251.6245
Do	153-154	1.152	+ 0.4969	− 0.4972	+ 0.4970	+ 0.3	− 62.6	154	202.651	1252.1215
Do	154-Z_{11}	0.013	− 0.2376	+ 0.2377	− 0.2376	− 0.1	− 62.7	Z_{11}	202.664	1251.8839
Do	Z_{11}-155	0.013	+ 0.2363	− 0.2364	+ 0.2364	+ 0.1	− 62.6	155	202.677	1252.1203
Do	155-156	1.060	− 0.3364	+ 0.3346	− 0.3355	+ 1.8	− 60.8	156	203.737	1251.7848
July 9-8	156-157	0.166	+ 0.5249	− 0.5262	+ 0.5256	+ 1.3	− 59.5	157	203.903	1252.3104
Do	157-A_{12}	1.176	− 0.6815	+ 0.6866	− 0.6836	− 0.8	− 60.3	A_{12}	205.079	1251.6268
July 9-9			− 0.6856	+ 0.6807						
July 9-10			− 0.6826	+ 0.6846						
July 9-8	A_{12}-158	0.538	− 0.0847	+ 0.0840	− 0.0844	+ 0.7	− 59.6	158	205.617	1251.5424
Do	158-159	1.061	+ 0.6219	− 0.6192	+ 0.6206	− 2.7	− 62.3	159	206.678	1252.1630
Do	*159-Magnus*	*0.906*	*+ 0.2377*	*− 0.2429*	*+ 0.2403*			*Rail*		*1252.4033*
Do	159-160	1.090	− 0.1490	+ 0.1523	− 0.1506	− 3.3	− 65.6	160	207.768	1252.0124
Do	160-B_{12}	1.106	+ 0.0570	− 0.0610	+ 0.0590	+ 4.0	− 61.6	B_{12}	208.874	1252.0714
Do	B_{12}-161	0.660	+ 0.3191	− 0.3147	+ 0.3158	− 2.4	− 64.0	161	209.534	1252.3872
July 10-10			+ 0.3149	− 0.3146						
July 9-8	161-162	1.131	− 0.2915	+ 0.2946	− 0.2930	− 3.1	− 67.1	162	210.665	1252.0942
Do	162-163	1.136	− 0.3643	+ 0.3663	− 0.3653	− 2.0	− 69.1	163	211.801	1251.7289
Do	163-C_{12}	1.262	+ 0.9459	− 0.9456	+ 0.9458	− 0.3	− 69.4	C_{12}	213.063	1252.6747
July 9-10	C_{12}-164	1.172	− 0.9420	+ 0.9412	− 0.9416	+ 0.8	− 68.6	164	214.235	1251.7331
Do	164-165	1.104	+ 0.3711	− 0.3717	+ 0.3714	+ 0.6	− 68.0	165	215.339	1252.1045
Do	165-166	1.169	− 0.0300	+ 0.0273	− 0.0286	+ 2.7	− 65.3	166	216.508	1252.0759
Do	166-D_{12}	1.281	+ 6.9239	− 6.9220	+ 6.9230	− 1.9	− 67.2	D_{12}	217.789	1258.9989
Do	D_{12}-167	1.029	+ 8.9400	− 8.9380	+ 8.9390	− 2.0	− 69.2	167	218.818	1267.9379
July 10-10	167-168	1.205	+11.6028	−11.5952	+11.5984	− 5.3	− 74.5	168	220.023	1279.5363
July 12-12			+11.5994	−11.5963						
July 10-10	*168-E_{12}*	*1.669*	*−21.9588*	*+21.9629*	*−21.9606*	*− 4.7*	*− 79.2*	*E_{12}*	*221.688*	*1257.5757*
July 12-14	*168-Thorne*	*0.116*	*+ 0.7384*	*− 0.7401*	*+ 0.7392*			*Rail*		*1280.2755*
Do	168-169	1.109	+10.7003	−10.7010	+10.7006	+ 0.7	− 73.8	169	221.132	1290.2369
Do	169-170	1.074	+11.1130	−11.1187	+11.1148	+ 1.2	− 72.6	170	222.206	1301.3517
July 14-14			+11.1153	−11.1122						
July 12-14	170-171	1.097	+ 8.5603	− 8.5630	+ 8.5616	+ 2.7	− 69.9	171	223.303	1309.9133
July 12-13	171-172	1.092	+ 8.0737	− 8.0779	+ 8.0758	+ 4.2	− 65.7	172	224.395	1317.9891
Do	172-173	1.082	+*7.6483	− 7.6533	+ 7.6537	+ 1.4	− 64.3	173	225.477	1325.6428
July 14-14			+ 7.6530	− 7.6556						
July 12-13	173-174	1.136	+11.8522	−11.8529	+11.8526	+ 0.7	− 63.6	174	226.613	1337.4954
Do	174-F_{12}	1.057	+10.9547	−10.9559	+10.9553	+ 1.2	− 62.4	F_{12}	227.670	1348.4507
Do	*F_{12}-Dover*	*0.417*	*+ 5.3855*	*− 5.3870*	*+ 5.3862*			*Rail*		*1353.8369*
Do	F_{12}-175	1.117	+11.7927	−11.7922	+11.7924	− 0.5	− 62.9	175	228.787	1360.2431
Do	175-176	1.095	+ 2.2606	− 2.2613	+ 2.2610	+ 0.7	− 62.2	176	229.882	1362.5041
Do	176-177	1.163	− 4.1181	+ 4.1222	− 4.1202	− 4.1	− 66.3	177	231.045	1358.3839
Do	177-178	1.088	+ 3.6673	− 3.6691	+ 3.6682	+ 1.8	− 64.5	178	232.133	1362.0521
Do	178-179	1.122	+ 0.2739	− 0.2797	+ 0.2762	+ 3.5	− 61.0	179	233.255	1362.3283
July 14-14			+ 0.2751	− 0.2763						

* Rejected.

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
July 12-13	179-G_{12}	0.700	+ 0.5744	− 0.5734	+ 0.5739	− 1.0	− 62.0	G_{12}	233.955	1362.9022
Do	G_{12}-180	1.107	+ 9.7229	− 9.7192	+ 9.7210	− 3.7	− 65.7	180	235.062	1372.6232
July 12	*180-Kinkead*	*0.393*	*+ 5.6928*		*+ 5.6928*			*Rail.*		*1378.3154*
July 12-13	180-181	1.043	+ 6.7082	− 6.7045	+ 6.7064	− 3.7	− 69.4	181	236.105	1379.3296
July 14-15	181-182	1.019	−13.2131	+13.2085	−13.2098	+ 2.1	− 67.3	182	237.124	1366.1198
July 16-16			−13.2087	+13.2090						
July 14-15	182-183	1.116	−19.4279	+19.4244	−19.4262	+ 3.5	− 63.8	183	238.240	1346.6936
Do	183-H_{12}	1.153	−12.8911	+12.8894	−12.8902	+ 1.7	− 62.1	H_{12}	239.393	1333.8034
Do	H_{12}-184	1.070	− 0.0730	+ 0.0702	− 0.0716	+ 2.8	− 59.3	184	240.463	1333.7318
Do	184-I_{12}	0.984	+ 0.7301	− 0.7286	+ 0.7294	− 1.5	− 60.8	I_{12}	241.447	1334.4612
July 16-15	I_{12}-185	1.084	+ 1.8700	− 1.8727	+ 1.8714	+ 2.7	− 58.1	185	242.531	1336.3326
Do	185-J_{12}	1.084	+ 2.3301	− 2.3287	+ 2.3294	− 1.4	− 59.5	J_{12}	243.615	1338.6620
Do	J_{12}-186	0.257	+ 0.5658	− 0.5668	+ 0.5663	+ 1.0	− 58.5	186	243.872	1339.2283
Do	186-187	1.081	+ 4.5707	− 4.5711	+ 4.5709	+ 0.4	− 58.1	187	244.953	1343.7992
Do	187-188	1.193	+ 4.6743	− 4.6713	+ 4.6728	− 3.0	− 61.1	188	246.146	1348.4720
Do	*188-Acme*	*0.765*	*+ 1.4701*	*− 1.4710*	*+ 1.4706*			*Rail.*		*1349.9426*
Do	188-189	1.063	+ 2.4633	− 2.4678	+ 2.4660	+ 3.1	− 58.0	189	247.209	1350.9380
July 17-17			+ 2.4657	− 2.4673						
July 16-15	189-K_{12}	1.146	+ 7.3544	− 7.3550	+ 7.3547	+ 0.6	− 57.4	K_{12}	248.355	1358.2927
Do	K_{12}-190	1.255	+ 8.2818	− 8.2772	+ 8.2795	− 4.6	− 62.0	190	249.610	1366.5722
July 16-17	190-191	1.087	+ 4.5932	− 4.5916	+ 4.5924	− 1.6	− 63.6	191	250.697	1371.1646
Do	191-192	1.135	+ 9.1641	− 9.1647	+ 9.1644	+ 0.6	− 63.0	192	251.832	1380.3290
Do	192-193	1.075	+ 6.3080	− 6.3065	+ 6.3072	− 1.5	− 64.5	193	252.907	1386.6362
Do	193-L_{12}	0.315	+ 1.3672	− 1.3666	+ 1.3669	− 0.6	− 65.1	L_{12}	253.222	1388.0031
July 17-17	L_{12}-194	0.634	+ 0.5139	− 0.5145	+ 0.5142	+ 0.6	− 64.5	194	253.856	1388.5173
Do	194-195	1.072	− 5.2692	+ 5.2671	− 5.2682	+ 2.1	− 62.4	195	254.928	1383.2491
Do	195-196	1.070	− 7.8070	+ 7.8092	− 7.8081	− 2.2	− 64.6	196	255.998	1375.4410
Do	196-197	1.129	− 7.0158	+ 7.0196	− 7.0177	− 3.8	− 68.4	197	257.127	1368.4233
Do	197-M_{12}	1.130	− 7.9585	+ 7.9583	− 7.9584	+ 0.2	− 68.2	M_{12}	258.257	1360.4649
July 19-20	M_{12}-198	1.123	− 4.8254	+ 4.8223	− 4.8238	+ 3.1	− 65.1	198	259.380	1355.6411
July 20	*M_{12}-Luning*	*0.110*	*− 0.3102*		*− 0.3102*			*Rail.*		*1360.1547*
July 19-20	198-199	1.131	− 2.9009	+ 2.9098	− 2.9044	− 2.5	− 67.6	199	260.511	1352.7367
July 20-20			− 2.9053	+ 2.9013						
July 19-20	199-200	1.115	+ 0.6411	− 0.6380	+ 0.6396	− 3.1	− 70.7	200	261.626	1353.3763
Do	200-N_{12}	1.278	+ 5.2222	− 5.2220	+ 5.2221	− 0.2	− 70.9	N_{12}	262.904	1358.5984
Do	N_{12}-201	1.092	− 0.1419	+ 0.1450	− 0.1434	− 3.1	− 74.0	201	263.996	1358.4550
Do	201-202	1.095	+ 2.7938	− 2.7926	+ 2.7932	− 1.2	− 75.5	202	265.091	1361.2482
Do	202-203	1.221	+ 3.1577	− 3.1589	+ 3.1583	+ 1.2	− 74.0	203	266.312	1364.4065
Do	203-O_{12}	1.226	+ 6.3629	− 6.3625	+ 6.3627	− 0.4	− 74.4	O_{12}	267.538	1370.7692
July 19	*203-New Boston.*	*1.187*	*+ 1.9761*		*+ 1.9761*			*Rail.*		*1366.3326*
July 19-20	O_{12}-204	1.136	+ 5.2098	− 5.2063	+ 5.2080	− 3.5	− 77.9	204	268.674	1375.9772
Do	204-205	1.098	+ 3.0634	− 3.0666	+ 3.0650	+ 3.2	− 74.7	205	269.772	1379.0422
Do	205-206	1.060	+ 1.9589	− 1.9607	+ 1.9598	+ 1.8	− 72.9	206	270.832	1381.0020
Do	206-207	1.080	+ 1.1831	− 1.1872	+ 1.1852	+ 4.1	− 68.8	207	271.912	1382.1872
Do	207-P_{12}	0.608	+ 3.4104	− 3.4099	+ 3.4102	− 0.5	− 69.3	P_{12}	272.570	1385.5974
Do	P_{12}-Q_{12}	0.244	− 0.3140	+ 0.3151	− 0.3146	− 1.1	− 70.4	Q_{12}	272.814	1385.2828
July 19	*P_{12}-Mina*	*0.051*	*− 0.3140*		*− 0.3140*			*Rail.*		*1385.2854*
July 21-21	Q_{12}-R_{12}	0.037	+ 1.0171	− 1.0165	+ 1.0168	− 0.6	− 71.0	R_{12}	272.851	1386.2996
July 21-22	R_{12}-208	1.166	+ 8.3696	− 8.3684	+ 8.3690	− 1.2	− 72.2	208	274.017	1394.6686
Do	208-209	1.067	+ 2.0687	− 2.0649	+ 2.0668	− 3.8	− 76.0	209	275.084	1396.7354
Do	209-210	1.037	− 1.5909	+ 1.5912	− 1.5910	− 0.3	− 76.3	210	276.121	1395.1444
Do	210-211	1.070	− 1.9660	+ 1.9639	− 1.9650	+ 2.1	− 74.2	211	277.191	1393.1794
Do	211-S_{12}	0.277	+ 3.0947	− 3.0949	+ 3.0948	+ 0.2	− 74.0	S_{12}	277.468	1396.2742
Do	S_{12}-212	1.160	− 2.2473	+ 2.2455	− 2.2464	+ 1.8	− 72.2	212	278.628	1394.0278
July 21	*S_{12}-Sodaville*	*0.802*	*+ 0.4815*		*+ 0.4815*			*Rail.*		*1396.7557*
July 21-22	212-213	1.080	−10.2718	+10.2707	−10.2712	+ 1.1	− 71.1	213	279.708	1383.7566
Do	213-214	1.070	−16.4313	+16.4251	−16.4298	+ 3.3	− 67.8	214	280.778	1367.3268
July 23-23			−16.4317	+16.4314						
July 21-22	214-215	1.135	−13.8224	+13.8150	−13.8210	+ 3.1	− 64.7	215	281.913	1353.5058
July 23-23			−13.8226	+13.8237						
July 21-22	215-T_{12}	0.295	− 2.8210	+ 2.8219	− 2.8214	− 0.9	− 65.6	T_{12}	282.208	1350.6844
Do	T_{12}-216	1.028	−12.6172	+12.6134	−12.6153	+ 3.8	− 61.8	216	283.236	1338.0691
Do	216-217	1.046	− 4.5890	+ 4.5848	− 4.5869	+ 4.2	− 57.6	217	284.282	1333.4822
Do	217-218	1.095	− 0.0188	+ 0.0195	− 0.0192	− 0.7	− 58.3	218	285.377	1333.4630
Do	*218-Rhodes*	*0.210*	*+ 0.5140*	*− 0.5114*	*+ 0.5127*			*Rail.*		*1333.9757*
Do	218-219	1.089	+ 3.2796	− 3.2790	+ 3.2793	− 0.6	− 58.9	219	286.466	1336.7423
Do	*219 - Tonopah Jnc.*	*0.670*	*+ 6.0208*	*− 6.0198*	*+ 6.0200*			*Rail.*		*1342.7623*
Do	219-U_{12}	0.812	+ 6.7759	− 6.7761	+ 6.7760	+ 0.2	− 58.7	U_{12}	287.278	1343.5183
Do	U_{12}-V_{12}	0.078	+ 0.7080	− 0.7080	+ 0.7080	0.0	− 58.7	V_{12}	287.356	1344.2263

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation.			Discrepancy.		Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
			Forward line.	Backward line.	Mean.	Partial.	Total accumulated.			
1915.		km.	m.	m.	m.	mm.	mm.		km.	m.
July 23-24	V_{12}-W_{12}	0.022	+ 0.2727	− 0.2730	+ 0.2728	+ 0.3	− 58.4	W_{12}.	287.378	1344.4991
Do	W_{12}-220	1.078	+ 1.6100	− 1.6107	+ 1.6104	+ 0.7	− 57.7	220	288.456	1346.1095
Do	220-221	1.136	+ 4.5655	− 4.5659	+ 4.5657	+ 0.4	− 57.3	221	289.592	1350.6752
Do	221-222	1.142	+20.7632	−20.7636	+20.7634	+ 0.4	− 56.9	222	290.734	1371.4386
Do	222-X_{12}	1.260	+23.6306	−23.6299	+23.6302	− 0.7	− 57.6	X_{12}	291.994	1395.0688
Do	X_{12}-223	1.092	+21.2693	−21.2640	+21.2674	− 3.6	− 61.2	223	293.086	1416.3362
July 26-26			+21.2692	−21.2671						
July 23-24	223-224	1.134	+23.1150	−23.1100	+23.1125	− 5.0	− 66.2	224	294.220	1439.4487
Do	224-225	1.080	+22.6062	−22.6014	+22.6016	− 2.8	− 69.0	225	295.300	1462.0503
July 26-26			+22.5998	−22.5990						
July 23-24	225-226	1.200	+24.1968	−24.1977	+24.1972	+ 0.9	− 68.1	226	296.500	1486.2475
Do	226-227	1.136	+24.6571	−24.6531	+24.6551	− 4.0	− 72.1	227	297.636	1510.9026
Do	227-Y_{12}	0.708	+10.9027	−10.9000	+10.9014	− 2.7	− 74.8	Y_{12}	298.342	1521.8040
July 27-24	Y_{12}-228	1.216	−11.0844	+11.0883	−11.0864	− 3.9	− 78.7	228	299.558	1510.7176
July 27	*Y_{12}-Redlich*	*0.049*	*− 0.7380*		*− 0.7380*			*Rail.*		*1521.0660*
July 27-24	228-229	1.087	−10.1588	+10.1641	−10.1609	− 2.2	− 80.9	229	300.645	1500.5567
July 27-27			−10.1607	+10.1600						
July 27-24	229-230	1.087	− 8.7572	+ 8.7605	− 8.7588	− 3.3	− 84.2	230	301.732	1491.7979
July 26-27	230-231	1.034	−20.0807	+20.0858	−20.0852	− 1.5	− 85.7	231	302.766	1471.7127
July 27-27			−20.0880	+20.0860						
July 26-27	231-Z_{12}	1.184	−24.4918	+24.4921	−24.4920	− 0.3	− 86.0	Z_{12}	303.950	1447.2207
Do	Z_{12}-232	1.087	−18.6584	+18.6641	−18.6602	− 1.6	− 87.6	232	305.037	1428.5605
July 27-27			−18.6605	+18.6579						
July 26-27	232-233	1.081	−20.3044	+20.3050	−20.3047	− 0.6	− 88.2	233	306.118	1408.2558
Do	233-A_{13}	1.126	−14.4578	+14.4553	−14.4566	+ 2.5	− 85.7	A_{13}	307.244	1393.7992
Do	*A_{13}-Rock Hill*	*0.106*	*+ 0.8975*	*− 0.8964*	*+ 0.8970*			*Rail.*		*1394.6962*
Do	A_{13}-234	1.088	− 6.7946	+ 6.7945	− 6.7946	+ 0.1	− 85.6	234	308.332	1387.0046
Do	234-235	1.088	− 4.8926	+ 4.8927	− 4.8926	− 0.1	− 85.7	235	309.420	1382.1120
Do	235-B_{13}	1.116	− 2.1638	+ 2.1625	− 2.1632	+ 1.3	− 84.4	B_{13}	310.536	1379.9488
Aug. 23-24	B_{13}-328	1.074	+ 1.0489	− 1.0472	+ 1.0480	− 1.7	− 86.1	328	311.610	1380.9968
Do	328-329	1.085	+ 2.8207	− 2.8204	+ 2.8206	− 0.3	− 86.4	329	312.695	1383.8174
Do	329-330	1.033	+ 0.3930	− 0.3900	+ 0.3915	− 3.0	− 89.4	330	313.728	1384.2089
Do	330-331	1.141	− 2.8183	+ 2.8218	− 2.8200	− 3.5	− 92.9	331	314.869	1381.3889
Do	331-H_{14}	1.193	− 0.5860	+ 0.5847	− 0.5854	+ 1.3	− 91.6	H_{14}	316.062	1380.8035
Aug. 25-25	H_{14}-332	0.497	+ 1.0761	− 1.0774	+ 1.0768	+ 1.3	− 90.3	332	316.559	1381.8803
Do	332-333	1.037	+ 2.8351	− 2.8351	+ 2.8351	0.0	− 90.3	333	317.596	1384.7154
Do	333-334	1.090	+ 2.9085	− 2.9104	+ 2.9094	+ 1.9	− 88.4	334	318.686	1387.6248
Do	334-335	1.142	+11.0700	−11.0727	+11.0714	+ 2.7	− 85.7	335	319.828	1398.6962
Aug. 25	*335-Coaldale*	*1.130*	*− 1.0115*		*− 1.0115*			*Rail.*		*1397.6847*
Aug. 24-24	335-336	*0.996*	*− 5.8665*	*+ 5.8668*	*− 5.8666*	*− 0.3*	*− 86.0*	336	*320.824*	*1392.8296*
Do	*336-I_{14}*	*0.941*	*+ 5.7172*	*− 5.7084*	*+ 5.7112*	*− 5.5*	*− 91.5*	*I_{14}*	*321.765*	*1398.5408*
Aug. 25-25			*+ 5.7107*	*− 5.7086*						
Aug. 25-24	335-337	0.282	+ 1.9864	− 1.9845	+ 1.9854	− 1.9	− 87.6	337	320.110	1400.0816
Do	337-J_{14}	1.201	+15.0272	−15.0261	+15.0266	− 1.1	− 88.7	J_{14}	321.311	1415.7082
Aug. 25-27	J_{14}-338	1.082	+18.4727	−18.4732	+18.4730	+ 0.5	− 88.2	338	322.393	1434.1812
Do	338-339	1.090	+18.1368	−18.1353	+18.1360	− 1.5	− 89.7	339	323.483	1452.3172
Aug. 26-27	339-340	1.095	+19.2382	−19.2417	+19.2400	+ 3.5	− 86.2	340	324.578	1471.5572
Do	340-341	1.099	+18.6997	−18.7032	+18.7014	+ 3.5	− 82.7	341	325.677	1490.2586
Do	341-K_{14}	0.449	+ 6.0523	− 6.0528	+ 6.0526	+ 0.5	− 82.2	K_{14}	326.126	1496.3112
Do	*K_{14}-Silver Peak Jnc.*	*0.479*	*+ 1.3608*	*− 1.3498*	*+ 1.3553*			*Rail.*		*1497.6665*
Do	K_{14}-342	1.089	− 1.3972	+ 1.3983	− 1.3978	− 1.1	− 83.3	342	327.215	1494.9134
Do	342-343	1.152	−12.6654	+12.6691	−12.6672	− 3.7	− 87.0	343	328.367	1482.2462
Do	343-344	1.087	− 5.0679	+ 5.0672	− 5.0676	+ 0.7	− 86.3	344	329.454	1477.1786
Do	344-345	1.085	− 6.0143	+ 6.0148	− 6.0146	− 0.5	− 86.8	345	330.539	1471.1640
Do	345-L_{14}	0.502	− 2.9061	+ 2.9075	− 2.9068	− 1.4	− 88.2	L_{14}	331.041	1468.2572
Do	L_{14}-M_{14}	0.522	− 0.7759	+ 0.7782	− 0.7770	− 2.3	− 90.5	M_{14}	331.563	1467.4802
Do	*M_{14}-Blair Jnc.*	*0.065*	*− 0.4066*	*+ 0.4069*	*− 0.4068*			*Rail.*		*1467.0734*
Do	M_{14}-346	1.096	− 3.7167	+ 3.7182	− 3.7174	− 1.5	− 92.0	346	332.659	1463.7628
Do	346-347	1.088	+ 0.0662	− 0.0630	+ 0.0646	− 3.2	− 95.2	347	333.747	1463.8274
Do	347-348	1.083	− 2.8443	+ 2.8518	− 2.8472	− 5.3	−100.5	348	334.830	1460.9802
Aug. 28-28			− 2.8447	+ 2.8477						
Aug. 26-28	348-N_{14}	1.030	− 2.3552	+ 2.3566	− 2.3559	− 1.4	−101.9	N_{14}	335.860	1458.6243
Do	N_{14}-349	1.078	+ 3.1047	− 3.0995	+ 3.1027	− 3.8	−105.7	349	336.938	1461.7270
Aug. 28-28			+ 3.1045	− 3.1021						
Aug. 26-28	349-350	1.081	+ 4.1738	− 4.1697	+ 4.1718	− 4.1	−109.8	350	338.019	1465.8988
Do	350-351	1.080	− 0.9382	+ 0.9401	− 0.9392	− 1.9	−111.7	351	339.099	1464.9596
Aug. 30-28	351-352	0.549	− 1.7751	+ 1.7792	− 1.7774	− 1.9	−113.6	352	339.648	1463.1822
Aug. 30-30			− 1.7778	+ 1.7774						
Aug. 30-28	352-O_{14}	1.088	− 0.4643	+ 0.4647	− 0.4645	− 0.4	−114.0	O_{14}	340.736	1462.7177

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		km.	m.	m.	m.	mm.	mm.		km.	m.
Aug. 30-28	O_{14}-353	0.437	− 1.5365	+ 1.5405	− 1.5380	− 2.4	−116.4	353	341.173	1461.1797
Aug. 30-30			− 1.5372	+ 1.5379						
Aug. 30-28	353-354	1.082	− 0.4914	+ 0.4974	− 0.4939	− 3.0	−119.4	354	342.255	1460.6858
Aug. 30-30			− 0.4935	+ 0.4934						
Aug. 30-28	354-355	1.081	− 1.6950	+ 1.6963	− 1.6956	− 1.3	−120.7	355	343.336	1458.9902
Aug. 30	*355-McLean's*	*0.806*	*− 2.6414*		*− 2.6414*			*Rail*		*1456.3488*
Aug. 30-28	355-356	1.141	− 5.8115	+ 5.8109	− 5.8112	+ 0.6	−120.1	356	344.477	1453.1790
Do	356-P_{14}	1.143	− 7.8891	+ 7.8892	− 7.8892	− 0.1	−120.2	P_{14}	345.620	1445.2898
Do	P_{14}-357	0.755	− 2.7514	+ 2.7496	− 2.7505	+ 1.8	−118.4	357	346.375	1442.5393
Do	357-358	1.137	− 0.2721	+ 0.2755	− 0.2738	− 3.4	−121.8	358	347.512	1442.2655
Aug. 30-31	358-359	1.088	+ 0.7855	− 0.7829	+ 0.7842	− 2.6	−124.4	359	348.600	1443.0497
Do	359-360	1.024	+ 1.5329	− 1.5279	+ 1.5302	− 2.1	−126.5	360	349.624	1444.5789
Aug. 31-31			+ 1.5295	− 1.5303						
Aug. 30-31	360-Q_{14}	0.885	+ 0.9798	− 0.9780	+ 0.9789	− 1.8	−128.3	Q_{14}	350.509	1445.5588
Do	Q_{14}-361	1.021	+ 2.6204	− 2.6164	+ 2.6184	− 4.0	−132.3	361	351.530	1448.1772
Do	361-362	1.041	+ 2.3035	− 2.3033	+ 2.3034	− 0.2	−132.5	362	352.571	1450.4806
Aug. 31-31	362-363	0.716	+ 0.3037	− 0.3073	+ 0.3055	+ 3.6	−128.9	363	353.287	1450.7861
Do	363-364	1.031	+ 1.2067	− 1.2038	+ 1.2052	− 2.9	−131.8	364	354.318	1451.9913
Do	364-R_{14}	1.056	+ 0.6675	− 0.6687	+ 0.6681	+ 1.2	−130.6	R_{14}	355.374	1452.6594
Aug. 31-Sept. 2	R_{14}-365	1.114	+ 0.9478	− 0.9461	+ 0.9470	− 1.7	−132.3	365	356.488	1453.6064
Do	365-366	1.082	+ 1.7761	− 1.7770	+ 1.7766	+ 0.9	−131.4	366	357.570	1455.3830
Do	366-367	1.080	+ 0.9101	− 0.9132	+ 0.9116	+ 3.1	−128.3	367	358.650	1456.2946
Sept. 2-1	367-368	0.803	+ 0.5871	− 0.5887	+ 0.5879	+ 1.6	−126.7	368	359.513	1456.8825
Sept. 2	*368-S_{14}*	*0.716*	*+ 1.8809*		*+ 1.8816*			*S_{14}*	*360.229*	*1458.7641*
Do	*S_{14}-369*	*0.388*	*+ 1.3069*							
Sept. 1	368-369	1.080	+ 3.1878	− 3.1854	+ 3.1866	− 2.4	−129.1	369	360.593	1460.0691
Sept. 2-1	369-370	1.032	+ 4.5275	− 4.5261	+ 4.5268	− 1.4	−130.5	370	361.625	1464.5959
Do	370-371	1.023	+10.6740	−10.6736	+10.6738	− 0.4	−130.9	371	362.648	1475.2697
Do	371-T_{14}	0.696	+ 4.0758	− 4.0762	+ 4.0760	+ 0.4	−130.5	T_{14}	363.344	1479.3457
Sept. 2	*T_{14}-Miller's*	*0.077*	*+ 0.1326*		*+ 0.1326*			*Rail*		*1479.4783*
Sept. 2-1	T_{14}-372	1.083	+ 4.9625	− 4.9618	+ 4.9622	− 0.7	−131.2	372	364.427	1484.3079
Do	372-373	1.068	+11.8120	−11.8127	+11.8124	+ 0.7	−130.5	373	365.495	1496.1203
Do	373-374	1.062	+ 5.0719	− 5.0687	+ 5.0703	− 3.2	−133.7	374	366.557	1501.1906
Do	374-375	1.085	+ 7.7853	− 7.7800	+ 7.7826	− 5.3	−139.0	375	367.642	1508.9732
Do	375-U_{14}	1.058	+ 6.8340	− 6.8272	+ 6.8307	− 2.6	−141.6	U_{14}	368.700	1515.8039
Sept. 3-3			+ 6.8299	− 6.8315						
Sept. 2-3	U_{14}-376	0.906	+ 9.4744	− 9.4733	+ 9.4738	− 1.1	−142.7	376	369.606	1525.2777
Do	376-377	1.026	+ 9.0779	− 9.0735	+ 9.0745	− 4.2	−146.9	377	370.632	1534.3522
Sept. 4-4			+ 9.0753	− 9.0714						
Sept. 2-3	377-378	0.950	+ 9.5632	− 9.5591	+ 9.5612	− 4.1	−151.0	378	371.582	1543.9134
Sept. 4-3	378-379	1.332	+14.7331	−14.7301	+14.7316	− 3.0	−154.0	379	372.914	1558.6450
Do	379-V_{14}	1.028	+11.9893	−11.9851	+11.9882	− 2.3	−156.3	V_{14}	373.942	1570.6332
Sept. 4-4			+11.9895	−11.9891						
Sept. 4-3	V_{14}-380	0.468	+ 5.2018	− 5.2021	+ 5.2020	+ 0.3	−156.0	380	374.410	1575.8352
Do	380-381	1.095	+11.9302	−11.9281	+11.9292	− 2.1	−158.1	381	375.505	1587.7644
Do	381-382	1.095	+10.8196	−10.8214	+10.8205	+ 1.8	−156.3	382	376.600	1598.5849
Do	382-383	1.094	+ 7.8938	− 7.8902	+ 7.8920	− 3.6	−159.9	383	377.694	1606.4709
Do	383-384	1.097	+ 7.4359	− 7.4303	+ 7.4316	− 2.8	−162.7	384	378.791	1613.9085
Sept. 4-4			+ 7.4301	− 7.4302						
Sept. 4-3	384-W_{14}	1.124	− 0.4784	+ 0.4777	− 0.4780	+ 0.7	−162.0	W_{14}	379.915	1613.4305
Do	*W_{14}-385*	*0.872*	*+ 1.3125*	*− 1.3113*	*+ 1.3119*	*− 1.2*	*−163.2*	*385*	*380.787*	*1614.7424*
Do	*385-386*	*1.091*	*+ 1.7698*	*− 1.7720*	*+ 1.7709*	*+ 2.2*	*−161.0*	*386*	*381.878*	*1616.5133*
Sept. 4-8	*386-387*	*1.011*	*+ 6.6480*	*− 6.6552*	*+ 6.6520*	*+ 2.9*	*−158.1*	*387*	*382.889*	*1623.1653*
Sept. 8-8			*+ 6.6531*	*− 6.6558*						
Sept. 4-8	*387-388*	*1.073*	*+ 8.3544*	*− 8.3567*	*+ 8.3550*	*+ 1.3*	*−156.8*	*388*	*383.962*	*1631.5003*
Sept. 8-8	*388-X_{14}*	*0.298*	*+ 3.0768*	*− 3.0749*	*+ 3.0758*	*− 1.9*	*−158.7*	*X_{14}*	*384.260*	*1634.5761*
Do	*X_{14}-389*	*0.511*	*+ 7.1521*	*− 7.1507*	*+ 7.1514*	*− 1.4*	*−160.1*	*389*	*384.771*	*1641.7275*
Do	*389-390*	*1.135*	*+13.6931*	*−13.6913*	*+13.6922*	*− 1.8*	*−161.9*	*390*	*385.906*	*1655.4197*
Do	*390-391*	*1.047*	*+13.8445*	*−13.8430*	*+13.8438*	*− 1.5*	*−163.4*	*391*	*386.953*	*1669.2635*
Do	*391-Y_{14}*	*1.150*	*+18.6112*	*−18.6081*	*+18.6066*	*− 4.9*	*−168.3*	*Y_{14}*	*388.103*	*1687.8701*
Sept. 9-9			*+18.6070*	*−18.6063*						
Sept. 7-8	*Y_{14}-Z_{14}*	*1.060*	*+24.8551*	*−24.8527*	*+24.8539*	*− 2.4*	*−170.7*	*Z_{14}*	*389.163*	*1712.7040*
Do	*Z_{14}-392*	*1.073*	*+27.7077*	*−27.7050*	*+27.7064*	*− 2.7*	*−173.4*	*392*	*390.236*	*1740.4104*
Do	*392-393*	*1.187*	*+29.8721*	*−29.8698*	*+29.8710*	*− 2.3*	*−175.7*	*393*	*391.363*	*1770.2814*
Do	*393-394*	*1.159*	*+32.3680*	*−32.3676*	*+32.3678*	*− 0.5*	*−176.2*	*394*	*392.522*	*1802.6492*
Sept. 7-7	*394-395*	*0.784*	*+19.4448*	*−19.4450*	*+19.4449*	*+ 0.2*	*−176.0*	*395*	*393.306*	*1822.0941*
Sept. 7	*395-Tonopah*	*0.783*	*− 0.8370*		*− 0.8370*			*Rail*		*1821.2571*
Sept. 7-7	*395-A_{16}*	*0.451*	*+14.6081*	*−14.6076*	*+14.6078*	*− 0.5*	*−176.5*	*A_{16}*	*393.757*	*1836.7019*
Do	*A_{16}-B_{15}*	*1.351*	*+37.0252*	*−37.0256*	*+37.0254*	*+ 0.4*	*−176.1*	*B_{15}*	*395.088*	*1873.7273*
Sept. 10-9	W_{14}-396	0.652	+ 4.2840	− 4.2837	+ 4.2838	− 0.3	−162.3	396	380.507	1617.7143
Do	*396-McSweeney Jct.*	*0.457*	*− 0.1776*	*+ 0.1782*	*− 0.1779*			*Rail*		*1617.5364*

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Backward line.	Mean.	Discrepancy. Partial.	Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Sept. 10-9	396-397	1.188	− 2.2785	+ 2.2785	− 2.2785	0.0	−162.3	397	381.755	1615.4358
Do	397-398	1.085	− 5.0477	+ 5.0470	− 5.0474	+ 0.7	−161.6	398	382.840	1610.3884
Do	398-399	1.141	− 9.4965	+ 9.4975	− 9.4970	− 1.0	−162.6	399	383.981	1600.8914
Do	399-400	1.087	−12.8350	+12.8342	−12.8346	+ 0.8	−161.8	400	385.068	1588.0568
Do	400-C_{15}	1.090	−14.4774	+14.4717	−14.4770	+ 3.5	−158.3	C_{15}	386.158	1573.5798
Sept. 10-10			−14.4800	+14.4788						
Sept. 10-9	C_{15}-401	1.165	−15.6487	+15.6457	−15.6472	+ 3.0	−155.3	401	387.323	1557.9326
Do	401-402	0.997	−11.2529	+11.2475	−11.2496	+ 3.2	−152.1	402	388.320	1546.6830
Sept. 10-10			−11.2496	+11.2486						
Sept. 11-9	402-D_{15}	1.087	−14.5066	+14.5072	−14.5069	− 0.6	−152.7	D_{15}	389.407	1532.1761
Do	D_{15}-403	0.810	− 8.2087	+ 8.2108	− 8.2098	− 2.1	−154.8	403	390.217	1523.9663
Do	403-404	1.066	−12.8615	+12.8688	−12.8666	− 2.9	−157.7	404	391.283	1511.0997
Sept. 11-11			−12.8687	+12.8671						
Sept. 11-13	404-405	1.080	−11.7877	+11.7857	−11.7867	+ 2.0	−155.7	405	392.363	1499.3130
Do	405-406	1.088	− 5.0185	+ 5.0107	− 5.0148	+ 2.4	−153.3	406	393.451	1494.2982
Sept. 13-13			− 5.0135	+ 5.0164						
Sept. 11-13	406-407	1.142	+ 2.1509	− 2.1551	+ 2.1530	+ 4.2	−149.1	407	394.593	1496.4512
Do	407-E_{15}	1.252	+ 4.8765	− 4.8776	+ 4.8770	+ 1.1	−148.0	E_{15}	395.845	1501.3282
Do	*E_{15}-Klondyke*	*0.904*	*− 1.5845*	*+ 1.5888*	*− 1.5866*			*Rail.*		*1499.7416*
Do	E_{15}-408	1.085	− 3.2383	+ 3.2381	− 3.2382	+ 0.2	−147.8	408	396.930	1498.0900
Do	408-409	1.088	+ 4.6994	− 4.6983	+ 4.6988	− 1.1	−148.9	409	398.018	1502.7888
Do	409-410	1.139	+ 6.1000	− 6.0984	+ 6.0992	− 1.6	−150.5	410	399.157	1508.8880
Do	410-411	1.143	+ 8.9295	− 8.9282	+ 8.9288	− 1.3	−151.8	411	400.300	1517.8168
Do	411-412	1.035	+ 9.8683	− 9.8649	+ 9.8666	− 3.4	−155.2	412	401.335	1527.6834
Do	412-F_{15}	0.973	+10.2980	−10.3023	+10.3002	+ 4.3	−150.9	F_{15}	402.308	1537.9836
Sept. 13-14	F_{15}-413	1.024	+ 5.9587	− 5.9602	+ 5.9594	+ 1.5	−149.4	413	403.332	1543.9430
Do	413-414	1.141	+15.2043	−15.2060	+15.2052	+ 1.7	−147.7	414	404.473	1559.1482
Do	414-415	0.611	+ 3.3432	− 3.3459	+ 3.3446	+ 2.7	−145.0	415	405.084	1562.4928
Sept. 15-14	415-416	0.584	+ 8.3746	− 8.3731	+ 8.3738	− 1.5	−146.5	416	405.668	1570.8666
Do	416-417	1.031	+14.2591	−14.2599	+14.2595	+ 0.8	−145.7	417	406.699	1585.1261
Do	417-418	1.193	+14.0447	−14.0478	+14.0462	+ 3.1	−142.6	418	407.892	1599.1723
Do	418-419	*1.081*	*+15.7532*	*−15.7522*	*+15.7527*	*− 1.0*	*−143.6*	419	408.973	1614.9250
Do	419-420	1.080	+14.1872	−14.1898	+14.1885	+ 2.6	−141.0	420	410.053	1629.1135
Sept. 15-15	*420-G_{15}*	*0.305*	*− 1.9024*	*+ 1.9018*	*− 1.9021*	*+ 0.6*	*−140.4*	G_{15}	*410.358*	*1627.2114*
Sept. 15-14	420-421	1.123	+16.9203	−16.9204	+16.9204	+ 0.1	−140.9	421	411.176	1646.0339
Do	421-422	1.046	+14.9162	−14.9123	+14.9142	− 3.9	−144.8	422	412.222	1660.9481
Do	422-423	1.130	+15.6927	−15.6938	+15.6932	+ 1.1	−143.7	423	413.352	1676.6413
Do	423-424	1.138	+14.5430	−14.5458	+14.5444	+ 2.8	−140.9	424	414.490	1691.1857
Do	424-H_{15}	1.108	+ 1.8996	− 1.8996	+ 1.8996	0.0	−140.9	H_{15}	415.598	1693.0853
Do	*H_{15}-crossing of L. V. & T. R. R. and T. & G. R. R.*	*0.531*	*+ 1.2996*	*− 1.2986*	*+ 1.2991*			*Rail.*		*1694.3844*
Do	H_{15}-425	0.551	+ 1.3620	− 1.3604	+ 1.3612	− 1.6	−142.5	425	416.149	1694.4465
Sept. 16-16	*425-426*	*1.181*	*+18.8025*	*−18.8020*	*+18.8022*	*− 0.3*	*−142.8*	*426*	*417.330*	*1711.2487*
Do	*426-I_{15}*	*0.929*	*+18.5699*	*−18.5661*	*+18.5680*	*− 3.8*	*−146.6*	I_{15}	*418.259*	*1729.8167*
Do	I_{15}-J_{15}	*0.165*	*+ 0.5313*	*− 0.5293*	*+ 0.5303*	*− 2.0*	*−148.6*	J_{15}	*418.424*	*1730.3470*
Do	J_{15}-K_{15}	*0.078*	*+ 3.4349*	*− 3.4342*	*+ 3.4342*	*− 0.1*	*−148.7*	K_{15}	*418.497*	*1733.7812*
Do	K_{15}-L_{15}	*0.244*	*+ 3.6089*	*− 3.6089*	*+ 3.6079*	*+ 2.0*	*−146.7*	L_{15}	*418.741*	*1737.3891*
Sept. 16-17	425-427	1.080	+18.9130	−18.9121	+18.9126	− 0.9	−143.4	427	417.229	1713.3591
Do	427-428	1.122	+24.9174	−24.9163	+24.9168	− 1.1	−144.5	428	418.351	1738.2759
Do	428-429	1.267	+27.5175	−27.5158	+27.5160	− 1.7	−146.2	429	419.618	1765.7925
Do	429-430	1.164	+12.2090	−12.2051	+12.2070	− 3.9	−150.1	430	420.782	1777.9995
Sept. 17	*430-Red Rock*	*0.109*	*− 0.0168*		*− 0.0168*			*Rail.*		*1777.9827*
Sept. 16-17	430-M_{15}	0.681	− 9.4338	+ 9.4346	− 9.4342	− 0.8	−150.9	M_{15}	421.463	1768.5653
Sept. 18-17	M_{15}-431	1.208	−15.4635	+15.4563	−15.4604	+ 2.9	−148.0	431	422.671	1753.1049
Sept. 20-20			−15.4600	+15.4615						
Sept. 18-17	431-432	1.157	−16.1844	+16.1840	−16.1842	+ 0.4	−147.6	432	423.828	1736.9207
Do	432-433	1.233	−17.8475	+17.8510	−17.8492	− 3.5	−151.1	433	425.061	1719.0715
Do	433-434	1.085	−20.0762	+20.0795	−20.0778	− 3.3	−154.4	434	426.146	1698.9937
Do	434-435	1.086	−22.7149	+22.7128	−22.7138	+ 2.1	−152.3	435	427.232	1676.2799
Do	435-N_{15}	1.066	−21.5042	+21.5026	−21.5034	+ 1.6	−150.7	N_{15}	428.298	1654.7765
Sept. 18-20	N_{15}-436	1.116	−21.4435	+21.4435	−21 4435	0.0	−150.7	436	429.414	1633.3330
Do	436-437	1.088	−20.1676	+20.1690	−20.1683	− 1.4	−152.1	437	430.502	1613.1647
Do	437-438	1.101	−19.2595	+19.2638	−19.2616	− 4.3	−156.4	438	431.603	1593.9031
Do	438-439	1.089	−23.8062	+23.8113	−23.8093	− 2.8	−159.2	439	432.692	1570.0938
Sept. 21-21			−23.8096	+23.8101						
Sept. 18-20	439-O_{15}	1.107	−23.1149	+23.1188	−23.1168	− 3.9	−163.1	O_{15}	433.799	1546.9770
Do	O_{15}-440	1.139	−19.3176	+19.3190	−19.3183	− 1.4	−164.5	440	434.938	1527.6587
Do	440-441	1.020	−10.2802	+10.2802	−10.2802	0.0	−164.5	441	435.958	1517.3785
Do	441-442	1.156	−13.8813	+13 8817	−13.8815	− 0.4	−164.9	442	437.114	1503.4970

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_5.	Observed elevation above mean sea level.
1915.		km.	m.	m.	m.	mm.	mm.		km.	m.
Sept. 18-20	442-443	1.121	−11.7333	+11.7324	−11.7328	+ 0.9	−164.0	443	438.235	1491.7642
Sept. 21-20	443-P_{15}	0.754	− 9.4238	+ 9.4237	− 9.4238	+ 0.1	−163.9	P_{15}	438.989	1482.3404
Do	P_{15}-444	1.069	−16.0667	+16.0704	−16.0686	− 3.7	−167.6	444	440.058	1466.2718
Do	444-445	1.090	−12.1892	+12.1891	−12.1892	+ 0.1	−167.5	445	441.148	1454.0826
Do	445-446	1.092	− 6.2045	+ 6.2083	− 6.2064	− 3.8	−171.3	446	442.240	1447.8762
Sept. 21-21	*446-Ralston*	*0.183*	*− 0.5448*	*+ 0.5467*	*− 0.5458*			*Rail*		*1447.3304*
Do	446-Q_{15}	0.471	− 0.6106	+ 0.6109	− 0.6108	− 0.3	−171.6	Q_{15}	442.711	1447.2654
Do	Q_{15}-447	1.081	− 3.0268	+ 3.0234	− 3.0251	+ 3.4	−168.2	447	443.792	1444.2403
Do	447-448	1.095	− 6.1440	+ 6.1461	− 6.1450	− 2.1	−170.3	448	444.887	1438.0953
Do	448-449	1.089	− 2.9478	+ 2.9493	− 2.9486	− 1.5	−171.8	449	445.976	1435.1467
Sept. 22-22	449-R_{15}	1.071	+ 1.5158	− 1.5138	+ 1.5148	− 2.0	−173.8	R_{15}	447.047	1436.6615
Do	R_{15}-450	1.057	− 5.6183	+ 5.6226	− 5.6204	− 4.3	−178.1	450	448.104	1431.0411
Do	450-451	1.099	− 4.8178	+ 4.8213	− 4.8196	− 3.5	−181.6	451	449.203	1426.2215
Do	451-452	1.090	− 2.8054	+ 2.8051	− 2.8052	+ 0.3	−181.3	452	450.293	1423.4163
Do	452-453	1.096	+ 3.7203	− 3.7201	+ 3.7202	− 0.2	−181.5	453	451.389	1427.1365
Do	453-S_{15}	1.088	+ 0.0270	− 0.0217	+ 0.0244	− 2.7	−184.2	S_{15}	452.477	1427.1609
Sept. 23-23			+ 0.0244	− 0.0243						
Sept. 22-22	S_{15}-454	1.098	− 4.2375	+ 4.2341	− 4.2358	+ 3.4	−180.8	454	453.575	1422.9251
Sept. 23-24	454-455	1.096	− 5.1224	+ 5.1243	− 5.1234	− 1.9	−182.7	455	454.671	1417.8017
Do	455-456	1.094	−12.1327	+12.1338	−12.1332	− 1.1	−183.8	456	455.765	1405.6685
Do	456-T_{15}	1.089	− 6.0237	+ 6.0243	− 6.0240	− 0.6	−184.4	T_{15}	456.854	1399.6445
Do	T_{15}-457	1.047	− 0.9543	+ 0.9598	− 0.9581	− 3.0	−187.4	457	457.901	1398.6864
Sept. 24-24			− 0.0589	+ 0.0595						
Sept. 23-24	457-458	1.148	+ 0.9610	− 0.9591	+ 0.9600	− 1.9	−189.3	458	459.049	1399.6464
Do	458-459	1.095	+ 2.9780	− 2.9768	+ 2.9774	− 1.2	−190.5	459	460.144	1402.6238
Sept. 23-23	*459-Wagner*	*0.232*	*+ 2.0007*	*− 2.0056*	*+ 2.0022*			*Rail*		*1404.6260*
Sept. 23-24	459-460	1.088	− 6.7736	+ 6.7735	− 6.7736	+ 0.1	−190.4	460	461.232	1395.8502
Sept. 24-27	460-U_{15}	0.436	− 5.5558	+ 5.5537	− 5.5548	+ 2.1	−188.3	U_{15}	461.668	1390.2954
Do	U_{15}-461	1.086	−16.4180	+16.4208	−16.4194	− 2.8	−191.1	461	462.754	1373.8760
Do	461-462	1.057	−16.7377	+16.7393	−16.7385	− 1.6	−192.7	462	463.811	1357.1375
Do	462-463	1.081	−15.9002	+15.8999	−15.9000	+ 0.3	−192.4	463	464.892	1341.2375
Do	463-464	0.973	−15.4144	+15.4143	−15.4144	+ 0.1	−192.3	464	465.865	1325.8231
Sept. 27-25	464-V_{15}	1.110	− 1.8394	+ 1.8444	− 1.8423	− 3.8	−196.1	V_{15}	466.975	1323.9808
Sept. 27-27			− 1.8415	+ 1.8439						
Sept. 27-25	V_{15}-465	1.315	−13.4342	+13.4379	−13.4360	− 3.7	−199.8	465	468.290	1310.5448
Do	465-466	1.188	−10.7469	+10.7494	−10.7482	− 2.5	−202.3	466	469.478	1299.7966
Do	466-W_{15}	1.072	− 6.4265	+ 6.4250	− 6.4258	+ 1.5	−200.8	W_{15}	470.550	1293.3708
Do	W_{15}-467	0.454	− 5.4438	+ 5.4450	− 5.4444	− 1.2	−202.0	467	471.004	1287.9264
Do	467-468	1.052	− 7.3884	+ 7.3832	− 7.3868	+ 1.7	−200.3	468	472.056	1280.5396
Sept. 27-27			− 7.3869	+ 7.3886						
Sept. 27-25	468-469	1.073	−14.2493	+14.2494	−14.2494	− 0.1	−200.4	469	473.129	1266.2902
Do	469-470	1.077	−10.7957	+10.7947	−10.7952	+ 1.0	−199.4	470	474.206	1255.4950
Do	470-471	1.079	−10.7540	+10.7528	−10.7534	+ 1.2	−198.2	471	475.285	1244.7416
Sept. 27-28	471-X_{15}	0.264	− 0.5251	+ 0.5259	− 0.5255	− 0.8	−199.0	X_{15}	475.549	1244.2161
Do	X_{15}-472	1.166	−15.9133	+15.9113	−15.9123	+ 2.0	−197.0	472	476.715	1228.3038
Sept. 28-28	472-473	1.152	−11.9093	+11.9130	−11.9112	− 3.7	−200.7	473	477.867	1216.3926
Do	473-474	1.073	− 8.4658	+ 8.4670	− 8.4663	− 1.4	−202.1	474	478.940	1207.9263
Do	474-Y_{15}	1.069	− 3.0364	+ 3.0374	− 3.0369	− 1.0	−203.1	Y_{15}	480.039	1204.8894
Do	Y_{15}-Z_{15}	0.483	+ 1.4999	− 1.5018	+ 1.5008	+ 1.9	−201.2	Z_{15}	480.522	1206.3902
Do	Z_{15}-475	1.046	+ 1.1848	− 1.1822	+ 1.1835	− 2.6	−203.8	475	481.568	1207.5737
Do	475-476	1.207	− 4.5070	+ 4.5058	− 4.5064	+ 1.2	−202.6	476	482.775	1203.0673
Sept. 29-28	476-477	1.070	− 0.5537	+ 0.5547	− 0.5542	− 1.0	−203.6	477	483.845	1202.5131
Do	477-A_{15}	1.076	+ 2.6598	− 2.6577	+ 2.6588	− 2.1	−205.7	A_{15}	484.921	1205.1719
Do	A_{15}-478	0.481	+ 0.7301	− 0.7298	+ 0.7300	− 0.3	−206.0	478	485.402	1205.9019
Do	478-479	1.073	+ 3.5054	− 3.5071	+ 3.5062	+ 1.7	−204.3	479	486.475	1209.4081
Do	479-480	1.078	+ 0.3793	− 0.3751	+ 0.3772	− 4.2	−208.5	480	487.553	1209.7853
Do	480-481	1.130	− 0.0443	+ 0.0483	− 0.0463	− 4.0	−212.5	481	488.683	1209.7390
Do	481-B_{15}	1.124	− 2.6408	+ 2.6402	− 2.6405	+ 0.6	−211.9	B_{15}	489.807	1207.0985
Sept. 29-30	B_{15}-482	1.131	− 1.6909	+ 1.6918	− 1.6914	− 0.9	−212.8	482	490.938	1205.4071
Do	482-483	1.071	+ 0.4629	− 0.4623	+ 0.4626	− 0.6	−213.4	483	492.009	1205.8697
Do	483-484	1.232	+ 0.9894	− 0.9893	+ 0.9894	− 0.1	−213.5	484	493.241	1206.8591
Do	484-C_{15}	1.344	+ 0.0236	− 0.0167	+ 0.0187	− 5.0	−218.5	C_{15}	494.585	1206.8778
Oct. 3-1			+ 0.0188	− 0.0158						
Sept. 29-30	C_{15}-485	1.066	− 0.4392	+ 0.4395	− 0.4394	− 0.3	−218.8	485	495.651	1206.4384
Do	485-486	1.075	− 0.2704	+ 0.2720	− 0.2712	− 1.6	−220.4	486	496.726	1206.1672
Do	486-487	1.182	+ 2.5911	− 2.5886	+ 2.5898	− 2.5	−222.9	487	497.908	1208.7570
Do	487-488	1.125	+ 1.1320	− 1.1340	+ 1.1330	+ 2.0	−220.9	488	499.033	1209.8900
Do	488-D_{15}	0.549	+ 1.0653	− 1.0657	+ 1.0655	+ 0.4	−220.5	D_{15}	499.582	1210.9555
Do	D_{15}-489	1.220	+ 2.4303	− 2.4240	+ 2.4265	− 3.4	−223.9	489	500.802	1213.3820
Oct. 1-1			+ 2.4262	− 2.4257						

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Sept. 29-30	489-490	1.075	+ 2.7617	− 2.7578	+ 2.7598	− 3.9	−227.8	490	501.877	1216.1418
Do	490-491	1.068	+ 1.4150	− 1.4124	+ 1.4137	− 2.6	−230.4	491	502.945	1217.5555
Oct. 1-Sept. 30	491-E_{16}	1.388	+ 1.0974	− 1.1001	+ 1.0988	+ 2.7	−227.7	E_{16}	504.333	1218.6543
Do	E_{16}-492	0.971	− 0.5595	+ 0.5634	− 0.5614	− 3.9	−231.6	492	505.304	1218.0929
Do	492-493	1.131	+ 5.6561	− 5.6567	+ 5.6564	+ 0.6	−231.0	493	506.435	1223.7493
Oct. 1-2	493-494	1.125	+ 2.4298	− 2.4306	+ 2.4302	+ 0.8	−230.2	494	507.560	1226.1795
Do	494-495	1.131	− 1.2928	+ 1.2914	− 1.2921	+ 1.4	−228.8	495	508.691	1224.8874
Do	495-F_{16}	0.511	+ 0.7397	− 0.7366	+ 0.7382	− 3.1	−231.9	F_{16}	509.202	1225.6256
Do	F_{16}-496	1.129	+ 0.7259	− 0.7255	+ 0.7257	− 0.4	−232.3	496	510.331	1226.3513
Do	496-497	1.134	+ 4.9409	− 4.9382	+ 4.9396	− 2.7	−235.0	497	511.465	1231.2909
Do	497-498	1.126	− 3.6567	+ 3.6602	− 3.6584	− 3.5	−238.5	498	512.591	1227.6325
Oct. 2-2	498-499	0.373	− 0.1886	+ 0.1894	− 0.1890	− 0.8	−239.3	499	512.964	1227.4435
Do	499-G_{16}	1.072	− 0.3434	+ 0.3437	− 0.3436	− 0.3	−239.6	G_{16}	514.036	1227.0999
Oct. 4-2	G_{16}-500	0.592	− 1.1497	+ 1.1523	− 1.1510	− 2.6	−242.2	500	514.628	1225.9489
Do	500-501	1.056	+ 3.0557	− 3.0562	+ 3.0560	+ 0.5	−241.7	501	515.684	1229.0049
Do	501-502	1.073	+ 2.3601	− 2.3622	+ 2.3612	+ 2.1	−239.6	502	516.757	1231.3661
Do	502-503	1.133	− 9.7661	+ 9.7642	− 9.7652	+ 1.9	−237.7	503	517.890	1221.6009
Do	503-H_{16}	1.114	− 7.2503	+ 7.2530	− 7.2516	− 2.7	−240.4	H_{16}	519.004	1214.3493
Do	H_{16}-504	0.264	− 3.7496	+ 3.7516	− 3.7506	− 2.0	−242.4	504	519.268	1210.5987
Do	504-505	1.129	− 4.5506	+ 4.5503	− 4.5504	+ 0.3	−242.1	505	520.397	1206.0483
Do	505-506	0.969	− 8.6150	+ 8.6176	− 8.6163	− 2.6	−244.7	506	521.366	1197.4320
Do	506-507	1.124	− 8.9989	+ 9.0015	− 9.0002	− 2.6	−247.3	507	522.490	1188.4318
Do	507-I_{16}	1.234	−12.1673	+12.1728	−12.1707	− 1.8	−249.1	I_{16}	523.724	1176.2611
Oct. 4-4			−12.1722	+12.1704						
Oct. 4	*I_{16}-Pioneer*		*− 3.2707*		*− 3.2707*			*Rail.*		*1172.9904*
Oct. 4-6	I_{16}-508	1.114	−14.3257	+14.3254	−14.3254	+ 0.1	−249.0	508	524.838	1161.9357
Oct. 6			−14.3253							
Oct. 4-6	508-509	1.040	−16.3822	+16.3833	−16.3828	− 1.1	−250.1	509	525.878	1145.5529
Do	509-510	1.136	−13.1049	+13.1031	−13.1040	+ 1.8	−248.3	510	527.014	1132.4489
Do	510-511	1.127	− 7.8921	+ 7.8926	− 7.8924	− 0.5	−248.8	511	528.141	1124.5565
Do	511-512	0.432	− 3.1678	+ 3.1673	− 3.1676	+ 0.5	−248.3	512	528.573	1121.3889
Oct. 6-6	512-J_{16}	0.057	− 0.1473	+ 0.1483	− 0.1478	− 1.0	−249.3	J_{16}	528.630	1121.2411
Do	J_{16}-513	0.056	− 0.0633	+ 0.0623	− 0.0628	+ 1.0	−248.3	513	528.686	1121.1783
Oct. 4-6	513-514	1.020	−14.4095	+14.4111	−14.4103	− 1.6	−249.9	514	529.706	1106.7680
Do	514-515	1.010	− 8.0182	+ 8.0160	− 8.0171	+ 2.2	−247.7	515	530.716	1098.7509
Oct. 7-6	515-516	0.482	− 2.6969	+ 2.6965	− 2.6967	+ 0.4	−247.3	516	531.198	1096.0542
Do	516-517	1.123	− 8.4693	+ 8.4669	− 8.4681	+ 2.4	−244.9	517	532.321	1087.5861
Do	517-K_{16}	1.138	−12.5261	+12.5257	−12.5259	+ 0.4	−244.5	K_{16}	533.459	1075.0602
Do	K_{16}-518	0.373	− 2.4415	+ 2.4427	− 2.4421	− 1.2	−245.7	518	533.832	1072.6181
Do	518-519	1.121	−12.8163	+12.8225	−12.8189	− 3.4	−249.1	519	534.953	1059.7992
Oct. 7-7			−12.8180	+12.8188						
Oct. 7-6	519-520	1.112	−10.4765	+10.4762	−10.4764	+ 0.3	−248.8	520	536.065	1049.3228
Do	520-521	1.130	− 6.3260	+ 6.3266	− 6.3263	− 0.6	−249.4	521	537.195	1042.9965
Do	521-L_{16}	1.123	− 7.9828	+ 7.9846	− 7.9837	− 1.8	−251.2	L_{16}	538.318	1035.0128
Do	L_{16}-522	1.023	−12.5107	+12.5118	−12.5112	− 1.1	−252.3	522	539.341	1022.5016
Do	522-523	1.070	−10.2235	+10.2217	−10.2226	+ 1.8	−250.5	523	540.411	1012.2790
Do	523-M_{16}	1.025	−11.6036	+11.6011	−11.6024	+ 2.5	−248.0	M_{16}	541.436	1000.6766
Oct. 7-7	*M_{16}-N_{16}*	*0.587*	*+ 7.2293*	*− 7.2279*	*+ 7.2286*	*− 1.4*	*−249.4*	N_{16}	*541.823*	*1007.9052*
Oct. 7	*M_{16}-Beatty*	*0.167*	*− 0.8280*		*− 0.8280*			*Rail.*		*999.8486*
Oct. 7-7	M_{16}-524	1.158	− 8.7277	+ 8.7278	− 8.7278	− 0.1	−248.1	524	542.594	991.9488
Oct. 7-5	524-525	1.281	−14.9273	+14.9354	−14.9312	− 5.7	−253.8	525	543.875	977.0176
Oct. 7-7			−14.9294	+14.9328						
Oct. 8-4	525-526	1.022	−11.3742	+11.3737	−11.3740	+ 0.5	−253.3	526	544.897	965.6436
Oct. 8-8	526-O_{16}	0.041	− 0.3773	+ 0.3777	− 0.3775	− 0.4	−253.7	O_{16}	544.938	965.2661
Do	O_{16}-527	0.041	− 0.0117	+ 0.0120	− 0.0118	− 0.3	−254.0	527	544.979	965.2543
Oct. 8-5	*527-Gold Center.*	*0.492*	*− 3.5124*	*+ 3.5122*	*− 3.5123*			*Rail.*		*961.7420*
Do	527-528	1.111	− 9.9616	+ 9.9681	− 9.9652	− 2.7	−256.7	528	546.090	955.2891
Oct. 9-9			− 9.9662	+ 9.9650						
Oct. 8-5	528-529	1.157	−11.0354	+11.0374	−11.0364	− 2.0	−258.7	529	547.247	944.2527
Do	529-530	1.091	− 9.1238	+ 9.1234	− 9.1236	+ 0.4	−258.3	530	548.338	935.1291
Do	530-531	1.092	−10.2525	+10.2499	−10.2512	+ 2.6	−255.7	531	549.430	924.8779
Do	531-P_{16}	1.093	−10.5882	+10.5897	−10.5890	− 1.5	−257.2	P_{16}	550.523	914.2889
Do	P_{16}-532	0.386	− 4.3028	+ 4.3033	− 4.3030	− 0.5	−257.7	532	550.909	909.9859
Do	532-533	1.095	− 9.5273	+ 9.5270	− 9.5272	+ 0.3	−257.4	533	552.004	900.4587
Do	533-534	1.090	− 9.4756	+ 9.4772	− 9.4764	− 1.6	−259.0	534	553.094	890.9823
Do	534-535	1.092	−10.0462	+10.0493	−10.0478	− 3.1	−262.1	535	554.186	880.9345
Do	535-Q_{16}	1.090	− 8.5199	+ 8.5243	− 8.5205	− 2.0	−264.1	Q_{16}	555.276	872.4140
Oct. 9-9			− 8.5191	+ 8.5187						
Oct. 8-5	Q_{16}-536	0.454	− 3.7654	+ 3.7659	− 3.7656	− 0.5	−264.6	536	555.730	868.6484
Do	536-537	1.095	− 9.2616	+ 9.2644	− 9.2630	− 2.8	−267.4	537	556.825	859.3854

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Oct. 8–5	537–538	1.097	− 7.4653	+ 7.4663	− 7.4658	− 1.0	−268.4	538	557.922	851.9196
Do	538–539	1.093	− 6.7571	+ 6.7524	− 6.7532	+ 3.3	−265.1	539	559.015	845.1664
Oct. 9–9			− 6.7525	+ 6.7506						
Oct. 8–5	539–R_{16}	1.091	− 6.3779	+ 6.3812	− 6.3796	− 3.3	−268.4	R_{16}	560.106	838.7868
Do	R_{16}–540	0.778	− 5.0626	+ 5.0603	− 5.0614	+ 2.3	−266.1	540	560.884	833.7254
Do	540–541	1.158	− 7.7185	+ 7.7158	− 7.7172	+ 2.7	−263.4	541	562.042	826.0082
Oct. 11–9	541–542	0.708	− 3.8225	+ 3.8211	− 3.8218	+ 1.4	−262.0	542	562.750	822.1864
Do	542–543	1.092	− 4.3926	+ 4.3934	− 4.3930	− 0.8	−262.8	543	563.842	817.7934
Do	543–S_{16}	1.096	− 6.6071	+ 6.6070	− 6.6070	+ 0.1	−262.7	S_{16}	564.938	811.1864
Do	S_{16}–544	0.457	− 0.5658	+ 0.5661	− 0.5660	− 0.3	−263.0	544	565.395	810.6204
Do	544–545	1.096	−10.8756	+10.8777	−10.8766	− 2.1	−265.1	545	566.491	799.7438
Do	545–546	1.091	− 7.7993	+ 7.8015	− 7.8004	− 2.2	−267.3	546	567.582	791.9434
Do	546–547	1.093	− 6.7549	+ 6.7531	− 6.7540	+ 1.8	−265.5	547	568.675	785.1894
Do	547–T_{16}	1.088	− 1.0200	+ 1.0214	− 1.0207	− 1.4	−266.9	T_{16}	569.703	784.1687
Do	T_{16}–548	0.774	+ 0.7161	− 0.7159	+ 0.7160	− 0.2	−267.1	548	570.537	784.8847
Do	548–U_{16}	1.047	+ 4.0662	− 4.0653	+ 4.0658	− 0.9	−268.0	U_{16}	571.584	788.9505
Oct. 9–11	*U_{16}–Rosewell*	*0.131*	*− 0.0077*	*+ 0.0089*	*− 0.0083*			*Rail*		*788.9422*
Oct. 11–9	U_{16}–549	0.444	− 1.5874	+ 1.5856	− 1.5865	+ 1.8	−266.2	549	572.028	787.3640
Do	549–550	1.026	+ 4.2283	− 4.2249	+ 4.2266	− 3.4	−269.6	550	573.054	791.5906
Oct. 11–11	550–551	1.093	− 3.7328	+ 3.7354	− 3.7341	− 2.6	−272.2	551	574.147	787.8565
Do	551–V_{16}	0.515	− 0.2430	+ 0.2437	− 0.2434	− 0.7	−272.9	V_{16}	574.662	787.6131
Do	V_{16}–552	1.107	− 5.8008	+ 5.8015	− 5.8012	− 0.7	−273.6	552	575.769	781.8119
Do	552–W_{16}	0.502	− 0.0813	+ 0.0837	− 0.0825	− 2.4	−276.0	W_{16}	576.271	781.7294
Oct. 12–13	W_{16}–553	1.110	− 6.5222	+ 6.5280	− 6.5243	− 3.8	−279.8	553	577.381	775.2051
Oct. 13–13			− 6.5226	+ 6.5244						
Oct. 12–13	553–554	1.095	+ 4.2710	− 4.2740	+ 4.2725	+ 3.0	−276.8	554	578.476	779.4776
Do	554–X_{16}	1.031	+ 6.9000	− 6.8987	+ 6.8994	− 1.3	−278.1	X_{16}	579.507	786.3770
Do	X_{16}–555	1.096	+ 6.4880	− 6.4900	+ 6.4890	+ 2.0	−276.1	555	580.603	792.8660
Do	555–556	1.095	+ 3.7263	− 3.7231	+ 3.7247	− 3.2	−279.3	556	581.698	796.5907
Do	556–557	1.094	+ 4.2410	− 4.2401	+ 4.2406	− 0.9	−280.2	557	582.792	800.8313
Do	557–558	1.081	+ 4.2122	− 4.2056	+ 4.2098	− 2.7	−282.9	558	583.873	805.0411
Do			+ 4.2100	− 4.2113						
Do	558–Y_{16}	0.461	+ 1.2113	− 1.2083	+ 1.2098	− 3.0	−285.9	Y_{16}	584.334	806.2509
Do	Y_{16}–559	1.097	+ 1.9643	− 1.9650	+ 1.9646	+ 0.7	−285.2	559	585.431	808.2155
Do	559–560	1.093	+ 2.8736	− 2.8731	+ 2.8734	− 0.5	−285.7	560	586.524	811.0889
Do	560–561	1.158	− 0.7573	+ 0.7601	− 0.7587	− 2.8	−288.5	561	587.682	810.3302
Do	561–562	1.095	− 0.5281	+ 0.5267	− 0.5274	+ 1.4	−287.1	562	588.777	809.8028
Do	562–563	1.091	+ 0.2246	− 0.2258	+ 0.2252	+ 1.2	−285.9	563	589.868	810.0280
Do	*563–Canon*	*0.162*	*+ 0.0256*	*− 0.0255*	*+ 0.0254*			*Rail*		*810.0514*
Do	563–Z_{16}	0.789	− 0.5350	+ 0.5324	− 0.5342	+ 1.6	−284.3	Z_{16}	590.657	809.4938
Do	Z_{16}–564	1.080	+10.4651	−10.4654	+10.4652	+ 0.3	−284.0	564	591.743	819.9590
Do	564–565	1.093	+15.6789	−15.6748	+15.6768	− 4.1	−288.1	565	592.836	835.6358
Oct. 13–12	565–A_{17}	1.089	+15.8270	−15.8285	+15.8278	+ 1.5	−286.6	A_{17}	593.925	851.4636
Do	A_{17}–566	1.097	+13.4683	−13.4648	+13.4666	− 3.5	−290.1	566	595.022	864.9302
Oct. 14–14	566–567	0.901	+ 6.8830	− 6.8822	+ 6.8826	− 0.8	−290.9	567	595.923	871.8128
Do	567–B_{17}	1.138	− 5.8454	+ 5.8462	− 5.8458	− 0.8	−291.7	B_{17}	597.061	865.9670
Do	B_{17}–568	0.801	− 3.6209	+ 3.6211	− 3.6210	− 0.2	−291.9	568	597.862	862.3460
Do	568–569	1.153	− 2.0311	+ 2.0827	− 2.0819	− 1.6	−293.5	569	599.015	860.2641
Do	569–570	1.155	− 5.6042	+ 5.6052	− 5.6047	− 1.0	−294.5	570	600.170	854.6594
Do	570–571	1.153	− 8.2096	+ 8.2081	− 8.2088	+ 1.5	−293.0	571	601.323	846.4506
Do	571–572	1.161	− 4.7263	+ 4.7269	− 4.7266	− 0.6	−293.6	572	602.484	841.7240
Oct. 15–14	572–C_{17}	1.094	− 0.8931	+ 0.8937	− 0.8934	− 0.6	−294.2	C_{17}	603.578	840.8306
Do	C_{17}–573	0.973	+ 0.4017	− 0.4003	+ 0.4032	+ 3.7	−290.5	573	604.551	841.2338
Oct. 15–15			+ 0.4012	− 0.4039						
Oct. 15–14	573–574	1.100	− 1.6038	+ 1.6046	− 1.6042	− 0.8	−291.3	574	605.651	839.6296
Do	574–D_{17}	1.205	+ 0.3050	− 0.3079	+ 0.3064	+ 2.9	−288.4	D_{17}	606.856	839.9360
Do	D_{17}–575	1.138	+ 0.8830	− 0.8841	+ 0.8836	+ 1.1	−287.3	575	607.994	840.8196
Do	575–576	1.014	+ 1.3900	− 1.3882	+ 1.3891	− 1.8	−289.1	576	609.008	842.2087
Do	576–E_{17}	1.077	− 0.1635	+ 0.1624	− 0.1630	+ 1.1	−288.0	E_{17}	610.085	842.0457
Do	E_{17}–577	0.263	− 0.0529	+ 0.0520	− 0.0524	+ 0.9	−287.1	577	610.348	841.9933
Do	577–578	1.015	− 0.3802	+ 0.3809	− 0.3806	− 0.7	−287.8	578	611.363	841.6127
Oct. 15	*578–Amargosa*	*1.214*	*+ 2.9763*		*+ 2.9763*			*Rail*		*844.5890*
Oct. 15–14	578–579	1.237	+ 2.5957	− 2.5971	+ 2.5964	+ 1.4	−286.4	579	612.600	844.2091
Oct. 15–16	579–F_{17}	0.145	+ 1.9891	− 1.9894	+ 1.9892	+ 0.3	−286.1	F_{17}	612.745	846.1983
Do	F_{17}–580	1.141	+ 2.3692	− 2.3717	+ 2.3704	+ 2.5	−283.6	580	613.886	848.5687
Do	580–581	1.217	+ 9.4954	− 9.4936	+ 9.4945	− 1.8	−285.4	581	615.103	858.0632
Do	581–582	1.092	+ 6.6690	− 6.6689	+ 6.6690	− 0.1	−285.5	582	616.195	864.7322
Do	582–G_{17}	0.387	+ 0.1771	− 0.1773	+ 0.1772	+ 0.2	−285.3	G_{17}	616.582	864.9094
Do	G_{17}–583	1.087	− 3.2288	+ 3.2278	− 3.2283	+ 1.0	−284.3	583	617.669	861.6811
Do	583–584	1.088	+ 8.2641	− 8.2624	+ 8.2632	− 1.7	−286.0	584	618.757	869.9443
Do	584–H_{17}	1.036	+12.6600	−12.6582	+12.6591	− 1.8	−287.8	H_{17}	619.793	882.6034
Do	H_{17}–585	1.035	+12.2662	−12.2625	+12.2644	− 3.7	−291.5	585	620.828	894.8678

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Backward line.	Mean.	Discrepancy. Partial.	Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Oct. 15-16	585-586	1.199	+14.9608	−14.9576	+14.9592	− 3.2	−294.7	586	622.027	909.8270
Do	586-I_{17}	1.112	+14.1905	−14.1893	+14.1899	− 1.2	−295.9	I_{17}	623.139	924.0169
Oct. 18-16	I_{17}-587	0.959	+10.9261	−10.9199	+10.9230	− 5.1	−301.0	587	624.098	934.9399
Oct 19-19			+10.9252	−10.9211						
Oct. 18-16	587-588	1.090	+14.6639	−14.6677	+14.6683	− 1.2	−302.2	588	625.188	949.6082
Do	588-589	1.163	+13.6332	−13.6350	+13.6341	+ 1.8	−300.4	589	626.351	963.2423
Do	589-590	1.071	+15.3408	−15.3382	+15.3395	− 2.6	−303.0	590	627.422	978.5818
Do	590-591	1.096	+16.2121	−16.2132	+16.2126	+ 1.1	−301.9	591	628.518	994.7944
Do	591-J_{17}	1.091	+16.3354	−16.3386	+16.3370	+ 3.2	−298.7	J_{17}	629.609	1011.1314
Do	J_{17}-592	1.170	+16.7554	−16.7533	+16.7544	− 2.1	−300.8	592	630.779	1027.8858
Do	592-593	1.065	+15.3139	−15.3125	+15.3132	− 1.4	−302.2	593	631.874	1043.1990
Do	593-594	1.053	+15.3434	−15.3444	+15.3439	+ 1.0	−301.2	594	632.927	1058.5429
Oct. 18-18	594-595	1.161	+16.8902	−16.8902	+16.8902	0.0	−301.2	595	634.088	1075.4331
Do	595-596	1.133	+15.0229	−15.0264	+15.0246	+ 3.5	−297.7	596	635.221	1090.4577
Do	596-K_{17}	1.022	+14.7577	−14.7584	+14.7580	+ 0.7	−297.0	K_{17}	636.243	1105.2157
Do	K_{17}-597	1.097	+ 2.4653	− 2.4645	+ 2.4649	− 0.8	−297.8	597	637.340	1107.6806
Do	*597-Charleston.*	*1.028*	*+ 0.5114*	*− 0.5111*	*+ 0.5112*			*Rail.*		*1108.1918*
Do	597-598	1.095	− 4.3445	+ 4.3394	− 4.3411	+ 1.8	−296.0	598	638.435	1103.3395
Oct. 20-20			− 4.3396	+ 4.3411						
Oct. 19-20	598-L_{17}	1.024	− 2.1440	+ 2.1451	− 2.1446	− 1.1	−297.1	L_{17}	639.459	1101.1949
Do	L_{17}-599	1.100	− 1.1565	+ 1.1611	− 1.1591	− 1.0	−298.1	599	640.559	1100.0358
Oct. 20-20			− 1.1607	+ 1.1582						
Oct. 19-20	599-600	1.089	− 4.7530	+ 4.7544	− 4.7537	− 1.4	−299.5	600	641.648	1095.2821
Do	600-M_{17}	1.029	− 5.9836	+ 5.9841	− 5.9838	− 0.5	−300.0	M_{17}	642.677	1089.2983
Do	M_{17}-601	1.092	− 6.3496	+ 6.3519	− 6.3508	− 2.3	−302.3	601	643.769	1082.9475
Do	601-602	1.093	− 4.8201	+ 4.8177	− 4.8189	+ 2.4	−299.9	602	644.862	1078.1286
Do	602-603	1.091	− 5.0440	+ 5.0420	− 5.0430	+ 2.0	−297.9	603	645.953	1073.0856
Do	603-604	1.090	− 7.3613	+ 7.3623	− 7.3618	− 1.0	−298.9	604	647.043	1065.7238
Do	604-605	1.090	−10.8913	+10.8909	−10.8911	+ 0.4	−298.5	605	648.133	1054.8327
Do	605-N_{17}	1.029	− 9.7429	+ 9.7392	− 9.7410	+ 3.7	−294.8	N_{17}	649.162	1045.0917
Do	N_{17}-606	1.055	−10.3376	+10.3418	−10.3397	− 4.2	−299.0	606	650.217	1034.7520
Do	606-607	1.129	−11.3319	+11.3302	−11.3310	+ 1.7	−297.3	607	651.346	1023.4210
Do	607-O_{17}	1.028	− 7.8017	+ 7.8001	− 7.8009	+ 1.6	−295.7	O_{17}	652.374	1015.6201
Do	O_{17}-608	1.028	− 7.3671	+ 7.3715	− 7.3698	− 1.9	−297.6	608	653.402	1008.2503
Oct. 20-20			− 7.3707	+ 7.3701						
Oct. 19-20	608-609	1.158	− 6.1448	+ 6.1473	− 6.1460	− 2.5	−300.1	609	654.560	1002.1043
Do	609-P_{17}	1.093	− 3.2201	+ 3.2190	− 3.2196	+ 1.1	−299.0	P_{17}	655.653	998.8847
Oct. 21-21	P_{17}-610	1.034	− 6.1800	+ 6.1802	− 6.1801	− 0.2	−299.2	610	656.687	992.7046
Do	610-611	1.037	− 8.7214	+ 8.7199	− 8.7206	+ 1.5	−297.7	611	657.724	983.9840
Do	611-612	1.090	− 9.9868	+ 9.9863	− 9.9866	+ 0.5	−297.2	612	658.814	973.9974
Oct. 22-21	612-613	1.090	−10.9737	+10.9721	−10.9729	+ 1.6	−295.6	613	659.904	963.0245
Do	613-614	1.097	− 9.7277	+ 9.7284	− 9.7280	− 0.7	−296.3	614	661.001	953.2965
Do	614-Q_{17}	1.098	+ 1.7512	− 1.7535	+ 1.7524	+ 2.3	−294.0	Q_{17}	662.097	955.0489
Do	*Q_{17}-Indian Springs.*	*0.778*	*− 3.6121*	*+ 3.6130*	*− 3.6126*			*Rail.*		*951.4363*
Do	Q_{17}-615	1.095	− 6.7326	+ 6.7374	− 6.7350	− 4.8	−298.8	615	663.192	948.3139
Do	615-616	1.091	+ 4.0385	− 4.0377	+ 4.0381	− 0.8	−299.6	616	664.283	952.3520
Do	616-617	1.096	+ 4.3353	− 4.3340	+ 4.3346	− 1.3	−300.9	617	665.379	956.6866
Do	617-618	1.095	+ 1.4487	− 1.4498	+ 1.4492	+ 1.1	−299.8	618	666.474	958.1358
Do	618-619	1.088	− 0.0480	+ 0.0447	− 0.0464	+ 3.3	−296.5	619	667.562	958.0894
Do	619-R_{17}	1.088	+ 0.5772	− 0.5774	+ 0.5773	+ 0.2	−296.3	R_{17}	668.650	958.6667
Do	R_{17}-620	0.902	− 1.1997	+ 1.2062	− 1.2014	− 3.5	−299.8	620	669.552	957.4653
Oct. 22-22			− 1.1994	+ 1.2000						
Oct. 22-21	620-621	1.155	− 5.9415	+ 5.9428	− 5.9422	− 1.3	−301.1	621	670.707	951.5231
Do	621-S_{17}	1.150	− 7.1242	+ 7.1269	− 7.1256	− 2.7	−303.8	S_{17}	671.857	944.3975
Do	S_{17}-622	0.969	− 4.1165	+ 4.1139	− 4.1152	+ 2.6	−301.2	622	672.826	940.2823
Do	622-623	1.158	− 2.4319	+ 2.4356	− 2.4338	− 3.7	−304.9	623	673.984	937.8485
Do	623-T_{17}	1.094	− 1.4287	+ 1.4334	− 1.4318	− 2.9	−307.8	T_{17}	675.078	936.4167
Oct. 22-22			− 1.4322	+ 1.4332						
Oct. 22-21	T_{17}-624	0.969	− 1.3724	+ 1.3687	− 1.3706	+ 3.7	−304.1	624	676.047	935.0461
Do	624-625	1.097	− 0.7455	+ 0.7474	− 0.7464	− 1.9	−306.0	625	677.144	934.2997
Oct. 22-22	625-626	1.162	− 1.0134	+ 1.0161	− 1.0148	− 2.7	−308.7	626	678.306	933.2849
Oct. 25-23	626-627	1.031	− 0.7518	+ 0.7498	− 0.7508	+ 2.0	−306.7	627	679.337	932.5341
Oct. 23-23	627-628	1.095	− 0.5961	+ 0.5968	− 0.5964	− 0.7	−307.4	628	680.432	931.9377
Oct. 25-23	628-U_{17}	1.093	+ 0.6851	− 0.6851	+ 0.6851	0.0	−307.4	U_{17}	681.525	932.6228
Do	U_{17}-629	1.034	+ 0.2440	− 0.2443	+ 0.2442	+ 0.3	−307.1	629	682.559	932.8670
Do	629-630	1.098	+ 0.9869	− 0.9857	+ 0.9863	− 1.2	−308.3	630	683.657	933.8533
Do	630-631	1.097	− 0.8001	+ 0.8002	− 0.8002	− 0.1	−308.4	631	684.754	933.0531
Do	631-632	1.032	− 2.0167	+ 2.0180	− 2.0174	− 1.3	−309.7	632	685.786	931.0357
Do	632-633	1.160	− 3.0756	+ 3.0743	− 3.0750	+ 1.3	−308.4	633	686.946	927.9607
Do	*633-Owen's*	*0.780*	*− 4.9473*	*+ 4.9554*	*− 4.9514*			*Rail.*		*923.0093*
Do	633-V_{17}	1.064	− 5.2849	+ 5.2875	− 5.2866	− 1.9	−310.3	V_{17}	688.010	922.6741
Oct. 25-25			− 5.2863	+ 5.2875						

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

RENO TO LAS VEGAS, NEV.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Backward line.	Mean.	Discrepancy. Partial.	Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Oct. 25-23	V_{17}-634	1.027	− 6.1496	+ 6.1532	− 6.1514	− 3.6	−313.9	634	689.037	916.5227
Do	634-635	1.099	− 8.2363	+ 8.2370	− 8.2366	− 0.7	−314.6	635	690.136	908.2861
Do	635-W_{17}	1.094	−11.0881	+11.0942	−11.0922	− 3.2	−317.8	W_{17}	691.230	897.1939
Oct. 25-25			−11.0930	+11.0934						
Oct. 25-23	W_{17}-636	1.036	− 7.1708	+ 7.1708	− 7.1708	0.0	−317.8	636	692.266	890.0231
Do	636-637	1.081	− 6.7823	+ 6.7788	− 6.7806	+ 3.5	−314.3	637	693.347	883.2425
Do	637-X_{17}	1.031	− 7.2356	+ 7.2332	− 7.2344	+ 2.4	−311.9	X_{17}	694.378	876.0081
Do	X_{17}-638	1.157	− 7.8122	+ 7.8099	− 7.8110	+ 2.3	−309.6	638	695.535	868.1971
Oct. 23	*638-Corn Creek*	*0.082*		*+ 0.2764*	*− 0.2764*			*Rail*		*867.9207*
Oct. 25-23	638-639	1.034	− 7.2705	+ 7.2699	− 7.2702	+ 0.6	−309.0	639	696.569	860.9269
Do	639-640	1.099	− 6.3740	+ 6.3734	− 6.3737	+ 0.6	−308.4	640	697.668	854.5532
Oct. 26-27	640-641	1.030	− 5.3393	+ 5.3402	− 5.3398	− 0.9	−309.3	641	698.698	849.2134
Do	641-642	1.003	− 1.7237	+ 1.7282	− 1.7260	− 2.3	−311.6	642	699.701	847.4874
Oct. 28-28			− 1.7261	+ 1.7261						
Oct. 26-27	642-Y_{17}	1.164	− 0.9400	+ 0.9409	− 0.9404	− 0.9	−312.5	Y_{17}	700.865	846.5470
Do	Y_{17}-643	1.099	− 2.8820	+ 2.8829	− 2.8824	− 0.9	−313.4	643	701.964	843.6646
Do	643-644	1.170	− 5.2914	+ 5.2918	− 5.2916	− 0.4	−313.8	644	703.134	838.3730
Do	644-645	1.165	− 6.8981	+ 6.8913	− 6.8950	+ 3.2	−310.6	645	704.299	831.4780
Oct. 28-28			− 6.8952	+ 6.8954						
Oct. 26-27	645-646	1.162	− 8.6570	+ 8.6576	− 8.6573	− 0.6	−311.2	646	705.461	822.8207
Do	646-647	1.153	−10.2435	+10.2444	−10.2440	− 0.9	−312.1	647	706.614	812.5767
Do	647-Z_{17}	0.773	− 6.9512	+ 6.9491	− 6.9502	+ 2.1	−310.0	Z_{17}	707.387	805.6265
Do	Z_{17}-648	1.096	−10.8821	+10.8820	−10.8820	+ 0.1	−309.9	648	708.483	794.7445
Do	*648-Tule*	*0.153*	*+ 0.4650*	*− 0.4634*	*+ 0.4642*			*Rail*		*795.2087*
Do	648-649	1.159	−11.4457	+11.4423	−11.4440	+ 3.4	−306.5	649	709.642	783.3005
Do	649-A_{18}	1.023	− 8.3357	+ 8.3312	− 8.3344	+ 0.4	−306.1	A_{18}	710.665	774.9661
Oct. 28-28			− 8.3336	+ 8.3371						
Oct. 26-27	A_{18}-650	1.159	− 8.8975	+ 8.8945	− 8.8960	+ 3.0	−303.1	650	711.824	766.0701
Do	650-651	1.308	−12.5225	+12.5230	−12.5228	− 0.5	−303.6	651	713.132	753.5473
Do	651-B_{18}	0.836	− 6.3097	+ 6.3092	− 6.3094	+ 0.5	−303.1	B_{18}	713.968	747.2379
Do	B_{18}-652	1.237	−13.0678	+13.0685	−13.0682	− 0.7	−303.8	652	715.205	734.1697
Do	652-653	1.009	− 9.7587	+ 9.7573	− 9.7580	+ 1.4	−302.4	653	716.304	724.4117
Do	653-654	1.091	− 7.6502	+ 7.6478	− 7.6490	+ 2.4	−300.0	654	717.395	716.7627
Oct. 28-29	654-655	1.154	− 8.3601	+ 8.3585	− 8.3593	+ 1.6	−298.4	655	718.549	708.4034
Do	655-656	1.031	− 2.4750	+ 2.4764	− 2.4757	− 1.4	−299.8	656	719.580	705.9277
Do	656-C_{18}	1.027	− 7.4243	+ 7.4213	− 7.4228	+ 3.0	−296.8	C_{18}	720.607	698.5049
Do	C_{18}-657	1.158	− 8.6099	+ 8.6048	− 8.6091	+ 2.0	−294.8	657	721.765	689.8958
Oct. 29-29			− 8.6103	+ 8.6114						
Oct. 28-29	657-658	1.158	− 3.6583	+ 3.6561	− 3.6572	+ 2.2	−292.6	658	722.923	686.2386
Do	658-D_{18}	0.730	− 5.6886	+ 5.6873	− 5.6880	+ 1.3	−291.3	D_{18}	723.653	680.5506
Do	D_{18}-659	1.156	− 9.4412	+ 9.4387	− 9.4400	+ 2.5	−288.8	659	724.809	671.1106
Do	659-660	1.028	− 6.9181	+ 6.9159	− 6.9170	+ 2.2	−286.6	660	725.837	664.1936
Do	660-E_{18}	1.157	−13.0175	+13.0133	−13.0154	+ 4.2	−282.4	E_{18}	726.994	651.1782
Do	E_{18}-661	1.225	−10.3466	+10.3464	−10.3465	+ 0.2	−282.2	661	728.219	640.8317
Do	661-662	1.092	− 6.2756	+ 6.2726	− 6.2741	+ 3.0	−279.2	662	729.311	634.5576
Do	662-663	0.897	− 4.7637	+ 4.7538	− 4.7573	+ 4.6	−274.6	663	730.208	629.8003
Oct. 29-29			− 4.7555	+ 4.7562						
Do	663-664	0.300	− 3.1767	+ 3.1770	− 3.1768	− 0.3	−274.9	664	730.508	626.6235
Do	664-665	1.056	− 4.7946	+ 4.7916	− 4.7931	+ 3.0	−271.9	665	731.564	621.8304
Do	665-O	1.104	− 3.8605	+ 3.8564	− 3.8584	+ 4.1	−267.8	O	732.668	617.9720
Oct. 29-30	O-F_{18}	0.811	− 2.3584	+ 2.3578	− 2.3581	+ 0.6	−267.2	F_{18}	733.479	615.6139
Oct. 30-29	F_{18}-2024 B	0.347	+ 0.4567	− 0.4558	+ 0.4562	− 0.9	−268.1	2024 B	733.826	616.0701
Do	2024 B-P	0.346	− 1.0884	+ 1.0880	− 1.0882	+ 0.4	−267.7	P	734.172	614.9819
Do	P-2033 B	0.479	+ 3.8131	− 3.8120	+ 3.8126	− 1.1	−268.8	2033 B	734.651	618.7945

TONOPAH JUNCTION, NEV., TO LAWS, CAL.

1915.										
July 29-Aug. 2	U_{12}-236	1.120	+14.2657	− 14.2688	+14.2672	+ 3.1	− 55.6	236	288.398	1357.7855
Do	236-237	1.092	+25.5846	− 25.5884	+25.5866	+ 3.1	− 52.5	237	289.490	1383.3721
Aug. 2-2			+25.5837	−*25.6006						
Do			+25.5869	− 25.5879						
Aug. 2	*236-spike*	*0.422*	*+ 9.4751*		*+ 9.4751*			*U.S. G.S. spike*		*1367.2606*
July 29-31	237-238	0.998	+23.4499	− 23.4516	+23.4508	+ 1.7	− 50.8	238	290.488	1406.8229
Do	238-239	1.088	+26.6447	− 26.6453	+26.6450	+ 0.6	− 50.2	239	291.576	1433.4679
Do	*239-U. S. G. S.*	*0.621*	*+15.4069*	*− 15.4063*	*+15.4066*	*− 0.6*	*− 50.8*	*U.S. G.S.*	*292.197*	*1448.8745*
Do	239-C_{13}	1.128	+29.0097	− 29.0068	+29.0082	− 2.9	− 53.1	C_{13}	292.704	1462.4761

* Rejected.

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

TONOPAH JUNCTION, NEV., TO LAWS, CAL.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Backward line.	Mean.	Discrepancy. Partial.	Total accumulated.	Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
July 30-31	C_{13}-240	1.108	+ 28.8717	−28.8721	+28.8719	+ 0.4	− 52.7	240	293.812	1491.3480
Do	240-241	1.142	+ 29.9413	−29.9451	+29.9432	+ 3.8	− 48.9	241	294.954	1521.2912
Do	241-D_{13}	0.874	+ 20.3930	−20.3982	+20.3959	+ 2.6	− 46.3	D_{13}	295.828	1541.6871
Aug. 2-2			+ 20.3961	−20.3963						
July 30-31	D_{13}-242	1.069	+ 26.9488	−26.9530	+26.9509	+ 4.2	− 42.1	242	296.897	1568.6380
Do	*242-Belleville*	*0.566*	*+ 7.2862*	*− 7.2843*	*+ 7.2852*			*Rail.*		*1575.9232*
Do	242-E_{13}	0.645	+ 7.3675	− 7.3674	+ 7.3674	− 0.1	− 42.2	E_{13}	297.542	1576.0054
Do	E_{13}-F_{13}	0.046	+ 1.0701	− 1.0700	+ 1.0700	− 0.1	− 42.3	F_{13}	297.588	1577.0754
Do	F_{13}-243	1.152	+ 18.4644	−18.4684	+18.4664	+ 4.0	− 38.3	243	298.740	1595.5418
Do	243-244	1.110	+ 17.7404	−17.7369	+17.7386	− 3.5	− 41.8	244	299.850	1613.2804
Do	244-245	1.155	+ 18.0469	−18.0433	+18.0451	− 3.6	− 45.4	245	301.005	1631.3255
Do	245-246	1.039	+ 18.1351	−18.1387	+18.1369	+ 3.6	− 41.8	246	302.044	1649.4624
Do	*246-Filben*	*0.360*	*+ 5.9606*	*− 5.9617*	*+ 5.9612*			*Rail.*		*1655.4236*
Do	246-G_{13}	0.552	+ 10.8946	−10.8957	+10.8952	+ 1.1	− 40.7	G_{13}	302.596	1660.3576
Do	G_{13}-247	1.138	+ 25.5415	−25.5388	+25.5402	− 2.7	− 43.4	247	303.734	1685.8978
Do	247-248	1.025	+ 24.4505	−24.4513	+24.4509	+ 0.8	− 42.6	248	304.759	1710.3487
Do	*247-1 mile S. Filben.*	*0.401*	*+ 8.9401*	*− 8.9334*	*+ 8.9368*			*Rail.*		*1694.8546*
Aug. 2-3	248-249	1.243	+ 27.9785	−27.9760	+27.9772	− 2.5	− 45.1	249	306.002	1738.3259
Do	249-250	1.080	+ 23.7700	−23.7676	+23.7688	− 2.4	− 47.5	250	307.082	1762.0947
Aug. 3-3	250-H_{13}	0.585	+ 12.0452	−12.0464	+12.0458	+ 1.2	− 46.3	H_{13}	307.667	1774.1405
Do	H_{13}-251	0.397	− 6.5957	+ 6.5933	− 6.5945	+ 2.4	− 43.9	251	308.064	1767.5460
Do	*H_{13}-Little Summit.*	*0.077*	*− 0.1226*		*− 0.1226*			*Rail.*		*1774.0180*
Do	251-252	1.080	− 20.8298	+20.8291	−20.8294	+ 0.7	− 43.2	252	309.144	1746.7166
Do	252-253	1.122	− 10.7683	+10.7604	−10.7640	+ 4.0	− 39.2	253	310.266	1735.9526
Aug. 4-4			− 10.7638	+10.7636						
Aug. 4-3	253-254	1.226	− 7.8024	+ 7.8032	− 7.8028	− 0.8	− 40.0	254	311.492	1728.1498
Do	254-I_{13}	1.156	+ 1.0429	− 1.0381	+ 1.0408	− 2.1	− 42.1	I_{13}	312.648	1729.1906
Aug. 5-5			+ 1.0419	−*1.0495						
Aug. 6-6			+ 1.0408	− 1.0415						
Aug. 4-3	I_{13}-255	0.820	− 0.3735	+ 0.3767	− 0.3754	− 2.6	− 44.7	255	313.468	1728.8152
Aug. 5			− 0.3747							
Aug. 4-3	255-J_{13}	1.126	− 0.5774	+ 0.5816	− 0.5795	− 4.2	− 48.9	J_{13}	314.594	1728.2357
Aug. 3	*J_{13}-4.5 mi. Pole*	*0.112*	*− 0.8051*		*− 0.8051*			*Rail.*		*1727.4306*
Aug. 4-5	J_{13}-256	1.091	− 0.3094	+ 0.3079	− 0.3086	+ 1.5	− 47.4	256	315.685	1727.9271
Do	256-257	0.725	− 0.8210	+ 0.8190	− 0.8200	+ 2.0	− 45.4	257	316.410	1727.1071
Do	257-258	1.093	+*25.4898	−25.5010	+25.4986	+ 0.5	− 44.9	258	317.503	1752.6057
Aug. 6-6			+ 25.4983	−25.4965						
Aug. 4-5	258-259	1.105	+ 25.4170	−25.4227	+25.4190	+ 1.9	− 43.0	259	318.608	1778.0247
Aug. 6-6			+ 25.4189	−25.4171						
Aug. 4-5	259-K_{13}	0.845	+ 18.1149	−18.1159	+18.1154	+ 1.0	− 42.0	K_{13}	319.453	1796.1401
Do	K_{13}-260	1.139	+ 25.5106	−25.5089	+25.5098	− 1.7	− 43.7	260	320.592	1821.6499
Do	260-261	1.201	+ 19.2466	−19.2477	+19.2472	+ 1.1	− 42.6	261	321.793	1840.8971
Do	261-262	1.121	+ 12.4663	−12.4698	+12.4680	+ 3.5	− 39.1	262	322.914	1853.3651
Do	*262-2¼ miles N.W. Basalt.*	*0.529*	*+ 4.2890*	*− 4.2868*	*+ 4.2879*			*Rail.*		*1857.6530*
Do	262-263	0.963	+ 15.9901	−15.9890	+15.9896	− 1.1	− 40.2	263	323.877	1869.3547
Do	263-264	0.981	+ 20.9190	−20.9175	+20.9182	− 1.5	− 41.7	264	324.858	1890.2729
Do	264-265	0.967	+ 24.2571	−24.2562	+24.2566	− 0.9	− 42.6	265	325.825	1914.5295
Do	265-L_{13}	0.706	+ 17.5347	−17.5299	+17.5342	− 1.9	− 44.5	L_{13}	326.531	1932.0637
Aug. 5-6			+ 17.5356	−17.5367						
Aug. 4	*265-Basalt*	*0.162*	*− 1.8595*		*− 1.8595*			*Rail.*		*1912.6700*
Aug. 6-7	L_{13}-266	0.975	+ 20.8248	−20.8249	+20.8248	+ 0.1	− 44.4	266	327.506	1952.8885
Aug. 6	*266-Railroad Crossing 1.08 miles W. Basalt.*	*0.772*	*+ 16.6351*		*+16.6351*			*Rail.*		*1969.5236*
Aug. 6-7	266-267	1.154	+ 22.4083	−22.4141	+22.4119	+ 1.0	− 43.4	267	328.660	1975.3004
Aug. 9-9			+ 22.4144	−22.4106						
Aug. 6-7	267-M_{13}	0.945	+ 15.2579	−15.2583	+15.2581	+ 0.4	− 43.0	M_{13}	329.605	1990.5585
Do	M_{13}-268	0.772	+ 31.8262	−31.8250	+31.8256	− 1.2	− 44.2	268	330.377	2022.3841
Do	268-269	0.839	+ 76.8162	−76.8104	+76.8133	− 5.8	− 50.0	269	331.216	2099.1974
Aug. 7-7	269-270	1.070	+ 31.5504	−31.5485	+31.5494	− 1.9	− 51.9	270	332.286	2130.7468
Do	270-271	1.155	+ 22.4819	−22.4839	+22.4829	+ 2.0	− 49.9	271	333.441	2153.2297
Aug. 7	*270-457 mi. post*		*+ 12.9705*		*+12.9705*			*Rail.*		*2143.7173*
Aug. 7-7	*271-.31 mi. N. Mt. Mont.*	*0.560*	*+ 11.4827*	*−11.4675*	*+11.4751*			*Rail.*		*2164.7048*
Do	271-272	1.143	+ 16.1828	−16.1898	+16.1854	+ 3.6	− 46.3	272	334.584	2169.4151
Aug. 9-9			+ 16.1843	−16.1847						
Aug. 7-7	*272-Mt. Montgomery.*	*0.976*	*+ 1.5372*	*− 1.5355*	*+ 1.5364*			*Rail.*		*2170.9515*

* Rejected.

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

TONOPAH JUNCTION, NEV., TO LAWS, CAL.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation. Forward line.	Difference of elevation. Backward line.	Difference of elevation. Mean.	Discrepancy. Partial.	Discrepancy. Total accumulated.	Designation of B.M.	Distance from B. M. H_2.	Observed elevation above mean sea level
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Aug. 7-7	*272-R. R. cross. Mt. Mont.*	*1.045*	*+ 1.1022*	*− 1.1005*	*+ 1.1014*			*Rail.*		*2170.5165*
Do	272-N_{13}	0.841	+ 1.0435	− 1.0436	+ 1.0436	+ 0.1	− 46.2	N_{13}	335.425	2170.4587
Aug. 9-10	N_{13}-273	1.100	−25.3556	+25.3576	−25.3566	− 2.0	− 48.2	273	336.525	2145.1021
Do	273-274	1.180	−26.3842	+26.3827	−26.3834	+ 1.5	− 46.7	274	337.705	2118.7187
Do	274-275	1.122	−51.2171	+51.2200	−51.2186	− 2.9	− 49.6	275	338.827	2067.5001
Do	275-O_{13}	1.123	−25.8535	+25.8522	−25.8528	+ 1.3	− 48.3	O_{13}	339.950	2041.6473
Aug. 10	O_{13}-*Crossing*	*1.000*		*+10.0753*	*−10.0753*			*Rail.*		*2031.5720*
Aug. 9-10	O_{13}-276	1.196	−27.0206	+27.0186	−27.0196	+ 2.0	− 46.3	276	341.146	2014.6277
Do	*276-mi. pole 463*	*0.238*	*− 6.4187*	*+ 6.4284*	*− 6.4236*			*Rail.*		*2008.2041*
Do	276-277	1.173	−27.7283	+27.7239	−27.7261	+ 4.4	− 41.9	277	342.319	1986.9016
Do	277-P_{13}	0.774	−17.0512	+17.0472	−17.0488	+ 2.9	− 39.0	P_{13}	343.093	1969.8528
Aug. 10-11			−17.0494	+17.0476						
Do	P_{13}-278	1.120	−27.1316	+27.1291	−27.1304	+ 2.5	− 36.5	278	344.213	1942.7224
Aug. 10	*278-mi. pole 465*	*0.407*	*− 9.7808*		*− 9.7808*			*Rail.*		*1932.9416*
Aug. 10-11	278-279	1.041	−26.1002	+26.0965	−26.0984	+ 3.7	− 32.8	279	345.254	1916.6240
Do	*279-"1 mi. to Queen" sign.*	*0.593*	*−12.0757*	*+12.0729*	*−12.0743*			*Rail.*		*1904.5497*
Do	279-280	1.130	−25.8423	+25.8396	−25.8410	+ 2.7	− 30.1	280	346.384	1890.7830
Do	*280-½ mi. N. Queen.*	*0.218*	*− 4.4273*	*+ 4.4260*	*− 4.4266*			*Rail.*		*1886.3564*
Do	280-Q_{13}	1.068	− 9.8275	+ 9.8279	− 9.8277	− 0.4	− 30.5	Q_{13}	347.452	1880.9553
Aug. 11-12	Q_{13}-281	1.104	−13.1505	+13.1532	−13.1518	− 2.7	− 33.2	281	348.556	1867.8035
Do	*Q_{13}-Queen*	*0.078*	*+ 0.2450*	*− 0.2493*	*+ 0.2472*			*Rail.*		*1881.2025*
Do	281-282	1.099	−20.5461	+20.5510	−20.5474	− 3.9	− 37.1	282	349.655	1847.2561
Aug. 13-13			−20.5447	+20.5476						
Aug. 11-12	*281-"1 mi. to Queen."*	*0.887*	*−13.2743*	*+13.2766*	*−13.2754*			*Rail.*		*1854.5281*
Do	282-283	1.077	−21.2465	+21.2493	−21.2479	− 2.8	− 39.9	283	350.732	1826.0082
Do	283-R_{13}	0.165	− 3.9999	+ 4.0015	− 4.0007	− 1.6	− 41.5	R_{13}	350.897	1822.0075
Do	*R_{13}-2.0 mi. from Queen.*	*0.195*	*− 4.9769*	*+ 4.9787*	*− 4.9778*			*Rail.*		*1817.0297*
Do	R_{13}-S_{13}	0.609	−13.0128	+13.0125	−13.0126	+ 0.3	− 41.2	S_{13}	351.506	1808.9949
Do	S_{13}-284	1.042	−21.7004	+21.6962	−21.6988	+ 4.0	− 37.2	284	352.548	1787.2961
Aug. 13-13			−21.7012	+21.6974						
Aug. 11-12	284-285	1.079	−23.8229	+23.8207	−23.8218	+ 2.2	− 35.0	285	353.627	1763.4743
Do	285-286	0.772	−15.9046	+15.9041	−15.9044	+ 0.5	− 34.5	286	354.399	1747.5699
Do	286-287	1.088	−19.5832	+19.5813	−19.5822	+ 1.9	− 32.6	287	355.487	1727.0877
Do	287-288	1.029	−22.6024	+22.5990	−22.6007	+ 3.4	− 29.2	288	356.516	1705.3870
Do	288-Z_{10}	1.019	−14.2964	+14.2961	−14.2962	+ 0.3	− 28.9	Z_{10}	357.535	1691.0908
Aug. 13-12	Z_{10}-289	0.324	− 4.2671	+ 4.2695	− 4.2683	− 2.4	− 31.3	289	357.859	1686.8225
Do	289-290	1.089	−12.3479	+12.3495	−12.3487	− 1.6	− 32.9	290	358.948	1674.4738
Do	*290-mi. pole 474*	*0.209*	*− 3.0274*	*+ 3.0274*	*− 3.0274*			*Spike*		*1671.4464*
Do	290-291	1.082	−10.8335	+10.8366	−10.8350	− 3.1	− 36.0	291	360.030	1663.6388
Do	291-292	1.088	− 8.9497	+ 8.9534	− 8.9516	− 3.7	− 39.7	292	361.118	1654.6872
Aug. 13	*291-mi. pole 475*	*0.755*	*− 7.6746*		*− 7.6746*			*Spike*		*1655.9642*
Aug. 13-12	292-A_{11}	1.123	−11.0446	+11.0509	−11.0461	− 4.2	− 43.9	A_{11}	362.241	1643.6411
Aug. 14-14			−11.0435	+11.0455						
Aug. 13-14	A_{11}-293	1.115	−13.7795	+13.7755	−13.7775	+ 4.0	− 39.9	293	363.356	1629.8636
Do	*293-1st pole S. 477.*	*0.669*	*− 5.4145*	*+ 5.4152*	*− 5.4149*			*Rail.*		*1624.4487*
Do	293-294	1.093	− 8.5453	+ 8.5457	− 8.5455	− 0.4	− 40.3	294	364.449	1621.3181
Do	294-295	1.159	− 8.7708	+ 8.7752	− 8.7732	− 1.2	− 41.5	295	365.608	1612.5449
Aug. 14-14			− 8.7743	+ 8.7725						
Aug. 13-14	*295-1st pole N. 478.*	*1.048*	*+ 0.8702*	*− 0.8696*	*+ 0.8699*			*Bolt.*		*1613.4148*
Do	295-296	1.157	− 5.3137	+ 5.3114	− 5.3126	+ 2.3	− 39.2	296	366.765	1607.2323
Do	296-B_{11}	0.386	− 2.7362	+ 2.7341	− 2.7352	+ 2.1	− 37.1	B_{11}	367.151	1604.4971
Do	*B_{11}-3.3 mi. S. Benton.*	*0.533*	*− 6.9347*	*+ 6.9344*	*− 6.9340*			*Rail.*		*1597.5625*
Do	B_{11}-297	1.029	−15.4831	+15.4827	−15.4829	+ 0.4	− 36.7	297	368.180	1589.0142
Do	297-298	1.067	−18.3484	+18.3454	−18.3469	+ 3.0	− 33.7	298	369.247	1570.6673
Do	298-299	1.107	−19.0024	+18.9994	−19.0009	+ 3.0	− 30.7	299	370.354	1551.6664
Aug. 14-16	*299-2nd pole S. 481.*	*0.140*	*− 2.2491*	*+ 2.2493*	*− 2.2492*			*Spike*		*1549.4172*
Do	*299-0.4 mi. S. 481*	*0.734*	*−14.0472*	*+14.0483*	*−14.0478*			*Rail.*		*1537.6186*
Do	299-300	1.092	−20.8692	+20.8698	−20.8695	− 0.6	− 31.3	300	371.446	1530.7969
Do	300-C_{11}	0.578	−11.8962	+11.9003	−11.8980	− 1.6	− 32.9	C_{11}	372.024	1518.8983
Aug. 16-16			−11.8993	+11.8984						
Do	C_{11}-301	0.387	− 6.7458	+ 6.7494	− 6.7469	− 1.4	− 34.3	301	372.411	1512.1514
Do			− 6.7465	+ 6.7459						

Results of leveling, Reno to Las Vegas, Nev., and Tonopah Junction, Nev., to Laws, Cal.—Continued.

TONOPAH JUNCTION, NEV., TO LAWS, CAL.—Continued.

Date.	From B. M. to B. M.	Distance.	Difference of elevation.			Discrepancy.		Designation of B.M.	Distance from B. M. H_9.	Observed elevation above mean sea level.
			Forward line.	Backward line.	Mean.	Partial.	Total accumulated.			
1915.		*km.*	*m.*	*m.*	*m.*	*mm.*	*mm.*		*km.*	*m.*
Aug. 16-16	301-D_{11}	1.102	−20.9161	+20.9200	−20.9180	− 3.9	− 38.2	D_{11}	373.513	1491.2334
Do	D_{11}-302	0.573	−11.4520	+11.4520	−11.4520	0.0	− 38.2	302	374.086	1479.7814
Do	302-E_{11}	1.102	−19.5357	+19.5326	−19.5342	+ 3.1	− 35.1	E_{11}	375.188	1460.2472
Do	E_{11}-303	0.495	− 8.7768	+ 8.7787	− 8.7778	− 1.9	− 37.0	303	375.683	1451.4694
Do	303-F_{11}	1.102	−19.2382	+19.2398	−19.2390	− 1.6	− 38.6	F_{11}	376.785	1432.2304
Aug. 17-16	F_{11}-304	0.826	−12.6119	+12.6142	−12.6130	− 2.3	− 40.9	304	377.611	1419.6174
Do	*304-pole "1 mi. to Hammil."*	*0.746*	*−10.2566*	*+10.2563*	*−10.2564*	.....	.....	*Spike*	.....	*1409.3610*
Do	*304-crossing 1.14 mi. N. Hammil.*	*0.789*	*− 8.7434*	*+ 8.7535*	*− 8.7484*	.....	.....	*Rail.*	.....	*1410.8690*
Do	304-305	1.129	−13.9608	+13.9604	−13.9606	+ 0.4	− 40.5	305	378.740	1405.6568
Do	305-G_{11}	1.067	− 7.9916	+ 7.9928	− 7.9922	− 1.2	− 41.7	G_{11}	379.807	1397.6646
Aug. 18-17	G_{11}-306	1.188	− 6.0413	+ 6.0388	− 6.0400	+ 2.5	− 39.2	306	380.995	1391.6246
Aug. 17	*G_{11}-Hammil*	*0.154*	*− 0.5187*	.....	*− 0.5187*	.....	.....	*Rail.*	.....	*1397.1459*
Aug. 18-17	*306-mi.pole 488*	*0.686*	*− 3.6354*	*+ 3.6312*	*− 3.6333*	.....	.....	*Spike*	.....	*1387.9913*
Do	306-307	1.083	− 4.5919	+ 4.5864	− 4.5900	+ 4.9	− 34.3	307	382.078	1387.0346
Aug. 18-18	.....	.....	− 4.5931	+ 4.5889	.....	.....	.....	.....	.....	.....
Aug. 18-17	307-H_{11}	1.151	− 1.5719	+ 1.5699	− 1.5709	+ 2.0	− 32.3	H_{11}	383.229	1385.4637
Do	*H_{11}-mi.pole 489*	*0.170*	*+ 0.1049*	*− 0.1054*	*+ 0.1052*	.....	.....	*Spike*	.....	*1385.5689*
Do	*H_{11}-Dehy*	*0.602*	*− 1.1692*	*+ 1.1713*	*− 1.1702*	.....	.....	*Rail.*	.....	*1384.2935*
Do	H_{11}-308	1.033	− 2.5672	+ 2.5685	− 2.5678	− 1.3	− 33.6	308	384.262	1382.8959
Do	*308-mi.pole 490*	*0.631*	*− 0.9928*	*+ 0.9937*	*− 0.9932*	.....	.....	*Nail.*	.....	*1381.9027*
Do	308-309	1.089	− 1.4521	+ 1.4569	− 1.4537	− 0.2	− 33.8	309	385.351	1381.4422
Aug. 18-18	.....	.....	− 1.4551	+ 1.4506	.....	.....	.....	.....	.....	.....
Aug. 18-17	309-I_{11}	1.093	− 0.2951	+ 0.2974	− 0.2962	− 2.3	− 36.1	I_{11}	386.444	1381.1460
Do	*I_{11}-Shealy*	*0.458*	*+ 1.9220*	*− 1.9219*	*+ 1.9220*	.....	.....	*Rail.*	.....	*1383.0680*
Do	I_{11}-310	0.514	+ 1.9710	− 1.9723	+ 1.9716	+ 1.3	− 34.8	310	386.958	1383.1176
Do	*310-crossing at Shealy.*	*0.108*	*+ 0.1169*	*− 0.1330*	*+ 0.1250*	.....	.....	*Rail.*	.....	*1383.2426*
Do	*310-0.056 mi. S. of Shealy.*	*0.898*	*+ 1.0413*	*− 1.0469*	*+ 1.0441*	.....	.....	*Rail.*	.....	*1384.1617*
Do	310-311	1.091	+ 1.0103	− 1.0069	+ 1.0086	− 3.4	− 38.2	311	388.049	1384.1262
Do	311-312	1.090	+ 0.4205	− 0.4229	+ 0.4217	+ 2.4	− 35.8	312	389.139	1384.5479
Aug. 17	*311-1st pole S. 492.*	*0.068*	*+ 0.4235*	.....	*+ 0.4235*	.....	.....	*Spike*	.....	*1384.5497*
Do	*312-1st pole S. 493.*	*0.687*	*− 2.3796*	.....	*− 2.3796*	.....	.....	*Spike*	.....	*1382.1683*
Aug. 18-17	312-313	1.090	− 3.7005	+ 3.6968	− 3.6986	+ 3.7	− 32.1	313	390.229	1380.8493
Do	313-314	1.062	−13.4125	+13.4095	−13.4110	+ 3.0	− 29.1	314	391.291	1367.4383
Do	*314-mi.pole 494*	*1.062*	*+ 0.4601*	*− 0.4601*	*+ 0.4601*	.....	.....	*Spike*	.....	*1367.8984*
Aug. 18-20	314-315	1.091	−17.0347	+17.0342	−17.0344	+ 0.5	− 28.6	315	392.382	1350.4039
Do	315-316	0.512	− 8.5160	+ 8.5171	− 8.5166	− 1.1	− 29.7	316	392.894	1341.8873
Do	*316-mi.pole 495*	*0.499*	*+ 0.0583*	*− 0.0627*	*+ 0.0605*	.....	.....	*Spike*	.....	*1341.9478*
Aug. 19-20	316-J_{11}	0.608	− 9.9581	+ 9.9574	− 9.9578	+ 0.7	− 29.0	J_{11}	393.502	1331.9295
Do	*J_{11}-mi.pole 496*	*0.983*	*−17.2127*	*+17.2133*	*−17.2130*	.....	.....	*Spike*	.....	*1314.7165*
Do	J_{11}-317	1.129	−19.2191	+19.2181	−19.2186	+ 1.0	− 28.0	317	394.631	1312.7109
Do	*317-crossing 2.43 mi. N. Chalfants.*	*0.445*	*− 5.6437*	*+ 5.6807*	*− 5.6622*	.....	.....	*Rail.*	.....	*1307.0487*
Do	317-318	1.092	−10.2302	+10.2261	−10.2282	+ 4.1	− 23.9	318	395.723	1302.4827
Do	*318-mi.pole 497*	*0.533*	*− 2.4263*	*+ 2.4242*	*− 2.4248*	.....	.....	*Spike*	.....	*1300.0579*
Do	318-319	1.091	− 4.8731	+ 4.8716	− 4.8724	+ 1.5	− 22.4	319	396.814	1297.6103
Do	319-K_{11}	0.160	− 0.2040	+ 0.2040	− 0.2040	0.0	− 22.4	K_{11}	396.974	1297.4063
Do	K_{11}-320	1.073	− 2.7827	+ 2.7891	− 2.7853	− 3.2	− 25.6	320	398.047	1294.6210
Aug. 20-20	.....	.....	− 2.7847	+ 2.7847	.....	.....	.....	.....	.....	.....
Aug. 19-20	320-321	1.090	− 3.8759	+ 3.8753	− 3.8756	+ 0.6	− 25.0	321	399.137	1290.7454
Do	*321-Chalfants*	*0.508*	*− 1.2696*	.....	*− 1.2696*	.....	.....	*Rail.*	.....	*1289.4758*
Do	321-322	1.085	− 3.9432	+ 3.9456	− 3.9444	− 2.4	− 27.4	322	400.222	1286.8010
Aug. 19	*322-mi.pole 500*	*0.770*	*− 2.3447*	.....	*− 2.3447*	.....	.....	*Spike*	.....	*1284.4563*
Aug. 19-20	322-323	1.091	− 3.2865	+ 3.2885	− 3.2875	− 2.0	− 29.4	323	401.313	1283.5135
Do	*323-0.34 mi. S. mi. pole 500.*	*0.208*	*− 0.2050*	*+ 0.2060*	*− 0.2055*	.....	.....	*Rail.*	.....	*1283.3080*
Do	323-L_{11}	1.393	− 1.2940	+ 1.2963	− 1.2952	− 2.3	− 31.7	L_{11}	402.706	1282.2183
Do	L_{11}-324	1.164	− 3.5228	+ 3.5229	− 3.5228	− 0.1	− 31.8	324	403.870	1278.6955
Do	324-325	1.167	− 8.5312	+ 8.5314	− 8.5313	− 0.2	− 32.0	325	405.037	1270.1642
Do	325-326	1.092	− 4.2256	+ 4.2292	− 4.2274	− 3.6	− 35.6	326	406.129	1265.9368
Do	326-327	1.092	− 4.2777	+ 4.2764	− 4.2770	+ 1.3	− 34.3	327	407.221	1261.6598
Do	327-M_{11}	0.384	− 0.2430	+ 0.2424	− 0.2427	+ 0.6	− 33.7	M_{11}	407.605	1261.4171

Statistics of the lines.

	Reno to Las Vegas, Nev.	Tonopah Junction, Nev., to Laws, Cal.	Entire season.
Length of main line, kilometers	735	120	855
Length of side line, kilometers	25	0	25
Total length, kilometers	760	120	880
Total length, miles	472	75	547
Number of permanent bench marks established or connected with	197	31	228
Average distance between permanent bench marks, kilometers	3.9	3.9	3.9
Speed, kilometers per month	165	155	163
Speed, miles per month	103	96	101
Maximum progress per month, miles	.....	.....	142
Maximum progress per day, miles	.....	.....	18
Percentage run more than twice	11	16	12
Discrepancy (B−F), total millimeters	−268.8	+25.0	.....
Discrepancy (B−F), millimeters per kilometer	− 0.37	+ 0.21	.....
Probable accidental error for 1 kilometer in millimeters *	± 0.7	± 0.8	.....
Probable systematic error for 1 kilometer in millimeters *	± 0.13	± 0.06	.....
Motor velocipede cars used	Yes.	Yes.	.....
Cost per mile of completed line, all field expenses, including salary of observer	.....	.....	$10.00

* Computed in accordance with resolutions adopted by the International Geodetic Association at Hamburg, Germany, 1912. (See p. 27, C. & G. S. Special Publication No. 22.)

CONNECTIONS WITH OTHER LEVELING.

At a number of places connections were made with bench marks of the United States Geological Survey. The bench marks of the railroads over which the lines were run were connected with whenever practicable and when of a substantial character were used instead of setting new permanent bench marks.

All bench marks of previous leveling with which connections were made were given the United States Coast and Geodetic Survey designation letter, followed by the initials of the organization which established the mark.

AGREEMENT OF ELEVATIONS AT LAS VEGAS, NEV.

The 1912 special adjustment of the level net, which is described in Special Publication No. 18, fixed the standard elevation of bench mark P at Las Vegas, Nev., as 615.356 meters, while the elevation of this mark, as given by the observed and unadjusted leveling from Reno, Nev., was 615.360 meters. The difference between the observed and standard elevations, 0.004 meter, was too small to distribute over the entire line, so a correction was applied to the last 40 kilometers of the line at the rate of 0.1 millimeter per kilometer.

CIRCUIT CLOSURES.

The most severe test of the accuracy of the new line is the closing errors of the two circuits of which it forms a part. The unadjusted leveling in the loop San Francisco-Reno-Las Vegas-San Diego has a closing error of 0.1873 meter. The correction which would close this circuit of 2020 kilometers is 0.093 millimeter per kilometer.

The closing error of the loop Reno-Brigham-Las Vegas-Reno as given by the unadjusted levels is 0.0739 meter. The correction which would close this circuit of 2474 kilometers is 0.030 millimeter per kilometer.

STUDY OF ERRORS.

Some of the errors of leveling are shown by the differences between the backward and forward runnings of the sections. These differences have, for the most part, tended to be of one sign, and observers have been unable to confine the accumulated discrepancies to as low a figure as desired. While it is believed that the mean of the two runnings is very near the truth, every effort possible has been made to make the field procedure such as to reduce to a minimum the individual discrepancies and to make them accidental in character.

In August, 1916, William Bowie, chief of the division of geodesy, visited Mr. Cowie's party and discovered that at least a part of the difference between the backward and forward runnings of a section was due to the tendency of the instrument (line of sight) to be higher for the backsights than for the foresights.

The leveling of the instrument is made approximately with the small universal level attached to the side of the telescope, after which it is perfected with the level proper. Observers, as a rule, only bring the bubble to within a level division of the center of the vial at this time, relying upon the micrometer screw to bring it to the exact center at the time the readings on the rods are made. In running north on a north-and-south line of levels the observer always faced westward when setting up and leveling the instrument, and the objective of the telescope pointed south when the leveling of the instrument was finished. Mr. Bowie found that the reading on the head of the micrometer screw was greater when sighting to the south than when sighting to the north. This difference as observed at about 100 instrument stations was, on an average, thirty-four hundredths of a complete turn of the micrometer screw. This indicated a creep of the bubble toward the south.

The value of one turn of the micrometer screw is 0.01 inch (0.25 mm.); therefore the difference between the elevation of the eye end of the telescope for the south and the north sights was 0.0034 inch (0.086 mm.). As the center of the telescope is approximately midway between the micrometer screw and the telescope supports near the objective, the change in the height of instrument between the two sights was 0.0017 inch (0.043 mm.). This would make an accumulation of the systematic error in a single line of levels from this cause proportional to the number of instrument stations. Since the average number of instrument stations per kilometer is about seven, the systematic error would be 0.012 inch (0.30 mm.) per kilometer.

When this systematic difference in the micrometer readings was discovered the observer set up the instrument for a number of stations while he was facing eastward, and it was found that the difference in the micrometer readings was the same as before, approximately, except that now the northern sight had the greater reading. The evident remedy suggested itself, that the observer when setting up the instrument should face westward at one half of the instrument stations and eastward at the other half, which would tend to eliminate the error; also, when leveling up the instrument, to bring the bubble to a position in the vial which would allow for the creep of the bubble. Mr. Cowie followed this system for the remainder of the season, and while what may be called the micrometer error was eliminated from even a single line of levels, the accumulation of the discrepancies continued to be large.

While the single line of levels was affected systematically by the failure to have the micrometer readings the same on both sights, this error was eliminated from the mean of the backward and forward runnings. This is due to the fact that while the observer always faced west when running north on a north-and-south line he faced east when running south on the line.

The observer rode between stations on a motor car which had the seats on the right side. The observer, therefore, was on the eastern side of the track when running his line north as he stepped from the car. Even had he walked between stations it is probable he would have faced in the same direction at all stations while setting up and leveling the instrument.

Upon his return to Washington Mr. Bowie learned from Mr. Cowie that the accumulation of the discrepancy between the backward and forward lines was still large. The following letter was sent to Mr. Cowie by Mr. Bowie on October 14, 1915:

I have been considering very carefully during the past few days the question of the accumulation of the B-F. As a matter of fact, I have been thinking of this subject for a number of years and have about arrived at the conclusion that there may be something connected with the rods and the rodmen which effects the accumulation. I can see nothing in connection with the instrument itself that would be of a constant or systematic character, nor do I believe that there can be any atmospheric trouble when you change entirely the program of your running. In other words, if, with the running of the forward line first, you get an accumulation of a plus sign for B-F and then you run the backward line first and continue with a plus accumulation, you certainly have eliminated the atmospheric conditions as the cause of the accumulation.

If the rodman is the source of the error, then changing the program of running would not affect the accumulation. Just what could be systematic in his method of rodding, I do not know, but I suggest that you try at least one thing; that is, to have the rodmen use the south rail for one section and the north rail for the other, and so on, alternately. It is possible that there may be some slight difference in the exact points on which the rod is held for the foresight and the back sight. If the top of the rail is always sloping towards the center of the track, there might be a tendency for the rod to be held in a lower position for one sight than for the other. This

seems to me to be a possibility and well worth considering. I believe that the method of holding on first one rail and then the other would tend to lessen the accumulation. I can see that this would not prevent a large value for the B–F in a single section, but it should control to a certain extent the accumulation of the constant sign of the difference between the B–F. You will, no doubt, be able to think of other methods or changes in method which might tend to eliminate the constant or systematic errors due to the rods or rodding.

The leveling was on a line running in an easterly and westerly direction when this letter was written. The method employed by the rodman was to make a cross on the top of the rail with a piece of chalk or kiel and then hold the foot of the rod as nearly as possible on the center of the cross.

Mr. Cowie followed the suggestions contained in the above letter with the very satisfactory result that for the last 60 miles of his line, from Charleston to Las Vegas, Nev., the accumulated value of the discrepancy was only 29 millimeters, and for that distance the accumulated value passed through zero twelve times.

It should be stated that the entire line of the party working in Nevada was along railroads which had light rails and in most cases very light old rails. This was especially the case for that part of the line between Tonopah Junction, Nev., and Laws, Cal. It is no doubt true that the mean of the two runnings of a line would be free from this rail error, as the same rail was used for both the backward and the forward lines. That such effect must be small in the mean line is shown by the small closing errors of the circuits formed by leveling in which the top of the rail has been used as the rod support.

ELEVATIONS AND DESCRIPTIONS OF BENCH MARKS.*

GENERAL NOTES DESCRIBING DIFFERENT FORMS AND MARKINGS OF BENCH MARKS.

NOTE 1.—This type of bench mark is the red metal disk designed by the Coast and Geodetic Survey, lettered "U. S. Coast and Geodetic Survey, B. M. $250 fine or imprisonment for disturbing this mark." The disk is 3 inches in diameter, with a 3-inch tenon upon the back for setting it, and is set in cement flush with a horizontal or vertical surface. In the latter case a horizontal mark cut on it, or the horizontal mark of a cross, is the bench mark.

NOTE 2.—This type of bench mark has the same lettering as that referred to in note 1, and is a 3-inch red metal cap, somewhat curved, screwed upon a 4-foot or 4½-foot iron pipe set in the ground and usually cemented at the base, from 4 to 6 inches being exposed above the ground. The base of the pipe is split and spread to a diameter of about a foot. For placing the foot of the level rod accurately a square or a small circle was cut in outline in the center of the cap.

NOTE 4.—This type of bench mark is a brass or copper bolt, usually set in lead or cement, flush with a horizontal or vertical surface. In the latter case, a horizontal mark cut on the face of the bolt, or the horizontal mark of a cross, is the bench mark.

*Any person who finds that one of the bench marks here described has been disturbed, or that the description is not in accordance with the facts, is requested to notify the Superintendent of the Coast and Geodetic Survey, Washington, D. C.

NOTE 11.—The bottom of hole about 25 millimeters square and about 4 to 5 millimeters deep, cut in the top of a stone or cement post about 4 feet long and with rectangular top from 4 to 8 inches on a side, projecting about 6 inches from the ground. The top of the post is lettered "U. S. B. M."

NOTE 11*a*.—A red metal disk like that described in note 1, set in the top of a stone or cement post about 4 feet long and with a rectangular top from 4 to 8 inches on a side, projecting about 6 inches from the ground.

NOTE 16.—The bottom of a hole in a horizontal surface, 25 to 30 millimeters square, 4 millimeters deep, not lettered.

NOTE 17.—A 3-inch aluminum or bronze disk lettered "U. S. Geological Survey, B. M. $250 fine or imprisonment for disturbing this mark. Elevation above sea — feet. Datum —." Each disk is stamped with the approximate elevation in feet and a letter or letters to indicate the datum plane. This elevation and the datum letter or letters usually form the name by which the bench mark is designated in this publication.

NOTE 18.—This type of bench mark has the same lettering as that referred to in note 17, and is a 3-inch aluminum or bronze cap riveted upon a 3-inch iron pipe, set in the ground, 5 to 6 inches being exposed above the ground. A cross cut in the center of the top is the bench mark.

ELEVATIONS AND DESCRIPTIONS OF PERMANENT BENCH MARKS BETWEEN RENO AND LAS VEGAS, NEV., 1915.

H_9.—At *Reno, Washoe County, Nev.*, a brass plate, 2 by 4 inches, in the granite top of the north balustrade of the east entrance to the city hall. The elevation marked on top is 96.72 feet above the zero of the city system of levels. (1370.224 meters=4495.477 feet.)

I_9 (U. S. G. S.).—At *Reno, Washoe County, Nev.*, on the main building of the Nevada State University in the side of the northeast corner stone. Stamped 4554.817 feet. Note 17.* (1389.031 meters=4557.179 feet.)

M_9.—At *Reno, Washoe County, Nev.*, in the north end of the abutment of a highway bridge over the Truckee River. Note 1.* (1368.446 meters=4489.643 feet.)

N_9.—About 3 miles south of *Reno, Washoe County, Nev.*, 75 meters (245 feet) southeast of a schoolhouse opposite Wingate's stock farm, 5 meters (16 feet) east of the Virginia & Truckee Railway tracks, in line with the telegraph poles and 50 meters (165 feet) south of a road crossing. Note 2.* (1353.451 meters=4440.447 feet.)

O_9.—About 5 miles south of *Reno, Washoe County, Nev.*, in the second pier from the south end of the Virginia & Truckee Railway bridge over a creek about 1¾ miles north of *Huffakers, Washoe County, Nev.* Note 1.* (1357.999 meters=4455.368 feet.)

P_9.—At *Huffakers, Washoe County, Nev.*, near the north end of the switch, in a fence corner, 5 meters (16 feet) east of the Virginia & Truckee Railway tracks near a road crossing. Note 2.* (1373.162 meters=4505.116 feet.)

Q_9.—About 9 miles south of *Reno, Washoe County, Nev.*, at the south end of a siding, 50 meters (165 feet) north of the switch stand, east of the tracks of the Virginia & Truckee Railway in line with the telegraph poles. Note 2.* (1384.829 meters=4543.393 feet.)

R_9.—At *Steamboat Springs, Washoe County, Nev.*, in the southwest corner of the south abutment of the Virginia & Truckee Railway culvert. Note 16.* (1402.341 meters=4600.847 feet.)

S_9.—About 1½ miles south of *Steamboat Springs, Washoe County, Nev.*, 8 meters (26 feet) east of the Virginia & Truckee Railway tracks. Note 2.* (1423.157 meters=4669.141 feet.)

T_9.—About 1 mile north of *Washoe, Washoe County, Nev.*, east of a road crossing on the Virginia & Truckee Railway tracks and near a crossing sign. Note 2.* (1500.791 meters=4923.845 feet.)

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* See p. 28 and above.

U_9.—About ½ mile north of *Washoe, Washoe County, Nev.*, in the west end of the north abutment of a Virginia & Truckee Railway bridge, 1 meter lower than the rail. Note 16.* (1531.800 meters=5025.580 feet.)

V_9 (R. S. B. M.).—At *Washoe, Washoe County, Nev.*, in the wing wall of the first culvert north of the station. Marked by a cross in the rock. (1535.620 meters=5038.113 feet.)

W_9.—At *Washoe, Washoe County, Nev.*, in the west side of a concrete culvert under the Virginia & Truckee Railway tracks near the station platform. Note 1.* (1536.123 meters=5039.763 feet.)

X_9.—About 3 miles south of *Washoe, Washoe County, Nev.*, opposite a station platform, in line with the telegraph poles and 30 meters (98 feet) north of a road crossing. Note 2.* (1545.071 meters=5069.120 feet.)

Y_9.—At *Franktown, Washoe County, Nev.*, in the northwest corner of the foundation of the Virginia & Truckee Railway water tank. Note 16.* (1540.488 meters=5054.084 feet.)

Z_9.—About 3 miles south of *Franktown, Washoe County, Nev.*, opposite the switch stand at the north end of a Virginia & Truckee Railway switch and in line with the telegraph poles. Note 2.* (1540.563 meters=5054.330 feet.)

A_{10}.—At *Lake View, Ormsby County, Nev.*, opposite the switch stand at the south end of the Virginia & Truckee Railway siding and 1 meter from the right of way fence. Note 2.* (1562.062 meters=5124.865 feet.)

B_{10}.—About 3½ miles north of *Carson City, Ormsby County, Nev.*, 5 meters (16 feet) west of the Virginia & Truckee Railway tracks, on a tangent of a 2 per cent grade on the side of a hill. The bench mark is a square in relief on the point of a large bowlder. (1516.573 meters=4975.623 feet.)

C_{10}.—About 2 miles northwest of *Carson City, Ormsby County, Nev.*, at the north end of a tangent of the Virgnia & Truckee Railway tracks near a crossroad. Marked by a square cut in a bowlder east of the tracks. Note 16.* (1473.867 meters=4835.512 eet.)

D_{10}.—About ¾ mile west of *Carson City, Ormsby County, Nev.*, in the concrete head gates of an irrigation ditch, on the railroad right of way and near a road crossing. Note 1.* (1449.583 meters=4755.840 feet.)

G10 E_{10}.—At *Carson City, Ormsby County, Nev.*, in the south wall of the Carson Bank near the rear entrance. Note 1.* (1428.400 meters=4686.342 feet.)

F10 (2.K) F_{10}.—At *Carson City, Ormsby County, Nev.*, in the footing of one of the supports of the pillars at the western entrance to the Nevada State Capitol. Note 1.* (1425.724 meters=4677.563 feet.)

E10 G_{10}.—At *Carson City, Ormsby County, Nev.*, in the front wall of the post office building just over the north balustrade. Note 1.* (1426.906 meters=4681.441 feet.)

H_{10}.—At *Carson City, Ormsby County, Nev.*, 400 meters (1,310 feet) east of the station, on the northwest end of the guard wall of a timber culvert over a creek near the west end of the railroad yards. Note 16.* (1422.771 meters=4667.874 feet.)

I_{10}.—About 2 miles east of *Carson City, Ormsby County, Nev.*, in the center of the north guard wall of a highway culvert, 20 meters (66 feet) south of the Virginia & Truckee Railway tracks. Note 1.* (1411.909 meters=4632.238 feet.)

J_{10}.—At *Morgan Mills, Ormsby County, Nev.*, in an old stone building 10 meters (33 feet) south of the Virginia & Truckee Railway tracks. The bench mark is a bolt, marked with a horizontal slit, set in the northeast corner. Note 4.* (1405.654 meters=4611.716 feet.)

K_{10}.—About 4½ miles east of *Carson City, Ormsby County, Nev.*, in the north end of the east abutment of a highway bridge over the Carson River. Note 4.* (1394.807 meters=4576.129 feet.)

L_{10}.—About 2 miles west of *Mound House, Lyon County, Nev.*, about ½ mile east of the section tool house, 3 meters (10 feet) north of the Virginia & Truckee Railway tracks, in a face of rock. Note 4.* (1427.370 meters=4682.963 feet.)

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* See pp. 28 and 29.

Elevations E10 & G10 reversed.

M_{10}.—At *Mound House, Lyon County, Nev.*, about 150 meters (492 feet) west of the railroad station, 10 meters (33 feet) west of the Virginia & Truckee Railroad tracks, on the northeast corner of a rail buried on end near a telegraph pole. The rail projects 4 feet out of ground. (1511.924 meters=4960.371 feet.)

N_{10}.—At *Mound House, Lyon County, Nev.*, 50 meters (164 feet) south of the station near a telegraph pole, about 75 meters (246 feet) east of the junction of the Virginia & Truckee Railway and the Southern Pacific Railway, 1 meter lower than the rail. Note 2.* (1504.434 meters=4935.797 feet.)

O_{10}.—About 3½ miles east of *Mound House, Lyon County, Nev.*, near mile pole 339, 10 meters (33 feet) north of the Southern Pacific Railway tracks, near a telegraph pole where the line crosses the tracks. Note 2.* (1396.507 meters=4581.707 feet.)

P_{10}.—At *Dayton, Lyon County, Nev.*, on the footing of the northwest pillar of the Southern Pacific Railway water tank. Note 4.* (1327.085 meters=4353.945 feet.)

Q_{10}.—At *Dayton, Lyon County, Nev.*, in the north face of the brick building used as a post office. Note 1.* (1332.584 meters=4371.986 feet.)

R_{10}.—About 3¼ miles east of *Dayton, Lyon County, Nev.*, 3 meters (10 feet) east of mile pole 333 and 10 meters (33 feet) south of the Southern Pacific Railway tracks. Note 2.* (1326.097 meters=4350.703 feet.)

S_{10} (U. S. L. O.).—About 3¼ miles east of *Dayton, Lyon County, Nev.*, 30 meters (98 feet) northeast of mile pole 333 and 5 meters (16 feet) north of the Southern Pacific Railway tracks. The following legend is stamped on the bronze top: $\frac{\frac{1}{4}\ S8}{S17}$. (1325.570 meters=4348.974 feet.)

T_{10}.—About 6¼ miles east of *Dayton, Lyon County, Nev.*, 20 meters (66 feet) west of mile pole 329 and 8 meters (26 feet) south of the Southern Pacific Railway tracks. Note 2.* (1308.022 meters=4291.402 feet.)

U_{10}.—One mile west of *Clifton, Lyon County, Nev.*, two telegraph poles east of mile pole 326 and 10 meters (33 feet) south of the Southern Pacific Railway tracks. Note 2.* (1302.682 meters=4273.882 feet.)

V_{10}.—About 2 miles east of *Clifton, Lyon County, Nev.*, 40 meters (131 feet) west and on the opposite side of the track from mile pole 323, 3 meters (10 feet) north of the Southern Pacific Railway tracks. Note 2.* (1296.203 meters=4252.626 feet.)

W_{10}.—About 5 miles east of *Clifton, Lyon County, Nev.*, 2 meters (7 feet) west of mile pole 320 and 10 meters (33 feet) south of the Southern Pacific Railway tracks. Note 2.* (1292.071 meters=4239.070 feet.)

X_{10}.—One mile west of *Churchill, Lyon County, Nev.*, two telegraph poles and 12 meters (39 feet) east of mile pole 317, 4 meters (13 feet) south of the Southern Pacific Railway tracks and 10 meters (33 feet) south of the Carson River. Note 2.* (1285.704 meters=4218.180 feet.)

Y_{10} (R. R. B. M.).—About ½ mile north of *Churchill, Lyon County, Nev.*, in the west end of the north abutment of concrete culvert No. 315 D of the Southern Pacific Railway. The bench mark is the top of an iron bolt marked "B. M. 52." (1282.543 meters=4207.810 feet.)

Z_{10}.—About ½ mile north of *Churchill, Lyon County, Nev.*, in the west end of the south abutment of concrete culvert No. 315D of the Southern Pacific Railway. Note 1.* (1283.177 meters=4209.890 feet.)

A_{11}.—At *Churchill, Lyon County, Nev.*, in the southwest footing of the Southern Pacific Railway oil tank. Note 16.* (1284.411 meters=4213.938 feet.)

B_{11}.—About 2½ miles south of *Churchill, Lyon County, Nev.*, ½ mile north of mile pole 319, 1 meter higher than the Southern Pacific Railway track, and in line with the telegraph poles near the north end of a long tangent of the tracks. Note 2.* (1307.947 meters=4291.156 feet.)

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* See pp. 28 and 29.

C_{11}.—About 5 miles south of *Churchill, Lyon County, Nev.*, 2 meters (7 feet) south of mile pole 322, in line with the telegraph poles and 8 meters (26 feet) west of the Southern Pacific Railway tracks. Note 2.* (1302.882 meters=4274.539 feet.)

D_{11}.—About 3 miles northwest of *Wabuska, Lyon County, Nev.*, 3 meters (10 feet) north of mile pole 325 and 8 meters (26 feet) west of the Southern Pacific Railway tracks. Note 2.* (1308.789 meters=4293.919 feet.)

E_{11} (U. S. G. S.).—At *Wabuska, Lyon County, Nev.*, 0.6 meter west of the station, 1.5 meters (5 feet) north of the southwest corner. Stamped 4297 WAB. Note 18.* (1310.332 meters=4298.981 feet.)

F_{11} (U. S. R. S.).—At *Wabuska, Lyon County, Nev.*, 244 meters (800 feet) south of the station, 6 meters (20 feet) west of the road to Yerington, near a sod house. An iron post stamped 4303.95 SP. (1310.382 meters=4299.145 feet.)

G_{11}.—About 4 miles southeast of *Wabuska, Lyon County, Nev.*, 2 meters (7 feet) north of mile pole 332 and 8 meters (26 feet) west of the Southern Pacific Railway tracks. Note 2.* (1313.150 meters=4308.226 feet.)

H_{11}.—About 9 miles east of *Wabuska, Lyon County, Nev.*, 15 meters (49 feet) west of the Southern Pacific Railway tracks and abreast of mile pole 337. Note 2.* (1313.790 meters=4310.326 feet.)

I_{11}.—About 11 miles east of *Wabuska, Lyon County, Nev.*, 10 meters (33 feet) west of the Southern Pacific Railway tracks, abreast of the third telegraph pole east of mile pole 339, in a dry lake bed. Note 2.* (1302.756 meters=4274.125 feet.)

J_{11}.—About 14½ miles southeast of *Wabuska, Lyon County, Nev.*, three telegraph poles northwest of the "One mile to Rio Vista Station" sign and 20 meters (66 feet) west of the Southern Pacific Railway tracks. Note 2.* (1309.175 meters=4295.185 feet.)

K_{11}.—About 8 miles north of *Schurz, Mineral County, Nev.*, 20 meters (66 feet) south of the Southern Pacific Railway tracks, abreast of mile pole 346. Note 2.* (1332.056 meters=4370.254 feet.)

L_{11}.—About 5½ miles northwest of *Schurz, Mineral County, Nev.*, 1 meter south of mile pole 349 and 8 meters (26 feet) south of the Southern Pacific Railway tracks. Note 2.* (1318.599 meters=4326.104 feet.)

M_{11}.—About 2½ miles northwest of *Schurz, Mineral County, Nev.*, 1 meter south of mile pole 352 and 7 meters (23 feet) south of the Southern Pacific Railway tracks. Note 2.* (1260.765 meters=4136.360 feet.)

N_{11}.—About 1 mile northwest of *Schurz, Mineral County, Nev.*, 15 meters (49 feet) south of the Southern Pacific Railway tracks, in the concrete weir of the Government irrigation ditch. Note 1.* (1259.361 meters=4131.754 feet.)

O_{11} (U. S. G. S.).—At *Schurz, Mineral County, Nev.*, 61 meters (200 feet) west of the station, 18 meters (60 feet) south of the Southern Pacific Railway, at the northeast corner of the Nevada Mercantile & Supply Co. store. Stamped 4130. The store has recently burned down. Note 18.* (1256.530 meters=4122.465 feet.)

P_{11} (U. S. G. S.).—At *Schurz, Mineral County, Nev.*, east of the slaughterhouse, 6 meters (20 feet) south of road. Stamped 4130. Note 18.* (1256.537 meters=4122.488 feet.)

Q_{11}.—At *Schurz, Mineral County, Nev.*, in the concrete footing of the northwest central pillar of the Southern Pacific Railway water tank. Note 16.* (1256.718 meters=4123.082 feet.)

R_{11}.—About ½ mile southeast of *Schurz, Mineral County, Nev.*, in the west end of the south side of a concrete culvert under the Southern Pacific Railway tracks. Note 1.* (1255.590 meters=4119.381 feet.)

S_{11}.—About 2 miles southeast of *Schurz, Mineral County, Nev.*, in the south side of concrete culvert No. 356A under the Southern Pacific Railway tracks. Note 4.* (1254.380 meters=4115.412 feet.)

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* See pp. 28 and 29.

T_{11}.—About 4 miles southeast of *Schurz, Mineral County, Nev.*, 10 meters (33 feet) east of mile pole 358 and 8 meters (26 feet) south of the Southern Pacific Railway tracks. Note 2.* (1252.115 meters=4107.981 feet.)

U_{11} (U. S. G. S.).—About 6 miles southeast of *Schurz, Mineral County, Nev.*, three telegraph poles south of mile pole 360, 15 meters (49 feet) west of the Southern Pacific Railway. Stamped 4113. Note 18.* (1251.613 meters=4106.334 feet.)

V_{11}.—About 8 miles southeast of *Schurz, Mineral County, Nev.*, 3 meters (10 feet) north of mile pole 362 and 8 meters (26 feet) west of the Southern Pacific Railway tracks. Note 2.* (1254.760 meters=4116.658 feet.)

W_{11} (U. S. G. S.).—About 11 miles south of *Schurz, Mineral County, Nev.*, and 2.4 miles north of *Gillis, Mineral County, Nev.*, two telegraph poles south of mile pole 365 and 10 meters (33 feet) west of the Southern Pacific Railway tracks. Stamped 4176. Note 18.* (1270.644 meters=4168.771 feet.)

X_{11}.—About ⅓ mile south of *Gillis, Mineral County, Nev.*, five telegraph pole and 40 meters (131 feet) north of mile pole 368 and 10 meters (33 feet) west of the Southern Pacific Railway tracks. Note 2.* (1268.815 meters=4162.771 feet.)

Y_{11} (U. S. G. S.).—About 2¼ miles south of *Gillis, Mineral County, Nev.*, two telegraph poles south of mile pole 370. Stamped 4163. Note 18.* (1266.668 meters =4155.727 feet.)

Z_{11}.—About 3½ miles north of *Magnus, Mineral County, Nev.*, 8 meters (26 feet) west of the Southern Pacific Railway tracks, south of a large bay on Walker Lake. Note 2.* (1251.977 meters=4107.528 feet.)

A_{12} (U. S. G. S.).—About 2 miles north of *Magnus, Mineral County, Nev.*, near mile pole 375. Stamped 4114. Note 18.* (1251.722 meters=4106.691 feet.)

B_{12}.—About ½ mile south of *Magnus, Mineral County, Nev.*, near mile pole 377½ and 8 meters (26 feet) east of the Southern Pacific Railway tracks. Note 2.* (1251.171 meters=4124.563 feet.)

C_{12} (U. S. G. S.).—About 4½ miles north of *Thorne, Mineral County, Nev.*, two telegraph poles south of mile pole 380 and 10 meters (33 feet) east of the Southern Pacific Railway tracks. Stamped 4117. Note 18.* (1252.780 meters=4110.162 feet.)

D_{12}.—About 1½ miles northwest of *Thorne, Mineral County, Nev.*, 2 meters (7 feet) south of mile pole 383 and 12 meters (39 feet) west of the Southern Pacific Railway tracks. Note 2.* (1259.109 meters=4130.927 feet.)

E_{12} (U. S. G. S.).—About 1 mile west of *Thorne, Mineral County, Nev.*, 1 meter north of old road to Hawthorne and 10 meters (33 feet) south of the new road. Stamped 4133. Note 18.* (1257.686 meters=4126.258 feet.)

F_{12}.—About 4¾ miles southeast of *Thorne, Mineral County, Nev.*, three telegraph poles and 20 meters (66 feet) south of mile pole 389 and 10 meters (33 feet) west of the Southern Pacific Railway tracks. Note 2.* (1348.565 meters=4424.417 feet.)

G_{12} (U. S. G. S.).—About 8½ miles southeast of *Thorne, Mineral County, Nev.*, one telegraph pole south of mile pole 393 and 10 meters (33 feet) west of the Southern Pacific Railway tracks. Stamped 4478. Note 18.* (1363.019 meters=4471.838 feet.)

H_{12}.—About 12 miles southeast of *Thorne, Mineral County, Nev.*, ½ mile southeast of mile pole 396, 8 meters (26 feet) west of the Southern Pacific Railway tracks. Note 2.* (1333.922 meters=4376.376 feet.)

I_{12}.—At *Acme, Mineral County, Nev.*, ¾ mile southeast of mile pole 397. The bench mark is a bolt marked with a cross in the foot plate of the southeast pillar of the Southern Pacific Railway water tank. (1334.580 meters=4378.535 feet.)

J_{12} (U. S. G. S.).—About 9 miles northwest of *Luning, Mineral County, Nev.*, near mile pole 399. Stamped 4399. Note 18.* (1338.780 meters=4392.314 feet.)

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* See pp. 28 and 29.

K_{12}.—About 6 miles northwest of *Luning, Mineral County, Nev.*, 1 meter south of mile pole 402 and 10 meters (33 feet) west of the Southern Pacific Railway tracks. Note 2.* (1358.411 meters=4456.720 feet.)

L_{12} (U. S. G. S.).—About 3 miles northwest of *Luning, Mineral County, Nev.*, one telegraph pole south of mile pole 405 and 10 meters (33 feet) west of the Southern Pacific Railway tracks. Stamped 4561. Note 18.* (1388.122 meters=4554.197 feet.)

M_{12}.—At *Luning, Mineral County, Nev.*, 40 meters (131 feet) northwest of the station and 10 meters (33 feet) west of the main track of the Southern Pacific Railway. Note 2.* (1360.583 meters=4463.846 feet.)

N_{12} (U. S. G. S.).—About 6 miles north of *Mina, Mineral County, Nev.*, near mile pole 411. Stamped 4464. Note 18.* (1358.721 meters=4457.737 feet.)

O_{12}.—At *New Boston, Mineral County, Nev.*, one telegraph pole north of mile pole 414, in the footing of the southeast pillar of the Southern Pacific Railway water tank. Note 16.* (1370.896 meters=4497.681 feet.)

P_{12} (U. S. G. S.).—At *Mina, Mineral County, Nev.*, in the southwest corner of the parking space near the Southern Pacific Railway station. Stamped 4553 1907. Note 18.* (1385.730 meters=4546.349 feet.)

Q_{12}.—At *Mina, Mineral County, Nev.*, in the concrete footing of the northwest pillar of the Southern Pacific Railway's tall water tank east of the station. Note 1.* (1385.416 meters=4545.319 feet.)

R_{12}.—At *Mina, Mineral County, Nev.*, in the west face of the heavy concrete footing of the southwest pillar of the small water tank of the Southern Pacific Railway. Note 1.* (1386.432 meters=4548.652 feet.)

S_{12}.—About 3 miles southeast of *Mina, Mineral County, Nev.*, 10 meters (33 feet) south of mile pole 420 and 10 meters west of the Southern Pacific Railway tracks. Note 2.* (1396.411 meters=4581.392 feet.)

T_{12}.—About 2½ miles southeast of *Sodaville, Mineral County, Nev.*, two telegraph poles north of mile pole 423. Stamped 4438. Note 18.* (1350.828 meters=4431.841 feet.)

U_{12}.—At *Tonopah Junction, Mineral County, Nev.*, in the area between the Tonopah & Goldfield Railway and the Southern Pacific Railway, 20 meters (66 feet) south of a log house and 60 meters (164 feet) northwest of the Southern Pacific Railway water tank. Note 2.* (1343.668 meters=4408.351 feet.)

V_{12}.—At *Tonopah Junction, Mineral County, Nev.*, in the northeast footing of a pillar of the Southern Pacific Railway water tank, 2 meters (7 feet) west of the tracks. Note 16.* (1344.376 meters=4410.674 feet.)

W_{12} (U. S. G. S.).—At *Tonopah Junction, Mineral County, Nev.*, the top of a hexagonal nut in the southwest pillar of the Southern Pacific Railway water tank, about 1 meter above the ground. Marked by a daub of white paint. (1344.648 meters=4411.566 feet.)

X_{12} (U. S. G. S.).—About 3 miles south of *Tonopah Junction, Mineral County, Nev.*, 5 meters (16 feet) north of mile pole 3. Stamped 4584. Note 18.* (1395.222 meters=4577.491 feet.

Y_{12} (U. S. G. S.).—At *Redlich, Mineral County, Nev.*, 30 meters (98 feet) east of the Tonopah & Goldfield Railway, 30 meters (98 feet) south of the section house, in rock embedded in the ground. Stamped 4999. Note 17.* (1521.964 meters=4993.310 feet.)

Z_{12}.—About 2¼ miles south of *Redlich, Mineral County, Nev.*, near the eleventh telegraph pole south of mile pole 10, 25 meters (82 feet) east of the Tonopah & Goldfield Railway tracks. Note 2.* (1447.385 meters=4748.629 feet.)

A_{13}.—At *Rock Hill, Esmeralda County, Nev.*, in the concrete foundation (no superstructure) of a water tank of the Tonopah & Goldfield Railway. The bench

* See pp. 28 and 29.

mark is the top of an iron anchor bolt set in the northeast footing and is marked by a cross. (1393.970 meters=4573.383 feet.)

B_{13}.—About 2¼ miles south of *Rock Hill, Esmeralda County, Nev.*, 12 meters (39 feet) south of the twelfth telegraph pole south of mile pole 14 and 20 meters (66 feet) east of the Tonopah & Goldfield Railway tracks. Note 2.* (1380.122 meters=4527.950 feet.)

H_{14}.—About 2 miles north of *Coaldale, Esmeralda County, Nev.*, 6 telegraph poles north of mile pole 18, in line with the telegraph poles and 20 meters (66 feet) east of the Tonopah & Goldfield Railway tracks. Note 2.* (1380.982 meters=4530.772 feet.)

I_{14} (U. S. G. S.).—One mile southwest of *Coaldale, Esmeralda County, Nev.*, 1 mile east of *Columbus Salt Marsh*, west of road near crossroads. Stamped 4671. Note 18.* (1398.722 meters=4588.974 feet.)

J_{14}.—About 1 mile southeast of *Coaldale, Esmeralda County, Nev.*, 5 meters (16 feet) outheast of mile pole 21 and 20 meters (66 feet) north of the Tonopah & Goldfield Railway tracks. Note 2.* (1415.889 meters=4645.296 feet.)

K_{14}.—About 3⅛ miles northwest of *Blair Junction, Esmeralda County, Nev.*, 6 meters (20 feet) southeast of mile pole 24 and 20 meters (66 feet) east of the Tonopah & Goldfield Railway tracks. Note 2.* (1496.494 meters=4909.747 feet.)

L_{14}.—About ⅛ mile northwest of *Blair Junction, Esmeralda County, Nev.*, 3 meters (10 feet) southeast of mile pole 27 and 20 meters (66 feet) northeast of the Tonopah & Goldfield Railway tracks. Note 2.* (1468.440 meters=4817.707 feet.)

M_{14}.—At *Blair Junction, Esmeralda County, Nev.*, in the concrete footing of the southwest pillar of the Tonopah & Goldfield Railway water tank, 2 meters (7 feet) north of the tracks. Note 16.* (1467.664 meters=4815.161 feet.)

N_{14}.—About 2⅔ miles southeast of *Blair Junction, Esmeralda County, Nev.*, 6 meters (20 feet) southeast of mile pole 30 and 20 meters (66 feet) north of the Tonopah & Goldfield Railway tracks. Note 2.* (1458.808 meters=4786.106 feet.)

O_{14}.—About 5⅔ miles southeast of *Blair Junction, Esmeralda County, Nev.*, 4 meters (13 feet) southeast of mile pole 33 and 20 meters (66 feet) northeast of the Tonopah & Goldfield Railway tracks. Note 2.* (1462.899 meters=4799.528 feet.)

P_{14}.—About 8⅔ miles southeast of *Blair Junction, Esmeralda County, Nev.*, 2 meters (7 feet) southeast of mile pole 36 and 20 meters (66 feet) north of the Tonopah & Goldfield Railway tracks. Note 2.* (1445.469 meters=4742.343 feet.)

Q_{14}.—About 8 miles northwest of *Millers, Esmeralda County, Nev.*, 10 meters (33 feet) southeast of mile pole 39 and 20 meters (66 feet) north of the Tonopah & Goldfield Railway tracks. Note 2.* (1445.736 meters=4743.219 feet.)

R_{14}.—About 5 miles northwest of *Millers, Esmeralda County, Nev.*, 25 meters (82 feet) southeast of mile pole 42 and 20 meters (66 feet) north of the Tonopah & Goldfield Railway tracks. Note 2.* (1452.834 meters=4766.506 feet.)

S_{14}.—About 2 miles northwest of *Millers, Esmeralda County, Nev.*, 8 meters (26 feet) southeast of mile pole 45 and 20 meters (66 feet) southeast of the Tonopah & Goldfield Railway tracks. Note 2.* (1458.936 meters=4786.526 feet.)

T_{14}.—At *Millers, Esmeralda County, Nev.*, in the southwest footing of the Tonopah & Goldfield Railway water tank in front of the station. Note 16.* (1479.514 meters=4854.039 feet.)

U_{14}.—At *Main Line Junction, Esmeralda County, Nev.*, in the angle of a Y near a telegraph pole, about 120 meters (400 feet) southeast of the section house. Note 2.* (1515.974 meters=4973.658 feet.)

V_{14}.—About 3⅛ miles southeast of *Main Line Junction, Esmeralda County, Nev.*, 20 meters (66 feet) west of the Tonopah & Goldfield Railway tracks, just south of a sink along the railroad embankment. Note 2.* (1570.810 meters=5153.566 feet.)

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* See pp. 28 and 29.

W_{14}.—At *McSweeney Junction, Esmeralda County, Nev.*, in the Y and about 100 meters (328 feet) north of the junction of the tracks. Note 2.* (1613.612 meters=5293.992 feet.)

X_{14}.—About 2½ miles south of *Columbia Junction, Esmeralda County, Nev.*, 15 meters (49 feet) south of a road crossing, 20 meters (66 feet) west of the Tonopah & Goldfield Railway tracks in line with the telegraph poles. Note 2.* (1634.753 meters=5363.352 feet.)

Y_{14}.—At *Columbia Junction, Esmeralda County, Nev.*, 30 meters (98 feet) north of the Tonopah & Goldfield Railway tracks, near telephone booth, in line with the telegraph poles. Note 2.* (1688.042 meters=5538.184 feet.)

Z_{14}.—About ⅝ mile east of *Columbia Junction, Esmeralda County, Nev.*, 8 meters (26 feet) south of the Tonopah & Goldfield Railway tracks, about ¼ mile west of a large mine hoist, in the end of a bowlder (2 by 1½ feet) about 1 foot above the surface of the ground. Note 16.* (1712.876 meters=5619.661 feet.)

A_{15} (U. S. G. S.).—At *Tonopah, Nye County, Nev.*, in the west face of the Tonopah Banking Corporation Building on Main Street. Note 17.* (1836.879 meters=6026.494 feet.)

B_{15} (U. S. G. S.).—At *Tonopah Nye County, Nev.*, 1 mile south of the Tonopah & Goldfield Railway station, 200 meters (650 feet) southeast of the baseball field and 20 meters (66 feet) west of the road to Goldfield. Note 18.* (1873.905 meters=6147.970 feet.)

C_{15}.—About 3½ miles south of *McSweeney Junction, Esmeralda County, Nev.*, 5 meters (16 feet) south of mile pole 61, 20 meters (66 feet) west of the Tonopah & Goldfield Railway tracks. Note 2.* (1573.766 meters=5163.264 feet.)

D_{15}.—About 5½ miles south of *McSweeney Junction, Esmeralda County, Nev.*, 5 meters (16 feet) south of mile pole 63, 20 meters (66 feet) west of the Tonopah & Goldfield Railway tracks. Note 2.* (1532.367 meters=5027.441 feet.)

E_{15}.—About ½ mile north of *Klondyke, Esmeralda County, Nev.*, 3 meters (10 feet) south of mile pole 67 and 20 meters (66 feet) west of the Tonopah & Goldfield Railway tracks. Note 2.* (1501.528 meters=4926.263 feet.)

F_{15}.—About 3½ miles southwest of *Klondyke, Esmeralda County, Nev.*, 3 meters (10 feet) south of mile pole 71, 20 meters (66 feet) west of the Tonopah & Goldfield Railway tracks, in line with the telegraph poles. Note 2.* (1538.191 meters=5046.548 feet.)

G_{15} (U. S. G. S.).—About 4 miles north of *Columbia, Esmeralda County, Nev.*, 300 meters (980 feet) east of the Tonopah & Goldfield Railway tracks, opposite the fifth telegraph pole north of mile pole 76. Stamped 5346. Note 18.* (1627.428 meters=5339.320 feet.)

H_{15}.—About 1 mile north of *Goldfield, Esmeralda County, Nev.*, in the west end of a concrete pier at the end of a spur of the Tonopah & Goldfield Railway tracks leading to an abandoned mill. Note 11.* (1693.312 meters=5555.474 feet.)

I_{15}.—At *Goldfield, Esmeralda County, Nev.*, in the west face of a bank on the corner of Columbia Street and the first street north of Crook Avenue. Note 1.* (1730.046 meters=5675.993 feet.)

J_{15} (U. S. G. S.).—At *Goldfield, Esmeralda County, Nev.*, at the southeast corner of Crook Avenue and the alley between Main and Columbia Streets. The bench mark is the bottom of a drill hole in the top of a 6-foot stone post set 3 feet in the ground. The top of the post containing an aluminum tablet stamped B 1905 1 H has been broken off. (1730.576 meters=5677.731 feet.)

K_{15}.—At *Goldfield, Esmeralda County, Nev.*, in the west face of the Goldfield Hotel. Note 1.* (1734.010 meters=5688.998 feet.)

L_{15} (U. S. G. S.).—At *Goldfield, Esmeralda County, Nev.*, in the south face of the county courthouse built in 1907. Note 17.* (1737.618 meters=5700.835 feet.)

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* See pp. 28 and 29.

M_{15}.—About 3½ miles south along the tracks of the Las Vegas & Tonopah Railway from the Tonopah & Goldfield Railway crossing at *Columbia, Esmeralda County, Nev.*, about ⅛ mile south of the signboard of *Red Rock*, about 100 meters (328 feet) south of the switch stand near the end of section 21 of the railroad and 10 meters (33 feet) west of the tracks. This is a United States Geological Survey bench mark, unmarked and set by this survey. Note 18.* (1768.797 meters=5803.128 feet.)

N_{15}.—About 7 miles south of *Columbia, Esmeralda County, Nev.*, ⅓ mile south of pole 189, 30 meters (98 feet) west of the Las Vegas & Tonopah Railway tracks, 3 meters (10 feet) lower than the rail. Note 2.* (1655.016 meters=5429.832 feet.)

O_{15}.—In Nye County, about 11 miles south of *Columbia, Esmeralda County, Nev.*, three and one-half telegraph poles north of mile pole 185, 15 meters (49 feet) west of the Las Vegas & Tonopah Railway tracks, and in line with the telegraph poles. Note 2.* (1547.223 meters=5076.181 feet.)

P_{15}.—In Nye County, about 14 miles south of *Columbia, Esmeralda County, Nev.*, 8 meters (26 feet) south of mile pole 182, 75 meters (246 feet) north of a road crossing, 15 meters (49 feet) west of the Las Vegas & Tonopah Railway tracks. Note 2.* (1482.591 meters=4864.134 feet.)

Q_{15}.—At *Ralston, Nye County, Nev.*, in the concrete foundation of the northeast pillar of the Las Vegas & Tonopah Railway well derrick. Note 11.* (1447.523 meters=4749.082 feet.)

R_{15}.—About 3 miles south of *Ralston, Nye County, Nev.*, 20 meters (66 feet) north of mile pole 177, 15 meters (49 feet) west of the Las Vegas & Tonopah Railway tracks in line with the telegraph poles. Note 2.* (1436.923 meters=4714.305 feet.)

S_{15}.—About 6 miles south of *Ralston, Nye County, Nev.*, 3 meters (10 feet) north of the ninth telegraph pole south of mile pole 174, 15 meters (49 feet) west of the Las Vegas & Tonopah Railway tracks. Note 2.* (1427.427 meters=4683.150 feet.)

T_{15}.—About 9 miles south of *Ralston, Nye County, Nev.*, near the first telegraph pole south of mile pole 171, 20 meters (66 feet) west of the Las Vegas & Tonopah Railway tracks. Note 2.* (1399.914 meters=4592.884 feet.)

U_{15}.—About 1 mile south of *Wagner, Nye County, Nev.*, 10 meters (33 feet) east of the old Bullfrog & Goldfield Railroad tracks and about 350 meters (1,150 feet) east of mile pole 168 on the Las Vegas & Tonopah Railway tracks, 200 meters (656 feet) east of large bowlders on a small knoll. Note 2.* (1390.567 meters=4562.219 feet.)

V_{15} (U. S. G. S.).—About 2 miles north of the *Goldfield & Tonopah Lumber Company Station, Nye County*, Nev., 170 meters (558 feet) west of the Bullfrog & Goldfield Railroad tracks near mile pole 108, opposite a small wooden culvert under the tracks, about 600 meters (1,968 feet) north of a road crossing. Stamped 16. Note 18.* (1324.257 meters=4344.666 feet.)

W_{15}.—About 7 miles south of *Wagner, Nye County, Nev.*, 100 meters (328 feet) south of Bullfrog & Goldfield Railroad mile pole 110, about 500 meters (1,640 feet) east of mile pole 162 on the Las Vegas & Tonopah Railway, 10 meters (33 feet) west of the Bullfrog & Goldfield Railroad tracks near one of the two large telegraph poles in that section of the line. Note 2.* (1293.651 meters=4244.253 feet.)

X_{15}.—About 3 miles north of *Bonnie Clare, Nye County, Nev.*, 300 meters (984 feet) south of mile pole 113 and 20 meters (66 feet) west of the tracks, about ½ mile east of mile pole 159 of the Las Vegas & Tonopah Railway. Note 11a.* (1244.502 meters=4083.004 feet.)

Y_{15}.—At *Bonnie Clare, Nye County, Nev.*, on the northeast footing of the ruined water tank of the Bullfrog & Goldfield Railroad, 20 meters (66 feet) north of the station building. The bench mark is the center of an outlined square on the steel footplate. (1205.179 meters=3953.991 feet.)

Z_{15}.—At *Bonnie Clare, Nye County, Nev.*, 150 meters (492 feet) south of the old station building of the Bullfrog & Goldfield Railroad, 95 meters (312 feet) west of

* See pp. 28 and 29.

the tracks and 60 meters (197 feet) north of an east and west road. Note 11a.* (1206.679 meters=3958.913 feet.)

A_{16}.—About 1¾ miles south of the junction of the Bullfrog & Goldfield Railroad and the Las Vegas & Tonopah Railway near *Bonnie Clare, Nye County, Nev.*, 5 meters (16 feet) north of mile pole 119 and 15 meters (49 feet) west of the tracks. Note 11a.* (1205.465 meters=3954.930 feet.)

B_{16}.—About 5½ miles south of *Bonnie Clare, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 122 and 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks. Note 11a.* (1207.395 meters=3961.262 feet.)

C_{16}.—About 8½ miles south of *Bonnie Clare, Nye County, Nev.*, 30 meters (98 feet) north of mile pole 123 and 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks. Note 11a.* (1207.178 meters=3960.550 feet.)

D_{16}.—About 11½ miles south of *Bonnie Clare, Nye County, Nev.*, two telegraph poles and 20 meters (66 feet) south of mile pole 128, 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks. Note 11a.* (1211.257 meters=3973.932 feet.)

E_{16}.—About 15½ miles south of *Bonnie Clare, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 131 and 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks. Note 11a.* (1218.960 meters=3999.205 feet.)

F_{16}.—At *Ancram, Nye County, Nev.*, opposite the north end of the switch 3 meters (10 feet) north of mile pole 134, 15 meters (49 feet) west of the main tracks of the Bullfrog & Goldfield Railroad. Note 11a.* (1225.933 meters=4022.082 feet.)

G_{16}.—About 3 miles south of *Ancram, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 137, 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks, in line with the telegraph poles. Note 11a.* (1227.411 meters=4026.931 feet.)

H_{16}.—About 3 miles north of *Pioneer, Nye County, Nev.*, two telegraph poles and 5 meters (16 feet) south of mile pole 140, 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks, on a small hill made by the railroad cutting through a small ridge, 200 meters (656 feet) north of a road crossing. Note 11a.* (1214.662 meters=3985.104 feet.)

I_{16}.—At *Pioneer, Nye County, Nev.*, near the north end of the sidetrack, 250 meters (820 feet) north of the station, 35 meters (115 feet) west of the main tracks of the Bullfrog & Goldfield Railroad, abreast of mile pole 143. Note 2.* (1176.576 meters=3860.150 feet.)

J_{16}.—About 3 miles south of *Pioneer, Nye County, Nev.*, one telegraph pole south of mile pole 146, 10 meters (33 feet) west of the Bullfrog & Goldfield Railroad tracks, opposite a farmhouse 400 meters (1,312 feet) west of the tracks. Note 11a.* (1121.559 meters=3679.648 feet.)

K_{16}.—About ¾ mile south of *Hot Springs, Nye County, Nev.*, 10 meters (33 feet) west of mile pole 149, 20 meters (66 feet) west of the Bullfrog & Goldfield Railroad tracks. Note 11a.* (1075.380 meters=3528.143 feet.)

L_{16}.—About 2 miles north of *Beatty, Nye County, Nev.*, 3 meters (10 feet) south of mile pole 152, 15 meters (49 feet) west of the Bullfrog & Goldfield Railroad tracks, 50 meters (164 feet) south of a road crossing. Note 11a.* (1035.335 meters=3396.762 feet.)

M_{16}.—At *Beatty, Nye County, Nev.*, 100 meters (328 feet) north of the station, 50 meters (164 feet) west of the Tonopah & Tidewater Railway tracks, 20 meters (66 feet) south of road crossing, and ½ meter east of fence line. Note 11a.* (1001.001 meters=3284.117 feet.)

N_{16} (U. S. G. S.).—At *Beatty, Nye County, Nev.*, in a ravine, 30 meters (100 feet) south of the principal street, 152 meters (500 feet) north of the plant of the Beatty Ice & Manufacturing Co. Stamped 31. Note 17.* (1008.229 meters=3307.831 feet.)

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* See pp. 28 and 29.

O_{16}.—About 2 miles south of *Beatty, Nye County, Nev.*, ½ mile south of the junction of the Las Vegas & Tonopah Railway and the Tonopah & Tidewater Railway, 11 telegraph poles and 25 meters (82 feet) north of mile pole 116, 15 meters (49 feet) west of the Las Vegas & Tonopah Railway tracks. Note 11a.* (965.592 meters=3167.946 feet.)

P_{16} (U. S. G. S.).—About 5 miles south of *Beatty, Nye County, Nev.*, 6 meters (20 feet) north of mile pole 113. Stamped 3002. Note 18.* (914.617 meters=3000.706 feet.)

Q_{16} (U. S. G. S.).—About 8 miles south of *Beatty, Nye County, Nev.*, 3 meters (10 feet) east of mile pole 110. Stamped 2865. Note 18.* (872.745 meters=2863.331 feet.)

R_{16} (U. S. G. S.).—About 11 miles south of *Beatty, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 107. Stamped 2755. Note 18.* (839.120 meters=2753.013 feet.)

S_{16} (U. S. G. S.).—About 14 miles south of *Beatty, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 104. Stamped 2664. Note 18.* (811.522 meters=2662.468 feet.)

T_{16} (U. S. G. S.).—About 17 miles south of *Beatty, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 101. Stamped 2575. Note 18.* (784.507 meters=2573.837 feet.)

U_{16}.—At *Rosewell, Nye County, Nev.*, in the south end of the west footing of the Las Vegas & Tonopah Railway water tank, 2 meters (7 feet) east of the tracks. The bench mark is the center of an outlined square. (789.291 meters=2589.532 feet.)

V_{16} (U. S. G. S.).—About 2 miles southeast of *Rosewell, Nye County, Nev.*, 3 meters (10 feet) northeast of mile pole 98. Stamped 2587. Note 18.* (787.955 meters=2585.149 feet.)

W_{16}.—Three miles southeast of *Rosewell, Nye County, Nev.*, 15 meters (49 feet) west of the Las Vegas & Tonopah Railway tracks, 10 meters (33 feet) north of mile pole 97. Note 11a.* (782.071 meters=2565.845 feet.)

X_{16} (U. S. G. S.).—About 5 miles southeast of *Rosewell, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 95. Stamped 2582. Note 18.* (786.720 meters=2581.097 feet.)

Y_{16} (U. S. G. S.).—About 8 miles southeast of *Rosewell, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 92. Stamped 2648. Note 18.* (806.595 meters=2646.304 feet.)

Z_{16} (U. S. G. S.).—About 12 miles southeast of *Rosewell, Nye County, Nev.*, 3 meters (10 feet) east of mile pole 88. Stamped 2658. Note 18.* (809.839 meters=2656.947 feet.)

A_{17}.—About 11½ miles northwest of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) west of mile pole 86, 15 meters (49 feet) south of the Las Vegas & Tonopah Railway tracks. Note 11a.* (851.809 meters=2794.643 feet.)

B_{17} (U. S. G. S.).—About 9.6 miles west of *Amargosa, Nye County, Nev.*, 64 meters (210 feet) north of mile pole 84. Stamped 2843. Note 18.* (866.313 meters=2842.229 feet.)

C_{17} (U. S. G. S.).—About 5.6 miles west of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 80. Stamped 2762. Note 18.* (841.177 meters=2759.762 feet.)

D_{17}.—About 3½ miles west of *Amargosa, Nye County, Nev.*, 5 meters (16 feet) west of mile pole 78, 15 meters (49 feet) south of the Las Vegas & Tonopah Railway tracks. Note 11a.* (840.283 meters=2756.828 feet.)

E_{17} (U. S. G. S.).—About 1.6 miles west of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 76. Stamped 2765. Note 18.* (842.394 meters=2763.754 feet.)

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* See pp. 28 and 29.

F_{17}.—At *Amargosa, Nye County, Nev.*, in the southwest footing of the well derrick, 150 meters (492 feet) east of the station and 10 meters (33 feet) north of the Las Vegas & Tonopah Railway tracks. Note 1.* (846.547 meters=2777.380 feet.)

G_{17} (U. S. G. S.).—About 2.4 miles east of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 72. Stamped 2840. Note 18.* (865.257 meters=2838.764 feet.)

H_{17}.—About 4.4 miles east of *Amargosa, Nye County, Nev.*, 10 meters (33 feet) south of mile pole 70, 25 meters (82 feet) south of the Las Vegas & Tonopah Railway tracks. Note 11a.* (882.950 meters=2896.812 feet.)

I_{17} (U. S. G. S.).—About 6.4 miles east of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 68. Stamped 3034. Note 18.* (924.362 meters=3032.678 feet.)

J_{17} (U. S. G. S.).—About 10.4 miles east of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 64. Stamped 3320. Note 18.* (1011.478 meters=3318.491 feet.)

K_{17} (U. S. G. S.).—About 14.4 miles east of *Amargosa, Nye County, Nev.*, 3 meters (10 feet) north of mile pole 60. Stamped 3628. Note 18.* (1105.564 meters=3627.171 feet.)

L_{17}.—About 16.2 miles east of *Amargosa, Nye County, Nev.*, 5 meters (16 feet) west of mile pole 58, 15 meters (49 feet) north of the Las Vegas & Tonopah Railway tracks. Note 11a.* (1101.544 meters=3613.982 feet.)

M_{17} (U. S. G. S.).—About 18.4 miles east of *Amargosa, Nye County, Nev.*, 12 miles west of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 56. Stamped 3576. Note 18.* (1089.648 meters=3574.953 feet.)

N_{17} (U. S. G. S.).—About 8 miles west of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 52. Stamped 3431. Note 18.* (1045.441 meters=3429.918 feet.)

O_{17}.—About 6 miles west of *Indian Springs, Clark County, Nev.*, 1 meter east of mile pole 50, 15 meters (49 feet) north of the Las Vegas & Tonopah Railway tracks. Note 11a.* (1015.968 meters=3333.222 feet.)

P_{17} (U. S. G. S.).—About 4 miles west of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 48. Stamped 3279. Note 18.* (999.232 meters=3278.314 feet.)

Q_{17} (U. S. G. S.).—About 0.2 mile west of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 44. Stamped 3135. Note 18.* (955.397 meters=3134.498 feet.)

R_{17} (U. S. G. S.).—About 3.5 miles east of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 40. Stamped 3148. Note 18.* (959.016 meters=3146.372 feet.)

S_{17} (U. S. G. S.).—About 5.5 miles east of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) west of mile pole 38. Note 11a.* (944.750 meters=3099.567 feet.)

T_{17} (U. S. G. S.).—About 7.5 miles east of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 36. Stamped 3084. Note 18.* (936.770 meters=3073.386 feet.)

U_{17} (U. S. G. S.).—About 11½ miles east of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 32. Stamped 3062. Note 18.* (932.978 meters=3060.945 feet.)

V_{17} (U. S. G. S.).—About 15.5 miles east of *Indian Springs, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 28. Stamped 3029. Note 18.* (923.032 meters=3028.314 feet.)

W_{17}.—About 17.5 miles east of *Indian Springs, Clark County, Nev.*, 2 meters (7 feet) west of mile pole 26. Note 11a.* (891.554 meters=2925.040 feet.)

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* See pp. 28 and 29.

X_{17} (U. S. G. S.).—About 0.6 mile west of *Corn Creek, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 24. Stamped 2876. Note 18.* (876.371 meters=2875.227 feet.)

Y_{17} (U. S. G. S.).—About 3.4 miles east of *Corn Creek, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 20. Stamped 2779. Note 18.* (846.912 meters=2778.577 feet.)

Z_{17} (U. S. G. S.).—About 7.4 miles east of *Corn Creek, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 16. Stamped 2645. Note 18.* (805.993 meters=2644.329 feet.)

A_{18}.—About 5.4 miles east of *Corn Creek, Clark County, Nev.*, 2 meters (7 feet) west of mile pole 14. Note 11a.* (775.335 meters=2543.745 feet.)

B_{18} (U. S. G. S.).—About 12 miles north of *Las Vegas, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 12. Stamped 2454. Note 18.* (747.607 meters=2452.774 feet.)

C_{18} (U. S. G. S.).—About 8 miles north of *Las Vegas, Clark County, Nev.*, 12 meters (40 feet) south of mile pole 8. Stamped 2294. Note 18.* (698.875 meters=2292.892 feet.)

D_{18}.—About 6 miles north of *Las Vegas, Clark County, Nev.*, two telegraph poles north of mile pole 6, 36 meters (118 feet) east of the Las Vegas & Tonopah Railway tracks. Note 11a.* (680.922 meters=2233.992 feet.)

E_{18} (U. S. G. S.).—About 4 miles north of *Las Vegas, Clark County, Nev.*, 3 meters (10 feet) north of mile pole 4. Stamped 2139. Note 18.* (651.551 meters=2137.630 feet.)

F_{18}.—At *Las Vegas, Clark County, Nev.*, in the south end of the lower step to the Clark County Courthouse. Note 1.* (615.988 meters=2020.954 feet.)

O.—At *Las Vegas, Clark County, Nev.*, at the southeast corner of Main and Garcia Streets, six blocks south and one block east of the San Pedro, Los Angeles & Salt Lake Railroad depot, one-half block southeast of the plant of the Las Vegas Ice & Manufacturing Co., 7 meters (23 feet) south of the curb on Garcia Street, 9½ meters (31 feet) east of the curb on Main Street. Note 11.* (618.357 meters=2028.727 feet.)

2024B.—At *Las Vegas, Clark County, Nev.*, near the northwest corner of First and Fremont Streets, in the sidewalk at the foot of the column at the southeast corner of the First State Bank Building, 1 decimeter north of the foot of the column. Stamped B 1907 117, 2024. Note 17.* (616.443 meters=2022.447 feet.)

P.—At *Las Vegas, Clark County, Nev.*, two blocks north and two blocks east of the San Pedro, Los Angeles & Salt Lake Railroad depot, at the northeast corner of Stewart and First Streets, 4 meters (13 feet) east of the curb on First Street, 4 meters north of the curb on Stewart Street, one-half block north of the Arizona Club. Note 2.* (615.356 meters=2018.880 feet.)

2033 B.—At *Las Vegas, Clark County, Nev.*, 46 meters (150 feet) west of the entrance to the ladies' waiting room of the San Pedro, Los Angeles & Salt Lake Railroad depot, 31 meters (102 feet) west of the main track, set ½ meter above the base of the rail. Stamped B 1907, 116, 2033. Note 17.* (619.170 meters=2031.393 feet.)

ELEVATIONS AND DESCRIPTIONS OF PERMANENT BENCH MARKS BETWEEN TONOPAH JUNCTION, NEV., AND LAWS, CAL., 1915.

U_{12}.—At *Tonopah Junction, Mineral County, Nev.* (See p. 34.)

V_{12}.—At *Tonopah Junction, Mineral County, Nev.* (See p. 34.)

W_{12} (U. S. G. S.).—At *Tonopah Junction, Mineral County, Nev.* (See p. 34.)

C_{13}.—About 3½ miles west of *Tonopah Junction, Mineral County, Nev.*, 8 meters (26 feet) south of the Southern Pacific Railway tracks at a point where the road to Belleville runs along the railroad embankment. Note 2.* (1462.627 meters=4798.635 feet.)

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* See pp. 28 and 29.

D_{13} (U. S. G. S.).—About 1 mile east of *Belleville, Mineral County, Nev.*, in the south end of a wooden culvert of the Southern Pacific Railway, near the "One Mile to Station" sign. The bench mark is a spike. (1541.843 meters=5058.530 feet.)

E_{13} (U. S. G. S.).—At *Belleville, Mineral County, Nev.*, 18 meters (60 feet) west of the deserted station, 8 meters (25 feet) west of the Southern Pacific Railway tracks, 38 meters (125 feet) south of the section foreman's house, 50 meters (165 feet) north of a water tank, in a large rock. Stamped 5178. Note 17.* (1576.164 meters=5171.131 feet.)

F_{13}.—At *Belleville, Mineral County, Nev.*, in the footing of the southeast pillar of the Southern Pacific Railway water tank. Note 16.* (1577.234 meters=5174.642 feet.)

G_{13} (U. S. G. S.).—At *Filben, Mineral County, Nev.*, in the southwest corner of a Y, between the tracks, 6 meters (20 feet) south of a wagon road, 4 meters (13 feet) southeast of a crossing sign, in rock. Stamped 5455. Note 17.* (1660.523 meters=5447.899 feet.)

H_{13} (U. S. G. S.).—At *Little Summit, Mineral County, Nev.*, 11 meters (36 feet) northwest of the end of a spur, 11 meters west of a crossing sign, 15 meters (49 feet) west of a road crossing, in the summit of a saddle in rock. Stamped 5828. Note 17.* (1774.314 meters=5821.228 feet.)

I_{13} (U. S. G. S.).—Three miles south of *Little Summit, Mineral County, Nev.*, 9 meters (30 feet) east of a wagon road, 12 meters (39 feet) southeast of a crossing, in quartz rock. Stamped 5681. Note 17.* (1729.369 meters=5673.771 feet.)

J_{13}.—About 4 miles west of *Little Summit, Mineral County, Nev.*, 10 meters (33 feet) south of the Southern Pacific Railway tracks, 10 meters east of mile pole 443. Note 2.* (1728.416 meters=5670.645 feet.)

K_{13} (U. S. G. S.).—About 8.3 miles southeast of *Little Summit, Mineral County, Nev.*, between the track drain, 8 meters (27 feet) west of the Southern Pacific Railway tracks, 18 meters (60 feet) southwest of mile pole 446, in rock. Stamped 5901. Note 17.* (1796.324 meters=5893.440 feet.)

L_{13} (U. S. G. S.).—At *Basalt, Mineral County, Nev.*, 24 meters (80 feet) south of the station, 17 meters (55 feet) west of the Southern Pacific Railway tracks, 107 meters (350 feet) north of the water tank, in a rock. Stamped 6347. Note 17.* (1932.250 meters=6339.390 feet.)

M_{13}.—About 2 miles southwest of *Basalt, Mineral County, Nev.*, 8 meters (26 feet) south of the Southern Pacific Railway tracks, in line with the telegraph poles where they cross the tracks to head for Mount Montgomery. Note 2.* (1990.748 meters=6531.312 feet.)

N_{13} (U. S. G. S.).—At *Sunland, Mineral County, Nev.*, 10 meters (33 feet) southwest of the station, 10 meters west of a whistling post, 13 meters (42 feet) west of a road crossing, cemented in rock. Stamped 7129. Note 17.* (2170.660 meters=7121.574 feet.)

O_{13}.—About 3½ miles southwest of *Sunland, Mineral County, Nev.*, one telegraph pole and 30 meters (98 feet) west of mile pole 462, 6 meters (20 feet) north of the Southern Pacific Railway tracks. Note 2.* (2041.852 meters=6698.976 feet.)

P_{13} (U. S. G. S.).—About 5.5 miles southwest of *Sunland, Mineral County, Nev.*, 0.1 mile north of *Nichols, Mineral County, Nev.*, 72 meters (235 feet) west of mile pole 464, 13 meters (42 feet) west of the Southern Pacific Railway tracks, 11 meters (36 feet) northwest of culvert sign 464A, on the bank of a small drain, cemented in large boulder. Stamped 6471. Note 17.* (1970.058 meters=6463.432 feet.)

Q_{13} (U. S. G. S.).—At *Queen, Mineral County, Nev.*, in the section foreman's yard, 9 meters (30 feet) east of the house, 8 meters (26 feet) west of the Southern Pacific Railway tracks, under a large cottonwood tree. Stamped 6179. Note 18.* (1881.157 meters=6171.763 feet.)

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* See pp. 28 and 29.

R_{13}.—About 2 miles west of *Queen, Mineral County, Nev.*, on the State line monument, in the south side of the footing. Note 16.* (1822.212 meters=5978.374 feet.)

S_{13} (U. S. G. S.).—About 2.4 miles southwest of *Queen, Mineral County, Nev.*, 0.35 mile southwest of the Von Schmidt monument, 23 meters (75 feet) west of the Southern Pacific Railway tracks, 1.5 meters west of a rock cairn on the United States Coast and Geodetic Survey State line. Stamped 5943. Note 18.* (1809.200 meters=5935.684 feet.)

Z_{10} (U. S. G. S.).—In Mono County, Cal., about 6.2 miles southwest of *Queen, Mineral County, Nev.*, 73 meters (240 feet) south of a road crossing, 12 meters (39 feet) east of the Southern Pacific Railway tracks, 3 meters (10 feet) east of mile pole 473. Stamped 5556. Note 18.* (1691.306 meters=5548.893 feet.)

A_{11} (U. S. G. S.).—At *Benton Station, Mono County, Cal.*, 15 meters (50 feet) east of the Southern Pacific Railway tracks, in the southwest corner of the section foreman's yard. Stamped 5405. Note 18.* (1643.864 meters=5393.244 feet.)

B_{11} (U. S. G. S.).—About 3 miles south of *Benton Station, Mono County, Cal.*, 9 meters (30 feet) east of the Southern Pacific Railway tracks, 1.5 meters east of mile pole 479. Stamped 5277. Note 18.* (1604.725 meters=5264.835 feet.)

C_{11} (U. S. G. S.).—About 6 miles south of *Benton Station, Mono County, Cal.*, 17 meters (55 feet) east of the Southern Pacific Railway tracks, in a low spot, behind the first telegraph pole south of mile pole 482. Stamped 4996. Note 18.* (1519.130 meters=4984.012 feet.)

D_{11} (U. S. G. S.).—About 7 miles south of *Benton Station, Mono County, Cal.*, near mile pole 483, 3 meters (10 feet) east of the Southern Pacific Railway tracks, opposite culvert sign 482E, on granite rock. The bench mark is a painted circle marked 4904. (1491.468 meters=4893.258 feet.)

E_{11} (U. S. G. S.).—About 8 miles south of *Benton Station, Mono County, Cal.*, 6 meters (20 feet) west of the Southern Pacific Railway tracks, 30 meters (100 feet) west of mile pole 484, halfway between culvert signs 483C and 484A. The bench mark is a chiseled granite rock marked 4804. (1460.484 meters=4791.605 feet.)

F_{11} (U. S. G. S.).—About 9 miles south of *Benton Station, Mono County, Cal.*, 12 meters (40 feet) east of the Southern Pacific Railway tracks, 2 meters from first telegraph pole north of mile pole 485. Stamped 4712. Note 18.* (1432.469 meters=4699.692 feet.)

G_{11} (U. S. G. S.).—At *Hammil, Mono County, Cal.*, 9 meters (30 feet) west of the Southern Pacific Railway tracks, outside the inclosure near the southeast corner of section foreman's yard. Stamped 4598. Note 18.* (1397.906 meters=4586.297 feet.)

H_{11}.—About ⅓ mile north of *Dehy, Mono County, Cal.*, 5 meters (16 feet) north of mile pole 489, 10 meters (33 feet) east of the Southern Pacific Railway tracks, 20 meters (66 feet) northwest of the corner of Jim Déhy's fence. Note 2.* (1385.711 meters=4546.287 feet.)

I_{11} (U. S. G. S.).—About 4 miles south of *Hammil, Mono County, Cal.*, 17 meters (55 feet) east of the Southern Pacific Railway tracks, 8 meters (25 feet) east of mile pole 491. Stamped 4543. Note 18.* (1381.397 meters=4532.133 feet.)

J_{11} (U. S. G. S.).—About 4.06 miles south of *Shealy, Mono County, Cal.*, 0.35 mile south of mile pole 495, 12 meters (40 feet) east of the Southern Pacific Railway tracks. Stamped 4382. Note 18.* (1332.185 meters=4370.677 feet.)

K_{11} (U. S. G. S.).—About 1.5 miles north of *Chalfant, Mono County, Cal.*, 12 meters (40 feet) east of the Southern Pacific Railway tracks, halfway between two telegraph poles. Stamped 4268. Note 18.* (1297.666 meters=4257.426 feet.)

L_{11} (U. S. G. S.).—About 2 miles south of *Chalfant, Mono County, Cal.*, or 5.5 miles north of *Laws, Inyo County, Cal.*, 11 meters (35 feet) west of the Southern Pacific Railway tracks, 98 meters (320 feet) southwest of mile pole 501. Stamped 4210. Note 18.* (1282.481 meters=4207.606 feet.)

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* See pp. 28 and 29.

M_{11} (U. S. G. S.).—About 2.5 miles north of *Laws, Inyo County, Cal.*, four telegraph poles south of mile pole 504 and 10 meters (33 feet) west of the Southern Pacific Railway tracks, nearly level with the top of the rail. Note 18.* (1261.690 meters=4139.395 feet.)

Elevations of top of rail in front of railroad stations.

Place.	Standard elevation.		Place.	Standard elevation.	
	Meters.	Feet.		Meters.	Feet.
Virginia & Truckee Ry.:			Southern Pacific Ry.—Cont'd.		
Carson City, Nev	1427.40	4683.06	Hammil, Cal	1397.39	4584.60
Empire, Nev	1403.60	4604.98	Dehy, Cal	1384.54	4542.44
Mound House, Nev	1506.65	4943.07	Shealy, Cal	1383.32	4538.44
Southern Pacific Ry.:			Chalfant, Cal	1289.74	4231.42
Dayton, Nev	1327.43	4355.08	Tonopah & Goldfield Ry.:		
Randall, Nev	1328.60	4358.92	Redlich, Nev	1521.23	4990.90
Canty, Nev	1308.66	4293.50	Rock Hill, Nev	1394.87	4576.34
Clifton, Nev	1301.51	4270.04	Coaldale, Nev	1397.86	4586.15
Tugele, Nev	1291.36	4236.74	Silver Peak Junction, Nev	1497.85	4914.20
Churchill, Nev	1284.40	4213.90	Blair Junction, Nev	1467.25	4813.80
Wabuska, Nev	1309.97	4297.79	McLeans, Nev	1456.53	4778.63
Moquist, Nev	1317.10	4321.19	Millers, Nev	1479.65	4854.48
Rio Vista, Nev	1321.75	4336.44	Tonopah, Nev	1821.44	5975.84
Reservation, Nev	1345.22	4413.44	McSweeney Junction, Nev	1617.72	5307.47
Schurz, Nev	1256.57	4122.60	Klondyke, Nev	1499.94	4921.05
Modoc, Nev	1252.68	4109.83	Las Vegas & Tonopah Ry. and Tonopah & Goldfield Ry. crossing	1694.61	5559.73
Gillis, Nev	1270.04	4166.79	Las Vegas & Tonopah Ry.:		
Magnus, Nev	1252.50	4109.24	Red Rock, Nev	1778.21	5834.01
Thorne, Nev	1280.39	4200.75	Ralston, Nev	1447.59	4749.30
Dover, Nev	1353.95	4442.08	Wagoner, Nev	1404.90	4609.24
Kinkead, Nev	1378.44	4522.43	Pioneer, Nev	1173.30	3849.40
Acme, Nev	1350.06	4429.32	Beatty, Nev	1000.17	3281.39
Luning, Nev	1360.27	4462.82	Gold Center, Nev	962.07	3156.39
New Boston, Nev	1366.51	4483.29	Rosewell, Nev	789.28	2589.50
Mina, Nev	1385.41	4545.30	Canon, Nev	810.39	2658.75
Sodaville, Nev	1396.90	4583.00	Amargosa, Nev	844.94	2772.11
Rhodes, Nev	1334.13	4377.06	Charleston, Nev	1108.54	3636.93
Tonopah Junction, Nev	1342.91	4405.86	Indian Springs, Nev	951.79	3122.66
Belleville, Nev	1576.08	5170.86	Owens, Nev	923.37	3029.42
Filben, Nev	1655.59	5431.71	Corn Creek, Nev	868.28	2848.68
Little Summit, Nev	1774.19	5820.82	Tule, Nev	795.58	2610.17
Basalt, Nev	1912.86	6275.77			
Mount Montgomery, Nev	2171.15	7123.18			
Queen, Nev	1881.40	6172.56			

Secondary elevations along the Southern Pacific Railway.

Place.	Standard elevation.	
	Meters.	Feet.
Between Canty and Clifton, Nev., R. R. B. M.10A	1306.29	4285.72
Between Canty and Clifton, Nev., R. R. B. M.9A	1303.84	4277.68
Railroad spike in signboard 1 mile south of Tonopah Junction, Nev. (U. S. G. S.)	1367.41	4486.24
Spike in base of north end of culvert 429A, 3.06 miles southwest of Tonopah Junction (U. S. G. S.)	1449.02	4753.99
Top of rail 1 mile south of Filben, Nev. (U. S. G. S.)	1695.00	5561.01
Top of rail at mile pole 443 (U. S. G. S.)	1727.61	5668.00
Top of rail 2½ miles northwest of Basalt, Nev. (U. S. G. S.)	1857.83	6095.23
Top of rail at mile pole 457 (U. S. G. S.)	2143.92	7033.84
Top of rail at mile pole 463 (U. S. G. S.)	2008.40	6589.23
Top of rail at mile pole 465 (U. S. G. S.)	1933.14	6342.31
Spike in mile pole 474 (U. S. G. S.)	1671.67	5484.47
Spike in mile pole 475 (U. S. G. S.)	1656.18	5433.65
Bolt in first telegraph pole north of mile pole 478 (U. S. G. S.)	1613.64	5294.08
Spike in mile pole 488 (U. S. G. S.)	1388.23	4554.55
Spike in mile pole 489 (U. S. G. S.)	1385.82	4546.64
Nail in mile pole 490 (U. S. G. S.)	1382.15	4534.60
Spike in mile pole 494 (U. S. G. S.)	1368.16	4488.70
Spike in mile pole 495 (U. S. G. S.)	1342.21	4403.57
Spike in mile pole 496 (U. S. G. S.)	1314.98	4314.23
Spike in mile pole 497 (U. S. G. S.)	1300.32	4266.13
Spike in mile pole 500 (U. S. G. S.)	1284.73	4214.98

*See pp. 28 and 29.

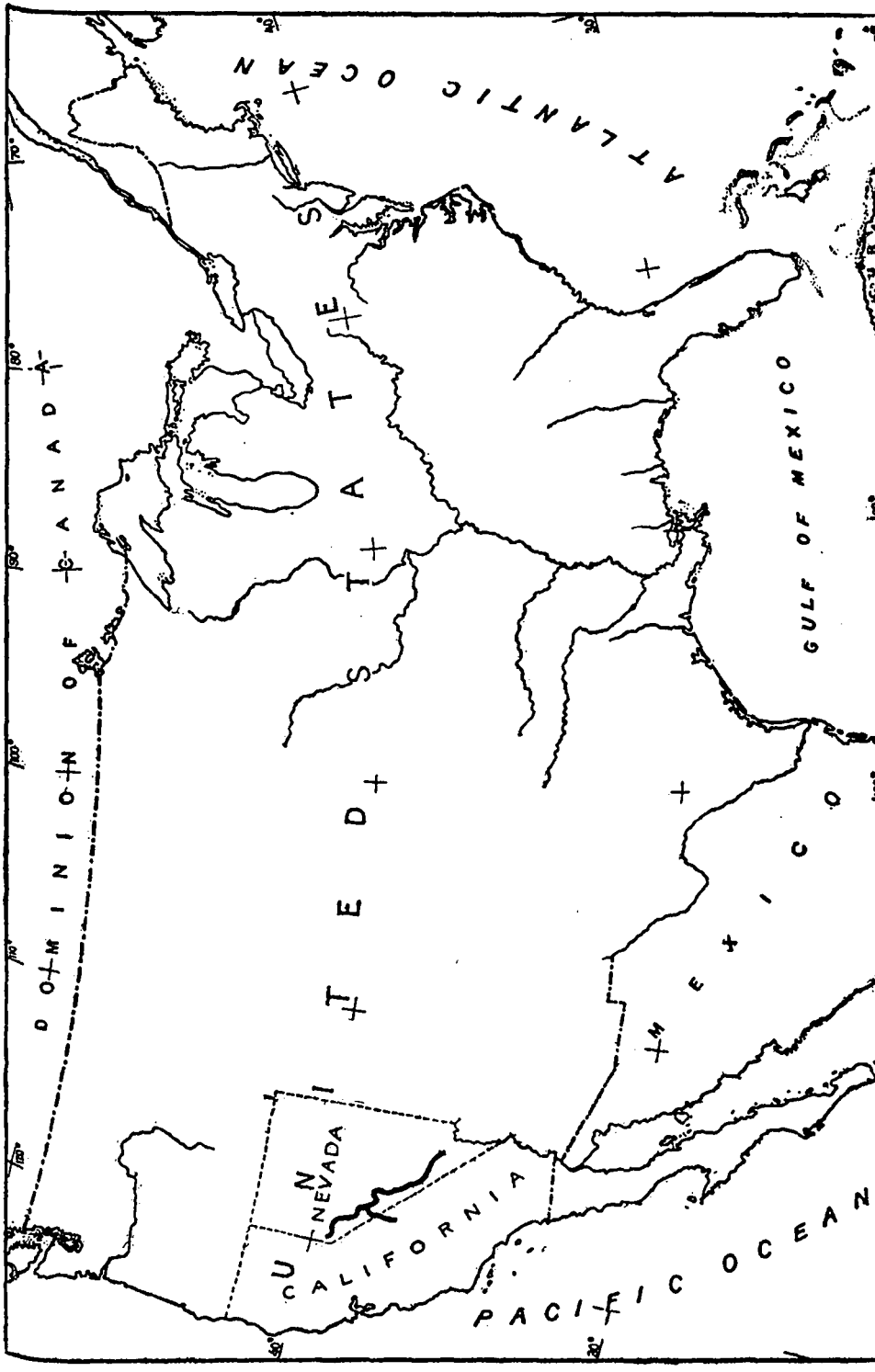

FIG. 2.—*Index map showing general location of the leveling.*

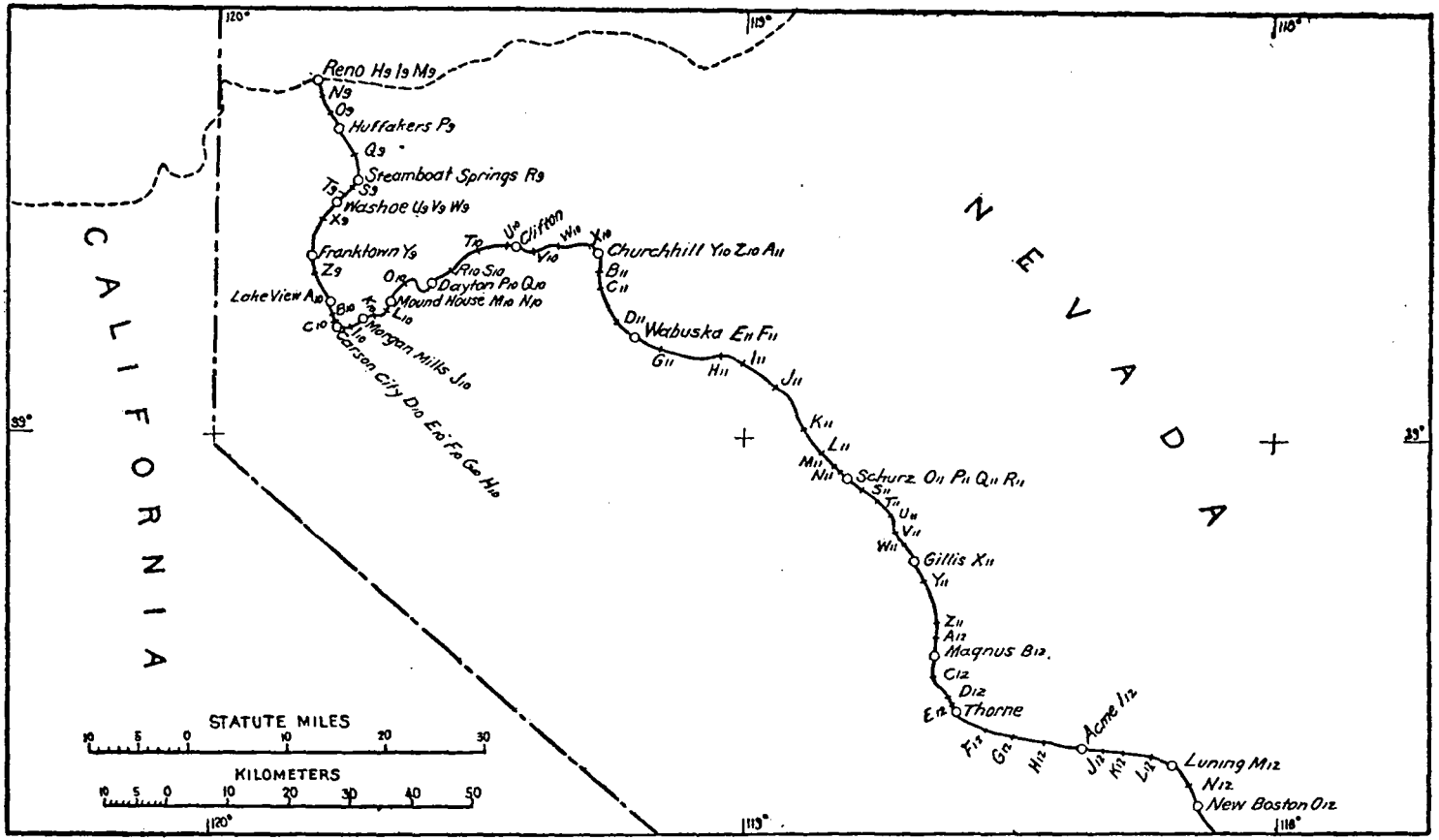

FIG. 3.—*Location of bench marks between Reno and Mina, Nev.*

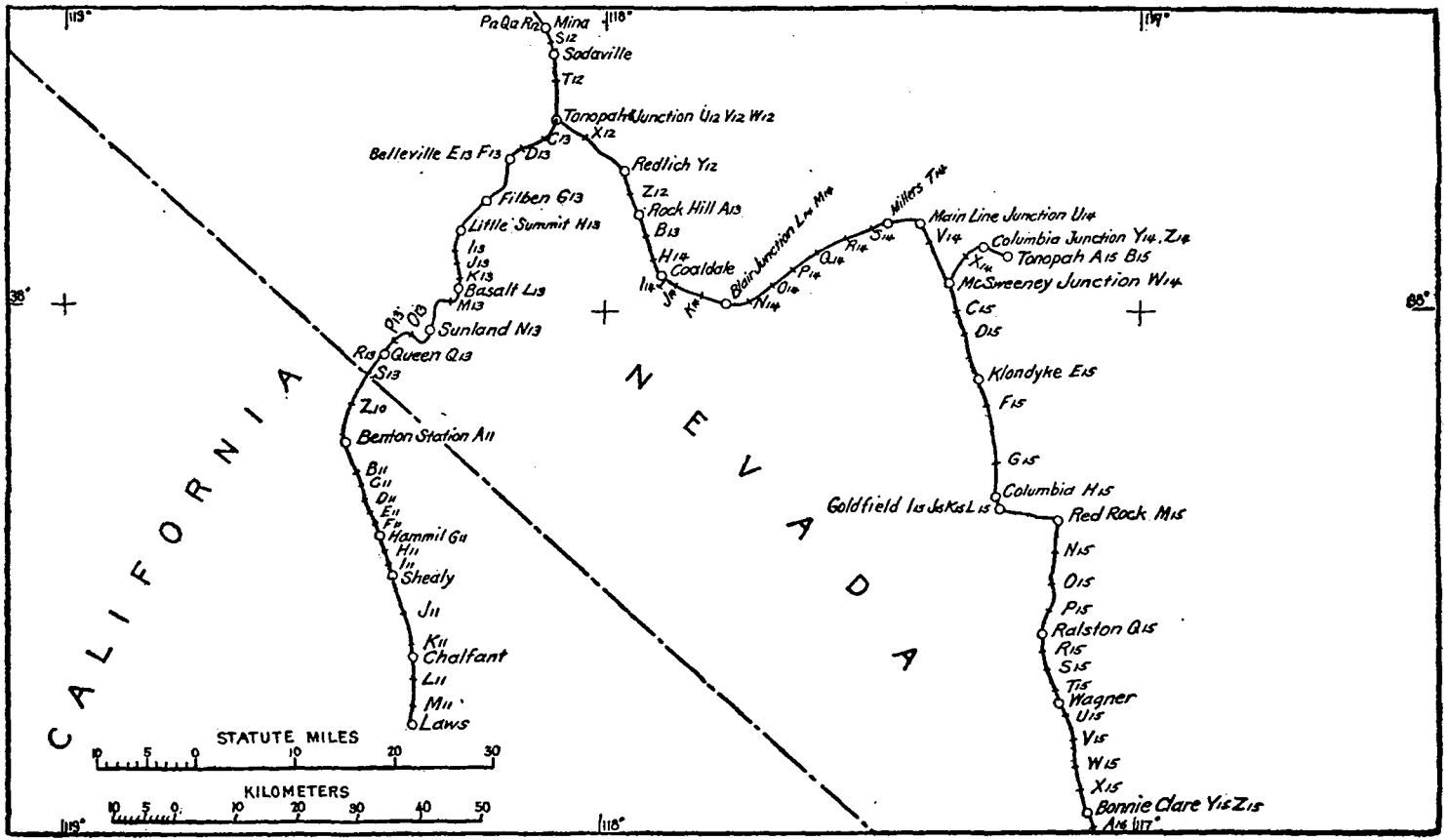

FIG. 4.—*Location of bench marks between Mina and Bonnie Clare, Nev., and between Tonopah Junction, Nev., and Laws, Cal.*

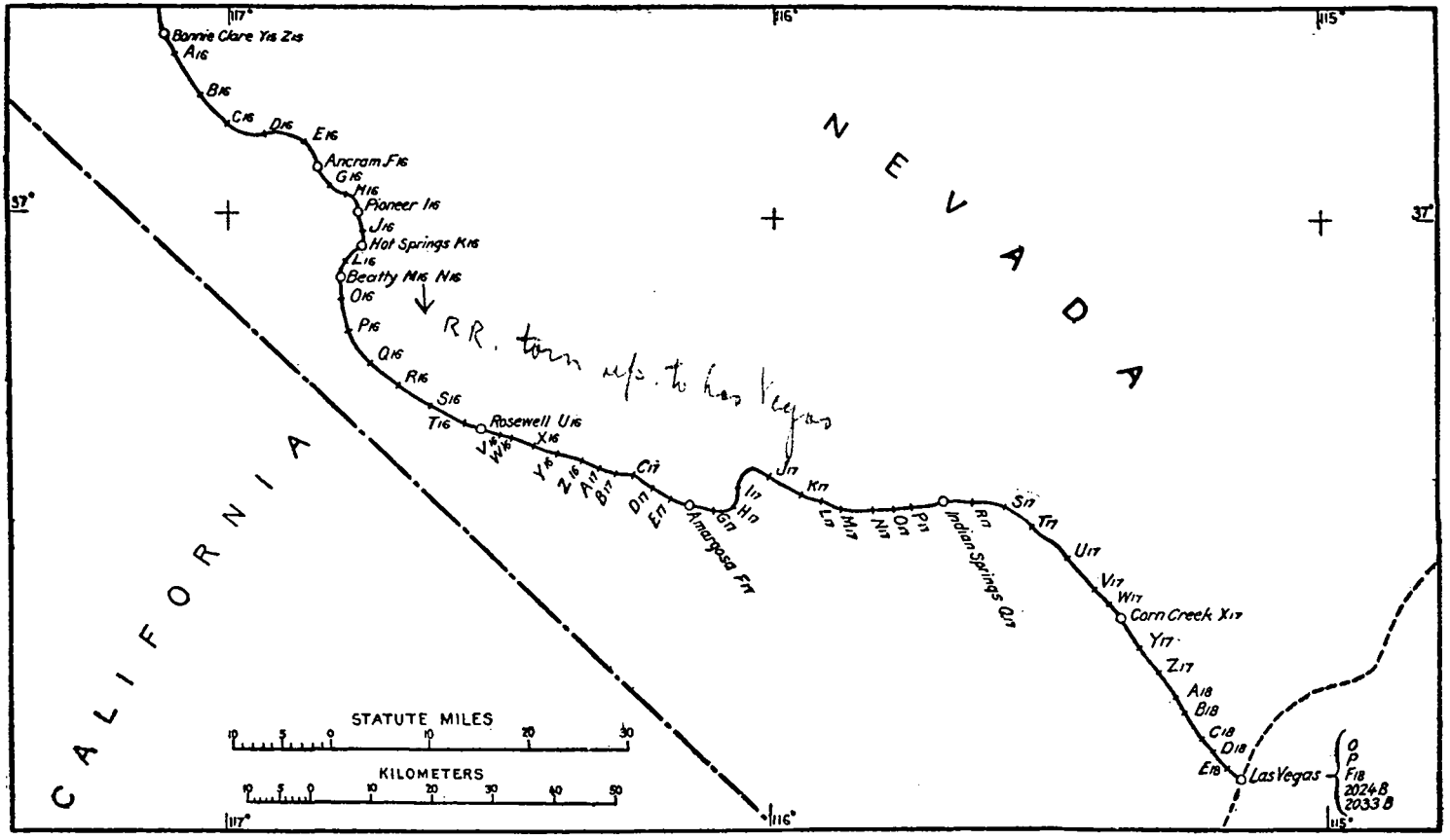

FIG. 5.—*Location of bench marks between Bonnie Claire and Las Vegas, Nev.*

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