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No. 16

OPERATIONS AT RIVER STATIONS, 1897.—PART II

WASHINGTON
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1898

UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

OPERATIONS AT RIVER STATIONS, 1897

A REPORT OF THE

DIVISION OF HYDROGRAPHY

OF THE

UNITED STATES GEOLOGICAL SURVEY

PART II



WASHINGTON

GOVERNMENT PRINTING OFFICE

1898

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF HYDROGRAPHY,
Washington, February 15, 1898.

SIR: I have the honor to transmit herewith brief descriptions of the river stations at which work was carried on by the Division of Hydrography of this Survey during 1897, together with tables of daily height.

Very respectfully,

F. H. NEWELL,
Hydrographer in Charge.

Hon. CHARLES D. WALCOTT,
Director United States Geological Survey.

OPERATIONS AT RIVER STATIONS, 1897.

INTRODUCTION.

Descriptions of river stations in the eastern part of the United States and those on the headwaters of the Missouri and Platte rivers are given in paper No. 15 of this series. The results of the computations of discharge, together with diagrams, maps, and other illustrations, are prepared for publication in the Nineteenth Annual Report of this Survey, in form similar to the results for 1896, given in the Eighteenth Annual Report, Part IV, pp. 1-418. The descriptions of operations at river stations, with accompanying tables of daily gage heights, are printed in this series of Water-Supply and Irrigation Papers in order that the results may be available at as early a date as possible, the preparation and printing of the necessary illustrations for the annual report requiring much time. In order to print these descriptions in this series of papers it has been found necessary to divide them into two parts, as by the act of June 11, 1896 (Stat. L., Vol. XXIX, p. 453), the papers can not exceed 100 pages in length.

The subject-matter of this and the preceding paper has been so arranged as to follow the general geographic order of the drainage basins, beginning at the extreme east and extending southerly along the Atlantic slope, then taking up the headwaters of the Ohio, next the upper Missouri and its great tributary the Platte. This material has been found to occupy the prescribed limit of 100 pages of paper No. 15. In the present paper (No. 16), the stations on the Republican River and other tributaries of Kansas River are taken up; then those on the Arkansas River, Rio Grande, and the tributaries of the great Colorado River west; next the stations on the rivers of the great interior basin; then those on the streams flowing into Columbia River; and finally the stations in California.

SUPERIOR STATION ON REPUBLICAN RIVER.

This station, described in the Eighteenth Annual Report of the United States Geological Survey, Part IV, page 199, is located about 1 mile west of Superior, Nebraska. It is on the left bank of the river, about 25 feet above the iron highway bridge. A dam and the head of a mill race are only a short distance below the bridge. The observer is

T. C. Sheffer. The gage consists of an oak piece 2 by 4 inches, 10 feet long. The face is inclined 30 degrees to the horizontal, and the foot-marks are placed 2 feet apart to correspond to this inclination. The rod is fastened to cross-ties which are bedded in the bank of the river. The location is on the outside of an easy bend in the river. The bed of the river is of mud and sand. The top of the rim of the upstream cylinder of the north pier is 15.42 feet above zero of the gage. Bench mark 2 is the standard 4-foot iron pipe of the United States Geological Survey. It is 83 feet north of the upstream cylinder of the north pier of the bridge and is 10 feet west of the line of the upstream truss of the bridge. It is 1 foot inside a wire fence. The top of the pipe is 4 inches above the ground and the elevation is 4.88 feet above gage datum. The following measurements were made in 1897 by Adna Dobson and O. V. P. Stout:

April 12, gage height, 1.12 feet; discharge, 1,257 second-feet.

April 24, gage height, 0.99 foot; discharge, 887 second-feet.

May 18, gage height, 0.45 foot; discharge, 337 second-feet.

June 12, gage height, 0.72 foot; discharge, 716 second-feet.

July 8, gage height, 0.87 foot; discharge, 766 second-feet.

July 18, gage height, 0.32 foot; discharge, 222 second-feet.

August 6, gage height, 0.49 foot; discharge, 372 second-feet.

August 22, gage height, — 0.05 foot; discharge, 195 second-feet.

September 25, gage height, 0.04 foot; discharge, 81 second-feet.

October 24, gage height, 0.02 foot; discharge, 184 second-feet.

Daily gage height, in feet, of Republican River at Superior, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.....		1.01			0.87	0.28	1.48	0.08	0.12	—0.12
2.....	0.75	1.01	0.84	0.97	.77	.27	.75	.12	.06	— .34
3.....	.80	1.01			.69	.32	1.65	.08	.01	— .00
4.....	.80	1.01		1.00	.67	.32	1.39	.07	— .06	— .35
5.....	.80	1.01		1.67	.64	.27	1.35	.12	+ .04	— .30
6.....	.80	1.01	.70	1.50	.66	.30	2.15	.48	.03	— .58
7.....	.80	1.01	.70	1.05	.63	.54	1.64	.20	.01	— .30
8.....	.80	1.01		1.18	.60	.40	1.80	.57	— .20	— .52
9.....	.80	1.01		1.12	.77	.34	1.48	.56	— .25	— .71
10.....	.80	1.01	.64	1.08	.80	.31	1.06	.45	— .16	— .50
11.....	.80	1.01		1.09	.66	.92	.94	.45	— .02	— .35
12.....	.80	1.01		1.12	.62	.74	.70	.56	+ .20	— .30
13.....	.80	1.01		1.14	.60	.54	.51	.54	.60	— .53
14.....	.80			1.07	.54	.71	.39	.55	.00	— .58
15.....	.80	1.01	.71	1.09	.52	.48	.34	.10	.01	— .90
16.....	.80			1.62	.50	.76	.28	.14	.36	+ .04
17.....			.55	1.31	.48	.79	.28	.14	.26	1.22
18.....				1.14	.45	.74	.32	.18	.26	1.30
19.....		1.00		1.08	.42	.66	.25	.21	.15	1.25
20.....	.90		.61	1.05	.38	.68	.34	.31	.10	1.19
21.....		.60		1.03	.35	.58	.30	.24	.05	1.11
22.....			.86	1.02	.37	.47	.22	.30	.04	1.10
23.....	1.01		.65	.92	1.10	.43	.66	.27	— .05	1.11
24.....	1.01			1.00	.63	.48	.69	.57	+ .01	— .05
25.....	1.01	1.22		.98	.61	.33	.15	.50	.02	+1.06
26.....	1.01			.88	.57	2.42	.23	.39	— .35	1.25
27.....	1.01		.64	.82	.63	4.38	.16	.31	— .12	2.45
28.....	1.01			1.32	.42	1.87	.84	.26	— .09	2.32
29.....	1.01			1.20	.40	1.78	.30	.23	— .06	1.53
30.....	1.01			.98	.32	1.72	.17	.14	— .05	1.45
31.....	1.01		.81		.27		.14	.11		

JUNCTION CITY STATION ON REPUBLICAN RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 203, is located at the wagon bridge at the north end of Washington street, Junction City, Kansas. The observer is John Davis. The gage consists of two oak timbers bolted to a post and to a cottonwood tree. One bench mark consists of a 60-penny nail driven into the base of the abutment at an elevation of 10.67 feet on the scale. A second bench mark is the top of the stone in the base of the bridge abutment, 18 feet south of the gage; its elevation is 14.51 feet. A subsidiary gage for determining the slope has been placed 507 feet upstream, and referred to the same datum. The right bank is high, but the left is low and may overflow in high water. The bed of the stream is sandy and changeable. The following are the discharge measurements made in 1897 by W. G. Russell:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.ft.</i>		<i>Feet.</i>	<i>Sec.ft.</i>		<i>Feet.</i>	<i>Sec.ft.</i>
Feb. 23...	4.30	1,021	May 21....	3.10	725	July 28 ..	4.45	1,367
Mar. 23...	3.80	611	June 1	3.70	869	Aug. 18 ..	4.20	1,243
Apr. 7	4.30	1,015	June 16 ...	6.30	3,637	Sept. 30..	2.30	175
Apr. 20 ...	4.90	1,433	June 30 ...	7.40	6,053	Oct. 26...	2.80	313
Apr. 27 ...	6.10	3,565	July 13....	5.95	3,141	Nov. 12 ..	3.50	616
May 6	3.60	1,078						

Daily gage height, in feet, of Republican River at Junction City, Kansas for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	3.70	3.40	3.80	4.00	4.40	3.65	6.15	2.95	2.75	2.30	4.15	2.70
2.....	3.80	3.40	3.70	4.00	4.40	3.35	6.50	3.45	2.60	2.30	3.60	2.80
3.....	3.95	3.55	3.65	4.00	4.35	3.15	6.40	3.00	2.55	2.30	3.40	3.10
4.....	3.80	3.85	3.95	4.05	4.20	3.05	5.65	2.85	2.50	2.20	3.30	3.20
5.....	3.80	4.00	4.05	4.10	3.95	2.95	5.05	3.40	2.50	2.20	3.35	3.30
6.....	3.70	4.05	3.85	4.15	3.70	2.85	4.90	3.60	2.50	2.20	3.40	3.30
7.....	3.70	4.15	3.80	4.25	3.50	2.80	4.70	3.05	2.50	2.20	3.40	3.30
8.....	3.60	4.15	3.85	4.55	3.50	2.80	4.50	2.85	2.35	2.20	3.40	3.30
9.....	3.65	4.20	4.20	4.60	3.40	2.70	4.65	2.75	2.30	2.20	3.50	3.40
10.....	3.55	4.25	4.05	4.70	3.35	2.70	7.05	2.70	2.35	2.20	3.50	3.50
11.....	3.45	4.25	3.90	4.60	3.55	2.70	7.50	2.85	2.50	2.20	3.50	3.40
12.....	3.45	4.20	3.90	4.70	3.55	2.90	7.25	3.60	2.30	2.20	3.50	3.45
13.....	3.50	4.55	3.90	4.60	3.40	4.55	5.80	3.35	2.30	2.20	3.50	3.55
14.....	3.55	4.85	3.80	4.45	3.45	6.25	5.00	3.55	2.30	2.15	3.50	3.50
15.....	3.35	4.80	3.70	4.45	3.55	5.60	4.30	4.80	2.30	2.10	3.45	3.50
16.....	3.45	4.80	3.70	4.45	3.60	6.15	3.90	5.25	2.30	2.20	3.40	3.60
17.....	3.60	5.00	3.60	4.45	3.50	5.70	3.65	5.00	2.30	2.40	3.40	3.60
18.....	3.60	5.85	3.80	4.40	3.40	6.05	3.45	4.15	2.30	2.40	3.40	3.60
19.....	3.50	5.20	3.85	4.40	3.35	5.70	3.30	4.35	2.30	2.40	3.40	3.60
20.....	3.65	5.15	3.90	4.80	3.15	4.90	3.15	3.30	2.30	2.55	3.40	3.50
21.....	3.60	4.80	3.80	4.80	3.10	5.00	3.05	3.00	3.05	2.85	3.40	3.40
22.....	3.70	4.35	3.75	4.65	3.05	4.35	3.25	2.85	3.25	3.00	3.40	3.50
23.....	4.20	4.20	3.75	4.55	2.95	4.05	3.30	2.70	3.05	3.00	3.40	3.50
24.....	3.50	4.30	3.75	7.20	2.80	4.55	3.05	2.70	2.75	3.00	3.35	3.50
25.....	3.50	4.20	3.70	7.95	2.80	5.25	3.20	2.65	2.60	2.90	3.30	3.60
26.....	3.50	4.40	3.90	7.35	2.80	5.10	3.30	2.60	2.50	2.80	3.40	3.55
27.....	3.40	4.10	3.90	6.20	3.55	3.95	3.35	2.60	2.40	2.90	3.40	3.65
28.....	3.40	3.85	3.90	5.70	4.55	3.80	4.40	2.60	2.40	2.80	3.35	3.80
29.....	3.35	.....	3.90	5.05	5.50	5.70	3.90	2.85	2.35	2.80	2.85	3.90
30.....	3.30	.....	3.90	4.70	4.75	7.40	3.40	2.90	2.30	2.80	2.70	3.80
31.....	3.30	.....	3.90	.....	4.15	.....	3.15	2.80	.....	2.90	.....	3.80

BELOIT STATION ON SOLOMON RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 207, is located at the wagon bridge on the south edge of the town of Beloit, Kansas. The observer is W. F. Jordon. The rod of the wire gage is a spruce board, 12 feet long, graduated in feet and tenths, spiked to the upstream edge of the bridge floor, over the deepest water. The bench mark consists of a tenpenny nail driven into the base of a cottonwood tree 35 feet northwest of the pier upon which the marks are made. Its elevation is 13.70 feet. Measurements were made from the bridge, the initial point being at the south edge of the stone abutment on the left bank of the stream. This station was discontinued on June 30, 1897, as a more favorable location was found at Niles, and a station was therefore established at the latter place. The following discharge measurements were made in 1897 by W. G. Russell:

February 23, gage height, 3.50 feet; discharge, 102 second-feet.

March 23, gage height, 2.70 feet; discharge, 24 second-feet.

April 7, gage height, 4.20 feet; discharge, 508 second-feet.

April 20, gage height, 3.55 feet; discharge, 247 second-feet.

April 28, gage height, 3.40 feet; discharge, 270 second-feet.

May 20, gage height, 3.10 feet; discharge, 197 second-feet.

June 15, gage height, 7.80 feet; discharge, 2,565 second-feet.

Daily gage height, in feet, of Solomon River at Beloit, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1....	3.20	3.25	3.65	3.65	3.70	2.55	17.....	2.80	3.65	3.35	3.45	3.15	15.00
2....	3.20	2.95	3.45	3.60	3.55	2.75	18.....	3.40	3.90	3.60	3.30	3.15	5.20
3....	2.45	3.40	3.45	3.70	3.45	3.00	19.....	3.45	3.60	3.35	3.50	3.05	3.90
4....	3.10	2.60	3.65	5.30	3.45	2.75	20.....	3.45	3.55	3.60	3.35	3.00	3.65
5....	2.40	3.40	3.65	4.70	3.30	2.90	21.....	3.40	3.15	3.10	3.60	3.05	3.65
6....	3.15	3.40	3.70	4.55	3.25	2.60	22.....	3.40	3.50	3.60	3.60	2.90	4.00
7....	2.85	2.60	3.10	4.05	3.25	2.65	23.....	3.40	3.45	3.15	3.60	2.90	8.05
8....	3.05	3.40	3.40	3.90	3.40	2.75	24.....	2.95	3.45	3.45	7.10	3.65	4.00
9....	3.05	3.35	3.65	4.45	3.05	2.70	25.....	2.95	3.45	3.60	8.90	3.85	6.00
10....	2.35	3.35	3.35	4.20	3.20	2.75	26.....	3.45	3.40	3.05	8.55	3.20	3.90
11....	3.40	3.45	3.50	4.05	3.30	4.85	27.....	3.35	3.50	3.50	3.50	3.00	14.75
12....	3.10	3.55	3.45	4.05	3.55	11.55	28.....	3.40	2.60	3.25	3.45	2.50	22.35
13....	3.30	3.40	3.45	5.80	3.30	6.70	29.....	2.90	-----	3.70	3.65	3.00	19.45
14....	2.75	3.00	3.10	3.65	3.25	3.55	30.....	3.35	-----	3.65	3.95	2.60	5.25
15....	3.20	3.40	3.35	3.65	3.10	12.10	31.....	2.55	-----	3.65	-----	3.00	-----
16....	3.40	3.45	3.45	3.40	3.10	23.25							

NILES STATION ON SOLOMON RIVER.

This station is located at a bridge one-half mile west of Niles, Kansas, and was established May 5, 1897. The rod of the wire gage is spiked to the floor of the bridge. It is 1 by 4 inches by 24 feet long. The bench mark is the upper one of three nails driven into a cottonwood tree 18 inches in diameter, north side of the river and 25 feet east of the bridge. Its elevation is 24.96 feet above gage datum. The initial point for soundings is on the right bank. The channel is straight for about 100 feet above and below the section. The current is sluggish. The right bank is high, and the left bank overflows only in very high water. The bed of the stream is muddy. The observer is J. J. Little. The following discharge measurements were made in 1897 by W. G. Russell:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
May 5....	6.60	386	June 17...	13.55	2,083	July 28..	5.80	193
May 20...	5.70	253	June 18...	16.95	3,159	Aug. 18..	5.60	193
June 1...	5.30	179	June 18...	18.25	3,701	Sept. 30..	4.80	95
June 15..	13.60	1,898	July 1.....	20.70	4,856	Oct. 25...	4.50	83
June 16..	9.40	974	July 13....	7.55	451	Nov. 12..	4.80	96

Daily gage height, in feet, of Solomon River at Niles, Kansas, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		5.35	20.95	6.40	4.80	4.80	4.90	5.30
2.....		5.20	21.17	6.15	4.95	4.70	4.85	5.15
3.....		5.15	13.35	5.95	4.95	4.55	4.80	5.15
4.....		5.15	8.95	5.80	4.80	4.50	5.25	5.20
5.....		5.20	9.00	5.70	4.85	4.30	5.15	5.20
6.....	6.45	5.15	8.55	6.05	4.85	4.75	5.10	5.25
7.....	6.10	5.10	7.80	5.75	4.75	4.65	5.15	5.15
8.....	6.02	5.05	7.35	5.50	4.75	4.50	5.00	5.15
9.....	6.05	5.10	7.10	5.35	4.65	4.60	4.85	5.20
10.....	6.20	5.10	8.95	5.65	4.60	4.55	4.90	5.25
11.....	6.35	5.05	10.40	5.45	4.60	4.80	5.00	5.20
12.....	5.82	4.80	9.80	5.35	4.65	4.85	4.95	5.30
13.....	6.05	4.80	7.85	5.50	4.55	4.80	4.85	
14.....	6.15	4.70	7.45	5.40	4.50	4.65	4.95	
15.....	6.50	13.50	8.05	5.80	4.55	4.65	4.60	
16.....	6.05	8.80	7.10	6.20	4.90	4.55	4.60	
17.....	6.00	10.90	6.60	5.90	4.70	4.70	4.80	
18.....	5.85	17.45	6.35	5.65	4.55	4.65	4.90	5.00
19.....	5.85	20.00	6.25	5.65	4.40	4.55	4.90	5.00
20.....	5.80	17.85	6.20	5.60	4.60	5.10	4.95	
21.....	5.60	9.25	6.05	5.40	4.45	5.15	5.00	
22.....	5.55	8.65	6.16	5.35	5.05	4.90	4.85	
23.....	5.45	7.70	5.90	5.30	5.60	4.80	4.80	
24.....	5.30	8.70	5.80	5.20	5.40	4.70	4.80	
25.....	5.30	11.25	5.70	5.20	5.25	4.75	4.90	5.30
26.....	5.35	13.50	5.85	5.25	5.10	4.75	4.75	5.30
27.....	6.70	11.10	5.85	5.15	4.90	4.75	4.90	
28.....	8.30	9.15	5.90	5.05	4.95	4.90	4.95	
29.....	6.50	12.90	6.95	4.95	4.75	5.05	4.60	
30.....	5.85	18.50	8.00	4.85	4.80	4.95	4.90	
31.....	5.55		7.00			4.95		5.30

BEVERLY STATION ON SALINE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 210, is located at the iron highway bridge one-half mile southwest of Beverly, Kansas. The observer is Jerome Wilson, who lives about one-half mile from the station. The gage is an inclined timber, fastened to trestles which are set in the ground and well loaded down with rock. It is graduated up to 18 feet, and one of the iron cylinder bridge piers is then graduated up to 30 feet. The bench mark is the top of the lower iron strut at the north end connecting the two south piers. Its elevation is 18.95 feet above the zero of the gage. This station was discontinued on June 30, 1897, as a more favorable location was found at Salina, and a station was therefore established at the latter place. The following measurements of discharge were made in 1897 by W. G. Russell:

February 24, gage height, 4.70 feet; discharge, 67 second-feet.

March 26, gage height, 4.60 feet; discharge, 53 second-feet.

April 15, gage height, 5.40 feet; discharge, 161 second-feet.

April 30, gage height, 5.80 feet; discharge, 196 second-feet.

June 2, gage height, 4.80 feet; discharge, 75 second-feet.

Daily gage height, in feet, of Saline River at Beverly, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1....	4.45	.....	4.40	4.65	7.05	4.80	17....	4.75	4.95	4.60	5.25	5.20	4.45
2....	4.55	4.20	4.60	4.55	7.05	4.70	18....	4.35	5.15	4.50	5.15	5.15	4.45
3....	4.80	.....	4.70	4.55	6.20	4.75	19....	4.75	4.95	4.55	5.10	5.10	4.65
4....	4.35	4.30	4.70	4.65	5.95	4.60	20....	4.60	4.85	4.35	5.05	5.05	4.50
5....	4.25	.....	4.20	7.85	5.75	4.75	21....	4.75	4.75	4.45	5.05	5.00	4.45
6....	4.45	4.40	4.55	8.80	5.65	4.75	22....	4.70	4.70	4.30	5.00	4.95	4.55
7....	4.85	.....	4.50	9.40	5.55	4.70	23....	4.70	4.75	4.60	5.00	4.90	4.55
8....	4.20	.....	4.65	5.95	5.55	4.60	24....	4.60	4.55	4.45	6.00	4.90	4.40
9....	4.55	.....	4.60	5.95	5.50	4.75	25....	4.60	4.65	4.45	7.20	4.85	4.40
10....	4.35	4.40	4.55	6.50	5.45	4.50	26....	3.90	4.70	4.45	5.35	4.85	4.45
11....	4.50	5.00	4.50	6.65	5.50	4.55	27....	3.90	4.75	4.45	5.45	4.85	7.70
12....	4.70	4.70	4.65	6.10	5.45	4.60	28....	3.90	4.50	4.50	5.45	4.80	17.50
13....	4.60	5.30	4.50	5.75	5.50	4.50	29....	4.20	.....	4.40	5.45	4.70	7.85
14....	5.05	6.15	4.50	5.55	5.50	4.55	30....	4.20	.....	4.40	5.80	4.70	5.35
15....	4.60	5.40	4.35	5.45	5.50	4.55	31....	4.30	.....	4.70	.....	4.60	.....
16....	4.65	5.00	4.35	5.35	5.25	4.55							

SALINA STATION ON SALINE RIVER.

This station is located at a bridge 4.5 miles northeast of Salina, Kansas. The rod of the wire gage is spiked to the floor of the bridge. It is 1 by 4 inches, and 24 feet long. Bench mark 1 is a nail in an elm 2 feet in diameter, on the north side of the river and 6 feet west of the bridge, and its elevation is 22.90 feet above gage datum. Bench mark 2 is six nails driven into a 16-inch box elder on north side of river and 35 feet east of the bridge. Its elevation is 22.90 feet above datum. The channel is straight for a little distance above and below the station. Both banks are high, and are not liable to overflow. The bed of the stream is sandy and muddy. The observer is H. W. Barr. The following discharge measurements were made during 1897 by W. G. Russell:

May 4, gage height, 7.00 feet; discharge, 333 second-feet.
 May 17, gage height, 4.90 feet; discharge, 135 second-feet.
 May 31, gage height, 3.90 feet; discharge, 73 second-feet.
 June 18, gage height, 3.50 feet; discharge, 60 second-feet.
 June 28, gage height, 3.20 feet; discharge, 45 second-feet.
 July 14, gage height, 3.40 feet; discharge, 54 second-feet.
 July 26, gage height, 3.30 feet; discharge, 51 second-feet.
 August 19, gage height, 4.90 feet; discharge, 152 second-feet.
 September 28, gage height, 2.80 feet; discharge, 26 second-feet.
 October 20, gage height, 2.50 feet; discharge, 17 second-feet.
 November 11, gage height, 2.90 feet; discharge, 29 second-feet.

Daily gage height, in feet, of Saline River at Salina, Kansas, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		3.70	9.50	3.00	3.10	2.50	3.15	3.15
2.....		3.70	5.10	3.05	3.05	2.45	3.15	3.05
3.....		3.75	4.40	3.15	3.00	2.60	2.85	3.10
4.....	7.00	3.75	4.10	3.25	3.05	2.60	3.10	3.15
5.....	6.35	3.65	3.90	3.05	3.10	2.60	2.80	3.10
6.....	5.90	3.80	3.85	3.05	3.05	2.50	2.85	3.20
7.....	5.65	3.60	3.70	3.05	3.00	2.50	3.00	3.05
8.....	5.40	3.75	3.70	3.05	3.00	2.50	2.95	3.15
9.....	5.30	3.75	3.60	2.95	2.95	2.45	3.10	3.15
10.....	5.25	3.75	3.75	2.85	2.85	2.55	3.00	3.15
11.....	5.15	3.75	3.95	3.05	2.80	2.75	3.05	2.85
12.....	5.10	3.70	3.85	3.15	2.75	2.80	3.15	2.95
13.....	5.15	3.50	3.70	3.10	2.65	2.70	3.05	3.20
14.....	5.10	3.55	3.45	3.30	2.65	2.55	2.85	3.25
15.....	5.05	3.55	3.35	3.45	2.65	2.55	3.05	3.15
16.....	5.00	3.50	3.40	3.40	2.85	2.65	2.95	3.15
17.....	4.90	3.55	3.35	7.35	3.45	2.90	3.05	(a)
18.....	4.55	3.55	3.45	6.75	2.95	2.80	2.95	.....
19.....	4.70	3.50	3.25	4.80	2.90	2.65	3.05	.....
20.....	4.65	3.45	3.20	4.15	2.90	2.65	3.10	3.10
21.....	4.50	3.45	3.80	3.85	2.85	3.35	3.10	.....
22.....	4.45	3.45	3.40	3.90	2.75	3.70	3.05	.....
23.....	4.35	3.45	3.10	4.00	2.80	3.50	3.10	.....
24.....	4.25	3.30	3.00	3.80	2.85	3.55	3.05	3.10
25.....	4.25	3.50	3.00	3.50	2.75	3.00	3.10	.....
26.....	4.10	3.55	3.20	3.50	2.90	3.40	3.05	.....
27.....	4.05	3.35	3.15	3.50	2.75	3.45	3.25	.....
28.....	4.10	3.30	3.00	3.85	2.75	3.45	3.15	3.20
29.....	4.05	11.15	3.05	3.30	2.75	3.10	3.15	.....
30.....	3.90	14.90	3.00	3.30	2.70	3.05	3.20	.....
31.....	3.85	.....	3.05	3.10	.....	3.15	.....	3.20

a Frozen.

ELLSWORTH STATION ON SMOKY HILL RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 212, is located at the highway bridge on Douglas avenue, Ellsworth, Kansas. The observer is Robert Martin, who lives about 100 yards north of the bridge. The gage is an inclined ash timber spiked to a post driven in the bed of the river and bolted to an iron post of the bridge pier. The bench mark is a nail driven in the base of a large box-elder tree near the southeast corner of the bridge, 90 feet from the gage, and its elevation is 13.07 feet above the zero. A slope gage is spiked to the Frisco railroad bridge 2,536 feet upstream and is referred to same datum. The channel is nearly straight above and below the bridge, and the bed is sandy and shifting. The following discharge measurements were made by W. G. Russell in 1897.

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Feb. 26...	1.30	40	May 17....	1.80	167	Aug. 17...	1.60	84
Mar. 29...	1.15	30	June 4....	1.30	57	Aug. 24..	2.30	301
Apr. 6....	2.30	287	June 28...	1.40	79	Sept. 24..	1.25	57
Apr. 23...	1.45	80	July 15....	1.30	43	Oct. 19...	1.40	77
May 8....	1.70	141	July 26....	1.20	38	Nov. 9....	1.30	49

Daily gage height, in feet, of Smoky Hill River at Ellsworth, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.20	1.40	1.40	1.20	2.60	1.40	1.35	1.38	1.45	1.00	1.10	1.20
2.....	1.10	1.40	1.30	1.25	2.35	1.35	1.30	1.45	1.40	1.00	1.20	1.10
3.....	1.30	1.45	1.20	1.35	2.25	1.30	1.25	1.30	1.35	1.00	1.30	1.10
4.....	1.35	1.50	1.30	2.10	2.05	1.30	1.20	1.20	1.30	.95	1.40	1.10
5.....	1.20	1.50	1.30	2.60	1.85	1.30	1.20	1.20	1.25	.95	1.35	1.10
6.....	1.20	1.55	1.30	2.30	1.80	1.30	1.15	1.15	1.20	.95	1.35	1.10
7.....	1.25	1.70	1.30	2.15	1.70	1.30	1.10	1.20	1.15	.90	1.35	1.10
8.....	1.35	1.65	1.30	2.15	1.65	1.40	1.10	1.15	1.10	.90	1.30	1.15
9.....	1.45	1.60	1.25	2.15	1.70	1.30	1.05	1.10	1.10	.90	1.30	1.15
10.....	1.40	2.00	1.25	2.15	1.65	1.30	1.20	1.10	1.10	.90	1.30	1.15
11.....	1.40	1.85	1.20	2.05	1.85	1.30	1.20	1.00	1.10	.90	1.25	1.20
12.....	1.45	1.55	1.20	1.95	2.10	1.25	1.15	1.00	1.05	.90	1.25	1.20
13.....	1.30	2.00	1.15	1.80	2.20	1.20	1.15	1.15	1.00	.90	1.25	1.15
14.....	1.75	1.85	1.15	1.70	2.15	1.20	1.10	1.45	1.00	.90	1.25	1.10
15.....	1.60	1.75	1.15	1.65	2.05	1.20	1.20	1.80	1.05	.90	1.20	1.15
16.....	1.25	1.65	1.15	1.60	1.85	1.50	1.25	1.70	1.65	1.00	1.15	1.15
17.....	1.35	1.95	1.20	1.60	1.75	2.10	1.20	1.60	1.25	1.50	1.15	1.05
18.....	1.25	2.00	1.20	1.55	1.70	2.10	1.20	1.50	1.20	1.45	1.15	1.10
19.....	1.40	1.85	1.15	1.50	1.60	1.85	1.15	1.40	1.15	1.40	1.20	1.20
20.....	1.40	1.70	1.15	1.50	1.50	1.80	1.23	1.30	1.25	1.40	1.20	1.20
21.....	1.40	1.55	1.10	1.45	1.50	1.70	1.13	1.20	1.40	1.35	1.20	1.20
22.....	1.45	1.40	1.10	1.45	1.60	1.55	1.10	1.15	1.35	1.30	1.20	1.20
23.....	1.55	1.45	1.10	1.45	2.15	1.45	1.05	2.15	1.30	1.30	1.15	1.20
24.....	1.35	1.40	1.10	1.50	1.95	1.40	1.15	2.30	1.25	1.25	1.20	1.20
25.....	1.35	1.40	1.10	1.55	1.75	1.50	1.25	2.15	1.20	1.25	1.15	1.20
26.....	1.30	1.35	1.10	1.50	1.60	1.50	1.20	1.95	1.15	1.25	1.10	1.25
27.....	1.35	1.20	1.10	1.55	1.55	1.45	1.20	1.85	1.10	1.25	1.00	1.35
28.....	1.35	1.35	1.10	1.60	1.50	1.40	1.25	1.75	1.10	1.20	1.00	1.35
29.....	1.35	.....	1.15	1.85	1.50	1.35	1.35	1.65	1.05	1.15	1.00	1.40
30.....	1.40	.....	1.15	2.30	1.50	1.30	1.50	1.60	1.00	1.15	1.00	1.45
31.....	1.40	.....	1.20	.....	1.45	.....	1.45	1.53	.....	1.10	.....	1.55

MANHATTAN STATION ON BLUE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 215, is located at the county bridge 4 miles north of Manhattan, Kansas. The gage consists of three sections, the lower being an ash stick driven into the bottom of the river and bolted to an overhanging cottonwood tree 30 feet east of the bridge, and marked from 2.10 to 11.30 feet. The middle section consists of an oak stick bolted to the north side of the south bridge pier and marked from 11.30 to 17 feet. A similar stick on the south side of the same pier, and marked from 17 to 30 feet, completes the gage. The bench mark is a cross cut in the capstone of the south bridge pier immediately above the upper gage, and is 32.135 feet above datum. The observer is William Hudspeth. The following discharge measurements were made in 1897 by O. P. Hood and S. R. Vincent:

April 26, gage height, 25.45 feet; discharge, 31,942 second-feet.

April 30, gage height, 10.80 feet; discharge, 5,972 second-feet.

October 30, gage height, 4.00 feet; discharge, 602 second-feet.

December 8, gage height, 4.20 feet; discharge, 499 second-feet.

Daily gage height, in feet, of Blue River at Manhattan, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	4.00	5.40	6.00	8.75	9.70	6.75	8.75	5.20	4.90	3.55	4.00	4.40
2.....	4.10	5.10	6.00	16.50	10.30	6.55	7.90	5.05	4.65	3.50	4.00	4.30
3.....	4.10	5.00	5.80	17.25	9.95	6.40	7.25	4.90	4.55	3.50	3.80	4.25
4.....	4.25	4.90	5.70	11.50	9.15	6.25	7.00	4.00	4.35	3.40	3.70	4.20
5.....	4.60	4.55	5.55	10.90	7.95	5.90	6.80	4.70	4.25	3.40	3.80	4.10
6.....	4.80	4.35	5.00	10.30	7.80	5.70	6.50	5.35	4.05	3.40	3.90	4.10
7.....	4.90	4.25	4.80	9.75	7.60	5.60	6.20	6.15	3.80	3.30	4.00	4.00
8.....	4.85	4.00	4.75	8.75	7.50	5.50	6.00	8.85	3.70	3.30	4.00	4.20
9.....	4.80	4.05	4.65	8.20	7.25	5.40	7.50	8.55	3.60	3.20	4.10	4.30
10.....	4.60	4.25	5.10	7.90	6.85	5.00	8.35	7.50	3.50	3.20	4.25	4.25
11.....	4.60	4.35	5.30	7.40	6.75	4.75	10.40	7.15	3.30	3.15	4.25	4.20
12.....	4.80	4.50	5.45	7.10	6.75	4.55	12.75	6.25	2.50	3.05	4.25	4.25
13.....	4.85	4.90	5.65	6.90	7.05	4.50	12.25	6.00	2.30	3.00	4.40	4.30
14.....	4.90	5.65	6.60	6.70	7.10	4.80	9.65	5.75	2.30	3.00	4.50	4.15
15.....	4.80	5.90	7.15	6.40	6.85	4.95	9.00	6.90	2.75	3.65	4.45	4.00
16.....	4.75	6.00	6.85	6.00	6.75	5.40	8.50	8.10	3.35	4.00	4.35	4.00
17.....	4.70	6.25	6.65	5.75	6.35	5.60	8.10	7.90	3.75	4.15	4.30	4.10
18.....	4.80	6.80	6.35	5.60	6.20	5.90	7.90	7.50	3.85	4.25	4.20	4.15
19.....	4.85	7.20	6.10	5.50	6.10	6.20	7.10	7.35	4.25	4.35	4.20	4.20
20.....	4.90	6.65	5.80	5.45	6.00	8.90	6.10	7.05	4.60	4.40	4.10	4.20
21.....	5.15	6.30	5.75	5.40	5.90	8.75	5.70	6.65	4.50	4.30	4.05	4.35
22.....	5.00	6.10	5.65	5.50	5.80	8.00	5.55	6.45	4.30	4.25	4.00	4.50
23.....	4.95	6.00	5.60	9.25	5.75	7.50	5.20	6.35	4.25	4.20	4.05	4.50
24.....	4.85	5.90	5.50	20.95	5.95	7.00	5.00	6.30	4.15	4.40	4.20	4.60
25.....	4.80	5.75	5.40	24.15	5.80	7.00	7.20	6.15	4.00	4.30	4.25	4.60
26.....	5.50	5.65	5.35	25.30	5.85	7.00	6.90	6.05	4.00	4.25	4.30	4.60
27.....	5.50	5.50	5.30	25.60	6.70	14.55	6.65	5.75	3.90	4.20	4.40	4.60
28.....	5.50	5.80	6.25	19.65	7.85	19.45	6.10	5.60	3.85	4.30	4.40	4.55
29.....	5.50	.....	6.85	12.00	7.60	13.40	5.90	5.40	3.80	4.35	4.50	4.40
30.....	5.55	.....	6.95	10.75	6.80	9.80	5.55	5.25	3.60	4.40	4.50	4.40
31.....	5.60	.....	7.15	.....	6.85	.....	5.40	5.05	.....	4.40	.....	4.50

LAWRENCE STATION ON KANSAS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 219, is located at Lawrence, Kansas. The gage consists of a vertical board marked to feet and tenths and fastened to the south pier of the carriage bridge, about 50 feet up the river from the crest of a dam. The zero of the gage is on a level with a large stone in the crest of dam. There is also a short vertical board fastened by the side of this one for reading the level of the water when it stands below the zero of the gage. The channel is about 690 feet wide, broken by four piers. The observer is J. D. Bowersock. The following is a list of discharge measurements made in 1897 by E. C. Murphy:

April 9, gage height, 2.55 feet; discharge, 10,238 second-feet.
 April 10, gage height, 2.55 feet; discharge, 9,658 second-feet.
 April 26, gage height, 9.10 feet; discharge, 60,854 second-feet.
 June 17, gage height, 1.50 feet; discharge, 4,820 second-feet.
 June 23, gage height, 2.73 feet; discharge, 10,635 second-feet.
 June 25, gage height, 2.10 feet; discharge, 8,011 second-feet.

Daily gage height, in feet, of Kansas River at Lawrence, Kansas, for 1897

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.80	0.80	1.20	2.65	3.60	1.90	5.30	1.40	0.60	0.10	0.60	-1.60
2.....	.80	.70	1.10	2.80	3.10	1.70	4.65	1.20	.60	.20	.60	-1.70
3.....	1.00	.70	1.10	3.60	2.70	1.50	3.40	1.00	.60	.40	.60	-1.70
4.....	.60	.60	1.10	2.70	2.30	1.40	3.20	1.00	.60	.40	.60	-1.40
5.....	.40	.60	1.10	2.40	2.40	1.40	6.80	.80	.60	.25	.60	-.90
6.....	.50	.60	1.00	2.40	2.30	1.20	5.50	.80	.60	.10	.80	-.50
7.....	.60	.80	1.15	2.35	2.05	1.00	4.15	.80	.40	.10	.80	-.30
8.....	.60	.80	1.15	1.95	2.00	1.00	3.50	1.40	.40	.20	.90	+.10
9.....	.60	1.00	1.05	2.55	2.00	1.00	2.70	1.80	.40	.10	.90	.10
10.....	1.00	1.00	1.00	2.60	1.95	1.00	2.00	1.80	.40	.15	.90	.20
11.....	1.00	1.00	1.00	2.40	1.80	1.00	1.90	1.60	.40	.30	.80	.40
12.....	1.00	1.00	1.00	2.10	1.75	1.00	2.40	1.20	.40	.20	.80	.40
13.....	1.00	1.10	1.00	2.00	1.65	1.00	3.70	1.20	.40	.60	.80	.20
14.....	.80	1.70	1.20	1.95	1.60	1.00	3.90	1.00	.30	.70	1.00	.10
15.....	.80	1.90	1.20	1.90	1.60	.90	3.40	1.00	.20	.70	.90	-.20
16.....	.90	1.90	1.35	2.00	1.60	1.10	2.70	1.00	.20	.10	.80	-.70
17.....	1.00	2.30	1.40	2.05	1.60	1.45	2.00	1.30	.10	.10	.80	-1.00
18.....	1.00	2.90	1.50	1.65	1.60	1.50	1.70	1.80	.10	.10	.80	-1.00
19.....	1.00	3.00	1.60	1.60	1.45	2.00	1.60	1.50	.25	.00	.80	+.10
20.....	.90	2.65	1.60	1.55	1.40	1.80	1.40	1.75	.10	.20	.80	-.40
21.....	1.00	2.60	1.40	1.45	1.40	2.00	1.35	1.20	.40	.20	.80	-.50
22.....	1.00	2.30	1.40	1.40	1.40	3.00	1.30	1.20	.40	.20	.80	-.60
23.....	1.00	2.15	1.20	1.45	1.35	2.80	1.20	1.00	.40	.30	.80	-.60
24.....	1.00	1.90	1.30	1.45	1.20	2.60	1.20	.70	.25	.40	.80	-.40
25.....	.60	1.60	1.25	6.30	1.20	2.05	1.10	.60	.20	.40	.80	-.20
26.....	.20	1.40	1.20	8.80	1.20	2.80	1.20	.60	.40	.40	.60	+.40
27.....	.30	1.20	1.20	7.60	1.20	3.50	1.40	.55	.40	.50	.40	-.10
28.....	.60	1.30	1.20	7.60	1.20	4.50	1.35	.50	.20	.50	.20	-.10
29.....	.70	.....	1.30	6.40	2.00	6.00	1.40	.60	.20	.50	.20	.00
30.....	.80	.....	1.50	4.60	2.00	4.80	1.55	.60	.10	.50	.70	.00
31.....	.80	.....	1.85	.....	2.00	.....	1.50	.60	.....	.60	.....	-.10

GRANITE STATION ON ARKANSAS RIVER.

This station is located at the wagon bridge 250 feet from the railroad station at Granite, Colorado. The gage is a vertical 2 by 6 inch plank spiked to the upper end of the center pier of the bridge and graduated to tenths of a foot. The banks are low and liable to overflow; the bed is rocky and the current swift. This station was reestablished April 17, 1897, by Cyrus C. Babb, the records of daily gage heights being kept by the Denver and Rio Grande Railroad Company. The observer is H. D. Marquis. The following is a list of measurements of discharge made in 1897 by F. Cogswell:

April 17, gage height, 3.20 feet; discharge, 120 second-feet

May 8, gage height, 4.20 feet; discharge, 940 second-feet.

May 18, gage height, 4.90 feet; discharge, 1,326 second-feet.

June 29, gage height, 4.60 feet; discharge, 1,151 second-feet.

July 27, gage height, 3.75 feet; discharge, 415 second-feet.

August 31, gage height, 3.20 feet; discharge, 206 second-feet.

September 27, gage height, 3.10 feet; discharge, 203 second-feet.

November 6, gage height, 3.00 feet; discharge, 153 second-feet.

Daily gage height, in feet, of Arkansas River at Granite, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1....	3.35	6.00	4.50	3.65	3.35	3.00	17....	4.75	5.25	4.00	3.45	3.00	3.00
2....	3.60	6.00	4.35	3.65	3.35	3.00	18....	4.90	5.00	3.85	3.40	3.15	3.00
3....	3.65	6.00	4.35	3.80	3.35	3.00	19....	4.90	4.35	3.85	3.35	3.10	3.00
4....	3.55	5.75	4.30	3.70	3.50	3.00	20....	5.00	4.85	3.85	3.35	3.00	3.00
5....	3.75	5.00	4.25	3.65	3.50	3.00	21....	5.10	5.00	3.90	3.35	3.00	3.00
6....	3.85	5.00	4.10	3.65	3.40	3.00	22....	4.90	5.10	3.85	3.35	3.00	3.00
7....	4.05	4.40	4.35	3.75	3.25	3.00	23....	5.10	5.00	3.90	3.30	3.00	3.00
8....	4.05	4.50	4.35	3.75	3.25	3.00	24....	5.60	4.90	3.80	3.25	3.00	3.00
9....	4.35	4.50	4.50	3.80	3.25	3.00	25....	5.60	4.65	3.80	3.25	3.00	3.00
10....	4.25	4.75	4.60	3.65	3.25	3.00	26....	5.60	4.85	3.75	3.25	3.00	3.00
11....	4.30	5.35	4.40	3.60	3.00	3.00	27....	5.60	4.90	3.75	3.25	3.00	.....
12....	4.10	5.60	4.35	3.60	3.00	3.00	28....	5.40	4.75	3.75	3.25	3.00	.....
13....	4.00	5.60	4.15	3.65	3.00	3.00	29....	5.65	4.60	3.65	3.25	3.00	.....
14....	4.00	6.00	4.00	3.65	3.00	3.00	30....	5.75	4.45	3.65	3.20	3.00	.....
15....	4.10	5.75	4.05	3.50	3.00	3.00	31....	6.00	.....	3.65	3.15	.....	.....
16....	4.60	6.15	4.00	3.50	3.00	3.00							

SALIDA STATION ON ARKANSAS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 224, is located just back of the railroad yards, at a suspension bridge, at Salida, Colorado. The gage consists of a vertical 4 by 6 inch timber, with a 2 by 6 inch scale, bolted to the abutment of the bridge on the left-hand side of the river, and is marked to tenths of a foot. The banks are high and do not overflow; the current is swift; the bed of the stream consists of sand, gravel, and bowlders, but is not subject to any great changes, and is a most desirable station to be maintained. Stream measurements are made from the lower side of the footbridge. River-height observations are maintained by the Denver and Rio Grande Railroad Company. The observer is F. G. Dew. The following discharge measurements were made in 1897 by F. Cogswell:

April 17, gage height, 0.69 foot; discharge, 219 second-feet.

April 27, gage height, 1.55 feet; discharge, 709 second-feet.

May 8, gage height, 2.20 feet; discharge, 1,178 second-feet.

May 30, gage height, 4.05 feet; discharge, 2,821 second-feet.

June 29, gage height, 2.50 feet; discharge, 1,492 second-feet.

July 27, gage height, 1.35 feet; discharge, 606 second-feet.

August 31, gage height, 0.85 foot; discharge, 371 second-feet.

September 27, gage height, 1.00 foot; discharge, 405 second-feet.

November 6, gage height, 0.90 foot; discharge, 378 second-feet.

Daily gage height, in feet, of Arkansas River at Salida, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1....	1.20	4.10	2.30	1.30	1.00	0.65	17.....	2.75	3.00	1.90	1.20	0.90	0.65
2....	1.45	3.60	2.35	1.25	1.00	.65	18.....	3.10	3.00	1.85	1.15	.90	.65
3....	1.75	3.10	2.45	1.25	1.00	.65	19.....	3.00	2.90	2.00	1.10	.90	.65
4....	1.60	2.90	2.35	1.35	1.00	.65	20.....	3.00	2.75	1.90	1.10	1.00	.65
5....	1.60	2.40	2.00	1.45	1.00	.65	21.....	3.00	3.00	1.90	1.00	1.00	.65
6....	1.80	2.45	2.00	1.45	1.05	.65	22.....	2.85	3.00	1.65	1.10	1.00	.65
7....	1.95	2.25	2.00	1.40	1.00	.65	23.....	3.00	3.00	1.50	1.05	1.00	.65
8....	2.25	2.10	2.00	1.45	1.00	.65	24.....	3.50	3.00	1.50	1.00	1.00	.65
9....	2.25	2.35	2.45	1.55	1.00	.65	25.....	3.50	2.80	1.45	1.00	1.00	.65
10....	2.30	2.75	2.45	1.50	1.00	.65	26.....	3.40	2.75	1.40	1.00	1.00	.85
11....	2.30	2.80	2.20	1.40	1.00	.65	27.....	3.60	2.90	1.40	1.00	1.00	.....
12....	2.50	2.90	2.05	1.40	1.00	.65	28.....	3.45	2.55	1.40	1.00	1.00	.....
13....	2.30	3.50	2.00	1.35	1.00	.65	29.....	3.50	2.40	1.25	1.00	1.00	.....
14....	2.35	3.20	1.90	1.35	1.00	.65	30.....	4.00	2.35	1.25	1.00	1.00	.....
15....	2.35	3.35	1.95	1.35	1.00	.65	31.....	4.15	.....	1.25	1.00	.....	.....
16....	2.70	3.65	1.90	1.25	1.00	.65							

CANYON STATION ON ARKANSAS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 225, is located at the Hot Springs Hotel, $1\frac{1}{2}$ miles west of Canyon, Colorado, about 500 yards below the mouth of Grape Creek. The gage rod is placed on the left bank of the river just below the suspension footbridge, and consists of an inclined 4 by 4 inch by 16-foot timber bolted to a small juniper tree, and to posts set in the ground. A vertical rod is also fastened to the juniper tree for extreme high water. Both banks are high and not liable to overflow. The current is swift, and the cross section is not subject to any notable changes, except at extreme high-and-low-water stages. The observer is Dr. J. L. Prentiss. The following discharge measurements were made in 1897 by F. Cogswell:

April 16, gage height, 2.20 feet; discharge, 260 second-feet.

May 7, gage height, 3.10 feet; discharge, 827 second-feet.

May 26, gage height, 4.95 feet; discharge, 2,712 second-feet.

June 16, gage height, 5.25 feet; discharge, 3,071 second-feet.

July 14, gage height, 3.60 feet; discharge, 1,140 second-feet.

August 11, gage height, 3.05 feet; discharge, 744 second-feet.

November 5, gage height, 2.98 feet; discharge, 540 second-feet.

Daily gage height, in feet, of Arkansas River at Canyon City, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....				2.50	2.80	5.40	3.95	2.80	2.40	2.60	3.00	.....
2.....	2.60	.....		2.50	2.90	5.40	3.85	2.80	2.40	2.50	3.00	.....
3.....				2.50	3.10	5.40	3.75	2.85	2.40	2.50	3.00	.....
4.....				2.40	3.05	5.55	3.95	3.60	2.40	2.50	2.90	2.50
5.....				2.40	3.00	4.85	3.75	3.20	2.40	2.50	2.95	.....
6.....		2.50	2.50	2.30	3.15	4.25	3.60	3.00	2.40	2.50	2.95	.....
7.....				2.30	3.10	4.35	3.50	3.10	2.40	2.50	2.95	.....
8.....				2.20	3.50	4.50	3.50	3.40	2.40	2.60	2.90	.....
9.....	2.50	.....		2.20	3.60	4.60	4.17	3.30	2.45	2.70	2.90	.....
10.....				2.10	3.70	4.70	3.90	3.20	2.45	2.70	2.90	.....
11.....				2.15	3.65	4.65	4.00	3.10	2.45	2.70	2.90	2.60
12.....				2.20	3.60	4.95	3.85	3.10	2.50	2.70	2.95	.....
13.....		2.40	2.60	2.20	3.70	5.35	3.70	3.00	2.50	2.60	2.95	.....
14.....				2.20	3.80	5.25	3.60	2.90	2.60	2.65	3.00	.....
15.....				2.10	4.10	5.15	3.75	2.90	2.60	2.70	2.95	.....
16.....	2.30	.....		2.20	4.30	5.30	3.55	2.80	2.60	2.80	2.85	.....
17.....				2.20	4.50	5.15	3.50	2.80	2.60	2.80	2.85	.....
18.....				2.35	4.30	4.65	3.50	2.70	2.55	2.80	2.85	2.60
19.....				2.40	4.30	4.50	3.70	2.70	2.55	2.85	2.85	.....
20.....		2.50	2.50	2.50	4.25	4.50	3.60	2.60	2.50	2.85	2.85	.....
21.....				2.55	4.30	4.50	3.50	2.60	2.50	2.80	.....	.....
22.....				2.45	4.35	4.50	3.40	2.60	2.50	2.80	2.85	.....
23.....	2.40	.....		2.25	4.40	4.50	3.30	2.70	2.50	2.80	2.85	.....
24.....		2.70		2.20	4.75	4.45	3.20	2.55	2.50	2.80	2.75	.....
25.....		2.70		2.20	5.00	4.45	3.20	2.50	2.50	2.80	2.70	2.50
26.....				2.30	5.05	4.50	3.10	2.50	2.50	2.80	2.70	.....
27.....		2.50	2.60	2.55	5.00	4.35	3.00	2.50	2.50	2.80	2.70	.....
28.....			2.60	2.55	5.05	4.25	2.90	2.50	2.50	2.90	2.65	.....
29.....			2.70	2.85	5.10	4.05	2.90	2.50	2.50	3.00	2.60	.....
30.....	2.50	.....	2.60	2.75	5.35	4.00	2.85	2.50	2.50	3.00	2.50	.....
31.....			2.50	.....	5.45	.....	2.80	2.40	.....	.....	.....	.....

PUEBLO STATION ON ARKANSAS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 227, is located at the city of Pueblo, Colorado, 2 miles above the mouth of Fountain Creek. There are two gage rods. The main one, at Santa Fe avenue bridge, consists of a vertical 6 by 6 inch timber, bolted to the abutment of the Denver and Rio Grande Railroad bridge on the left-hand side of the river, marked to tenths of a foot. There is also a short vertical rod for extreme low water spiked to a pile about 20 feet out in the stream, reading same as the main gage. The 12-foot mark of this gage is opposite the top of the large capstone. The rod at Victoria avenue bridge consists of inclined 4 by 4 inch timbers fastened to posts set in right bank of stream, and was placed for the purpose of noting the change in the slope of the water surface. Stream measurements are made from lower side of the Main street bridge. The river is confined by the city levees, and the bed is sandy and constantly changing. The observer is R. L. Holden. The following is a list of discharge measurements made in 1897 by F. Cogswell and others:

April 16, gage height, 0.20 foot; discharge, 216 second-feet.

May 6, gage height, 1.00 foot; discharge, 799 second-feet.

May 21, gage height, 2.00 feet; discharge, 1,856 second-feet.

June 18, gage height, 2.55 feet; discharge, 2,219 second-feet.

July 16, gage height, 1.15 feet; discharge, 981 second-feet.

August 10, gage height, 0.95 foot; discharge, 805 second-feet.

September 8, gage height, 0.10 foot; discharge, 184 second-feet.

September 28, gage height, 0.45 foot; discharge, 394 second-feet.

November 4, gage height, 0.75 foot; discharge, 601 second-feet.

Daily gage height, in feet, of Arkansas River at Pueblo, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.30	0.65	0.30	0.20	0.70	3.30	1.45	0.55	0.20	0.20	0.70	0.45
2.....	.30	.40	.30	.00	.75	3.50	1.55	.60	.20	.20	.70	.50
3.....	.30	.40	.30	.15	1.00	3.05	1.65	.80	.10	.20	.70	.40
4.....	.35	.45	.25	.20	1.05	2.50	1.45	.65	.10	.25	.70	.45
5.....	.35	.35	.15	.15	.95	2.15	1.45	.95	.10	.30	.70	.40
6.....	.25	.35	.10	.05	.95	2.05	1.45	.60	.10	.30	.70	.40
7.....	.35	.45	.10	.00	1.05	1.90	1.65	1.20	.10	.35	.60	.45
8.....	.45	.40	.05	.10	1.30	1.75	1.10	1.05	.10	.40	.60	.50
9.....	.25	.35	.00	.00	1.40	1.70	2.10	1.45	.05	.35	.60	.50
10.....	.45	.40	.05	.05	1.45	2.00	2.00	1.00	.00	.55	.50	.50
11.....	.45	.45	.00	.00	1.45	2.45	1.85	.95	.10	.35	.55	.45
12.....	.50	.40	.00	.95	1.45	2.85	1.60	.90	.10	.45	.70	.40
13.....	.45	.45	.05	.10	1.35	2.90	1.35	.75	.25	.35	.70	.40
14.....	.35	.30	.05	.00	1.40	3.20	1.20	.55	.30	.35	.70	.50
15.....	.35	.20	.05	.00	1.45	3.00	2.10	.40	.50	.35	.70	.45
16.....	.30	.15	.15	.00	1.60	2.95	1.25	.40	.40	.45	.60	.40
17.....	.35	.40	.00	.15	1.90	3.05	1.15	.30	.35	.60	.50	.50
18.....	.25	.40	.25	.20	1.90	2.55	1.25	.30	.35	.60	.40	.45
19.....	.30	.30	.20	.30	2.20	2.30	1.45	.30	.40	.65	.50	.30
20.....	.30	.40	.20	.30	2.15	2.15	1.35	.30	.30	.70	.45	.30
21.....	.35	.35	.15	.35	2.00	2.30	1.15	.20	.30	.65	.40	.30
22.....	.30	.35	.15	.35	1.90	2.20	1.00	.20	.35	.60	.55	.30
23.....	.35	.40	.10	.30	1.85	2.15	.85	.20	.30	.55	.50	.20
24.....	.30	.25	.05	.10	2.15	2.00	.85	.40	.30	.55	.50	.20
25.....	.25	.25	.00	.25	2.85	1.95	.75	.35	.30	.50	.50	.20
26.....	.20	.25	.10	.30	2.85	1.85	.75	.25	.35	.65	.50	.20
27.....	.30	.25	.20	.30	2.75	2.00	.85	.20	.40	.60	.50	.30
28.....	.25	.20	.25	.35	3.05	1.90	.85	.10	.40	.50	.40	.40
29.....	.35	.....	.40	.65	2.80	1.65	.70	.20	.40	.60	.40	.45
30.....	.65	.....	.40	.75	3.15	1.50	.55	.20	.35	.65	.45	.40
31.....	.50	.....	.30	.....	3.30	.....	.55	.20	.....	.65	.....	.30

NEPESTA STATION ON ARKANSAS RIVER.

This station is located 1,000 feet north of Nepesta, Colorado, at a wagon bridge, 200 feet below Atchison, Topeka and Santa Fe Railroad bridge, and was established September 8, 1897. The gage consists of a vertical 2 by 6 inch by 12 foot timber marked in tenths, securely wired to upstream side of upstream cylinder of bridge on left side of river and marked with 1 by 6 inch scale on face and 1 by 3 inch scale on side. The initial point for soundings is on the left bank, which is low and liable to overflow. The right bank is high and riprapped above railroad bridge. The channel above and below the station is straight for 300 or 400 feet; the bed is sandy and shifting. The observer is G. J. Boyd, a storekeeper, who lives 1,000 feet from the gage. The following discharge measurements were made by Porter J. Preston in 1897:

September 8, gage height, 2.00 feet; discharge, 168 second-feet.

September 30, gage height, 2.34 feet; discharge, 281 second-feet.

Daily gage height, in feet, of Arkansas River at Nepesta, Colorado, for 1897.

Day.	Sept.	Oct.	Day.	Sept.	Oct.	Day.	Sept.	Oct.	Day.	Sept.	Oct.
1.....	-----	2.20	9.....	-----	2.15	17.....	-----	-----	25.....	2.00	-----
2.....	-----	2.10	10.....	-----	2.15	18.....	-----	-----	26.....	2.00	-----
3.....	-----	2.00	11.....	-----	2.20	19.....	1.90	-----	27.....	2.00	-----
4.....	-----	2.10	12.....	-----	2.35	20.....	1.50	-----	28.....	2.10	-----
5.....	-----	2.00	13.....	-----	1.75	21.....	1.80	-----	29.....	2.00	-----
6.....	-----	2.20	14.....	-----	2.00	22.....	2.10	-----	30.....	2.00	-----
7.....	-----	2.10	15.....	-----	2.10	23.....	2.00	-----	31.....	-----	-----
8.....	-----	2.05	16.....	-----	2.00	24.....	2.10	-----			

ROCKY FORD STATION ON ARKANSAS RIVER.

This station is located 2 miles northeast of Rocky Ford, Colorado, and was established May 3, 1897. The gage consists of a vertical 1 by 3 inch timber notched in tenths and securely nailed to pile protection to abutment of wagon bridge, left side of stream, upper side of bridge. The initial point of soundings is on the left bank at water's edge. Both banks are high and liable to overflow only at very high water. The channel is straight for about 300 feet above and below the station. The bed is sandy and shifting. The observer, S. W. Cressy, whose occupation is water commissioner, lives 2 miles distant from the gage. The following discharge measurement was made by Porter J. Preston in 1897:

September 29, gage height, 0.37 foot; discharge, 140 second-feet.

Daily gage height, in feet, of Arkansas River at Rocky Ford, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.70	0.72	0.65	0.45	0.40	0.92	0.33
2		2.50	.55	.65	.50	.38	1.02	.40
3	1.00	2.82	.80	.68	.42	.30	1.10	(a)
4	1.10	2.52	1.42	.69	.32	.32	1.10	
5	1.28	2.08	1.50	1.94	.25	.25	1.08	
6	1.25	2.40	1.50	1.60	.35	.32	1.10	
7	.90	1.98	1.25	1.28	.35	.35	.88	
8	.50	1.80	1.10	2.05	.30	.38	.68	
9	1.02	1.65	1.00	1.60	.30	.40	.60	
10	1.18	1.65	1.52	1.90	.18	.50	.60	
11	1.23	1.72	1.60	1.02	.30	.78	.58	
12	1.15	2.10	1.26	.60	.30	.65	.50	
13	1.37	2.40	1.26	1.28	.35	.45	.65	
14	1.42	2.40	1.17	.75	.35	.40	.48	
15	1.42	2.48	1.33	.82	.20	.60	.60	
16	1.32	2.22	1.41	3.10	.45	.72	.60	
17	1.40	2.20	.82	2.10	.66	.80	.48	
18	1.50	2.15	1.38	.95	.70	.80	.45	
19	1.60	2.00	2.05	1.15	.45	.82	.42	
20	1.55	1.75	1.80	.95	.38	.88		
21	1.60	1.62	1.02	.80	.25	.90	.50	
22	1.45	1.50	.62	.60	.15	.88	.50	
23	1.48	1.50	.50	.55	.20	.85	.45	
24	1.50	1.25	.40	.70	.20	.84	.50	
25	1.49	1.17	.35	.58	.22	.85	.50	
26	1.80	1.24	.35	.48	.30	.98	.50	
27	1.85	1.17	.61	.38	.35	1.00	.53	
28	2.90	1.82	.65	.30	.35	.98	.50	
29	2.00	1.75	.85	.22	.38	.92	.51	
30	2.05	1.22	.85	.20	.40	.80	.35	
31	2.38		.68	.32		.80		

a River frozen.

TRINIDAD STATION ON PURGATOIRE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 231, is located at the Las Animas street bridge in the city of Trinidad, Colorado. The gage consists of a vertical 2 by 6 inch plank, and is fastened with iron bands to the downstream side of a cylindrical bridge pier, on the right side of the river. The banks are high and not liable to overflow, the bed is of gravel and small stones, and the water moves with fair velocity. Stream measurements are made from the lower side of the bridge during high water, and at low stages by wading some 400 feet below the gage. The observer is J. N. Turner, water commissioner. The following measurements of discharge were made in 1897 by F. Cogswell:

May 22, gage height, 4.25 feet; discharge, 677 second-feet.

June 17, gage height, 4.10 feet; discharge, 386 second-feet.

July 15, gage height, 3.90 feet; discharge, 189 second-feet.

September 23, gage height, 3.60 feet; discharge, 49 second-feet.

November 13, gage height, 3.55 feet; discharge, 46 second-feet.

Daily gage height, in feet, of Purgatoire River at Trinidad, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	3.75	4.05	4.20	4.15	3.50	3.50	3.60	3.60
2.....	3.70	4.15	4.25	4.05	3.45	3.50	3.60	3.60
3.....	3.75	4.05	4.30	4.00	3.65	3.50	3.60	3.55
4.....	3.75	4.30	4.20	3.90	3.60	3.50	3.60	3.55
5.....	3.75	4.30	4.05	3.90	3.55	3.55	3.60	3.50
6.....	3.65	4.35	4.00	3.85	4.00	3.60	3.60	3.50
7.....	3.75	4.30	4.00	3.80	3.85	3.55	3.60	3.60
8.....	3.75	4.30	4.00	3.80	4.80	3.50	3.60	3.60
9.....	3.80	4.40	4.00	4.05	4.25	3.60	3.65	3.60
10.....	3.85	4.30	4.00	4.20	4.10	3.95	3.60	3.60
11.....	3.75	4.25	4.00	4.10	3.95	3.95	3.60	3.60
12.....	3.80	4.20	4.05	4.00	4.00	3.90	3.60	3.60
13.....	3.90	4.30	4.10	3.95	3.90	4.10	3.60	3.60
14.....	3.90	4.30	4.15	3.90	3.90	3.90	3.60	3.60
15.....	3.85	4.30	4.10	3.90	4.70	3.90	3.60	3.50
16.....	3.75	4.15	4.10	3.95	4.00	4.05	3.60	3.55
17.....	3.80	4.20	4.10	4.00	4.00	3.85	3.75	3.55
18.....	3.75	4.20	4.05	4.00	4.00	3.75	3.65	3.50
19.....	3.90	4.35	4.00	3.95	3.90	3.60	3.60	3.50
20.....	3.90	4.55	4.00	3.90	4.00	3.55	3.60	3.50
21.....	4.00	4.40	3.90	3.90	3.90	3.60	3.60	3.50
22.....	3.90	4.22	3.90	3.80	4.00	3.50	3.60	3.50
23.....	3.85	4.20	3.90	3.80	4.00	3.60	3.60	3.50
24.....	3.95	4.20	3.90	3.80	3.90	3.60	3.60	3.60
25.....	4.00	4.20	3.90	3.80	3.60	3.50	3.70	3.60
26.....	3.95	4.30	4.60	3.80	3.45	3.60	3.70	3.60
27.....	3.90	4.35	4.25	3.80	3.40	3.60	3.65	3.50
28.....	4.00	4.30	4.05	3.80	3.30	3.60	3.65	3.50
29.....	4.00	4.25	4.00	3.75	3.35	3.60	3.65	3.50
30.....	4.05	4.30	4.20	3.55	3.40	3.60	3.60	3.50
31.....	-----	4.30	-----	3.50	3.40	-----	3.60	-----

HUTCHINSON STATION ON ARKANSAS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 232, is located at the wagon bridge at the south end of Main street, Hutchinson, Kansas. The observer is Daniel Lauer, who lives about 100 yards from the station. The gage consists of an oak timber painted white, graduated in feet and tenths and spiked to an oak pile a few feet above the bridge, driven as a protection to the bridge pier from ice and drift. There are two bench marks: One is the upper cross piece of the pier guard, having an elevation of 8.35 feet above zero; the second is the top of the iron doorsill, next to the river, of the first brick building. Its elevation is 8.12 feet above zero of the gage. Measurements are made from the bridge, and at low water may be made by wading. The channel is generally straight for some distance, both above and below, and is sandy and very shifting. At very low stages the water is in several channels and crooked. The following discharge measurements were made in 1897 by W. G. Russell:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Feb. 25...	2.30	471	May 18....	2.00	202	Aug. 3 ...	1.15	6
Mar. 25...	1.75	158	June 3....	1.60	60	Aug. 20 ..	2.20	275
Apr. 14...	2.00	221	June 29...	2.10	284	Sept. 29..	1.10	4
Apr. 22...	1.70	122	July 14....	1.30	15			
May 7....	1.95	170	July 27....	1.10	4			

Daily gage height, in feet, of Arkansas River at Hutchinson, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.60	1.80	2.20	1.70	2.15	1.60	1.85	1.35	2.00	1.10	1.30	(a)
2.....	1.60	1.80	2.15	1.70	2.10	1.60	1.75	1.15	1.95	1.10	1.30	(a)
3.....	1.80	1.80	2.30	1.80	2.05	1.55	1.70	1.05	1.90	1.10	1.30	(a)
4.....	1.80	2.20	2.30	1.80	2.00	1.55	1.95	1.00	1.80	1.10	1.30	(a)
5.....	1.80	2.20	2.25	1.90	2.00	1.60	1.75	1.00	1.75	1.10	1.30	1.65
6.....	1.80	2.20	2.20	2.05	2.00	1.60	1.55	1.10	1.65	1.10	1.30	1.70
7.....	1.80	1.70	2.20	2.10	1.95	1.60	1.55	1.10	1.55	1.10	1.30	1.60
8.....	1.80	1.80	2.10	2.20	1.95	1.60	1.45	1.10	1.50	1.10	1.30	1.50
9.....	1.80	1.80	2.10	2.20	1.90	1.60	1.65	1.05	1.45	1.10	1.30	1.50
10.....	1.80	1.90	2.10	2.20	2.10	1.55	1.65	1.05	1.45	1.10	1.30	1.50
11.....	1.80	2.45	2.00	2.15	2.30	1.90	1.50	1.00	1.40	1.10	1.30	1.50
12.....	1.80	2.35	1.90	2.10	2.40	2.10	1.50	1.00	1.35	1.05	1.30	1.50
13.....	1.70	2.25	1.90	2.05	2.35	2.20	1.40	1.00	1.30	1.00	1.30	1.45
14.....	1.70	2.20	1.90	1.95	2.30	2.20	1.35	1.45	1.30	1.00	1.20	1.40
15.....	1.70	2.70	2.10	1.85	1.90	2.15	2.20	1.30	1.30	1.00	1.20	1.40
16.....	1.70	1.65	1.80	1.85	2.10	2.20	1.30	1.15	1.75	1.05	1.20	1.40
17.....	1.70	1.60	1.80	1.80	2.05	2.20	1.30	2.05	1.65	1.20	1.20	1.40
18.....	1.70	1.60	1.80	1.80	2.00	2.20	1.30	2.25	1.55	1.45	1.20	1.40
19.....	1.80	1.60	1.80	1.80	1.90	2.15	1.30	2.30	1.50	1.40	1.20	1.40
20.....	1.90	2.05	1.80	1.80	1.90	2.20	1.25	2.20	1.45	1.40	1.20	1.40
21.....	1.90	2.50	1.80	1.70	1.90	2.20	1.20	2.15	1.49	1.49	1.20	1.40
22.....	1.90	2.50	1.80	1.70	1.90	2.20	1.10	2.00	1.35	1.40	1.20	1.40
23.....	1.90	2.45	1.80	1.70	1.85	2.30	1.10	2.20	1.50	1.30	1.20	1.40
24.....	1.90	2.35	1.80	1.85	1.80	2.30	1.10	2.65	1.30	1.30	1.30	1.40
25.....	1.90	2.30	1.75	2.10	1.75	2.30	1.20	2.95	1.25	1.35	1.35	1.40
26.....	1.80	2.30	1.70	2.15	1.70	2.30	1.20	2.75	1.20	1.40	1.40	1.40
27.....	1.60	2.20	1.70	2.20	1.70	2.25	1.30	2.55	1.20	1.30	1.40	1.40
28.....	1.60	3.85	1.70	2.20	1.70	2.15	1.35	2.30	1.20	1.30	1.30	1.40
29.....	1.60	.....	1.70	2.20	1.65	2.10	1.70	2.20	1.10	1.30	1.30	1.40
30.....	1.60	.....	1.70	2.20	1.60	2.05	1.60	2.20	1.10	1.30	1.30	1.40
31.....	1.80	.....	1.70	.....	1.60	.....	1.45	2.10	.....	1.30	.....	1.40

a Frozen.

LIBERTY STATION ON VERDIGRIS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 235, is located at a wagon bridge, about 250 feet below McTaggart's milldam, about 3 miles southwest of the town of Liberty, Kansas. The gage is in two parts—a vertical board marked to feet and tenths fastened to the flume, which serves to give ordinary heights, and horizontal marks one-half foot apart on the corner of wheelhouse. The zero of gage is 12.46 feet below the heads of three large nails in flume. Bench mark 2 is the head of a spike in root of cottonwood tree 4.75 feet in circumference and 40 feet south of gage. The spike has a circle cut around it, with letters U. S. above. Its elevation is 10.98 feet above datum. The bed is rock and gravel, and subject to very little change. September 11, 1897, a secondary gage was placed about 7 miles above gage No. 1. It is located at the Independence waterworks, and is to be read hourly when the river is in flood. The zeros of the two gages are referred to the same datum. The observer is A. C. McTaggart. The following discharge measurements were made in 1897 by E. C. Murphy:

April 2, gage height, 6.55 feet; discharge, 2,558 second-feet.
 April 3, gage height, 5.87 feet; discharge, 2,003 second-feet.
 April 30, gage height, 17.00 feet; discharge, 10,367 second-feet.
 May 1, gage height, 7.38 feet; discharge, 3,384 second-feet.
 June 29, gage height, 2.35 feet; discharge, 70 second-feet.
 July 20, gage height, 3.00 feet; discharge, 312 second-feet.
 September 8, gage height, 1.95 feet; discharge, 14 second-feet.

Daily gage height, in feet, of Verdigris River at Liberty, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		3.60	3.60	10.15	7.20	2.90	2.40	2.20	2.00	2.00	1.70	1.60
2.....	3.80		3.60	7.05	5.80	2.90	2.40	2.20	2.00			
3.....		3.40	3.80	5.70	5.25	3.10	2.40	2.20	2.00		1.60	1.60
4.....	4.00		5.00	5.05	4.95	2.90	2.40	2.20	2.00	1.90		
5.....		9.80	20.00	4.75	4.65	2.90	2.45	2.20	2.00		1.60	
6.....	3.80		13.75	4.55	4.45	2.90	2.45	2.20	2.00	1.80		1.70
7.....			7.50	4.35	4.35	3.00	2.90	2.20	2.00			
8.....		6.00	6.00	4.30	4.15	3.00	5.00	2.10	2.00	1.80	1.60	1.70
9.....	3.80		7.15	4.30	4.10	8.25	3.70	2.10	2.00			
10.....		5.60	6.90	4.55	4.10	6.65	2.95	2.10	2.00		1.60	1.70
11.....	3.20		5.80	5.00	6.05	4.75	2.75	2.10	2.00	1.80		
12.....		7.20	4.95	4.70	13.25	4.10	2.60	2.10			1.60	
13.....	4.20		4.80	4.30	6.85	3.60	2.50	2.10	2.00	1.80		1.70
14.....			4.35	4.15	5.10	3.40	2.50	2.10				
15.....		5.00	4.25	4.00	4.80	3.30	2.45	2.10	2.00	1.80	1.60	1.90
16.....	4.80		4.10	3.85	4.50	3.30	2.40	2.10				
17.....		5.30	5.05	3.70	4.30	3.20	2.40	2.10			1.60	1.90
18.....	5.10		5.80	3.60	4.15	3.10	2.40	2.10	2.00	1.70		
19.....		4.60	5.40	3.60	3.95	3.00	2.60	2.10			1.60	
20.....	5.80		5.55	3.60	3.75	3.10	2.95	2.10	2.00	1.70		1.90
21.....			5.70	3.60	3.55	3.35	3.05	2.10				
22.....	5.80	4.40	5.10	3.40	3.35	3.10	2.80	2.00	2.00	1.70	1.60	2.20
23.....			4.60	3.40	4.05	2.80	2.80	2.00				
24.....		4.00	4.20	3.40	3.95	2.70	2.70	2.00			1.60	2.20
25.....	4.70		4.00	6.85	3.70	2.60	2.55	2.00	2.00	1.70		
26.....		4.00	3.95	6.70	3.55	2.50	2.35	2.00			1.60	
27.....	4.10		3.80	4.85	3.20	2.50	2.20	2.00	2.00	1.70		1.75
28.....			3.80	18.75	3.10	2.40	2.20	2.00				
29.....	3.80		3.80	28.20	3.00	2.40	2.20	2.00	2.00	1.70	1.60	1.90
30.....			6.50	21.50	3.00	2.30	2.20	2.00				
31.....			9.30		3.00		2.20	2.00				1.90

IOLA STATION ON NEOSHO RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 238, is located at a highway bridge 1 mile west of the city of Iola, Kansas. The gage is in two parts—one part, a vertical board marked to feet and tenths and fastened to flume, serves to give ordinary heights; the other is a smooth stone wall near by, having horizontal lines on it one-half foot apart, for use when the water is high. The zero is 13.30 feet below the heads of three large nails driven into crosspiece of flume. The observer is Elias Bruner. The following is a list of discharge measurements made by E. C. Murphy in 1897:

March 19, gage height, 3.15 feet; discharge, 566 second-feet.
 April 1, gage height, 4.60 feet; discharge, 2,049 second-feet.
 April 2, gage height, 4.35 feet; discharge, 1,752 second-feet.
 May 1, gage height, 3.28 feet; discharge, 544 second-feet.
 June 28, gage height, 4.75 feet; discharge, 2,226 second-feet.
 December 1, gage height, 1.80 feet; discharge, 1 second-foot.

Daily gage height, in feet, of Neosho River at Iola, Kansas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.20	3.20	2.95	4.75	3.30	2.40	2.25	2.00	2.05	1.80	1.80	1.80
2.....	2.30	3.50	3.05	4.20	3.30	2.40	2.20	2.10	2.00	1.80	1.80	1.80
3.....	2.40	3.90	3.00	4.10	3.30	2.40	2.20	2.40	2.00	1.80	1.80	1.80
4.....	2.50	5.90	3.10	3.85	3.20	2.45	2.25	2.10	2.00	1.80	1.80	1.80
5.....	2.60	4.70	6.35	3.05	3.20	2.50	2.35	2.10	1.90	1.80	1.80	1.80
6.....	2.60	3.20	5.05	3.45	3.15	2.50	2.30	2.10	1.90	1.80	1.80	1.80
7.....	2.60	3.30	4.00	3.40	3.10	2.50	2.20	2.10	1.80	1.80	1.80	1.80
8.....	2.70	3.15	3.55	3.60	3.10	2.45	2.65	2.00	1.80	1.80	1.80	1.80
9.....	2.90	3.45	3.45	3.90	3.10	2.40	2.70	2.10	1.80	1.80	1.80	1.80
10.....	2.90	3.75	3.25	4.00	3.00	2.40	2.90	2.10	1.80	1.80	1.80	1.80
11.....	2.95	4.25	3.05	4.00	3.00	3.60	2.95	2.10	1.80	1.80	1.80	1.80
12.....	3.10	5.15	2.95	4.00	3.00	3.55	2.85	2.10	1.80	1.80	1.80	1.80
13.....	3.15	4.85	2.90	3.90	3.00	3.25	2.75	2.10	1.80	1.80	1.80	1.80
14.....	3.20	4.80	2.90	3.80	2.90	3.15	2.65	2.10	1.80	1.80	1.80	1.80
15.....	3.20	5.85	2.80	3.65	2.90	2.85	2.50	2.00	1.80	1.80	1.80	1.80
16.....	3.15	5.30	2.85	3.40	2.90	2.75	2.40	2.10	1.80	1.80	1.80	1.80
17.....	3.00	4.80	2.90	3.20	2.80	2.55	2.30	2.10	1.80	1.80	1.80	1.80
18.....	3.20	5.40	2.90	3.10	2.80	2.35	2.30	2.10	1.80	1.80	1.80	1.80
19.....	3.20	5.85	3.05	3.10	2.70	2.25	2.25	2.15	1.80	1.80	1.80	1.80
20.....	3.30	5.20	4.85	3.10	2.70	2.30	2.25	2.15	1.80	1.80	1.80	1.80
21.....	3.40	4.65	3.85	3.00	2.60	2.25	2.20	2.15	1.80	1.80	1.80	1.80
22.....	3.50	4.30	3.50	3.00	2.60	2.20	2.20	2.10	1.80	1.80	1.80	1.80
23.....	3.60	3.85	3.05	3.00	2.50	2.20	2.20	2.10	1.80	1.80	1.80	1.80
24.....	3.60	3.25	3.25	2.90	2.50	2.10	2.20	2.10	1.80	1.80	1.80	1.80
25.....	3.50	2.70	3.20	2.90	2.50	2.10	2.15	2.10	1.80	1.70	1.80	1.80
26.....	3.50	3.30	3.10	3.10	2.50	2.50	2.15	2.10	1.80	1.70	1.80	1.80
27.....	3.40	3.00	3.00	3.10	2.40	3.85	2.15	2.10	1.80	1.70	1.80	1.80
28.....	3.35	2.90	3.00	3.45	2.40	3.85	2.15	2.10	1.80	1.70	1.80	1.80
29.....	3.30	-----	3.00	3.55	2.40	4.10	2.15	2.00	1.80	1.70	1.80	1.80
30.....	3.30	-----	4.80	3.45	2.40	2.75	2.15	2.05	1.80	1.70	1.80	1.80
31.....	3.30	-----	5.35	-----	2.40	-----	2.15	2.05	-----	1.80	-----	1.80

DEL NORTE STATION ON RIO GRANDE.

This station, described in the Eighteenth Annual Report, Part IV, page 246, is located about two miles above the town of Del Norte, Colorado. The gage consists of an inclined 2 by 6 inch plank, fastened to posts driven into the right bank of the river. Bench mark No. 1 is a large nail in the root of a tree 15 feet northwest of the end of the cable on left bank of river. Bench mark No. 2 is a large nail in the root of a tree 25 feet southwest of the end of the inclined gage. Both bench marks are 7.54 feet above gage datum. While the banks are not high, the river has never been known to overflow. The current is swift; the bed is composed of small stones and the cross section does not change materially. Discharge measurements are made from a box suspended from a five-eighth inch wire cable fastened to trees on each side of the river. The observer is J. S. Regan. The following discharge measurements were made in 1897 by F. Cogswell:

April 26, gage height, 3.00 feet; discharge, 1,507 second-feet.

May 17, gage height, 4.05 feet; discharge, 3,014 second-feet.

May 29, gage height, 5.45 feet; discharge, 4,898 second-feet.

June 28, gage height, 3.30 feet; discharge, 1,769 second-feet.

July 26, gage height, 2.00 feet; discharge, 640 second-feet.

August 30, gage height, 1.55 feet; discharge, 373 second-feet.

October 25, gage height, 2.66 feet; discharge, 1,113 second-feet.

Daily gage height, in feet, of Rio Grande at Del Norte, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				2.18	3.40	5.42	3.40	1.88	1.48	2.22	2.36	
2	1.86											
3				2.24	3.52	5.30	3.56	1.90	1.54	2.50	2.28	
4												2.30
5				2.24	3.14	5.20	3.18	1.86	1.70	3.36	2.26	
6		2.78	2.98									
7				2.16	3.86	4.42	2.76	1.92	2.00	3.08	2.18	
8												
9	2.64			2.00	4.14	4.60	3.00	1.96	1.78	3.54	2.14	
10												
11				1.96	4.08	4.78	2.84	1.84	1.76	3.26	2.22	2.18
12												
13		2.82	2.64	2.04	4.26	4.76	2.62	1.76	2.48	3.38	2.12	
14												
15				2.24	4.48	4.82	2.50	1.72	2.12	3.50	2.00	
16	2.52											
17				2.90	4.22	4.16	2.48	1.76	1.98	3.24	1.98	
18												2.86
19				3.46	4.50	3.84	2.32	1.70	2.02	3.12	1.96	
20		2.84	2.38									
21				3.20	4.36	3.92	2.18	1.64	2.00	2.96	1.94	
22												
23	2.72			2.60	5.12	4.00	2.14	1.60	2.06	2.82	1.90	
24												
25				2.70	5.56	3.56	2.10	1.56	2.20	2.66	1.86	2.72
26												
27		2.76	2.04	2.94	5.70	3.16	1.98	1.54	2.46	2.54	1.84	
28												
29				3.04	5.40	3.88	1.94	1.52	2.24	2.46	1.88	
30	2.70										1.92	
31			2.12		5.58		1.92	1.50		2.44		2.66

EMBUDO STATION ON RIO GRANDE.

This station, described in the Eighteenth Annual Report, Part IV, page 248, is located about 300 feet east of the railroad depot of Embudo, New Mexico. The observer is A. H. Wasson. Equipment consists of a five-eighths inch cable and car with tagged wire. The gage is inclined, and consists of 4 by 4 timber, notched and marked every tenth of a foot vertically and spiked to small hand-driven piles. The bench marks are as follows: No. 1 is a rock near the end of cable, left bank, marked "B. M." with white paint, and is 20.66 feet above datum. No. 2, rock 100 feet above cable, left bank, marked similarly and is 18.79 feet above datum; No. 3, notch cut in southeast corner of station house 2 feet above platform and is 30.48 feet above datum. The initial point of sounding is on the right bank. The left bank is steep and the right bank of more gentle slope. The following discharge measurements were made in 1897 by P. E. Harroun:

February 27, gage height, 7.90 feet; discharge, 414 second-feet.

March 19, gage height, 8.80 feet; discharge, 672 second-feet.

June 10, gage height, 12.20 feet; discharge, 5,122 second-feet.

June 23, gage height, 10.55 feet; discharge, 2,735 second-feet.

July 11, gage height, 9.50 feet; discharge, 1,527 second-feet.

July 24, gage height, 8.30 feet; discharge, 640 second-feet.

August 12, gage height, 7.40 feet; discharge, 312 second-feet.

August 29, gage height, 7.60 feet; discharge 273 second-feet.

September 13, gage height, 7.60 feet; discharge, 296 second-feet.

October 8, gage height, 9.60 feet; discharge, 1,501 second-feet.

October 25, gage height, 9.70 feet; discharge, 1,511 second-feet.

Daily gage height, in feet, of Río Grande at Embudo, New Mexico, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	7.70	7.70	8.10	8.80	10.85	13.85	9.90	7.60	7.60	8.20	9.50	8.70
2.....	7.70	7.70	8.25	8.75	11.15	13.90	9.80	7.60	7.60	8.30	9.50	8.50
3.....	7.70	7.80	8.20	8.70	11.25	13.75	9.75	7.60	7.70	8.30	9.50	8.50
4.....	7.70	7.85	8.20	8.70	11.60	13.35	9.65	7.50	7.60	9.05	9.50	8.40
5.....	7.70	7.90	8.05	8.75	11.55	12.95	9.60	7.45	7.55	8.45	9.60	8.20
6.....	7.70	7.90	7.95	8.70	11.35	12.45	9.50	7.40	7.50	8.30	9.60	8.30
7.....	7.70	7.90	7.90	8.90	11.35	12.10	9.35	7.50	7.50	8.60	9.50	8.20
8.....	7.70	7.90	7.90	8.90	11.30	12.10	9.55	7.55	7.50	9.60	9.50	8.25
9.....	7.70	7.90	8.10	9.05	11.40	12.10	9.70	7.60	7.50	9.80	9.50	8.40
10.....	7.70	7.90	8.20	9.10	11.65	12.10	9.50	7.50	7.50	9.80	9.50	8.40
11.....	7.70	7.95	8.05	9.15	12.00	12.30	9.50	7.50	7.60	10.10	9.50	8.30
12.....	7.70	7.95	8.25	9.30	12.00	12.35	9.55	7.40	7.60	10.20	9.50	8.40
13.....	7.70	7.90	8.25	9.30	11.85	12.45	9.65	7.40	7.65	10.15	9.50	8.30
14.....	7.80	7.90	8.30	9.30	11.90	12.40	9.65	7.35	7.60	10.10	9.50	8.10
15.....	7.90	7.85	8.25	9.45	11.95	12.40	10.36	7.30	7.60	10.15	9.50	8.20
16.....	7.90	7.80	8.30	9.50	12.15	12.35	10.00	7.40	7.70	10.20	9.50	8.30
17.....	7.90	7.95	8.40	9.55	12.20	12.25	9.50	7.50	7.70	10.20	9.40	8.30
18.....	7.90	7.90	8.40	9.95	12.25	12.00	9.50	7.45	7.75	10.25	9.35	8.40
19.....	7.95	7.90	8.40	10.30	12.55	11.70	9.35	7.40	7.80	10.30	9.20	8.30
20.....	8.00	7.90	8.50	10.35	13.05	11.20	9.05	7.40	7.80	10.25	9.00	8.30
21.....	8.00	7.85	8.60	10.70	13.40	11.00	8.80	8.90	7.80	10.15	9.00	8.40
22.....	8.00	7.85	8.60	10.70	13.40	10.75	8.70	7.60	7.85	9.55	8.90	8.30
23.....	8.00	7.90	8.45	10.75	13.20	10.50	8.55	7.60	7.90	10.15	8.85	8.20
24.....	8.00	7.80	8.20	10.60	13.10	10.45	8.30	7.60	7.85	9.95	8.80	8.30
25.....	8.00	7.80	8.45	10.45	13.10	10.40	8.10	7.55	7.95	9.70	8.70	8.40
26.....	7.85	8.15	8.45	10.30	13.50	10.40	8.00	7.50	8.00	9.70	8.70	8.30
27.....	7.70	7.90	8.60	10.50	13.55	10.40	8.00	7.50	8.00	9.90	8.70	8.30
28.....	7.70	8.00	8.80	10.75	13.90	10.30	7.85	7.55	8.00	10.15	8.70	8.30
29.....	7.70	.....	8.95	10.85	14.00	10.20	7.80	7.60	8.10	9.90	8.70	8.30
30.....	7.70	.....	9.00	10.75	13.80	10.85	7.75	7.60	8.10	9.60	8.70	8.30
31.....	7.70	.....	8.85	.....	13.80	.....	7.65	7.60	.....	9.50	.....	8.40

ABIQUITU STATION ON CHAMA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 252, is located about 200 yards above the town of Abiquiu, New Mexico. The gage consists of two pieces of 4 by 4 inch timbers laid on the slope of the river bank and spiked to hand-driven piles. The gaging equipment consists of five-eighths inch cable, car, and tagged wire. The initial point for soundings is on the left bank. The channel is straight, both above and below the station, for a distance of about 300 feet, although at stages of very low water it is likely to divide and swing in the main bed. The right bank is steep and rocky, but the left is liable to overflow during an excessive flood. The observer is Henry Grant. This station was discontinued on April 7, 1897. The following is a list of discharge measurements made during 1897 by P. E. Harroun:

February 26, gage height, 2.20 feet; discharge, 66 second-feet.

March 18, gage height, 3.00 feet; discharge, 318 second-feet.

Daily gage height, in feet, of Chama River at Abiquiu, New Mexico, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1...	3.40	2.10	2.35	4.15	12...	1.95	2.15	3.15	.....	23...	1.95	2.00	3.70	.....
2...	2.55	2.10	2.35	3.95	13...	1.90	2.00	3.00	.....	24...	2.00	1.95	4.05	.....
3...	2.40	2.05	2.50	4.20	14...	3.45	2.00	3.05	.....	25...	2.05	2.10	3.70	.....
4...	2.25	2.05	3.55	5.10	15...	3.25	2.00	2.90	.....	26...	2.15	2.05	3.70	.....
5...	2.20	2.00	3.55	4.85	16...	3.00	2.00	2.90	.....	27...	2.15	2.15	4.10	.....
6...	2.05	2.15	3.20	5.75	17...	2.45	2.00	3.15	.....	28...	2.05	2.25	4.05	.....
7...	1.90	2.05	2.90	4.85	18...	2.30	2.25	3.25	.....	29...	2.10	.....	4.10	.....
8...	2.05	2.15	3.05	.....	19...	2.20	2.40	3.15	.....	30...	2.10	.....	3.95	.....
9...	2.10	1.95	2.95	.....	20...	2.05	2.15	2.95	.....	31...	1.95	.....	3.85	.....
10...	2.05	2.00	2.80	.....	21...	2.00	2.05	3.05	.....				
11...	2.10	2.10	2.85	.....	22...	2.15	2.05	3.25	.....				

RIO GRANDE STATION ON RIO GRANDE.

This station, described in the Eighteenth Annual Report, Part IV, page 252, is located about one-fourth of a mile above the railroad station, Rio Grande, New Mexico. The equipment consists of a five-eighths inch wire cable, car, and tagged wire. The gage is inclined, and consists of two timbers 4 inches square fastened to hand-driven piles and wired to solid rocks. The bench mark is on the top of a boulder, to which the upper portion of the gage is fastened, and is 17.815 feet above gage datum. Measurements are made from the car suspended from the cable. The bed of the stream is rocky and is confined between high banks. The observer is L. M. Fewell. The following discharge measurements were made in 1897 by P. E. Harroun:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.ft.</i>		<i>Feet.</i>	<i>Sec.ft.</i>		<i>Feet.</i>	<i>Sec.ft.</i>
Feb. 25...	4.90	487	July 10....	5.90	1,757	Sept. 24..	5.20	637
Mar. 17...	5.83	1,003	July 23....	5.20	995	Oct. 7....	6.10	1,584
May 15...	10.50	10,892	Aug. 11....	4.80	406	Oct. 24....	7.00	2,712
June 9...	8.80	6,794	Aug. 28....	4.20	266			
June 22..	7.20	3,470	Sept. 12...	5.70	1,044			

Daily gage height, in feet, of Rio Grande at Rio Grande, New Mexico, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	5.00	4.95	5.20	6.10	9.50	10.50	6.50	4.70	4.40	5.40	6.20	5.15
2.....	4.75	4.95	5.25	6.10	10.00	10.50	6.30	4.55	4.20	5.45	6.20	5.15
3.....	4.70	5.10	5.90	6.00	10.35	10.20	6.10	4.00	4.45	5.40	6.20	5.05
4.....	4.65	5.10	6.30	6.05	10.90	10.20	6.00	4.90	4.30	5.50	6.20	4.80
5.....	4.35	4.95	5.40	6.00	10.55	9.70	6.00	4.70	4.20	7.40	6.20	4.80
6.....	4.30	5.00	5.15	6.60	9.95	9.25	6.00	4.90	4.20	6.35	6.10	4.80
7.....	4.85	5.00	5.15	7.25	9.80	9.00	5.90	4.80	4.80	6.25	6.00	4.05
8.....	4.75	5.00	5.22	7.40	10.05	8.90	5.90	4.80	4.50	6.60	5.90	5.20
9.....	4.70	4.95	5.80	6.85	10.40	8.80	5.80	4.80	5.05	7.00	5.80	5.20
10.....	4.85	5.00	5.70	6.80	10.55	8.90	6.15	4.80	5.45	7.55	5.75	5.30
11.....	5.00	5.00	5.55	7.10	10.85	9.00	6.20	4.80	5.35	7.20	5.70	5.30
12.....	5.05	4.90	5.40	7.25	10.60	9.10	6.20	4.80	5.70	7.15	5.75	5.35
13.....	5.00	5.00	5.40	7.40	10.50	9.20	6.05	5.15	5.90	7.10	5.80	4.80
14.....	4.90	5.05	5.35	7.40	10.50	9.25	6.00	4.55	6.70	7.00	5.80	4.80
15.....	5.05	4.90	5.20	7.75	10.45	9.20	6.10	4.50	5.60	6.90	5.90	4.70
16.....	5.05	4.82	5.62	8.25	10.55	8.95	6.20	4.30	5.20	6.60	5.90	4.80
17.....	4.85	4.90	5.85	8.30	10.40	8.60	7.00	5.85	4.95	6.70	5.80	5.20
18.....	4.70	4.95	5.65	8.70	10.80	8.35	7.00	5.25	5.00	7.05	5.80	5.00
19.....	4.65	5.00	5.60	8.95	12.35	8.20	6.35	5.00	5.05	7.10	5.70	4.95
20.....	4.60	5.05	5.65	9.15	12.25	7.70	5.95	4.70	5.10	7.00	5.70	5.00
21.....	4.70	5.10	5.50	9.30	11.70	7.45	5.65	4.60	5.10	6.85	5.70	4.95
22.....	4.65	4.90	5.55	9.25	11.60	7.25	5.35	5.25	5.10	6.70	5.70	4.70
23.....	4.80	4.85	5.35	9.45	11.25	7.05	5.20	4.85	5.20	6.55	5.60	4.50
24.....	4.80	4.90	5.25	9.15	10.80	6.95	5.20	4.75	5.30	6.55	5.60	4.80
25.....	4.80	4.95	5.45	9.10	10.60	6.85	5.10	4.65	5.30	6.50	5.60	4.90
26.....	4.85	5.05	5.75	9.20	10.90	6.50	4.95	4.50	5.30	6.50	5.60	4.80
27.....	4.85	5.05	5.35	9.80	10.90	6.65	4.75	4.30	5.35	6.50	5.60	4.85
28.....	4.70	5.05	6.40	9.82	11.00	6.75	4.60	4.20	5.50	6.40	5.60	4.90
29.....	4.70	.....	6.85	9.40	11.00	6.60	4.45	4.20	5.40	6.30	5.45	4.90
30.....	4.95	.....	6.80	9.40	10.90	6.55	4.40	5.25	5.40	6.30	5.25	5.00
31.....	5.00	.....	6.32	.....	11.20	.....	4.30	4.50	.....	6.30	.....	5.00

SAN MARCIAL STATION ON RIO GRANDE.

This station, as described in the Eighteenth Annual Report, Part IV, page 254, is located at the railway bridge one-half mile south of San Marcial, New Mexico. The wire gage is attached to the guard rail of the bridge, lower side, south span. Bench marks: The 13-foot mark is level with the extension of the pier to which the old gage was fastened; the 15-foot mark is level with the top of the capstone on which the bridge truss rests. The channel is sandy and shifting. Several bridge piers also break the current. The observer is H. C. Lohman. The following discharge measurements were made by P. E. Harroun in 1897:

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Feb. 21...	7.40	344	June 7....	9.60	9,141	Aug. 18..	5.20	5
Mar. 24...	7.50	478	June 21...	8.70	4,142	Aug. 26..	5.60	23
Apr. 9....	7.50	800	June 29...	8.10	2,811	Sept. 4...	5.10	7
Apr. 9....	8.00	1,650	July 8....	7.40	1,053	Sept. 19..	8.00	4,276
Apr. 20...	8.50	3,165	July 16....	7.70	1,150	Oct. 3....	7.00	816
May 5....	10.20	8,679	July 30....	7.00	401	Oct. 15...	8.10	3,980
May 19...	10.00	10,403	Aug. 9.....	6.60	188	Oct. 28...	8.10	3,796

Daily gage height, in feet, of Rio Grande at San Marcial, New Mexico, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	7.50	7.40	7.50	8.50	9.50	10.15	7.80	6.60	5.00	7.00	8.00	7.90
2.....	7.50	7.40	7.50	8.20	9.50	10.05	7.90	6.60	5.00	7.00	8.00	7.80
3.....	7.50	7.40	7.50	7.60	9.50	10.00	7.95	6.40	5.10	6.90	8.00	7.70
4.....	7.40	7.40	7.50	7.60	9.80	9.75	7.60	6.30	5.10	6.90	7.90	7.70
5.....	7.40	7.40	7.50	7.60	10.25	9.80	7.60	6.65	7.60	8.45	7.90	7.70
6.....	7.40	7.40	7.50	7.60	10.65	9.60	7.50	6.90	7.75	9.40	8.00	7.80
7.....	7.40	7.40	7.50	7.60	11.20	9.50	7.50	6.60	7.10	8.55	8.00	7.90
8.....	7.40	7.40	7.50	7.60	10.75	9.25	7.40	6.95	6.80	8.10	8.00	7.70
9.....	7.40	7.40	7.50	7.90	10.50	9.05	7.60	6.55	6.35	8.25	7.90	7.70
10.....	7.40	7.40	7.50	8.00	10.50	9.00	7.70	6.25	6.80	11.00	8.00	7.70
11.....	7.40	7.40	7.50	8.30	10.50	9.00	7.80	6.00	6.40	9.15	8.00	7.70
12.....	7.25	7.40	7.50	8.30	10.50	9.15	7.55	6.00	6.85	8.65	7.80	7.70
13.....	7.25	7.40	7.50	8.30	10.50	9.20	7.85	5.90	8.30	8.40	7.60	7.70
14.....	7.25	7.40	7.45	8.60	10.50	9.25	7.60	5.90	8.50	8.30	7.60	7.70
15.....	7.12	7.40	7.55	8.95	10.50	9.20	7.55	5.85	7.75	8.20	7.60	7.80
16.....	7.00	7.40	7.65	8.50	10.50	9.00	7.50	5.70	7.35	8.10	7.60	7.80
17.....	7.00	7.48	7.50	8.50	10.50	9.00	7.50	5.60	7.50	8.00	7.80	7.70
18.....	7.00	7.45	7.40	8.50	10.50	8.95	7.50	5.30	7.20	8.00	7.80	7.70
19.....	7.00	7.45	7.40	8.50	10.50	9.00	7.80	5.20	7.65	8.00	7.90	7.70
20.....	7.00	7.45	7.40	8.65	11.55	8.90	7.70	5.85	7.00	8.20	7.90	7.70
21.....	7.00	7.45	7.40	9.15	12.35	8.70	7.50	5.90	6.80	8.30	7.90	7.70
22.....	7.00	7.45	7.48	9.40	12.35	8.55	7.40	5.85	6.80	8.40	7.90	7.70
23.....	7.00	7.50	7.50	9.75	11.70	8.40	7.40	5.70	6.80	8.30	7.90	7.70
24.....	7.00	7.50	7.50	9.50	10.00	8.20	7.40	5.60	7.00	8.20	7.80	7.70
25.....	7.30	7.50	7.80	9.50	10.00	8.15	7.30	5.75	7.70	8.20	7.80	7.70
26.....	7.30	7.50	7.65	9.50	10.00	8.00	7.30	5.70	8.25	8.20	7.80	7.70
27.....	7.30	7.50	7.60	9.50	10.00	7.85	7.30	5.65	8.15	8.20	7.80	7.70
28.....	7.32	7.50	7.60	9.50	10.00	8.40	7.30	5.65	7.65	8.10	7.80	7.70
29.....	7.40	.....	7.60	6.50	10.00	8.00	7.15	5.55	7.35	8.10	7.80	7.70
30.....	7.40	.....	7.60	9.50	10.80	7.85	7.00	5.35	7.00	8.20	7.90	7.70
31.....	7.40	.....	7.70	.....	10.60	.....	6.80	5.00	.....	8.20	.....	7.70

EL PASO STATION ON RIO GRANDE.

This station, as described in the Eighteenth Annual Report, Part IV, page 259, was located at the pumping house of the smelter company 3 miles north of El Paso, Texas. The bed of the stream here is composed of mud, constantly shifting and changing. May 1, 1897, the station was placed under the charge of W. W. Follett, consulting engineer, International (Water) Boundary Commission, and by him removed 1 mile farther up the river to Courchesne's limekiln. The river heights are measured at the masonry pump foundation pier 150 feet above the kiln. The top of the downstream chisel draft on this pier was assumed to be at gage height 15.0 feet, and the distance of the surface of the water below it was measured with a carefully graduated rod. The left bank of the river is formed by the loose rock fill of the Atchison, Topeka and Santa Fe Railroad embankment, and will not overflow. The right bank, however, is not so good, being made ground and subject to overflow. The bottom of the river here has also proven unstable, scouring on a rise and filling on a falling river. It is probably the best site for a station in the vicinity of El Paso, however, as the entire river bed is constantly shifting for many miles above and below. On account of this shifting character of the stream, the only accurate method of estimating the daily discharges is by taking a large number of measurements, which was done in 1897 as follows, by P. E. Harroun, W. W. Follett, and T. M. Courchesne:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Feb. 22...	6.60	195	May 23....	13.40	8,816	June 21..	10.00	5,227
Mar. 25...	6.00	52	May 24....	13.70	10,088	June 23..	9.60	4,100
Apr. 10...	7.00	242	May 25....	14.10	10,421	June 25..	8.90	2,809
May 4....	11.40	5,355	May 26....	14.35	11,583	June 26..	8.40	2,474
May 5....	11.35	5,277	June 4....	12.60	10,410	July 1....	10.40	5,617
May 7....	11.45	5,891	June 7....	12.30	9,448	July 3....	9.60	3,931
May 8....	11.95	6,588	June 11...	10.70	7,175	July 6....	8.30	1,733
May 11...	12.50	7,241	June 12...	10.30	5,228	July 8....	7.60	976
May 12...	11.85	6,810	June 14...	10.20	4,980	July 10...	7.50	1,059
May 19...	12.20	7,407	June 16...	10.10	5,340	July 16...	7.90	1,288
May 21...	12.40	8,099	June 18...	10.10	5,424	July 17...	7.60	902
May 22...	12.80	9,803	June 19...	10.20	5,446	July 19...	7.50	865

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.ft.</i>		<i>Feet.</i>	<i>Sec.ft.</i>		<i>Feet.</i>	<i>Sec.ft.</i>
July 24...	6.90	716	Sept. 20...	8.20	1,042	Nov. 22...	8.00	1,033
July 26...	6.70	508	Sept. 23...	7.20	555	Nov. 25...	8.00	1,049
July 29...	6.40	385	Sept. 25...	6.60	317	Nov. 27...	7.90	999
July 31...	6.20	302	Sept. 27...	6.65	347	Nov. 29...	8.10	959
Aug. 2....	6.10	229	Sept. 29...	7.75	1,289	Dec. 1....	8.10	886
Aug. 4....	5.80	100	Oct. 2.....	7.50	599	Dec. 3....	7.80	917
Aug. 6....	5.70	68	Oct. 22....	8.55	1,403	Dec. 6....	7.60	645
Aug. 9....	5.60	57	Oct. 25....	8.80	1,463	Dec. 8....	7.50	534
Aug. 11...	5.50	50	Oct. 29....	8.80	1,406	Dec. 11...	7.80	678
Aug. 13...	5.90	178	Nov. 1.....	8.90	1,654	Dec. 13...	7.30	503
Aug. 14...	5.80	130	Nov. 3.....	8.60	1,493	Dec. 15...	7.40	582
Aug. 17...	5.50	53	Nov. 6.....	8.40	1,332	Dec. 18...	7.80	687
Aug. 19...	7.00	495	Nov. 8.....	8.30	1,162	Dec. 20...	7.60	657
Aug. 22...	6.40	228	Nov. 10....	8.40	1,215	Dec. 22...	7.00	467
Sept. 10..	6.50	261	Nov. 13....	8.40	1,242	Dec. 24...	7.30	541
Sept. 12..	6.65	308	Nov. 15....	8.10	1,006	Dec. 27...	7.40	583
Sept. 14..	7.20	702	Nov. 17....	7.90	882	Dec. 29...	7.50	616
Sept. 16..	9.05	2,882	Nov. 19....	8.20	1,248			
Sept. 18..	8.60	1,892	Nov. 20....	8.10	1,034			

Daily gage height, in feet, of Rio Grande at El Paso, Texas, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	6.60	6.90	6.30	6.05	all 30	12.70	10.30	6.20	(b)	7.85	8.90	8.10
2.....	6.60	6.90	6.30	6.00	11.40	12.60	9.90	6.10	(b)	7.40	8.70	8.00
3.....	6.70	6.80	6.20	5.90	11.50	12.80	9.00	5.95	(b)	7.00	8.60	8.00
4.....	6.70	6.80	6.20	6.75	11.40	12.60	8.60	5.80	(b)	6.65	8.50	7.95
5.....	6.75	6.80	6.20	7.80	11.35*	12.55	8.20	5.80	6.10	6.45	8.45	7.85
6.....	6.80	6.80	6.15	7.50	11.40	12.55	8.20	5.70	5.95	6.35	8.40	7.85
7.....	7.20	6.85	6.10	7.05	11.50	12.25	7.70	5.60	5.90	6.15	8.40	7.70
8.....	6.95	6.80	6.00	7.00	12.00	11.95	7.55	5.60	6.40	7.00	8.35	7.55
9.....	6.65	6.70	6.00	7.00	12.65	11.70	7.30	5.60	6.10	10.15	8.40	7.70
10.....	6.45	6.75	5.90	7.00	13.40	11.05	7.60	5.60	6.60	9.55	8.40	7.90
11.....	6.45	6.85	5.90	7.00	12.65	10.65	8.40	5.50	6.60	9.45	8.40	8.00
12.....	6.20	6.85	5.80	7.95	11.75	10.30	7.90	5.40	6.70	10.60	8.40	7.75
13.....	6.20	6.80	5.85	8.50	11.55	10.25	7.90	5.80	7.05	11.15	8.40	7.35
14.....	6.20	6.80	5.85	8.40	11.70	10.15	7.90	5.80	7.40	10.00	8.25	7.40
15.....	6.20	6.90	6.20	8.30	11.95	9.90	7.95	5.60	7.30	9.20	8.10	7.35
16.....	6.20	6.85	6.20	8.30	12.05	10.10	7.85	5.70	9.10	8.90	8.10	7.40
17.....	7.50	6.80	6.10	8.50	12.35	10.10	7.55	5.50	8.90	8.65	7.95	7.40
18.....	8.25	6.80	6.05	8.60	12.35	10.15	7.45	6.50	8.60	8.75	8.00	7.80
19.....	8.00	6.75	6.00	8.60	12.20	10.15	7.50	7.20	8.70	8.70	8.15	7.75
20.....	7.60	6.70	6.00	8.80	12.10	10.10	7.20	6.80	8.10	8.60	8.10	7.55
21.....	7.35	6.60	6.00	9.05	12.60	10.05	6.90	6.50	7.90	8.60	8.15	7.25
22.....	7.30	6.60	6.35	9.15	12.80	9.75	7.20	6.40	7.50	8.55	8.05	7.00
23.....	7.20	6.50	6.30	9.80	13.25	9.55	7.70	6.10	7.20	8.60	8.10	7.20
24.....	7.20	6.50	6.20	10.05	13.80	9.20	6.90	5.90	7.00	8.85	8.05	7.35
25.....	7.20	6.45	6.00	10.15	14.15	8.80	6.75	5.70	6.70	8.80	7.95	7.50
26.....	7.10	6.50	5.85	10.25	14.45	8.35	6.70	5.50	6.50	8.70	7.85	7.50
27.....	7.00	6.40	5.75	10.45	15.30	8.20	7.30	(b)	6.70	8.70	7.95	7.40
28.....	6.90	6.35	5.75	10.50	14.20	8.05	6.40	(b)	7.15	8.80	7.95	7.50
29.....	6.75	.....	5.60	10.45	13.35	8.05	6.30	(b)	7.85	8.80	8.10	7.60
30.....	6.80	.....	5.80	10.40	12.90	9.30	6.25	(b)	8.35	8.80	8.00	7.35
31.....	6.80	.....	6.00	.....	12.70	.....	6.20	(b)	.....	8.70	.....	7.20

a Location of gaging station changed.

b No flow.

GRANGER STATION ON BLACKS FORK.

The old station, described in the Eighteenth Annual Report, Part IV, page 270, was located 3 miles west of Granger, Wyoming, at the Union Pacific railroad bridge, and above Hams Fork. On April 28 the location was abandoned and the station was removed to a point below Hams Fork, about one-fourth of a mile below Granger. The new rod consists of a horizontal timber 4 by 4 inches by 16 feet, fastened to two upright posts 6 feet apart and set firmly in the bank of the river above high-water mark. One end of this horizontal timber, to which the wire gage is fastened, projects out over the water. The length of the gage wire is 13.35 feet. The distance from the outside edge of the pulley to the zero of the rod is 2.45 feet. The bench mark is a rail spike in an old tie 24 feet southwest of inside post of gage. The letters "B. M." are marked in black paint on the tie. The elevation of the head of the spike above datum is 8.74 feet. The observer, pump man for the railroad, is J. R. Kirby. Discharge measurements are made from a cable and car 400 feet below the rod. The following are those made in 1897, by C. T. Johnston:

May 7, gage height, 4.55 feet; discharge, 3,724 second-feet.

May 18, gage height, 4.60 feet; discharge, 4,079 second-feet.

May 26, gage height, 5.10 feet; discharge, 4,976 second-feet.

June 3, gage height, 3.60 feet; discharge, 2,910 second-feet.

June 10, gage height, 2.75 feet; discharge, 1,758 second-feet.

June 15, gage height, 2.45 feet; discharge, 1,432 second-feet.

August 9, gage height, 0.40 foot; discharge, 222 second-feet.

Daily gage height, in feet, of Blacks Fork at Granger, Wyoming, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.				3.00	2.80	4.00	1.00	0.20	-0.10	0.65		
2.	2.90			3.20	3.05	3.85	1.00	.20	- .10	1.50		
3.				2.90	3.20	3.50	1.05	.20	- .10			
4.				3.20	3.35	3.20	1.20	.30	- .10			0.80
5.				3.20	3.70	2.90	1.15	.30	+ .05			
6.		2.90	2.90	2.90	4.20	2.65	1.05	.30	.00			
7.				23.60	4.55	2.50	.95	.35	.00		0.60	
8.				3.40	4.95	2.40	.90	.40	.00			
9.	2.90			3.20	5.10	2.50	.85	.40	.00	.90		
10.				3.50	4.95	2.65	.80	.40	.00			
11.				5.50	4.60	2.70	.70	.40	.00			1.20
12.				4.60	4.10	2.50	.70	.40	.00			
13.		2.90	2.90	4.20	3.85	2.30	.60	.35	.00		.60	
14.				3.70	4.10	2.40	.60	.30	.10			
15.				3.50	4.25	2.30	.60	.30	.10			
16.	2.90			3.90	4.50	2.25	.60	.30	.20	.80		
17.				4.20	4.55	2.05	.60	.20	.30			
18.				4.40	4.60	2.05	.60	.20	.30			
19.			2.90	4.60	4.50	1.75	.60	.10	.30			1.10
20.		2.90		4.60	4.55	1.60	.55	.10	.25		.50	
21.				4.50	5.05	1.45	.50	.10	.20			
22.				4.20	5.30	1.40	.50	.10	.20			
23.	2.90			3.60	5.30	1.40	.50	.10	.20	.60		
24.				3.30	5.60	1.30	.50	.05	.20			
25.				3.30	5.40	1.20	.40	.00	.20			1.10
26.				3.20	4.95	1.20	.40	.00	.25			
27.		2.90	2.90	3.50	4.70	1.10	.35	.00	.35			
28.				61.90	4.35	1.05	.30	.00	.40			
29.				2.30	4.20	1.10	.30	.00	.50			
30.	2.90			2.50	4.20	1.10	.20	.00	.50			
31.					4.05		.20	.00				

a New wire gage.

b Station moved to one-fourth mile below Granger, Wyoming.

GREENRIVER STATION ON GREEN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 272, is located at Greenriver, Wyoming. The rod is fastened to an old pile near the east end of the bridge at the pump house of the railroad company. The pumpman in charge, William Slater, is the observer. The bench mark consists of a cross on the third step from the bottom on the south end of east abutment, and is 12.48 feet above datum. The section under the railroad bridge is poor, and discharge measurements are made from the new iron highway bridge one-half mile below. The channel here is straight for some distance above and below. The banks are medium high, and the bed is composed of small cobblestones and gravel, being quite permanent in character. The following discharge measurements were made by Cyrus C. Babb and C. T. Johnston in 1897:

April 27, gage height, 1.85 feet; discharge, 1,820 second-feet.
 May 7, gage height, 3.30 feet; discharge, 6,970 second-feet.
 May 18, gage height, 4.00 feet; discharge, 9,325 second-feet.
 May 26, gage height, 5.35 feet; discharge, 15,318 second-feet.
 June 3, gage height, 5.10 feet; discharge, 14,896 second-feet.
 June 10, gage height, 3.45 feet; discharge, 6,104 second-feet.
 June 15, gage height, 3.60 feet; discharge, 7,094 second-feet.
 August 9, gage height, 2.00 feet; discharge, 2,081 second-feet.

Daily gage height, in feet, of Green River at Greenriver, Wyoming, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1				1.88	2.35	4.80	2.85	1.85	1.10	1.00	1.25
2				1.75	2.50	4.92	2.75	1.95	1.05	1.32	
3	1.80			1.55	2.55	5.08	2.75	2.02	1.00		1.25
4				1.50	2.72	4.80	2.85	2.25	0.98		
5		2.20	2.15	1.58	2.95	4.40	3.00	2.22	.95		1.20
6		2.20	2.15	1.52	3.15	4.12	2.92	2.18	.95		
7				1.50	3.32	3.82	2.75	2.08	1.00		
8	1.80			1.52	3.45	3.55	2.65	2.10	1.00		1.20
9	1.80			1.48	3.68	3.48	2.58	2.02	.95		
10				1.45	3.65	3.58	2.50	2.10	1.00		1.20
11				1.55	3.58	3.68	2.50	2.05	1.00	1.35	
12	1.80	2.10	2.15	1.72	3.50	3.72	2.50	1.98	1.00		1.20
13		2.10		1.78	3.38	3.65	2.45	1.88	1.00	1.30	
14			2.15	1.95	3.38	3.65	2.40	1.82	.95		
15				2.00	3.50	3.68	2.32	1.80	.95	1.25	1.20
16	1.80			2.05	3.68	3.75	2.30	1.80	.95		
17				2.15	3.88	3.75	2.25	1.75	.90		1.20
18	1.80	2.10		2.30	4.02	3.80	2.30	1.68	.90	1.80	
19			2.15	2.25	4.10	3.75	2.25	1.58	.90		1.15
20		2.10	2.15	2.35	4.25	3.55	2.25	1.50	.90	1.60	
21				2.40	4.62	3.35	2.22	1.45	.90		
22	1.90			2.50	5.30	3.12	2.18	1.40	.90	1.20	
23				2.40	5.86	3.05	2.12	1.40	.90		
24	1.90			1.85	5.58	3.00	2.10	1.35	.90		
25				1.78	5.42	2.98	2.02	1.32	.90	1.25	
26		2.15	2.40	1.80	5.32	3.02	1.98	1.28	.95		
27		2.15	2.40	1.98	5.28	3.00	1.95	1.25	.95	1.30	
28				2.05	5.15	3.00	1.90	1.20	.95		
29	2.00			2.22	4.88	3.00	1.90	1.20	1.00	1.30	
30	2.00			2.35	4.60	2.98	1.85	1.15	1.00		
31					4.62		1.80	1.12			

BLAKE STATION ON GREEN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 275, is located at the crossing of the Rio Grande Western Railroad at Blake, Utah. The elevation of the top of the pier, to which the old vertical rod is attached, is 22.00 feet above the rod datum. The rod of the wire gage is nailed to the guard rail on the lower side of the bridge. The distance from the end of the rod to the outside edge of the pulley wheel is 1 foot; from the end of the weight to the wire index marker, 27.67 feet. The observer is Frank Jacobs, rancher. The section at this point is good, the channel being straight for some distance above and below. The bed is gravelly. The initial point for soundings is on the right bank. The following discharge measurements were made in 1897 by Cyrus C. Babb and W. B. Dougall:

April 21, gage height, 4.88 feet; discharge, 8,175 second-feet.

May 22, gage height, 10.10 feet; discharge, 55,886 second-feet.

November 22, gage height, 2.80 feet; discharge, 3,373 second-feet.

Daily gage height, in feet, of Green River at Blake, Utah, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.					6.75	10.55	5.55	3.30	2.30	3.95	3.20	2.60
2.	1.70				7.05	10.25	5.35	3.30	2.20	4.50	3.20	2.50
3.				3.70	7.40	10.20	5.15	3.20	2.20	4.50	3.15	2.40
4.				3.70	7.80	10.00	5.15	3.10	2.35	4.50	3.10	2.30
5.				3.60	8.25	10.00	5.25	3.20	2.20	4.30	3.10	2.20
6.		1.80	2.00	3.75	8.70	9.95	5.20	3.30	2.35	4.15	3.00	2.10
7.				3.65	8.90	9.15	5.00	3.40	2.40	4.05	3.00	2.00
8.				3.50	9.05	8.60	4.90	3.50	2.55	4.35	3.00	1.90
9.	1.70			3.50	9.25	8.20	4.80	3.50	2.70	4.55	2.90	1.90
10.				3.60	9.45	7.90	4.70	3.40	2.85	4.85	2.90	1.90
11.				3.70	9.65	7.60	4.60	3.40	3.25	4.75	2.90	1.90
12.				3.55	9.90	7.50	4.50	3.40	4.70	4.60	2.80	1.80
13.		1.90		3.55	9.95	7.80	4.40	3.45	4.70	4.50	2.80	1.80
14.				3.70	9.85	7.70	4.30	3.50	5.30	4.35	2.80	1.70
15.			2.00	3.95	9.25	7.80	4.20	3.50	3.70	4.10	2.80	1.70
16.	1.80			4.15	9.15	7.70	4.10	3.40	3.40	3.85	2.80	1.60
17.				4.35	9.35	7.60	4.10	3.30	3.30	3.80	2.80	1.50
18.				4.50	9.55	7.50	4.10	3.15	2.90	3.70	2.80	1.40
19.				4.60	9.75	7.35	4.00	3.05	2.80	3.70	2.80	1.40
20.		1.90	2.10	4.60	9.95	7.25	4.00	2.90	2.80	3.60	2.80	1.30
21.				4.75	10.05	7.10	3.90	2.85	2.70	3.60	2.80	1.40
22.				5.60	10.05	6.95	3.90	2.70	2.60	3.50	2.80	1.30
23.	1.60			5.45	10.05	6.75	3.80	2.70	2.50	3.50	2.80	1.20
24.				6.15	10.25	6.55	3.80	2.60	2.50	3.40	2.80	1.20
25.				6.30	10.60	6.35	3.80	2.60	2.50	3.50	2.80	1.10
26.				5.80	11.00	6.25	3.70	2.50	2.50	3.55	2.80	1.20
27.		1.95	2.90	5.70	11.25	6.15	3.60	2.50	2.65	3.45	2.80	1.30
28.				5.70	11.35	6.35	3.50	2.40	2.85	3.40	2.80	1.25
29.			3.90	5.95	11.40	5.95	3.50	2.40	3.05	3.40	2.80	1.35
30.	1.60			6.30	11.15	5.75	3.50	2.40	3.35	3.30	2.70	1.40
31.					10.95		3.40	2.40		3.20		1.30

SHOSHONE STATION ON GRAND RIVER.

This station is located at Shoshone, or Gypsum post-office, Colorado, on the line of Denver and Rio Grande Railroad, 10 miles east of Glenwood Springs, Colorado. The rod is a vertical 3 by 6 inch wooden timber set 3 or 4 feet into rock and well braced. Observations are taken by the station agent, George Ruark, under the direction of the division superintendent of the railroad company. No discharge measurements were made at this point in 1897.

Daily gage height, in feet, of Grand River at Shoshone, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Day.	May.	June.	July.	Aug.
1.....	4.10	13.40	6.55	1.55	17.....	10.35	11.40	4.00	(a)
2.....	5.15	13.35	6.60	1.55	18.....	10.90	10.25	4.00	(a)
3.....	5.70	12.50	7.00	1.90	19.....	11.05	9.35	3.69	(a)
4.....	6.95	10.25	6.90	2.50	20.....	11.10	9.25	3.50	(a)
5.....	7.15	9.50	6.50	2.70	21.....	11.45	9.50	3.00	(a)
6.....	8.20	8.50	5.35	2.95	22.....	11.60	9.85	2.45	(a)
7.....	8.90	8.30	4.85	2.55	23.....	11.75	9.95	2.50	(a)
8.....	9.90	7.55	5.00	2.00	24.....	12.65	9.55	2.40	(a)
9.....	10.10	8.20	6.00	2.05	25.....	13.35	8.85	2.60	(a)
10.....	9.95	9.55	6.70	1.95	26.....	13.20	8.60	2.50	(a)
11.....	9.45	10.00	5.70	1.55	27.....	13.00	9.00	2.25	(a)
12.....	8.75	10.65	5.35	1.20	28.....	12.85	8.60	2.20	(a)
13.....	8.60	11.40	4.70	1.10	29.....	12.95	7.55	1.75	(a)
14.....	9.90	11.60	4.45	1.10	30.....	13.25	7.05	1.80	(a)
15.....	9.35	11.55	4.40	1.00	31.....	13.30	-----	1.60	(a)
16.....	10.05	11.85	4.35	.90					

a Below gage.

GRAND JUNCTION STATION ON GRAND RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 260, is located at the wagon bridge across the Grand River, near the pump house of the city waterworks, Grand Junction, Colorado. The river at this point discharges through two channels. Gage rod No. 1 consists of a vertical 4 by 6 inch timber, with 1 by 6 inch scale, bolted to the bridge abutment on right-hand side of the right channel. The 12-foot mark is on a level with the top of the bridge abutment. The banks of the right channel are both liable to overflow at very high water; the bed is of sand, and the current very sluggish. The horizontal wire gage No. 2 is fastened to the upper side of the bridge over the left channel between marks 595 and 605 feet. The distance from the end of the weight to outer end of snap is 31.80 feet. The bench mark is a cross on iron post of bridge at 592 foot mark, and is 31.0 feet above datum. The right bank of the left channel is low and liable to overflow, the left is high and rocky; the bed is sandy; the water is deep and moves with considerable velocity. At high water it becomes necessary to guy the meter to a wire stretched across the channel above the bridge to prevent it from being swept down stream by the swift current. The observer is B. W. Vedder, engineer at the pumping station. The following measurements were made in 1897 by C. C. Babb and F. Cogswell in Channel No. 1:

April 20, gage height, 1.75 feet; discharge, 1,157 second-feet.

May 18, gage height, 4.80 feet; discharge, 10,927 second-feet.

July 29 to November 23 the channel was dry.

The following measurements were made in Channel No. 2:

April 20, gage height, 5.60 feet; discharge, 4,019 second-feet.

May 19, gage height, 10.20 feet; discharge, 21,759 second-feet.

July 29, gage height, 5.35 feet; discharge, 4,044 second-feet.

September 29, gage height, 4.05 feet; discharge, 2,062 second-feet.

October 28, gage height, 3.98 feet; discharge, 1,764 second-feet.

November 23, gage height, 3.90 feet; discharge, 1,423 second-feet.

Daily gage height, in feet, of Grand River at Gage No. 1, Grand Junction, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Day.	Apr.	May.	June.	July.
1.....	0.00	2.60	5.10	1.45	17.....	1.00	4.55	3.80	.00
2.....	.00	2.90	5.25	1.25	18.....	1.25	4.70	3.40	.00
3.....	.00	3.25	4.65	1.35	19.....	1.55	4.95	2.85	.00
4.....	.00	3.50	3.75	1.65	20.....	1.80	4.75	2.55	.00
5.....	.00	3.80	2.85	1.50	21.....	1.85	4.60	2.65	.00
6.....	.00	4.15	2.50	.90	22.....	1.75	4.80	2.75	.00
7.....	.00	4.35	2.35	.65	23.....	1.60	4.85	2.85	.00
8.....	.00	4.70	2.20	.70	24.....	1.45	5.10	2.75	.00
9.....	.00	4.90	2.15	.90	25.....	1.50	5.35	2.40	.00
10.....	.00	4.75	2.80	1.15	26.....	1.65	5.30	2.10	(a)
11.....	.00	4.50	3.05	1.05	27.....	2.15	5.25	2.15	(a)
12.....	.00	4.35	3.40	1.00	28.....	2.40	5.00	2.15	(a)
13.....	.00	4.30	3.70	.50	29.....	2.40	4.90	1.90	(a)
14.....	.00	4.35	4.00	.15	30.....	2.45	5.10	1.55	(a)
15.....	.50	4.40	4.10	.00	31.....	.....	5.10	.....	(a)
16.....	.70	4.45	4.00	.00					

a Dry for rest of year.

Daily gage height, in feet, of Grand River at Gage No. 2, Grand Junction, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	.....	.....	.....	3.50	6.75	10.30	7.95	5.10	4.00	4.00	3.85	3.80
2.....	2.80	.....	.....	3.60	7.20	10.55	7.75	5.15	4.00	4.00	3.90	3.90
3.....	.....	3.00	3.30	3.50	7.65	10.10	7.85	5.55	4.00	4.00	3.90	3.90
4.....	.....	.....	.....	3.40	7.90	9.30	8.15	5.75	4.00	4.00	3.90	3.70
5.....	.....	.....	.....	3.45	8.20	8.40	8.05	5.80	4.00	4.10	3.90	.....
6.....	.00	3.10	3.20	3.50	8.55	9.35	7.45	5.90	3.90	4.00	4.05	.....
7.....	.....	.....	.....	3.75	8.75	9.15	7.15	5.85	3.90	4.20	4.10	.....
8.....	.00	.....	.....	3.55	9.10	9.00	7.15	5.60	4.10	4.10	4.10	3.80
9.....	.....	.....	.....	3.60	9.45	8.95	7.45	5.40	4.10	4.20	4.05	.....
10.....	.....	.....	3.20	3.50	9.25	9.40	7.70	5.40	4.00	4.30	4.00	.....
11.....	.....	3.00	.....	3.60	9.00	9.75	7.75	5.30	4.20	4.20	3.85	3.80
12.....	.....	.....	.....	3.70	8.90	9.90	7.45	5.15	4.20	4.15	3.80	.....
13.....	.....	3.10	3.10	3.60	8.70	10.00	7.05	4.95	4.25	4.10	3.95	.....
14.....	3.00	.....	.....	3.80	8.85	10.30	6.75	4.90	4.70	4.10	4.10	.....
15.....	.....	.....	.....	3.90	8.90	10.35	6.65	4.90	4.45	4.10	4.10	3.80
16.....	3.10	.....	.....	4.10	8.95	10.25	6.80	4.75	4.25	4.10	4.00	.....
17.....	.....	3.10	3.40	4.55	9.10	9.95	6.60	4.60	4.10	4.50	3.90	.....
18.....	.....	.....	.....	4.85	9.20	9.75	6.45	4.55	4.00	4.35	3.80	3.70
19.....	.....	.....	.....	5.25	10.20	9.40	6.40	4.40	4.00	4.15	3.80	.....
20.....	.....	3.20	3.60	5.50	10.10	9.25	6.30	4.30	4.00	4.10	3.80	.....
21.....	2.90	.....	.....	5.65	10.00	9.20	6.15	4.30	4.00	4.00	3.95	.....
22.....	.....	.....	.....	5.55	10.20	9.25	5.95	4.20	4.00	4.00	3.90	3.70
23.....	3.00	.....	.....	5.40	10.25	9.35	5.75	4.10	4.00	4.00	3.90	.....
24.....	.....	3.10	3.00	5.15	10.50	9.25	5.70	4.10	3.95	4.00	3.90	.....
25.....	.....	.....	.....	5.20	10.70	9.00	5.60	4.05	3.90	4.10	4.10	3.80
26.....	.....	.....	.....	5.45	10.60	8.85	5.60	4.00	3.95	4.10	4.00	.....
27.....	.00	3.00	4.20	6.15	10.50	9.05	5.55	4.00	4.00	4.00	3.90	.....
28.....	.....	.....	.....	6.45	10.20	8.85	5.35	4.00	4.00	3.90	3.85	3.90
29.....	.....	.....	.....	6.50	10.10	8.50	5.35	4.00	4.00	3.80	3.75	.....
30.....	.00	.....	.....	6.55	10.20	8.20	5.25	4.00	4.00	3.80	.....	.....
31.....	.....	.....	.....	.....	10.35	.....	5.10	4.00	.....	3.80	.....	.....

FORT CRAWFORD STATION ON UNCOMPAHGRE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 265, is located about one-half mile east of the depot at Fort Crawford, Colorado, at a wagon bridge, and is about 8 miles above Montrose. The gage consists of an inclined 4 by 4 inch timber, bolted to the bridge bent on the right-hand side of the stream. The bench mark consists of a spike driven in the base of a cottonwood post, and is 9.18 feet above zero. Both banks are low and liable to overflow at high water, and the bed of the stream is composed of sand and gravel. The observer is Mrs. F. Humphrey; post-office, Uncompahgre, Colorado. The following discharge measurements were made during 1897 by F. Cogswell.

April 18, gage height, 3.90 feet; discharge, 487 second-feet.

May 10, gage height, 4.55 feet; discharge, 884 second-feet.

June 21, gage height, 5.05 feet; discharge, 1,081 second-feet.

July 19, gage height, 4.50 feet; discharge, 473 second-feet.

August 23, gage height, 3.45 feet; discharge, 70 second-feet.

September 20, gage height, 3.85 feet; discharge, 153 second-feet.

October 18, gage height, 4.00 feet; discharge, 195 second-feet.

Daily gage height, in feet, of Uncompahgre River at Fort Crawford, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	3.15	4.05	4.50	4.50	4.00	3.35	4.35	3.95
2.....	3.15	4.15	4.40	4.60	4.20	3.40	4.15	3.90
3.....	2.95	4.25	4.05	5.35	4.10	3.40	4.05	3.90
4.....	3.05	4.40	3.95	4.70	3.95	3.40	4.00	3.90
5.....	3.20	4.40	4.05	4.65	4.15	3.45	4.00	3.90
6.....	3.20	4.50	4.00	4.65	4.05	3.45	4.15	3.85
7.....	3.30	4.50	4.10	4.70	4.20	3.55	4.15	3.85
8.....	3.28	4.45	4.65	4.85	4.00	3.40	4.15	3.80
9.....	3.25	4.40	5.00	4.95	4.00	3.60	4.05	3.80
10.....	3.25	4.45	5.00	4.85	3.85	3.45	4.05	3.70
11.....	3.25	4.20	4.85	4.70	3.95	3.40	4.05	3.65
12.....	3.30	4.45	4.80	4.65	4.00	3.55	4.00	3.70
13.....	3.32	4.30	5.10	4.65	3.85	3.85	4.00	3.75
14.....	3.50	4.25	5.30	4.60	3.80	4.10	4.05	3.70
15.....	3.60	4.35	5.40	4.65	3.85	4.05	4.20	3.75
16.....	3.80	4.20	5.35	4.50	3.85	4.05	4.05	3.80
17.....	3.90	4.15	5.05	4.45	3.75	3.85	4.00	3.65
18.....	4.10	4.45	5.05	4.50	3.60	3.80	4.00	3.75
19.....	4.20	4.40	4.90	4.45	3.60	3.85	4.10	3.70
20.....	4.05	4.40	4.95	4.10	3.55	3.90	4.00	3.65
21.....	3.95	4.50	5.00	4.30	3.50	4.05	4.00	3.60
22.....	3.75	4.35	5.15	4.45	3.50	4.00	3.90	3.60
23.....	3.60	4.45	5.40	4.45	3.45	3.95	3.80	3.65
24.....	3.65	4.65	5.20	4.35	3.45	4.00	3.90	3.65
25.....	4.10	4.55	5.05	4.45	3.40	3.95	3.90	3.60
26.....	4.00	4.85	5.15	4.15	3.40	4.15	4.00	3.65
27.....	4.15	4.90	5.00	4.15	3.35	4.15	3.85	3.65
28.....	4.30	4.20	4.55	4.25	3.35	3.95	3.85	.....
29.....	4.30	5.00	4.90	3.85	3.40	4.05	3.85	.....
30.....	4.40	5.00	5.00	4.00	3.40	4.20	3.90	.....
31.....	.....	4.95	.....	4.00	3.40	.....	3.90	.....

ROUBIDEAU AND WHITEWATER STATIONS ON GUNNISON RIVER.

Gage heights at these stations are reported daily by telegraph to the division superintendent of the Denver and Rio Grande Railroad Company at Salida, Colorado, who has kindly furnished this office with copies of same.

Roubideau station is at the railroad bridge at Roubideau, Colorado, 6 miles west of Delta. The observer is M. J. Johnston, track foreman.

Whitewater station is located 13 miles southeast of Grand Junction at Whitewater, Colorado. The gage is a vertical rod graduated to feet and halves and securely fastened on the right bank of the river. The observer is James Page, station agent. No measurements of discharge have been made at these stations.

Daily gage height, in feet, of Gunnison River at Roubideau, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Day.	May.	June.	July.	Aug.	Day.	May.	June.	July.	Aug.
1..	3.75	4.65	1.60	0.15	12...	4.50	3.60	1.25	0.15	23...	4.50	2.85	0.50	(a)
2..	4.25	5.15	1.50	.15	13...	4.75	3.85	1.15	.15	24...	4.75	2.85	.50	(a)
3..	4.50	4.50	1.75	.15	14...	4.75	4.25	1.15	.15	25...	5.00	2.75	.25	(a)
4..	4.00	3.75	1.75	.15	15...	4.85	4.00	1.00	.15	26...	4.90	2.25	.25	(a)
5..	4.50	3.25	1.50	.15	16...	4.75	4.00	.85	.15	27...	4.85	2.35	.25	(a)
6..	5.25	2.85	1.35	.15	17...	4.50	3.75	.85	.15	28...	4.75	2.35	.15	(a)
7..	5.50	2.75	1.25	.15	18...	4.40	3.25	.85	.15	29...	4.40	2.00	.25	(a)
8..	5.75	2.85	1.25	.15	19...	4.60	2.75	.85	.15	30...	4.60	1.75	.50	(a)
9..	5.75	3.00	1.25	.15	20...	4.50	2.65	.65	(a)	31...	4.50	.....	.15	(a)
10..	5.50	3.50	1.25	.15	21...	4.40	2.85	.65	(a)					
11..	5.00	3.60	1.25	.15	22...	4.35	2.75	.50	(a)					

a Below gage.

Daily gage height, in feet, of Gunnison River at Whitewater, Colorado, for 1897.

Day.	May.	June.	July.	Day.	May.	June.	July.	Day.	May.	June.	July.
1....	4.40	5.35	1.00	12....	5.50	4.00	(a)	23.....	5.00	3.00	(a)
2....	4.60	5.75	1.00	13....	5.60	4.15	(a)	24.....	5.25	3.00	(a)
3....	4.85	5.25	1.00	14....	5.65	4.35	(a)	25.....	5.60	3.00	(a)
4....	4.65	4.50	1.00	15....	5.60	4.35	(a)	26.....	5.50	2.75	(a)
5....	4.90	3.85	.65	16....	5.50	4.35	(a)	27.....	5.50	2.35	(a)
6....	5.60	3.60	.65	17....	5.40	4.40	(a)	28.....	5.50	2.55	(a)
7....	5.90	3.35	.50	18....	5.15	3.75	(a)	29.....	5.15	2.50	(a)
8....	6.35	3.15	.40	19....	5.35	3.30	(a)	30.....	5.15	1.60	(a)
9....	6.25	3.40	.35	20....	5.35	3.00	(a)	31.....	5.35	.....	(a)
10....	6.10	3.75	.35	21....	5.00	3.00	(a)				
11....	5.75	4.00	(a)	22....	5.00	3.00	(a)				

a Below gage.

GRAND JUNCTION STATION ON GUNNISON RIVER.

This station is located at the iron highway bridge 1.5 miles from the town of Grand Junction, Colorado. The gage is vertical and consists of a 2 by 6 inch timber bolted to the stone pier of the bridge. The top of the capstone is 17.60 feet above gage datum. The channel above the station is curved, but below it is nearly straight. The right bank is low and liable to overflow, but the left is high and rocky with still water at low stages. The observer is A. Lindquist, engineman at the Denver and Rio Grande Railroad Company's pump house. The following discharge measurements were made in 1897 by Cyrus C. Babb and F. Cogswell:

April 20, gage height, 4.60 feet; discharge, 5,975 second-feet.

May 20, gage height, 7.30 feet; discharge, 16,644 second-feet.

July 28, gage height, 2.65 feet; discharge, 1,814 second-feet.

September 28, gage height, 2.40 feet; discharge, 1,246 second-feet.

October 27, gage height, 2.50 feet; discharge, 1,270 second-feet.

November 23, gage height, 2.30 feet; discharge, 828 second-feet.

Daily gage height, in feet, of Gunnison River at Grand Junction, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		7.50	4.10	2.60	1.60	2.60	2.40	1.70
2.....	6.10	7.90	4.00	2.60	1.60	2.50	2.40	1.90
3.....	6.80	7.30	4.10	2.60	1.60	2.50	2.40	2.20
4.....	6.90	6.70	4.40	2.80	1.50	2.40	2.40	2.10
5.....	6.80	5.90	4.30	2.80	1.50	2.40	2.40	
6.....	7.30	5.70	4.10	2.80	1.60	2.40	2.40	
7.....	7.70	5.50	4.00	2.70	1.70	2.40	2.40	
8.....	8.10	5.40	4.00	2.60	1.70	2.50	2.30	
9.....	8.30	5.50	4.00	2.70	1.70	2.50	2.20	
10.....	8.10	6.00	4.30	2.70	1.70	2.70	2.10	
11.....	7.80	6.40	4.20	2.60	1.80	2.90	1.90	
12.....	7.40	6.60	4.00	2.50	1.80	2.80	2.10	
13.....	7.30	6.40	3.70	2.40	1.90	2.70	2.20	
14.....	7.40	6.70	3.50	2.30	2.00	2.60	2.40	
15.....	7.50	6.70	3.30	2.20	2.20	2.60	2.40	
16.....	7.60	6.70	3.30	2.20	2.20	2.70	2.30	
17.....	7.50	6.60	3.20	2.20	2.10	2.90	2.30	
18.....	7.10	6.00	3.20	2.10	2.10	2.80	2.10	
19.....	7.30	5.60	3.20	2.00	2.00	2.70	2.00	
20.....	7.40	5.40	3.20	2.00	2.00	2.70	2.10	
21.....	7.00	5.40	3.10	2.00	1.90	2.70	2.20	
22.....	7.00	5.40	3.00	1.90	2.00	2.60	2.10	
23.....	7.00	5.50	3.00	1.80	2.20	2.60	2.10	
24.....	7.30	5.50	2.90	1.70	2.20	2.60	2.30	
25.....	7.80	5.30	2.90	1.60	2.10	2.50	2.30	
26.....	7.60	5.20	2.90	1.60	2.10	2.50	2.20	
27.....	7.50	5.00	2.80	1.60	2.20	2.40	2.20	
28.....	7.50	4.90	2.70	1.50	2.30	2.40	2.00	
29.....	7.00	4.70	2.70	1.60	2.40	2.40	1.70	
30.....	7.30	4.40	2.70	1.60	2.60	2.30	1.60	
31.....	7.30		2.60	1.60		2.40		

FALL CREEK STATION ON SAN MIGUEL RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 264, is located about 300 yards southwest of Fall Creek, Colorado, a station on the Rio Grande Southern Railroad. Discharge measurements are made from the wagon bridge. The gage is vertical, 4 inches square, and is spiked to the west side of the north abutment. One bench mark is a bolthead in the north end of the west truss, 1 foot from the gage. It is 11.15 feet above the gage zero. The second bench mark is a spike driven into a tree 200 feet northwest. This is 8.65 feet above the zero. As the channel at this point is nearly straight and the banks rarely overflow, the section is a desirable one for measurements. Fall Creek empties into the San Miguel about 200 feet below the gage. The observer is Mrs. H. H. Hart; post-office address, Sawpit, Colorado. The following is a list of discharge measurements made in 1897 by F. Cogswell:

April 20, gage height, 3.40 feet; discharge, 304 second-feet.

May 11, gage height, 4.05 feet; discharge, 572 second-feet.

June 22, gage height, 4.45 feet; discharge, 811 second-feet.

July 20, gage height, 3.45 feet; discharge, 336 second-feet.

August 24, gage height, 2.85 feet; discharge, 145 second-feet.

September 21, gage height, 3.30 feet; discharge, 248 second-feet.

October 19, gage height, 3.05 feet; discharge, 197 second-feet.

Daily gage height, in feet, of San Miguel River at Fall Creek, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	2.45	3.70	4.60	4.05	3.30	2.80	3.35	2.80
2.....	2.35	3.75	4.50	4.05	3.40	2.85	3.25	2.80
3.....	2.35	3.75	4.10	4.15	3.40	3.15	3.15	2.75
4.....	2.25	3.65	3.95	3.90	3.35	3.00	3.10	2.75
5.....	2.55	3.75	4.10	3.70	3.25	2.95	3.05	2.75
6.....	2.55	3.85	4.10	3.60	3.20	2.90	3.00	2.70
7.....	2.55	3.95	4.30	3.65	3.20	2.90	3.20	2.65
8.....	2.60	4.10	4.45	3.90	3.20	3.15	3.10	2.50
9.....	2.65	4.00	4.65	3.85	3.15	3.10	3.15	2.50
10.....	2.80	4.10	4.65	3.80	3.10	3.00	3.15	2.55
11.....	2.75	4.00	4.40	3.85	3.10	3.00	3.10	2.65
12.....	2.70	4.00	4.45	3.80	3.00	3.00	3.10	2.70
13.....	2.80	4.10	4.50	3.80	3.00	3.05	3.10	2.70
14.....	2.90	4.15	4.55	3.80	3.00	3.45	3.05	2.75
15.....	3.05	4.10	4.65	3.75	3.05	3.35	3.05	2.75
16.....	3.25	4.15	4.70	3.70	3.05	3.30	3.15	2.60
17.....	3.35	4.05	4.40	3.65	3.00	3.20	3.15	2.55
18.....	3.60	4.20	4.40	3.60	3.00	3.15	3.00	2.60
19.....	3.55	4.20	4.40	3.55	3.00	3.10	3.05	2.55
20.....	3.55	4.05	4.25	3.50	2.90	3.20	3.00	2.60
21.....	3.50	4.05	4.45	3.25	2.85	3.30	3.00	2.55
22.....	3.25	4.05	4.50	3.25	2.80	3.35	2.95	2.50
23.....	3.25	4.25	4.50	3.30	2.75	3.20	2.85	2.50
24.....	3.35	4.40	4.45	3.45	2.75	3.20	2.80	2.50
25.....	3.55	4.50	4.45	3.45	2.80	3.25	2.95	2.50
26.....	3.70	4.65	4.50	3.45	2.80	3.25	2.85	2.40
27.....	3.80	4.65	4.20	3.40	2.80	3.20	2.85	2.40
28.....	3.65	4.40	3.95	3.30	2.80	3.25	2.75	2.45
29.....	3.60	4.60	4.00	3.30	2.80	3.30	2.75	2.40
30.....	3.55	4.55	4.05	3.30	2.80	3.30	2.80	2.35
31.....	.....	4.50	.....	3.35	2.75	.....	2.85	.....

DOLORES STATION ON DOLORES RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 261, is located about one-half mile above the railroad depot at Dolores, Colorado. The gage consists of a vertical 2 by 6 inch plank, bolted to the abutment of a footbridge, on the left side of the river. The bench mark consists of a nail driven in the base of a cottonwood tree 18 feet southwesterly from the gage, and it is 15.60 feet above datum. The observer is Mrs. Mary D. Smith. The following discharge measurements were made in 1897 by F. Cogswell:

April 21, gage height, 5.10 feet; discharge, 2,133 second-feet.

May 12, gage height, 5.15 feet; discharge, 2,216 second-feet.

June 23, gage height, 4.20 feet; discharge, 1,089 second-feet.

July 21, gage height, 3.00 feet; discharge, 273 second-feet.

August 25, gage height, 2.65 feet; discharge, 92 second-feet.

September 22, gage height, 3.32 feet; discharge, 404 second-feet.

October 20, gage height, 3.25 feet; discharge, 330 second-feet.

Daily gage height, in feet, of Dolores River at Dolores, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	3.00	5.15	5.55	3.60	2.90	2.60	3.35	3.00
2	3.00	5.40	5.40	3.55	2.90	2.60	3.50	3.00
3	3.05	5.45	4.85	3.55	3.00	2.85	3.50	3.00
4	3.25	5.35	4.75	3.55	3.00	2.80	3.55	3.00
5	3.35	5.45	4.80	3.40	3.00	3.80	3.40	3.00
6	3.35	5.45	4.75	3.40	2.95	3.80	3.30	2.90
7	3.35	5.50	4.85	3.40	2.90	3.80	3.30	2.90
8	3.35	5.60	4.95	3.40	2.90	3.90	3.45	2.85
9	3.50	5.85	4.80	3.50	2.90	3.25	3.55	2.85
10	3.75	5.60	5.15	3.40	2.90	3.15	3.45	3.05
11	4.10	5.40	4.85	3.30	2.85	3.05	3.40	2.95
12	4.15	5.20	5.35	3.30	2.80	3.20	3.30	2.95
13	4.45	5.45	4.65	3.30	2.80	3.20	3.30	2.90
14	4.70	5.50	4.80	3.20	2.80	3.35	3.30	2.80
15	5.05	5.45	4.80	3.20	2.80	3.25	3.30	2.85
16	5.15	5.20	4.75	3.30	2.80	3.15	3.30	2.80
17	5.40	5.10	4.50	3.30	2.80	3.10	3.30	2.80
18	5.95	5.35	4.40	3.20	2.80	3.00	3.30	2.80
19	5.85	5.55	4.25	3.15	2.70	2.95	3.30	2.80
20	5.40	5.75	4.25	3.00	2.70	3.10	3.20	2.80
21	5.15	5.65	4.25	3.00	2.70	3.40	3.20	2.80
22	4.85	5.40	4.25	3.00	2.70	3.40	3.20	2.80
23	4.75	5.40	4.20	3.20	2.70	3.20	3.20	2.80
24	4.70	5.70	4.05	3.10	2.70	3.25	3.20	2.80
25	5.15	5.80	3.95	3.10	2.70	3.40	3.20	2.80
26	5.50	5.65	3.95	3.05	2.70	3.45	3.10	2.80
27	5.80	5.75	3.80	3.00	2.70	3.45	3.10	2.80
28	5.05	5.05	3.70	3.00	2.70	3.35	3.10	2.70
29	5.20	5.35	3.65	2.95	2.70	3.45	3.00	2.70
30	5.15	5.60	3.55	2.95	2.70	3.40	3.00	2.70
31		5.45		2.90	2.60		3.00	

ARBOLES STATION ON SAN JUAN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 279, is located at a foot bridge about 1,000 feet below the Denver and Rio Grande Railroad depot at Arboles, Colorado, and is above the mouth of the Piedra River. The gage consists of two inclined 4 by 4 inch timbers marked to vertical tenths of a foot, the space between marks being 0.131 of a foot, and it is bolted to the rocky bank on the right-hand side of the river. The left bank is low and liable to overflow, the right is high and rocky; the current is sluggish, and the bed sandy and shifting. Discharge measurements are made during high water at the footbridge, and at low stages about 1,300 feet below the gage, where the bed of the stream is composed of small stones and is less liable to change, and the current is swift. The observer is T. F. Burke, section foreman. The following discharge measurements have been made in 1897 by F. Cogswell:

April 25, gage height, 8.30 feet; discharge, 2,753 second-feet.

May 16, gage height, 8.80 feet; discharge, 3,316 second feet.

June 27, gage height, 7.60 feet; discharge, 1,604 second-feet.

July 25, gage height, 6.50 feet; discharge, 446 second-feet.

August 29, gage height, 5.80 feet; discharge, 209 second-feet.

September 26, gage height, 8.00 feet; discharge 2,048 second-feet.

October 24, gage height, 6.90 feet; discharge, 795 second-feet.

Daily gage height, in feet, of San Juan River at Arboles, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	6.50	8.20	9.10	7.25	6.20	5.70	6.50	6.60
2.....	6.80	8.40	8.85	7.30	6.20	5.70	6.50	6.50
3.....	6.60	8.45	8.35	7.45	6.30	6.50	6.65	6.50
4.....	6.75	8.60	8.10	7.40	6.30	5.90	7.50	6.50
5.....	6.95	8.05	8.05	7.10	6.35	6.00	7.35	6.50
6.....	7.45	8.50	8.10	7.05	6.25	6.65	7.10	6.50
7.....	7.85	8.63	8.25	6.90	6.20	7.00	7.05	6.50
8.....	7.25	8.70	8.50	6.95	6.20	6.40	7.15	6.40
9.....	7.20	8.85	8.50	7.05	6.20	6.80	8.05	6.40
10.....	7.25	8.90	8.60	7.10	6.30	6.50	7.90	6.40
11.....	7.85	8.55	8.75	7.05	6.20	6.45	7.70	6.40
12.....	7.65	8.50	8.50	6.90	6.10	7.90	7.55	6.40
13.....	7.75	8.70	8.40	6.90	6.10	6.95	7.40	6.40
14.....	7.80	8.75	8.40	6.70	6.15	7.15	7.20	6.35
15.....	8.10	8.60	8.35	6.70	6.10	6.65	7.50	6.30
16.....	8.20	8.75	8.40	6.70	6.15	6.50	7.50	6.30
17.....	8.60	8.65	8.15	6.70	6.35	6.40	7.50	6.30
18.....	8.90	8.85	7.85	6.75	6.15	6.40	7.40	6.30
19.....	8.90	9.20	7.80	6.60	6.10	6.30	7.55	6.20
20.....	8.50	9.55	7.90	6.60	6.05	6.30	7.20	6.20
21.....	8.45	9.05	7.85	6.50	6.00	6.60	7.05	6.20
22.....	8.10	8.75	7.95	6.50	6.00	6.45	6.95	6.20
23.....	7.70	8.95	7.95	6.75	6.00	6.40	6.90	6.20
24.....	7.85	9.20	7.75	6.65	6.00	6.40	6.90	6.20
25.....	8.15	9.20	7.60	6.50	5.90	7.10	6.85	6.20
26.....	8.35	9.30	7.70	6.40	5.90	7.65	6.80	6.20
27.....	8.75	9.35	7.65	6.40	5.90	7.05	6.80	6.20
28.....	8.20	9.05	7.55	6.30	5.90	6.90	6.70	6.15
29.....	8.10	9.10	7.40	6.30	5.80	6.70	6.70	6.10
30.....	8.10	9.00	7.20	6.25	5.80	6.55	6.60	6.10
31.....		9.05	-----	6.20	5.70	-----	6.60	-----

ARBOLES STATION ON PIEDRA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 281, is located at the railroad bridge across the Piedra River, about one-half mile from the Denver and Rio Grande Railroad depot at Arboles, Colorado. The Piedra empties into the San Juan a short distance below this point. The gage is bolted to the stone abutment of the railroad bridge on the right-hand side of the stream, and consists of a vertical 4 by 4 inch timber. A cross cut in the top of the abutment in the southeast corner of bridge 402A is 14.88 feet above gage zero. The banks are both high, the current is swift, the bed is composed of small stones, and the cross section does not change materially. The observer is T. F. Burke. The following discharge measurements were made in 1897 by F. Cogswell:

April 24, gage height, 5.20 feet; discharge, 1,429 second-feet.

May 15, gage height, 5.65 feet; discharge, 1,629 second-feet.

June 26, gage height, 4.20 feet; discharge, 677 second-feet.

July 24, gage height, 3.10 feet; discharge, 230 second-feet.

August 28, gage height, 2.60 feet; discharge, 65 second-feet.

September 25, gage height, 4.15 feet; discharge, 675 second-feet.

October 23, gage height, 4.00 feet; discharge, 586 second-feet.

Daily gage height, in feet, of Piedra River at Arboles, Colorado, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1.....	3.45	5.80	6.15	3.70	2.80	2.60	3.70	3.50
2.....	3.75	6.10	5.85	3.75	2.80	2.60	4.20	3.40
3.....	3.55	6.05	5.35	4.00	2.80	3.20	4.25	3.40
4.....	3.65	6.40	5.10	3.90	2.80	3.00	5.00	3.35
5.....	4.20	6.45	5.05	3.70	2.80	2.95	5.05	3.30
6.....	4.45	6.60	5.05	3.60	2.80	3.40	4.75	3.30
7.....	4.95	6.65	5.25	3.50	2.80	3.50	4.55	3.30
8.....	4.80	6.60	5.40	3.50	2.80	3.30	4.60	3.30
9.....	4.80	6.25	5.35	3.45	2.80	3.65	5.75	3.20
10.....	4.90	6.25	5.45	3.60	2.95	3.40	5.25	3.25
11.....	5.45	5.90	5.35	3.50	2.80	3.35	4.95	3.30
12.....	5.45	5.75	5.30	3.50	2.75	4.20	4.85	3.20
13.....	5.55	5.95	5.15	3.40	2.85	4.00	4.65	3.20
14.....	5.65	5.95	5.20	3.30	2.80	4.05	4.50	3.20
15.....	6.00	5.75	5.15	3.25	2.75	3.65	4.90	3.10
16.....	6.00	5.80	5.30	3.30	2.70	3.50	4.85	3.10
17.....	6.20	5.65	5.00	3.25	2.70	3.45	4.60	3.10
18.....	6.35	5.95	4.70	3.20	2.80	3.50	4.50	3.05
19.....	6.35	6.10	4.65	3.20	2.70	3.20	4.40	3.00
20.....	6.00	6.15	4.70	3.10	2.80	3.50	4.25	3.00
21.....	6.05	5.95	4.60	3.00	2.75	4.05	4.10	3.00
22.....	5.70	5.80	4.60	3.00	2.70	3.70	4.05	3.00
23.....	5.50	5.90	4.55	3.05	2.70	3.55	4.00	3.00
24.....	5.30	6.35	4.45	3.10	2.70	3.60	3.80	3.00
25.....	5.50	6.40	4.25	3.00	2.60	4.00	3.80	3.00
26.....	5.60	6.40	4.25	3.00	2.60	4.35	3.80	3.00
27.....	6.00	6.35	4.20	3.00	2.60	4.05	3.70	3.00
28.....	5.65	6.05	4.05	2.90	2.60	3.95	3.70	.....
29.....	5.70	6.15	3.90	2.90	2.60	3.80	3.65	.....
30.....	5.80	6.00	3.80	2.90	2.60	3.70	3.60	.....
31.....	.....	6.05	.....	2.90	2.60	.....	3.50	.....

DURANGO STATION ON ANIMAS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 283, is located about 200 yards west of the railroad station at Durango, Colorado, at the wagon bridge crossing Animas River, 200 feet above the Rio Grande Southern Railroad Bridge. The observer is George Robertson, a miller at Durango. The gage is spiked to the west side of the south end of the middle pier of the wagon bridge. The head of a bolt at the east abutment of the railroad bridge is 17.24 feet above gage datum. The banks are high and rocky and the section is excellent for obtaining accurate measurements of discharge. Lighter Creek enters Animas River from the right about 100 feet below the wagon bridge and between it and the railroad bridge. The following discharge measurements were made in 1897 by F. Cogswell:

April 23, gage height, 7.75 feet; discharge, 2,176 second-feet.

May 14, gage height, 9.20 feet; discharge, 4,786 second-feet.

June 25, gage height, 7.85 feet; discharge, 2,534 second-feet.

July 23, gage height, 6.10 feet; discharge, 997 second-feet.

August 27, gage height, 5.10 feet; discharge, 328 second-feet.

September 24, gage height, 6.05 feet; discharge, 905 second-feet.

October 22, gage height, 6.50 feet; discharge, 1,121 second-feet.

Daily gage height, in feet, of Animas River at Durango, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	5.10	.....	.....	5.75	8.75	9.40	7.15	5.70	5.10	6.35	5.80	5.20
2.....	5.20	.....	.....	5.80	8.85	8.85	7.00	5.75	5.00	6.75	5.80	5.20
3.....	.....	5.00	5.10	5.75	8.70	8.15	7.00	5.75	5.60	7.05	5.80	5.20
4.....	.....	.....	.....	6.20	8.55	7.90	6.80	5.75	5.70	7.15	5.70	5.15
5.....	5.20	.....	.....	6.20	8.50	8.10	6.50	5.90	5.65	7.05	5.70	.....
6.....	.....	4.90	5.00	7.10	8.80	8.25	6.55	5.80	5.60	6.85	5.70	5.30
7.....	.....	.....	.....	7.30	9.20	8.40	6.85	5.80	5.60	6.70	5.70	.....
8.....	.....	.....	.....	7.40	9.50	8.90	6.85	5.70	5.70	6.80	5.60	.....
9.....	5.00	5.00	.....	7.40	9.75	8.95	7.00	5.70	6.25	7.65	5.60	.....
10.....	.....	.....	5.10	7.75	9.30	9.10	6.95	5.65	5.95	7.45	5.60	.....
11.....	.....	.....	.....	7.80	8.90	8.60	6.85	5.60	5.95	7.25	5.60	5.10
12.....	5.00	.....	.....	7.55	8.70	8.50	6.75	5.60	6.55	7.15	5.60	.....
13.....	.....	5.10	5.00	7.75	8.95	8.55	6.55	5.60	6.55	7.05	5.50	.....
14.....	.....	.....	.....	8.00	9.20	8.90	6.45	5.55	6.70	6.95	5.50	5.30
15.....	.....	.....	.....	8.60	8.95	8.95	6.45	5.50	6.50	7.55	5.50	.....
16.....	4.90	5.00	.....	8.80	8.95	9.05	6.45	5.50	6.20	7.25	5.50	.....
17.....	.....	.....	5.10	8.95	8.60	8.45	6.35	5.50	6.00	7.05	5.50	.....
18.....	.....	.....	.....	9.00	9.05	8.05	6.25	5.50	5.95	6.85	5.40	5.20
19.....	.....	.....	.....	9.20	9.15	7.95	6.15	5.45	5.85	6.75	5.40	.....
20.....	5.00	4.80	5.20	8.50	9.00	8.10	6.05	5.40	5.80	6.65	5.40	.....
21.....	.....	.....	.....	8.30	8.70	8.30	6.00	5.40	6.30	6.55	5.40	5.30
22.....	.....	.....	.....	7.90	8.70	8.30	6.00	5.35	6.25	6.50	5.40	.....
23.....	5.30	.....	.....	7.65	9.25	8.40	6.05	5.30	6.15	6.40	5.45	.....
24.....	.....	5.00	5.10	7.50	9.60	8.10	6.05	5.25	6.05	6.30	5.40	5.10
25.....	.....	.....	.....	8.35	9.75	7.75	6.00	5.20	6.25	6.30	5.40	.....
26.....	.....	.....	.....	8.65	9.65	8.00	5.90	5.20	6.50	6.20	5.40	.....
27.....	5.00	5.10	5.50	8.90	9.55	8.05	5.90	5.10	6.40	6.10	5.35	.....
28.....	.....	.....	.....	8.35	8.85	7.50	5.80	5.10	6.25	6.00	5.30	5.20
29.....	.....	.....	.....	8.50	9.25	7.30	5.80	5.10	6.30	6.00	5.25	.....
30.....	5.00	.....	5.60	8.60	9.35	7.15	5.75	5.10	6.30	5.95	5.20	.....
31.....	.....	.....	.....	.....	9.25	.....	5.70	5.10	.....	5.90	.....	5.50

BUTTES STATION ON GILA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 286, is located at the buttes 16 miles above Florence, Arizona. This gage is bolted to a solid rock on the right bank, where the river emerges from the lower end of the gorge. Measurements are made from a car suspended from a cable, a short distance above the gage. Owing to the shifting character of the bottom, it was necessary to make a large number of discharge measurements and the following were made by W. J. Brash and A. T. Colton in 1897:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Jan. 1	2.30	445	Feb. 26	2.60	646	May 28...	1.65	94
Jan. 5	2.25	413	Mar. 2.....	2.50	593	June 10 ..	1.50	72
Jan. 8	2.24	377	Mar. 5.....	2.52	614	June 30 ..	1.30	20
Jan. 12 ...	2.90	853	Mar. 9.....	2.60	687	July 11...	3.00	726
Jan. 14 ...	3.10	846	Mar. 12....	2.48	568	July 27...	1.93	173
Jan. 15 ...	3.80	1,891	Mar. 16....	2.45	585	Aug. 11...	2.25	365
Jan. 16 ...	5.30	3,895	Mar. 20....	2.58	681	Aug. 14...	4.70	3,181
Jan. 18 ...	4.60	3,085	Mar. 23....	2.90	1,010	Aug. 31...	1.90	246
Jan. 22 ...	3.40	1,446	Mar. 26....	2.74	833	Sept. 8...	6.75	5,588
Jan. 26 ...	3.05	1,045	Mar. 31....	2.78	837	Sept. 13..	3.50	1,946
Jan. 29 ...	2.85	912	Apr. 8.....	2.54	675	Sept. 15..	5.30	4,950
Feb. 1	3.50	1,530	Apr. 14....	2.70	797	Sept. 23..	3.75	2,099
Feb. 5	3.20	1,123	Apr. 20....	2.60	757	Sept. 28..	3.70	2,068
Feb. 10 ...	2.85	926	Apr. 28....	2.43	516	Oct. 10 ...	2.65	868
Feb. 13 ...	2.71	840	May 6.....	2.22	318	Oct. 24 ...	2.23	601
Feb. 16 ...	2.54	700	May 14....	1.96	188			
Feb. 22 ...	2.82	808	May 20....	1.80	134			

Daily gage height, in feet, of Gila River at the Buttes, Arizona, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1.....	2.30	3.50	2.57	2.75	-----	1.60	1.30	2.40	1.80	3.10
2.....	2.30	3.40	2.50	2.70	2.30	1.50	1.30	2.40	1.80	2.97
3.....	2.26	3.30	2.52	2.68	-----	1.50	1.30	2.20	1.80	2.90
4.....	2.26	3.25	2.64	2.65	2.27	1.50	1.30	2.30	1.76	2.80
5.....	2.25	3.20	2.52	-----	-----	1.50	1.30	2.60	1.72	2.65
6.....	2.25	3.10	2.52	2.67	2.22	1.50	1.30	2.40	1.73	2.60
7.....	2.24	3.00	2.70	-----	-----	1.50	1.30	2.30	1.83	2.58
8.....	2.24	2.95	2.62	2.54	2.17	1.50	1.20	3.00	7.00	2.55
9.....	2.24	2.90	2.60	-----	-----	1.50	1.20	2.30	4.40	2.47
10.....	2.23	2.85	2.60	2.60	2.10	1.50	4.10	2.20	3.80	-----
11.....	3.28	2.80	2.50	-----	-----	1.50	3.00	2.20	4.90	-----
12.....	2.90	2.73	2.48	2.67	2.05	1.55	4.00	2.20	4.20	-----
13.....	3.87	2.71	2.48	-----	-----	1.50	3.40	5.30	3.50	-----
14.....	3.10	2.70	2.50	2.70	1.96	1.50	3.00	4.70	4.90	-----
15.....	3.45	2.62	2.40	-----	-----	1.50	2.50	4.70	5.30	-----
16.....	5.30	2.54	2.45	2.70	1.91	1.50	2.00	4.80	5.10	-----
17.....	5.60	2.50	2.46	-----	-----	1.50	2.20	2.90	4.60	-----
18.....	4.60	2.47	2.50	2.70	1.88	1.50	2.10	2.70	5.40	-----
19.....	4.10	2.45	2.53	-----	-----	1.50	3.00	2.40	4.80	-----
20.....	3.90	2.50	2.58	2.65	1.80	1.40	3.50	2.30	3.85	-----
21.....	3.70	2.95	2.71	-----	-----	1.40	2.50	2.30	4.60	-----
22.....	2.40	2.85	2.83	2.59	1.77	1.40	3.00	2.60	4.20	-----
23.....	3.30	2.80	2.90	-----	-----	1.40	3.00	2.40	3.75	-----
24.....	3.25	2.79	2.90	2.55	1.70	1.40	2.50	2.20	3.70	-----
25.....	3.15	2.65	2.90	-----	-----	1.40	2.00	2.20	3.65	-----
26.....	3.05	2.60	2.74	2.50	1.68	1.30	2.20	2.10	3.75	-----
27.....	3.00	2.58	2.72	-----	-----	1.30	2.10	2.10	3.70	-----
28.....	2.90	2.58	2.70	2.43	1.65	1.30	2.50	2.00	3.70	-----
29.....	2.85	-----	2.73	-----	-----	1.30	2.00	2.00	3.55	-----
30.....	3.25	-----	2.85	2.40	-----	1.30	2.00	1.90	3.25	-----
31.....	3.17	-----	2.78	-----	-----	-----	2.00	1.90	-----	-----

MCDOWELL STATION ON SALT RIVER.

This station is located $\frac{3}{4}$ mile above the mouth of the Verde River and 35 miles northeast of Phenix, Arizona, and was established April 20, 1897. The gage consists of 2 by 6 inch scantling, bolted to rocks on south side of river about 300 feet above the cable. The bench mark is a nail in polyverde tree about 75 feet west of north cable anchorage, and it is 17.33 feet above gage zero. The observer is B. Valasco. The following is a list of discharge measurements made in 1897 by W. A. Farish and others:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Apr. 21...	13.30	4,085	May 29....	10.40	715	June 30..	9.55	217
Apr. 25...	12.50	2,913	June 1....	10.35	647	July 10..	9.50	169
Apr. 28...	12.10	2,290	June 3....	10.30	606	July 19..	9.55	198
Apr. 30...	12.00	2,035	June 5....	10.23	569	Aug. 15..	10.10	373
May 4....	11.55	1,639	June 8....	10.09	476	Aug. 29..	10.15	403
May 8....	11.33	1,563	June 10...	10.00	456	Sept. 13..	11.35	733
May 11...	11.20	1,385	June 12...	9.95	430	Sept. 26..	11.45	1,068
May 15...	10.94	1,223	June 15...	9.90	399	Oct. 20...	10.10	393
May 18...	10.73	992	June 17...	9.86	379	Oct. 31...	10.10	325
May 20...	10.66	875	June 19...	9.80	341	Nov. 21..	10.00	284
May 22...	10.61	852	June 22...	9.74	299	Nov. 28..	10.00	270
May 25...	10.54	805	June 24...	9.70	270	Dec. 19..	10.10	264
May 27...	10.45	748	June 26...	9.63	244	Dec. 27..	10.05	273

Daily gage height, in feet, of Salt River at McDowell, Arizona, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		11.00	10.35	9.50	9.50	10.00	11.45	10.05	10.00
2		11.75	10.32	9.72	9.55	9.88	11.30	10.05	10.05
3		11.62	10.29	9.52	10.55	10.40	10.90	10.05	10.10
4		11.55	10.26	9.50	9.90	10.45	11.40	10.05	10.10
5		11.62	10.23	9.36	10.04	10.00	10.65	10.05	10.10
6		11.62	10.18	9.64	9.70	10.44	10.60	10.05	10.10
7		11.48	10.12	9.66	9.88	10.60	10.70	10.05	10.10
8		11.44	10.08	9.36	9.75	10.90	10.40	10.00	10.10
9		11.40	10.04	9.34	9.70	10.90	10.90	10.00	10.10
10		11.26	9.99	9.50	9.70	11.51	10.05	10.00	10.10
11		11.20	9.96	9.50	9.82	12.73	10.04	10.00	10.10
12		11.12	9.95	9.50	10.85	11.15	10.20	10.00	10.10
13		11.06	9.90	9.50	10.62	11.50	10.60	10.00	10.10
14		11.00	9.87	9.60	10.85	11.50	10.30	10.00	10.10
15		10.94	9.90	9.76	10.10	10.60	10.30	10.00	10.10
16		10.85	9.86	9.60	10.10	10.20	10.20	10.00	10.10
17		10.75	9.85	9.60	10.55	10.30	10.30	10.00	10.10
18		10.72	9.83	9.58	10.30	10.30	10.20	10.05	10.10
19		10.68	9.79	9.55	10.50	10.03	10.30	10.00	10.10
20	13.60	10.65	9.77	9.52	10.76	10.48	10.10	10.00	10.15
21	13.30	10.62	9.75	9.43	10.30	10.25	10.25	10.00	10.15
22	13.20	10.60	9.73	9.45	10.20	10.90	9.90	10.00	10.10
23	12.90	10.58	9.70	9.45	10.20	11.00	10.00	10.00	10.10
24	12.60	10.53	9.68	9.45	10.10	11.45	10.45	10.00	10.10
25	12.50	10.53	9.65	9.42	10.00	11.50	10.50	10.00	10.10
26	12.32	10.49	9.62	9.45	10.30	11.45	10.45	10.00	10.05
27	12.15	10.44	9.60	9.45	10.60	11.70	10.45	10.00	10.05
28	12.10	10.41	9.58	9.42	10.50	12.02	10.02	10.00	10.10
29	12.10	10.40	9.56	9.75	10.00	11.90	10.90	10.00	10.10
30	12.00	10.39	9.55	9.55	10.45	11.75	10.75	10.00	10.05
31		10.36		9.55	10.00		10.10		10.05

MCDOWELL STATION ON VERDE RIVER.

This station is located $\frac{3}{4}$ mile above the mouth of Verde River, and 35 miles northeast of Phoenix, Arizona, and was established April 20, 1897. The gage consists of a 2 by 4 inch inclined rod fastened to posts driven into the east bank of the river about 400 feet below the gaging cable. The bench mark is on a catclaw tree about 100 feet southeast from the old gage on cottonwood tree, which latter is 60 feet below the cable. The elevation of the bench mark is 27.02 feet above gage datum. The observer is B. Valasco. The following is a list of discharge measurements made by W. A. Farish and others in 1897:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Apr. 21 ...	8.85	1,328	May 29	7.74	172	July 10 ..	7.65	183
Apr. 25 ...	8.50	731	June 1	7.80	177	July 19 ..	7.70	186
Apr. 28 ...	8.37	540	June 3	7.78	174	Aug. 15 ..	7.95	322
Apr. 30 ...	8.32	508	June 8	7.75	176	Aug. 29 ..	8.51	440
May 4	8.16	364	June 10 ...	7.76	178	Sept. 13 ..	9.35	1,949
May 8	8.12	325	June 12 ...	7.78	159	Sept. 26 ..	7.60	435
May 11 ...	8.00	259	June 15 ...	7.70	165	Oct. 21 ...	6.70	279
May 15 ...	7.93	236	June 17 ...	7.63	138	Oct. 31 ...	6.65	305
May 18 ...	7.94	229	June 19 ...	7.63	132	Nov. 21 ..	6.60	246
May 20 ...	7.85	227	June 22 ...	7.58	128	Nov. 28 ..	6.63	264
May 22 ...	7.88	224	June 24 ...	7.63	135	Dec. 19 ..	6.75	264
May 25 ...	7.84	205	June 26 ...	7.55	122	Dec. 26 ..	6.70	308
May 27 ...	7.85	244	June 30 ...	7.56	111			

Daily gage height, in feet, of Verde River at McDowell, Arizona, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		8.20	7.80	7.56	7.55	7.70	7.45	6.65	6.65
2		8.23	7.76	7.54	7.54	7.55	7.00	6.60	6.70
3		8.18	7.77	7.43	7.52	7.60	7.00	6.65	6.70
4		8.16	7.77	7.42	7.52	7.65	7.40	6.65	6.70
5		8.14	7.78	7.38	7.56	7.60	7.30	6.65	6.65
6		8.12	7.76	7.44	7.60	7.50	7.10	6.60	6.60
7		8.12	7.74	7.44	7.60	7.61	7.10	6.60	6.60
8		8.12	7.74	7.40	7.65	8.80	7.20	6.60	6.60
9		8.12	7.75	7.40	7.64	8.90	6.90	6.60	5.65
10		8.08	7.74	7.40	7.72	8.30	7.10	6.60	6.65
11		8.05	7.76	7.68	7.72	12.00	7.00	6.60	6.65
12		8.00	7.76	7.65	7.72	12.00	7.10	6.65	6.65
13		8.00	7.78	7.88	9.00	9.40	7.00	6.60	6.65
14		7.98	7.76	7.80	8.50	9.40	7.00	6.60	6.65
15		7.93	7.74	7.72	8.00	9.40	7.00	6.65	6.60
16		7.93	7.70	7.74	8.00	7.50	7.00	6.95	6.60
17		7.93	7.66	7.70	8.00	7.50	7.00	6.60	6.60
18		7.92	7.62	7.75	8.20	7.85	7.10	6.65	6.65
19		7.92	7.62	7.75	8.50	7.60	7.10	6.65	6.65
20		7.91	7.62	7.70	8.10	7.10	7.10	6.60	6.75
21	9.00	7.86	7.62	7.64	8.50	7.20	7.10	6.60	6.75
22	8.80	7.84	7.59	7.43	8.60	2.10	6.70	6.60	6.80
23	8.70	7.86	7.58	7.58	8.70	7.00	6.70	6.60	6.75
24	8.65	7.84	7.60	7.64	7.90	7.50	6.65	6.60	9.70
25	8.60	7.84	7.62	7.58	8.30	7.45	6.65	6.60	6.70
26	8.50	7.84	7.60	7.54	8.30	7.65	6.60	6.60	6.70
27	8.42	7.84	7.54	7.52	8.45	7.60	6.65	6.60	6.70
28	8.37	7.84	7.56	7.50	8.45	9.00	6.70	6.60	1.70
29	8.37	7.82	7.57	7.49	8.45	9.90	6.70	6.60	6.70
30	8.36	7.74	7.57	7.60	8.50	7.80	6.65	6.60	6.70
31	8.32	7.85	7.56	7.50	7.50	7.55	6.65	6.60	6.70
		7.84		7.51	7.50		6.65		6.70

YUMA STATION ON COLORADO RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 298, is located at the bridge of the Southern Pacific Railroad Company at Yuma, Arizona, and the gage readings are maintained by that company. The gage at this point, reading from 10 to 22 feet, is nailed to the lower side of the first pier on the south bank of the river; the portion reading from 22 feet to 40 feet is nailed to a large post on the north side, east of the bridge. The figures of gage height, plus 100, indicate the elevation above sea level according to the South Pacific elevation. The channel of the river is shifting, scouring or filling with every change of river height. No discharge measurements were made in 1897.

Daily gage height, in feet, of Colorado River at Yuma, Arizona, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1....	18.58	18.33	18.33	19.42	22.42	25.17	21.50	19.25	18.58	18.92	18.75	18.42
2....	18.75	18.17	18.50	19.67	22.42	25.42	21.25	19.17	18.58	18.92	18.83	18.42
3....	18.58	18.33	18.50	19.25	22.67	25.67	20.92	19.17	18.50	18.92	19.17	18.75
4....	18.50	18.25	19.17	20.17	22.92	25.75	20.92	19.17	18.50	18.83	19.17	18.58
5....	18.42	18.42	19.33	20.00	23.00	25.83	20.92	19.00	18.58	19.17	18.92	18.42
6....	18.33	18.50	19.08	20.42	22.92	25.83	20.92	18.92	18.50	19.17	18.75	18.58
7....	18.25	18.50	19.75	20.42	23.00	25.92	20.58	18.83	18.42	18.92	18.75	18.58
8....	18.17	18.50	19.42	20.67	23.42	26.00	20.42	18.83	18.25	18.75	18.75	18.42
9....	18.00	18.42	19.00	21.00	23.75	26.08	20.42	18.67	18.25	18.42	18.67	18.42
10....	18.00	18.17	19.50	21.42	24.00	26.00	20.25	18.75	18.17	18.50	18.67	18.33
11....	18.00	18.00	20.33	21.42	24.33	25.83	20.33	18.75	18.08	18.83	18.67	18.25
12....	17.92	17.92	19.75	21.00	24.58	25.33	20.50	18.58	18.42	19.25	18.58	18.25
13....	18.33	18.17	19.58	21.42	24.83	24.75	20.58	18.83	18.17	21.00	18.58	18.08
14....	19.00	18.25	19.33	21.50	24.92	24.00	20.25	18.75	18.67	20.75	18.50	18.08
15....	20.92	18.25	19.17	21.50	25.08	23.58	20.08	19.00	18.75	21.50	18.58	18.08
16....	21.42	18.25	19.00	21.42	25.25	23.33	20.25	18.92	18.33	21.42	18.58	18.00
17....	22.50	18.25	19.17	21.25	25.33	23.25	20.25	18.92	18.25	20.92	18.58	18.00
18....	22.83	18.17	19.50	21.25	25.42	23.17	20.33	19.00	19.33	20.17	18.58	18.00
19....	21.92	18.17	19.25	21.42	25.50	23.08	20.33	19.08	19.83	19.92	18.58	18.00
20....	20.00	18.17	19.17	21.42	25.50	23.25	20.25	19.17	20.25	19.67	18.50	18.00
21....	19.42	18.17	19.00	21.42	25.42	23.25	20.00	19.08	20.75	19.58	18.42	17.92
22....	19.75	18.17	18.92	21.92	25.25	23.42	19.75	19.08	20.75	19.42	18.42	18.00
23....	19.42	18.17	18.92	22.42	25.08	23.25	19.50	18.92	19.83	19.92	18.42	18.17
24....	19.00	18.00	18.92	22.75	25.00	22.75	19.50	18.83	19.50	19.50	18.33	18.25
25....	18.83	18.00	18.75	23.00	25.00	22.33	19.42	18.75	19.50	19.33	18.33	18.08
26....	18.75	18.42	19.33	23.17	25.17	22.17	19.42	19.25	19.25	19.25	18.42	18.08
27....	18.67	18.42	19.17	23.00	25.25	21.75	19.42	18.75	19.00	19.00	18.50	18.08
28....	18.67	18.33	19.17	22.83	25.42	21.67	19.33	18.67	18.83	19.00	18.50	18.08
29....	18.67	.....	18.92	22.50	25.42	21.67	19.33	18.75	19.08	19.00	18.50	18.08
30....	18.50	.....	18.92	22.42	25.33	21.67	19.33	18.75	18.92	18.83	18.42	18.08
31....	18.42	.....	19.33	.....	25.25	.....	19.25	18.75	.....	18.75	.....	18.00

ELKO STATION ON HUMBOLDT RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 299, is located at a point 1 mile southwest of the town of Elko, Nevada. The gage is inclined, fastened to iron bolts driven into the solid rock, and placed on the left bank immediately below the bridge. The bench mark is on the southwest corner of the cofferdam surrounding a stone pier of the bridge, 80 feet north of the gage, and is at an elevation of 7.5 feet above zero on the gage. The channel is straight both above and below this point; the right bank is quite low, but the left is high and rocky. The bed of the stream is of gravel and sand, shifting slightly. The observer is John Garrecht. The following discharge measurements were made in 1897 by L. H. Taylor:

March 23, gage height, 2.80 feet; discharge, 140 second-feet.
 April 9, gage height, 6.20 feet; discharge, 1,276 second-feet.
 May 6, gage height, 7.20 feet; discharge, 1,778 second-feet.
 June 22, gage height, 4.93 feet; discharge, 773 second-feet.
 July 10, gage height, 3.30 feet; discharge, 256 second-feet.
 July 26, gage height, 2.45 feet; discharge, 88 second-feet.
 September 6, gage height, 1.80 feet; discharge, 6 second-feet.
 November 30, gage height, 2.20 feet; discharge, 44 second-feet.

Daily gage height, in feet, of Humboldt River at Elko, Nevada, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.50	2.45	2.65	5.90	6.80	7.60	4.15	2.20	1.85	1.75	2.10	2.35
2.....	2.55	2.45	2.80	4.80	6.80	7.45	4.15	2.15	1.85	1.75	2.10	2.35
3.....	2.45	2.45	2.80	4.30	6.90	7.30	4.00	2.15	1.85	1.75	2.15	2.40
4.....	2.50	2.50	2.85	4.40	7.50	7.20	3.95	2.10	1.85	1.75	2.15	2.45
5.....	2.50	2.65	2.80	4.50	7.90	7.15	3.90	2.10	1.85	1.80	2.15	2.50
6.....	2.50	2.70	2.80	4.60	7.90	6.80	3.80	2.00	1.80	1.80	2.20	2.45
7.....	2.50	2.72	2.80	5.00	7.90	6.50	3.70	2.00	1.80	1.85	2.20	2.50
8.....	2.55	2.90	2.70	5.50	7.70	6.40	3.60	2.05	1.80	1.90	2.25	2.50
9.....	2.50	2.93	2.70	6.30	7.55	6.15	3.40	2.00	1.80	1.90	2.25	2.60
10.....	2.50	2.95	2.80	6.40	7.50	5.95	3.35	2.00	1.80	2.00	2.25	2.80
11.....	2.40	3.00	2.85	6.60	7.50	5.85	3.25	2.00	1.83	1.95	2.25	2.80
12.....	2.50	2.95	2.80	6.80	7.55	5.80	3.15	2.00	1.80	1.95	2.25	2.70
13.....	2.40	2.85	2.70	7.20	7.50	5.75	3.00	1.95	1.80	1.95	2.20	2.50
14.....	2.40	2.70	2.70	7.40	7.10	5.60	2.95	1.95	1.80	2.00	2.25	2.30
15.....	2.30	2.70	2.70	7.40	7.20	5.40	2.93	1.95	1.80	2.00	2.25	2.20
16.....	2.40	2.65	2.75	7.20	6.90	5.40	2.90	1.95	1.80	2.00	2.30	2.40
17.....	2.40	2.70	2.85	7.30	6.80	5.43	2.90	1.95	1.80	2.00	2.30	2.60
18.....	2.30	2.45	2.95	7.30	6.80	5.55	2.80	1.90	1.80	2.00	2.80	2.60
19.....	2.40	2.60	3.00	7.40	7.00	5.70	2.80	1.85	1.80	2.00	2.30	2.60
20.....	2.40	2.70	3.00	7.90	7.30	5.60	2.70	1.85	1.80	2.05	2.30	2.60
21.....	2.37	2.70	3.00	8.10	7.35	5.30	2.70	1.85	1.80	2.05	2.30	2.60
22.....	2.35	2.60	2.80	8.20	7.55	5.00	2.65	1.85	1.80	2.10	2.30	2.50
23.....	2.30	2.50	2.90	8.20	7.70	4.85	2.60	1.87	1.80	2.05	2.35	2.60
24.....	2.37	2.50	3.00	7.80	8.00	4.50	2.60	1.87	1.80	2.05	2.40	2.65
25.....	2.40	2.40	3.60	7.50	8.25	4.50	2.55	1.87	1.80	2.05	2.35	2.50
26.....	2.40	2.50	3.90	7.20	8.30	4.20	2.50	1.87	1.80	2.00	2.35	2.45
27.....	2.42	2.60	4.30	6.90	8.40	4.15	2.40	1.87	1.77	2.10	2.35	2.50
28.....	2.40	2.70	5.30	6.60	8.45	4.15	2.35	1.87	1.77	2.15	2.30	2.40
29.....	2.40	.....	7.30	6.70	8.35	4.30	2.20	1.87	1.77	2.05	2.25	2.40
30.....	2.42	.....	6.90	6.70	8.10	4.25	2.30	1.85	1.75	2.05	2.30	2.40
31.....	2.40	.....	6.10	.....	7.90	.....	2.25	1.85	.....	2.10	.....	2.40

BATTLE MOUNTAIN STATION ON HUMBOLDT RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 302, is located at the county highway bridge, three-fourths of a mile northeast of the town of Battle Mountain, Nevada. C. R. Taylor is the observer. The gage is vertical and is spiked to the timber wing wall immediately above the bridge, on the left bank. The bench mark is on a spike in the tie beam at the east side of the bridge near the south end, at an elevation of 10 feet above zero on the gage. The channel is curved at this point and the banks are low and liable to overflow at high water. There are also several sloughs or side channels, so at extreme high water it is difficult to obtain an accurate measurement of the flow of the stream. The bed of the stream is of sand and gravel and shifts considerably. The following discharge measurements were made in 1897 by L. H. Taylor:

March 17, gage height, 2.85 feet; discharge, 276 second-feet.
 April 4, gage height, 6.10 feet; discharge, 944 second-feet.
 April 10, gage height, 7.10 feet; discharge, 1,557 second-feet.
 April 15, gage height, 8.30 feet; discharge, 2,454 second-feet.
 May 26, gage height, 8.60 feet; discharge, 2,870 second-feet.
 June 24, gage height, 6.70 feet; discharge, 1,394 second-feet.
 July 6, gage height, 4.70 feet; discharge, 711 second-feet.
 July 21, gage height, 2.55 feet; discharge, 306 second-feet.
 August 20, gage height, 0.85 foot; discharge, 16 second-feet.
 September 23, gage height, 0.45 foot; discharge, 4 second-feet.

Daily gage height, in feet, of Humboldt River at Battle Mountain, Nevada, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.20	2.30	2.45	5.80	8.58	8.76	5.25	1.60	0.60	0.55	1.55	2.00
2.....	2.20	2.30	2.45	6.60	8.58	8.80	5.10	1.50	.55	.55	1.55	2.00
3.....	2.25	2.30	2.40	6.90	8.57	8.76	5.00	1.45	.50	.55	1.60	2.00
4.....	2.25	2.35	2.40	6.10	8.56	8.73	4.90	1.40	.50	.60	1.60	2.05
5.....	2.25	2.35	2.50	6.10	8.56	8.70	4.80	1.30	.50	.60	1.60	2.05
6.....	2.15	2.20	2.50	6.15	8.55	8.66	4.70	1.25	.50	.65	1.65	2.05
7.....	2.15	2.35	2.50	6.30	8.54	8.60	4.60	1.20	.50	.65	1.65	2.00
8.....	2.10	2.30	2.70	6.50	8.55	8.56	4.50	1.20	.50	.75	1.65	2.10
9.....	2.10	2.30	2.85	6.90	8.56	8.45	4.40	1.15	.50	1.20	1.65	2.10
10.....	2.20	2.35	2.60	7.20	8.57	8.30	4.20	1.15	.50	1.20	1.65	2.10
11.....	2.20	2.35	2.45	7.60	8.58	8.10	4.00	1.10	.50	1.00	1.70	2.20
12.....	2.20	2.35	2.45	7.90	8.59	7.95	3.85	1.10	.50	.90	1.70	2.35
13.....	2.20	2.35	2.50	8.10	8.60	7.80	3.75	1.05	.50	.90	1.70	2.40
14.....	2.20	2.35	2.60	8.25	8.55	7.70	3.40	1.05	.50	.90	1.70	2.40
15.....	2.20	2.40	2.70	8.35	8.54	7.65	3.20	1.05	.50	.95	1.70	2.50
16.....	2.20	2.40	2.80	8.42	8.54	7.60	3.40	1.00	.50	.95	1.70	2.80
17.....	2.10	2.45	2.85	8.47	8.52	7.55	4.80	1.00	.50	1.00	1.70	2.70
18.....	2.10	2.50	2.90	8.50	8.50	7.50	2.90	.95	.45	1.00	1.75	2.70
19.....	2.20	2.45	2.90	8.55	8.47	7.45	2.75	.90	.45	1.10	1.75	2.70
20.....	2.15	2.45	2.90	8.60	8.45	7.30	2.65	.90	.45	1.10	1.75	2.50
21.....	2.15	2.40	2.85	8.63	8.47	7.15	2.55	.85	.45	1.15	1.75	2.55
22.....	2.10	2.40	2.30	8.67	8.50	7.00	2.40	.85	.45	1.20	1.80	2.70
23.....	2.00	2.40	3.00	8.70	8.52	6.85	2.30	.80	.45	1.25	1.80	2.70
24.....	2.00	2.35	2.80	8.73	8.55	6.70	2.20	.80	.45	1.30	1.80	2.70
25.....	2.10	2.35	3.00	8.70	8.58	6.40	2.10	.75	.45	1.30	1.85	2.75
26.....	2.10	2.35	3.10	8.70	8.60	6.20	2.00	.75	.45	1.35	1.85	2.75
27.....	2.15	2.35	2.90	8.68	8.62	6.00	1.90	.70	.50	1.40	1.90	2.75
28.....	2.15	2.40	3.00	8.65	8.65	5.80	1.90	.70	.50	1.40	1.95	2.75
29.....	2.20	.....	3.30	8.63	8.68	5.60	1.85	.65	.50	1.45	1.90	2.80
30.....	2.20	.....	3.70	8.60	8.70	5.40	1.75	.65	.50	1.50	1.95	2.80
31.....	2.20	.....	5.00	.....	8.73	.....	1.70	.60	.....	1.50	.....	2.90

GOLCONDA STATION ON HUMBOLDT RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 303, is located $1\frac{1}{4}$ miles northerly from the town of Golconda, Nevada. The observer is L. Dutertre, a farmer and merchant. The gage is vertical and is spiked to posts driven into the left bank of the river. There are two bench marks, one on a 2 by 4 inch post driven flush with the ground surface 20 feet from the gage, and the other on a large spike driven into a post which is firmly set about 15 feet from the gage. The first is at an elevation of 10.55 feet and the second 13.70 feet above zero on the gage. Measurements are made from a cable and suspended car. The channel is nearly straight for about 400 feet. The banks are moderately high, but liable to overflow at extreme flood stages, perhaps once in four or five years. The bed of the stream is of gravel and sand, shifting somewhat. The following discharge measurements were made in 1897 by L. H. Taylor:

March 24, gage height, 2.80 feet; discharge, 207 second-feet.
 April 9, gage height, 5.30 feet; discharge, 650 second-feet.
 April 21, gage height, 7.05 feet; discharge, 1,363 second-feet.
 June 2, gage height, 9.20 feet; discharge, 2,608 second-feet.
 June 27, gage height, 6.87 feet; discharge, 1,198 second-feet.
 July 5, gage height, 5.65 feet; discharge, 796 second-feet.
 July 30, gage height, 2.90 feet; discharge, 251 second-feet.
 August 10, gage height, 1.94 feet; discharge, 124 second-feet.
 September 13, gage height, 0.70 foot; discharge, 7 second-feet.
 November 2, gage height, 1.20 feet; discharge, 43 second-feet.
 November 27, gage height, 1.75 feet; discharge, 89 second-feet.

Daily gage height, in feet, of Humboldt River at Golconda, Nevada, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.20	2.50	2.85	3.80	9.95	9.20	6.20	2.70	1.10	0.50	1.10	2.00
2.....	2.20	2.40	2.90	4.40	9.95	9.25	5.90	2.60	1.00	.50	1.20	2.00
3.....	2.20	2.45	2.90	4.80	10.00	9.25	5.90	2.50	1.00	.50	1.25	2.00
4.....	2.20	2.50	2.95	5.00	9.90	9.30	5.70	2.40	1.00	.50	1.30	2.00
5.....	2.20	2.65	2.85	5.10	9.90	9.40	5.60	2.30	1.00	.50	1.40	2.00
6.....	2.20	2.60	2.80	5.40	9.80	9.50	5.50	2.25	1.00	.50	1.45	2.10
7.....	2.20	2.50	2.80	5.40	9.75	9.55	5.35	2.20	.85	.50	1.50	2.10
8.....	2.20	2.50	2.85	5.40	9.70	9.65	5.20	2.15	.90	1.80	1.50	2.20
9.....	2.20	2.60	2.90	5.30	9.60	9.75	5.15	2.10	.85	1.50	1.50	2.30
10.....	2.20	2.60	2.90	5.40	9.55	9.65	4.95	1.95	.80	1.30	1.55	2.40
11.....	2.20	2.65	3.20	5.50	9.50	9.55	4.90	1.85	.80	1.30	1.55	2.45
12.....	2.20	2.70	2.10	5.70	9.50	9.40	4.85	1.80	.75	1.20	1.55	2.50
13.....	2.25	2.70	2.00	5.75	9.50	9.40	5.85	1.75	.70	1.20	1.55	2.50
14.....	2.30	2.70	2.90	5.80	9.50	9.20	4.80	1.70	.70	1.10	1.60	2.50
15.....	2.30	2.80	2.90	5.90	9.50	9.00	4.60	1.65	.70	1.00	1.60	2.60
16.....	2.30	2.90	2.90	6.10	9.50	8.80	4.40	1.65	.70	.90	1.65	2.60
17.....	2.30	3.00	2.90	6.40	9.50	8.60	4.20	1.60	.70	.80	1.65	2.65
18.....	2.30	3.00	2.80	6.50	9.50	8.40	4.00	1.55	.70	.80	1.65	2.65
19.....	2.25	2.90	2.85	6.80	9.50	8.10	3.90	1.50	.70	.80	1.65	2.65
20.....	2.25	2.85	2.90	6.90	9.50	7.80	3.80	1.45	.70	.75	1.70	2.55
21.....	2.30	2.95	2.95	7.00	9.50	7.70	3.75	1.40	.65	.80	1.70	2.60
22.....	2.20	2.85	2.95	7.40	9.50	7.60	3.60	1.30	.65	.80	1.75	2.65
23.....	2.10	2.80	2.95	7.60	9.45	7.40	3.50	1.30	.65	.80	1.75	2.65
24.....	2.15	2.70	2.90	8.00	9.40	7.20	3.40	1.35	.60	.80	1.85	2.65
25.....	2.20	2.70	3.00	8.10	9.30	7.20	3.45	1.40	.60	.80	1.90	2.70
26.....	2.30	2.75	3.50	8.50	9.30	7.00	3.30	1.40	.60	.85	1.95	2.70
27.....	2.80	2.90	3.50	8.80	9.30	6.90	3.20	1.35	.60	.95	1.90	2.70
28.....	2.70	2.80	3.10	9.15	9.25	6.70	3.10	1.35	.55	.95	1.90	2.70
29.....	2.40	.....	3.10	9.50	9.20	6.60	3.00	1.30	.55	.90	1.90	2.70
30.....	2.30	.....	3.30	9.80	9.10	6.40	2.90	1.25	.55	1.00	1.95	2.70
31.....	2.35	.....	3.50	.....	9.15	.....	2.80	1.20	.....	1.00	.....	2.75

OREANA STATION ON HUMBOLDT RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 306, is located at the old Oreana highway bridge, about 12 miles northeast of Lovelocks, Nevada. The observer is Joe Rodgers, section foreman of the Central Pacific Railroad. The bridge abutment to which the gage was fastened was undermined and fell May 26, 1897. A temporary gage was used until September 8, 1897, when a new inclined one was placed on the left bank of the river about a mile and a half above the site of the old gage and opposite the section house. It is made of a 2 by 4 inch pine timber spiked to posts driven well into the bank. The bench mark is a 10 by 10 inch post near the left bank of the river about 40 feet below the gage, and its elevation is 10.0 feet above the zero. The channel here is straight for about 500 feet above the gage and for about 150 feet below. The station is provided with a cable and car. The river banks are high and not liable to overflow. The bed of the stream is sandy and shifting. The following measurements were made in 1897 by L. H. Taylor:

March 25, gage height, 3.85 feet; discharge, 203 second-feet.
 April 22, gage height, 6.70 feet; discharge, 1,037 second-feet.
 April 30, gage height, 9.35 feet; discharge, 1,939 second-feet.
 May 14, gage height, 11.70 feet; discharge, 2,932 second-feet.
 June 26, gage height, 8.75 feet; discharge, 1,910 second-feet.
 July 9, gage height, 6.80 feet; discharge, 1,169 second-feet.
 July 22, gage height, 5.00 feet; discharge, 625 second-feet.
 September 9, gage height, 2.50 feet; discharge, 59 second-feet.
 November 7, gage height, 2.10 feet; discharge, 25 second-feet.

Daily gage height, in feet, of Humboldt River at Oreana, Nevada, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.80	3.30	3.80	4.50	9.80	10.60	8.10	4.20	2.60	2.30	2.05	2.45
2.....	2.80	3.30	3.80	4.60	9.90	10.40	7.85	4.10	2.55	2.30	2.05	2.50
3.....	2.80	3.20	3.90	4.60	10.30	10.30	7.60	4.10	2.55	2.30	2.05	2.55
4.....	2.80	3.30	3.80	4.70	10.50	10.20	7.40	4.10	2.55	2.30	2.10	2.60
5.....	2.90	3.40	3.80	4.80	10.80	10.10	7.20	4.00	2.55	2.30	2.10	3.10
6.....	2.90	3.40	3.80	4.90	11.00	10.10	7.10	3.90	2.50	2.25	2.10	3.00
7.....	2.90	3.40	3.80	5.00	11.20	10.10	7.00	3.90	2.50	2.35	2.10	2.90
8.....	2.90	3.40	3.80	5.10	11.40	10.00	6.95	3.80	2.50	2.50	2.10	2.95
9.....	2.95	3.50	3.85	5.20	11.70	9.90	6.80	3.80	2.50	2.40	2.15	2.70
10.....	2.90	3.50	3.80	5.20	11.80	9.90	6.60	3.70	2.50	2.35	2.15	2.70
11.....	2.90	3.40	3.90	5.20	11.90	9.80	6.40	3.60	2.45	2.30	2.15	2.75
12.....	2.90	3.40	3.90	5.30	12.00	9.80	6.30	3.50	2.45	2.30	2.15	2.75
13.....	3.00	3.50	3.85	5.40	11.90	9.80	6.10	3.40	2.45	2.30	2.20	2.80
14.....	3.00	3.50	3.80	5.40	11.75	9.80	6.00	3.40	2.45	2.30	2.20	2.80
15.....	3.00	3.50	3.80	5.60	11.80	9.80	5.90	3.30	2.45	2.25	2.20	2.80
16.....	3.00	3.50	3.90	5.80	11.60	9.80	5.80	3.20	2.45	2.25	2.25	2.80
17.....	3.10	3.50	3.80	5.80	11.40	9.80	5.60	3.10	2.40	2.25	2.25	2.85
18.....	3.10	3.50	3.85	5.90	11.20	9.70	5.50	3.10	2.40	2.20	2.25	2.85
19.....	3.10	3.60	3.80	6.00	11.00	9.70	5.40	3.10	2.40	2.20	2.25	2.85
20.....	3.10	3.60	3.80	6.40	11.00	9.60	5.20	3.10	2.40	2.20	2.30	2.80
21.....	3.10	3.60	3.80	6.50	10.90	9.40	5.10	3.10	2.40	2.20	2.30	2.90
22.....	3.20	3.60	3.80	6.80	10.90	9.30	5.00	3.00	2.40	2.15	2.30	2.90
23.....	3.20	3.70	3.80	7.10	10.90	9.00	4.90	3.00	2.40	2.15	2.20	2.90
24.....	3.20	3.70	3.85	7.50	10.90	8.90	4.80	2.90	2.40	2.15	2.30	2.90
25.....	3.30	3.70	3.85	8.05	10.90	8.80	4.80	2.80	2.40	2.15	2.35	2.95
26.....	3.30	3.80	3.90	8.50	10.90	8.70	4.70	2.70	2.35	2.10	2.35	2.95
27.....	3.20	3.80	3.90	8.80	10.90	8.60	4.60	2.70	2.35	2.10	2.40	3.00
28.....	3.20	3.80	4.00	9.10	10.90	8.50	4.50	2.60	2.35	2.10	2.40	3.00
29.....	3.30	-----	4.10	9.30	10.90	8.40	4.40	2.60	2.35	2.05	2.45	3.00
30.....	3.40	-----	4.50	9.50	10.80	8.20	4.30	2.60	2.30	2.05	2.45	3.05
31.....	3.30	-----	4.45	-----	10.80	-----	4.20	2.60	-----	2.05	-----	3.05

MASON'S RANCH STATION ON SOUTH FORK OF HUMBOLDT RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 311, is located at a point on the South Fork of Humboldt River, about 10 miles southwest of the town of Elko, Nevada, and about 6 miles above its junction with the main stream. The observer is Martin Mason, a farmer. The gage is inclined and spiked to posts driven firmly into the right bank. There is one bench mark on a 2 by 4 inch post $2\frac{1}{2}$ feet long driven flush with the ground 10 feet north of the gage, and having an elevation of 7.50 feet above zero on the gage. Measurements are made from a cable and suspended car at a point 1 mile above the gage, the latter being placed, for the convenience of the observer, near his farm. At the point of measurement the banks are high and the channel is straight for over 600 feet. The bed of the stream is of rock and gravel and is quite stable. The following discharge measurements were made in 1897 by L. H. Taylor:

April 6, gage height, 1.95 feet; discharge, 139 second-feet.
 May 7, gage height, 5.00 feet; discharge, 1,128 second-feet.
 June 9, gage height, 3.65 feet; discharge, 800 second-feet.
 June 22, gage height, 2.30 feet; discharge, 363 second-feet.
 July 11, gage height, 1.75 feet; discharge, 211 second-feet.
 July 25, gage height, 1.20 feet; discharge, 102 second-feet.
 September 24, gage height, 0.35 foot; discharge, 5 second-feet.
 October 10, gage height, 0.60 foot; discharge, 19 second-feet.
 November 29, gage height, 0.90 foot; discharge, 56 second-feet.

Daily gage height, in feet, of South Fork of Humboldt River at Mason's ranch, Nevada, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Déc.
1.....	1.20	1.20	1.30	2.20	4.00	4.25	2.05	0.90	0.30	0.40	0.80	1.00
2.....	1.20	1.30	1.30	1.85	4.05	3.90	2.00	.85	.30	.45	.80	1.20
3.....	1.25	1.25	1.20	1.80	4.15	3.70	2.25	.85	.30	.45	.80	.80
4.....	1.25	1.30	1.20	1.80	4.30	3.55	2.10	1.35	.30	.45	.85	.55
5.....	1.30	1.40	1.25	1.95	4.50	3.40	2.00	1.30	.30	.45	.85	.90
6.....	1.20	1.50	1.30	1.95	4.80	3.30	1.95	1.00	.30	.45	.85	1.00
7.....	1.20	1.40	1.25	2.10	5.00	3.30	1.90	.90	.30	.45	.85	1.10
8.....	1.10	1.35	1.20	2.20	4.90	3.40	1.85	.85	.30	.50	.85	1.10
9.....	1.00	1.30	1.20	2.20	4.55	3.65	1.80	.75	.30	.50	.85	1.00
10.....	.85	1.40	1.25	2.60	4.30	3.60	1.75	.70	.30	.60	.85	1.25
11.....	1.00	1.50	1.30	2.90	4.15	3.35	1.75	.65	.30	.60	.85	1.15
12.....	1.10	1.25	1.30	2.85	4.00	3.25	1.70	.65	.30	.60	.90	1.20
13.....	1.10	1.45	1.30	2.95	3.95	3.20	1.65	.60	.35	.60	.90	1.10
14.....	1.15	1.50	1.20	3.05	4.10	3.20	1.60	.60	.35	.70	.90	1.05
15.....	1.10	1.25	1.20	3.30	4.25	3.35	1.65	.55	.35	.80	.80	1.00
16.....	1.20	1.30	1.25	3.50	4.45	3.25	1.65	.50	.35	.80	.85	1.00
17.....	.80	1.40	1.40	3.70	4.55	3.30	1.55	.45	.35	.80	1.15	1.00
18.....	.75	1.40	1.35	4.20	4.70	2.90	1.50	.45	.35	.80	.90	1.00
19.....	1.00	1.50	1.30	4.20	4.80	2.75	1.40	.45	.35	.75	.85	.95
20.....	1.10	1.55	1.30	4.50	4.80	2.55	1.20	.40	.35	.75	.85	.90
21.....	1.10	1.40	1.35	4.40	5.20	2.45	1.10	.40	.35	.75	.90	.90
22.....	1.15	1.45	1.25	4.20	5.20	2.25	1.10	.40	.35	.75	.95	1.00
23.....	1.10	1.40	1.35	3.60	5.40	2.25	1.15	.40	.35	.80	.95	1.00
24.....	1.15	1.50	1.65	3.40	5.45	2.25	1.10	.35	.35	.90	.95	.90
25.....	1.20	1.30	2.40	3.30	5.50	2.20	1.15	.35	.35	.90	.90	.90
26.....	1.20	1.25	2.40	3.30	5.40	2.20	1.20	.35	.35	.85	1.50	1.00
27.....	.80	1.25	2.25	3.50	5.05	2.20	1.10	.35	.35	.80	1.60	1.00
28.....	1.20	1.30	3.20	3.75	4.75	2.10	1.05	.45	.35	.80	1.10	.90
29.....	1.20	.....	3.50	3.85	4.60	2.00	1.00	.35	.40	.80	.95	.90
30.....	1.20	.....	3.20	3.95	4.55	1.95	.95	.35	.40	.80	.90	.95
31.....	1.20	.....	2.70	.....	4.60	.....	.95	.30	.....	.80	.....	.90

BATTLE CREEK STATION ON BEAR RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 313, is located 5 miles northwest of Preston, Idaho. The observer is John A. Nelson. The station is equipped with a cable and car. The gage consists of a vertical board nailed to a pile. The bench mark is a nail in the southeast corner of the house near the gage, about 1.5 feet from the ground, and it is 10.95 feet above the zero of the gage. The following discharge measurements were made by Samuel Fortier and others in 1897:

May 20, gage height, 5.05 feet; discharge, 5,700 second-feet.

June 17, gage height, 3.50 feet; discharge, 2,527 second-feet.

June 17, gage height, 3.50 feet; discharge, 2,969 second-feet.

July 28, gage height, 1.75 feet; discharge, 917 second-feet.

August 23, gage height, 1.57 feet; discharge, 692 second-feet.

October 29, gage height, 1.90 feet; discharge, 1,027 second-feet.

Daily gage height, in feet, of Bear River at Battle Creek, Idaho, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	-----	-----	1.70	-----	4.00	5.00	2.50	1.70	1.60	1.60	1.90	1.90
2	1.80	-----	-----	-----	4.10	4.90	2.50	1.70	1.60	1.90	1.90	1.90
3	-----	-----	-----	2.00	4.20	4.80	2.45	1.70	1.80	1.80	1.90	1.90
4	-----	1.70	-----	-----	4.20	4.70	2.40	1.70	1.70	1.80	1.90	1.80
5	-----	-----	-----	-----	4.30	4.70	2.40	1.70	1.60	1.80	1.90	1.70
6	1.80	1.70	1.70	-----	4.40	4.70	2.40	1.70	1.60	1.80	1.90	1.80
7	-----	-----	-----	-----	4.50	4.60	2.40	1.70	1.60	1.80	1.90	1.90
8	-----	-----	-----	-----	4.50	4.60	2.40	1.70	1.60	1.80	1.90	1.90
9	1.80	1.70	-----	-----	4.50	4.50	2.30	1.70	1.60	1.80	1.90	1.90
10	-----	-----	-----	2.50	4.50	4.40	2.20	1.70	1.60	1.80	1.90	1.80
11	-----	-----	-----	2.60	4.60	4.40	2.20	1.70	1.60	1.80	1.90	1.90
12	-----	-----	1.70	2.70	4.60	4.40	2.20	1.70	1.60	1.80	1.90	1.90
13	-----	-----	-----	2.80	4.60	4.30	2.20	1.70	1.60	2.00	1.90	1.80
14	-----	-----	-----	2.90	4.60	4.30	2.20	1.70	1.60	2.20	1.90	1.70
15	-----	-----	1.70	3.00	4.60	4.20	2.20	1.70	1.60	2.20	1.90	1.80
16	1.80	-----	-----	3.10	4.90	4.10	2.20	1.70	1.60	2.10	1.90	1.80
17	-----	-----	-----	3.20	5.00	3.50	2.10	1.70	1.80	2.00	1.90	1.70
18	-----	-----	-----	3.30	5.00	3.40	2.00	1.70	1.60	2.00	1.90	1.65
19	-----	-----	-----	3.40	5.00	3.30	2.00	1.70	1.60	2.00	1.90	1.60
20	-----	1.70	1.70	3.50	5.10	3.20	2.00	1.70	1.60	2.00	1.90	1.70
21	-----	-----	-----	3.60	5.10	3.10	2.00	1.60	1.60	2.00	2.00	1.70
22	-----	-----	-----	3.70	5.15	3.00	1.90	1.60	1.60	2.00	2.00	1.80
23	-----	-----	-----	3.80	5.20	3.00	1.90	1.60	1.60	2.00	2.10	1.80
24	1.80	-----	-----	3.90	5.15	3.00	1.80	1.60	1.60	2.00	2.10	1.80
25	-----	-----	-----	4.00	5.20	2.90	1.90	1.60	1.60	2.00	2.00	1.80
26	-----	-----	-----	4.20	5.25	2.90	1.80	1.60	1.60	2.00	2.00	1.80
27	-----	1.70	-----	4.30	5.30	2.80	1.80	1.60	1.60	2.00	2.00	1.80
28	-----	-----	-----	4.40	5.25	2.65	1.80	1.60	1.60	2.00	2.00	1.80
29	-----	-----	2.00	4.30	5.15	2.60	1.80	1.60	1.60	1.90	2.00	1.80
30	1.70	-----	-----	4.20	5.10	2.55	1.80	1.60	1.60	1.90	2.00	1.90
31	-----	-----	-----	-----	5.10	-----	1.80	1.60	-----	1.90	-----	1.90

LOGAN STATION ON LOGAN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 316, is located in the river canyon about 2 miles east of the city of Logan, Utah. The gage is a vertical iron post set firmly into the ground and graduated to tenths of a foot. The equipment consists of a cable, car, and tag wire. The observer is J. S. Pehrson, living about one-half mile from the gage. The bench mark is a stone 35 feet northeast of the end of the cable on the north side of the river. The elevation is 14.01 feet above datum. The point of the rock and the letters "B. M." are marked with red paint. The following discharge measurements were made by Samuel Fortier and others in 1897:

May 7, gage height, 4.13 feet; discharge, 1,210 second-feet.
 May 29, gage height, 4.60 feet; discharge, 1,336 second-feet.
 June 17, gage height, 4.15 feet; discharge, 1,097 second-feet.
 July 20, gage height, 3.20 feet; discharge, 478 second-feet.
 July 26, gage height, 3.10 feet; discharge, 413 second-feet.
 August 21, gage height, 2.85 feet; discharge, 305 second-feet.
 August 30, gage height, 2.80 feet; discharge, 298 second-feet.
 September 13, gage height, 2.80 feet; discharge, 284 second-feet.
 November 12, gage height, 2.66 feet; discharge, 219 second-feet.
 November 16, gage height, 2.66 feet; discharge, 219 second-feet.

Daily gage height, in feet, of Logan River at Logan, Utah, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.45				3.80	4.75	3.50	3.05	2.80	2.80	2.70	2.65
2				2.45	3.90	4.65	3.60	3.05	2.80	2.80	2.70	2.65
3					4.10	4.45	3.55	3.00	2.90	2.80	2.70	2.65
4					4.20	4.30	3.50	3.00	2.85	2.80	2.70	2.60
5		2.45	2.40		4.10	4.25	3.45	3.00	2.75	2.75	2.70	2.60
6					4.20	4.15	3.45	3.00	2.75	2.75	2.70	2.60
7					4.15	4.15	3.45	3.00	2.75	2.75	2.70	2.60
8					3.95	4.20	3.40	3.05	2.75	2.75	2.65	2.60
9	2.45			2.50	3.80	4.20	3.35	3.00	2.75	2.75	2.65	2.55
10					3.80	4.15	3.35	3.00	2.75	2.75	2.65	2.60
11					3.75	4.10	3.30	2.75	2.75	2.75	2.70	2.60
12		2.45	2.40		3.80	4.10	3.30	2.75	2.75	2.75	2.70	2.60
13					3.90	4.05	3.25	2.75	2.75	2.75	2.70	2.60
14					4.10	4.05	3.25	2.95	2.75	2.75	2.70	2.60
15				2.75	4.15	4.05	3.25	2.95	2.75	2.75	2.65	2.55
16	2.45			2.80	4.20	4.10	3.25	2.95	2.75	2.75	2.65	2.55
17				2.95	4.00	4.00	3.25	2.90	2.75	2.75	2.65	2.55
18				3.05	4.20	3.85	3.20	2.90	2.75	2.75	2.65	2.55
19		2.45	2.40	3.40	4.40	3.80	3.20	2.90	2.75	2.75	2.65	2.50
20				3.35	4.90	3.75	3.20	2.90	2.75	2.75	2.65	2.50
21				3.15	4.90	3.75	3.20	2.85	2.75	2.75	2.65	2.50
22	2.45			3.05	4.75	3.75	3.15	2.85	2.75	2.75	2.65	2.50
23				2.95	4.80	3.75	3.15	2.85	2.75	2.75	2.65	2.50
24				2.90	4.80	3.75	3.10	2.85	2.80	2.80	2.65	2.45
25				3.00	4.80	3.70	3.10	2.85	2.75	2.75	2.65	2.50
26		2.40	2.50	3.15	4.80	3.65	3.10	2.85	2.75	2.70	2.65	2.50
27				3.35	4.70	3.65	3.10	2.85	2.75	2.70	2.65	2.55
28				3.50	4.55	3.60	3.10	2.85	2.75	2.70	2.65	2.50
29	2.45			3.70	4.50	3.55	3.05	2.85	2.75	2.70	2.65	2.55
30				3.75	4.55	3.55	3.05	2.80	2.75	2.70	2.65	2.55
31					4.70		3.05	2.80		2.70		2.50

COLLINSTON STATION ON BEAR RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 319, is located in the canyon below Cache Valley, Utah, about 4 miles from the railroad station of Collinston or 2 miles east of the town of Fielding, Utah. The observer is Robert Anglesey, who is the ditch rider of the Bear River Canal and lives near the station. The gage consists of a vertical iron rod, graduated to tenths of a foot. The bench mark is a nail in an oak post 20 feet west of the gage and 20 feet north of the cable. Its elevation is 7.35 feet above the zero of the gage. The chief source of error at this station is the large rocks which are scattered over the bed. The following discharge measurements were made in 1897 by T. H. Humphreys and W. B. Dougall:

May 3, gage height, 5.95 feet; discharge, 8,344 second-feet.

May 3, gage height, 5.95 feet; discharge, 8,445 second-feet.

May 28, gage height, 6.60 feet; discharge, 10,241 second-feet.

June 19, gage height, 4.03 feet; discharge, 3,822 second-feet.

July 28, gage height, 1.80 feet; discharge, 1,274 second-feet.

August 16, gage height, 1.70 feet; discharge, 1,084 second-feet.

Daily gage height, in feet, of Bear River at Collinston, Utah, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....			2.00	2.60	6.00	6.30	3.00	1.70	1.60	1.90	2.20	1.85
2.....		2.00		2.40	6.00	6.20	3.00	1.70	1.60	1.90	2.10	1.85
3.....			2.00	2.30	5.90	6.10	3.00	1.70	1.60	1.90	2.10	1.85
4.....	1.60	2.00		2.60	6.00	6.00	2.95	1.70	1.65	1.85	2.10	1.85
5.....			2.00	3.00	6.00	5.90	2.90	1.70	1.70	1.85	2.10	1.95
6.....	1.80	2.00		3.40	6.20	5.80	2.85	1.70	1.80	1.90	2.00	1.95
7.....				3.50	6.40	5.60	2.80	1.70	1.80	2.00	1.90	1.95
8.....		2.10	2.00	3.60	6.50	5.40	2.65	1.70	1.80	2.10	1.80	1.95
9.....	2.20			3.80	6.60	5.20	2.55	1.70	1.80	2.15	1.80	2.05
10.....		2.20	2.00	4.00	6.40	5.10	2.50	1.70	1.80	2.20	1.80	2.05
11.....	2.10			4.60	6.20	5.00	2.45	1.70	1.80	2.25	1.80	2.05
12.....		2.00		5.00	6.10	4.90	2.40	1.70	1.80	2.30	1.80	2.15
13.....		2.00	2.00	4.80	6.00	4.90	2.35	1.70	1.85	2.35	1.80	2.25
14.....	2.20		2.00	4.80	6.00	4.80	2.30	1.70	1.85	2.40	1.90	2.20
15.....		2.00	2.00	4.80	6.00	4.60	2.20	1.70	1.85	2.45	1.90	2.25
16.....	2.00		2.00	4.80	6.10	4.70	2.15	1.65	1.85	2.50	1.90	2.25
17.....		2.00	2.00	4.80	6.15	4.60	2.10	1.65	1.90	2.50	1.90	2.25
18.....	2.00		2.00	5.00	6.20	4.40	2.00	1.65	1.85	2.50	1.90	2.20
19.....			2.00	5.20	6.30	4.20	2.00	1.60	1.85	2.45	1.90	2.20
20.....	1.90	2.00	2.00	5.40	6.50	4.00	2.00	1.60	1.80	2.45	1.90	2.20
21.....			2.00	5.60	6.60	3.80	2.00	1.60	1.80	2.50	1.90	2.30
22.....		2.00	2.00	5.70	6.70	3.60	2.00	1.60	1.80	2.50	1.90	2.10
23.....	2.00		2.00	5.90	6.80	3.50	2.00	1.60	1.80	2.50	1.90	2.45
24.....	2.00	2.00	2.00	6.10	6.80	3.40	2.00	1.55	1.80	2.50	1.90	2.40
25.....			2.00	5.80	6.80	3.80	2.00	1.55	1.80	2.50	1.90	2.65
26.....	2.00		2.10	5.70	6.80	3.20	2.00	1.55	1.80	2.45	1.90	2.60
27.....		2.00	2.20	5.70	6.70	3.10	1.90	1.55	1.80	2.45	1.90	2.30
28.....	2.00		2.20	5.80	6.70	3.05	1.85	1.50	1.85	2.40	1.85	2.20
29.....			2.60	5.90	6.60	3.00	1.80	1.50	1.85	2.35	1.90	2.15
30.....	2.00		3.00	5.95	6.55	3.00	1.75	1.50	1.90	2.30	1.85	2.15
31.....			2.80		6.40		1.70	1.55		2.20		2.20

OGDEN STATION ON OGDEN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 316, was located about 10 miles east of the city of Ogden, Utah, at the upper end of the canyon. Owing to the presence of the dam of the Pioneer Electric Power Company, constructed in 1896, just below this location, water was backed up and ponded around the gage. In the spring of 1897, therefore, the station was moved down the river 5 miles to near a powder mill in the canyon. The station is equipped with cable, car and tag wire. The gage is inclined and divided into tenths of a foot. The bench mark is a point on a quartzite ledge, one foot above the ground, at edge of county road, 37 feet west and 25 feet south of gage, and its elevation is 11.14 feet above the zero. The observer is Frank Hart. The following discharge measurements were made in 1897 by Samuel Fortier and W. B. Dougall.

May 11, gage height, 6.69 feet; discharge, 1,890 second-feet.

May 26, gage height, 5.79 feet; discharge, 1,423 second-feet.

June 2, gage height, 4.79 feet; discharge, 682 second-feet.

June 26, gage height, 3.25 feet; discharge, 170 second-feet.

July 30, gage height, 2.80 feet; discharge, 74 second-feet.

September 15, gage height, 2.61 feet; discharge, 51 second-feet.

October 15, gage height, 2.68 feet; discharge, 78 second-feet.

Daily gage height, in feet, of Ogden River near Ogden, Utah, for 1897.

Day.	Jan.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			4.90	3.60	2.70	2.60	2.80	2.70	2.70
2			4.80	3.50	2.70	2.60	2.70	2.70	2.70
3			4.70	3.40	2.70	2.70	2.70	2.70	2.70
4			4.50	3.30	2.60	2.60	2.70	2.70	2.60
5			4.50	3.30	2.60	2.60	2.60	2.80	2.60
6			4.40	3.30	2.60	2.60	2.70	2.70	2.60
7		3.45	4.40	3.20	2.60	2.60	2.70	2.70	2.60
8			4.40	3.20	2.60	2.60	2.70	2.70	2.60
9			4.30	3.20	2.60	2.60	2.70	2.70	2.70
10		6.70	4.20	3.10	2.60	2.60	2.70	2.70	2.60
11		6.70	4.10	3.00	2.60	2.60	2.70	2.70	2.60
12		6.50	4.00	3.00	2.60	2.60	2.80	2.70	2.70
13		6.60	3.90	3.00	2.60	2.70	2.70	2.70	2.60
14		2.80	3.90	2.90	2.60	2.60	2.80	2.70	2.60
15		7.10	3.80	2.90	2.60	2.60	2.80	2.70	2.60
16		6.80	4.10	2.90	2.60	2.60	2.70	2.70	2.60
17		6.50	3.90	2.90	2.60	2.60	2.70	2.70	2.60
18		6.40	3.90	2.90	2.60	2.60	2.70	2.70	2.50
19		6.50	3.90	2.90	2.60	2.60	2.70	2.60	2.50
20		7.10	3.90	2.90	2.60	2.60	2.70	2.60	2.40
21		6.80	3.90	2.90	2.60	2.60	2.70	2.60	2.40
22		3.00	6.40	3.80	2.90	2.60	2.70	2.80	2.50
23			6.20	3.70	2.80	2.60	2.70	2.70	2.40
24			6.10	3.60	2.80	2.60	2.80	2.70	2.50
25			5.90	3.50	2.80	2.60	2.70	2.80	2.40
26			5.80	3.50	2.80	2.60	2.70	2.70	2.30
27		2.70	5.50	3.40	2.80	2.60	2.70	2.70	2.30
28			5.20	3.40	2.70	2.60	2.70	2.70	2.60
29			5.20	3.40	2.70	2.60	2.70	2.70	2.60
30			5.10	3.60	2.70	2.60	2.70	2.70	2.60
31			5.00		2.70	2.60	2.70		2.60

UINTA STATION ON WEBER RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 323, is located near the watchman's house at the Union Pacific Railroad bridge, 5 miles east of Uinta, Utah. The observer is Morgan Flaherty, post-office address, Uinta, Utah. The gage consists of a horizontal timber, 4 by 4 inches by 16 feet long, fastened to two vertical posts set in the ground at the edge of the bank of the river, with one end of the timber projecting out over the water. On this horizontal timber is placed a wire gage. The bench mark consists of a spike driven into the first telegraph pole up the canyon from the gage, and its elevation is 17.44 feet above gage datum. The following discharge measurements were made in 1897 by W. B. Dougall and others:

April 29, gage height, 5.40 feet; discharge, 3,760 second-feet.

May 12, gage height, 5.25 feet; discharge, 3,662 second-feet.

May 27, gage height, 4.95 feet; discharge, 3,281 second-feet.

June 24, gage height, 2.20 feet; discharge, 805 second-feet.

July 29, gage height, 1.12 feet; discharge, 149 second-feet.

September 16, gage height, 1.40 feet; discharge, 250 second-feet.

October 15, gage height, 1.83 feet; discharge, 433 second-feet.

Daily gage height, in feet, of Weber River at Uinta, Utah, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.50			2.10	5.55	4.40	1.20	1.10	1.10	1.60	1.70	1.60
2.....		1.50	1.40	2.20	5.65	4.40	1.20	1.10	1.10	1.60	1.70	1.60
3.....				2.20	5.80	3.85	1.10	1.10	1.10	1.65	1.70	1.60
4.....				2.45	6.10	3.55	1.20	1.10	1.10	1.80	1.70	1.60
5.....	1.50	1.50	1.40	2.65	6.45	3.85	1.20	1.10	1.10	1.80	1.70	1.60
6.....				2.75	6.65	3.70	1.20	1.10	1.10	1.80	1.70	1.60
7.....				2.75	6.90	3.45	1.20	1.10	1.20	1.80	1.70	1.60
8.....			1.60	2.70	6.75	3.05	1.20	1.10	1.20	1.80	1.70	1.60
9.....	1.50	1.50		2.95	6.25	2.90	1.20	1.10	1.20	1.80	1.70	1.60
10.....				3.50	5.65	2.90	1.20	1.10	1.20	1.80	1.70	1.60
11.....				3.45	5.40	2.90	1.20	1.10	1.20	1.80	1.70	1.60
12.....		1.50	1.60	3.65	5.30	2.75	1.20	1.10	1.20	1.80	1.70	1.60
13.....				3.80	5.50	2.80	1.20	1.10	1.20	1.80	1.70	1.60
14.....	1.50		1.50	3.85	5.80	2.70	1.20	1.10	1.20	1.80	1.70	1.60
15.....			1.50	4.05	5.90	2.55	1.20	1.10	1.20	1.80	1.70	1.60
16.....		1.50	1.50	4.50	5.85	2.60	1.20	1.10	1.20	1.80	1.70	1.60
17.....			1.50	4.60	5.65	2.60	1.20	1.10	1.20	1.80	1.70	1.60
18.....	1.40		1.50	4.85	5.65	2.60	1.10	1.10	1.20	1.80	1.70	1.60
19.....	1.40	1.50	1.50	5.30	5.65	2.60	1.10	1.10	1.30	1.80	1.70	1.60
20.....			1.50	5.70	5.85	2.45	1.10	1.10	1.30	1.80	1.70	1.60
21.....			1.60	5.35	5.75	2.30	1.10	1.10	1.30	1.80	1.60	1.60
22.....		1.40	1.75	4.90	5.75	2.30	1.10	1.10	1.30	1.80	1.60	1.60
23.....	1.40		1.80	4.50	5.55	2.20	1.10	1.10	1.30	1.80	1.60	1.60
24.....			1.85	4.05	5.55	2.10	1.10	1.10	1.30	1.80	1.60	1.60
25.....	1.50	1.40	2.10	3.85	5.50	2.10	1.10	1.10	1.30	1.80	1.60	1.60
26.....			2.50	4.10	5.25	2.10	1.10	1.10	1.35	1.80	1.60	1.45
27.....			2.70	4.70	4.95	1.90	1.10	1.10	1.40	1.80	1.60	1.50
28.....			2.75	5.15	4.45	1.65	1.10	1.10	1.40	1.80	1.60	1.45
29.....	1.50		2.60	5.40	4.25	1.55	1.10	1.10	1.55	1.80	1.60	1.40
30.....			2.10		4.45	1.45	1.10	1.10	1.60	1.80	1.60	1.40
31.....			2.10		4.50		1.10	1.10		1.70		1.40

PROVO STATION ON PROVO RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 325, is located in the canyon about 6 miles from the city of Provo, Utah. The observer is Henry V. Smith, a farmer. The gage is inclined and fastened to stakes set in the ground. The bench mark is a stone firmly bedded in a bank near the wagon road, about 100 feet southwest of the gage. It is marked "B. M." in black paint, and is 6.95 feet above the zero of the gage. The banks are medium high. The channel is straight for some distance above and below the station. The bed of the river is gravelly and the velocity is medium swift. The following discharge measurements were made in 1897 by W. B. Dougall:

May 7, gage height, 6.25 feet; discharge, 1,818 second-feet.
 May 14, gage height, 6.05 feet; discharge, 1,681 second-feet.
 May 24, gage height, 6.53 feet; discharge, 2,454 second-feet.
 June 4, gage height, 5.35 feet; discharge, 1,167 second feet.
 June 21, gage height, 4.60 feet; discharge, 564 second-feet.
 August 7, gage height, 4.10 feet; discharge, 306 second-feet.
 November 26, gage height, 4.40 feet; discharge, 436 second-feet.

Daily gage height, in feet, of Provo River at Provo Canyon, Utah, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....					5.60	5.80	4.30	4.00	4.00	4.40	4.50	4.40
2.....	4.40				5.70	5.80	4.30	4.00	4.00	4.40	4.50	4.40
3.....					5.80	5.60	4.30	4.00	4.00	4.40	4.50	4.40
4.....				4.80	5.90	5.50	4.20	4.00	4.00	4.40	4.50	4.40
5.....				4.80	5.90	5.40	4.20	4.00	4.00	4.40	4.50	4.40
6.....		4.60	4.40	4.80	6.00	5.20	4.20	4.00	4.00	4.40	4.50	4.40
7.....				4.80	6.10	5.10	4.20	4.00	4.00	4.40	4.50	4.40
8.....				4.80	6.10	5.10	4.20	4.00	4.00	4.40	4.50	4.30
9.....	4.40			4.80	6.20	5.10	4.20	4.00	4.00	4.40	4.50	4.30
10.....				4.80	6.20	5.10	4.20	4.00	4.00	4.40	4.50	4.30
11.....				5.00	5.90	5.00	4.20	4.00	4.10	4.40	4.50	4.30
12.....				5.00	5.80	5.00	4.20	4.00	4.10	4.40	4.50	4.30
13.....		4.60	4.40	5.00	6.00	5.00	4.20	4.00	4.10	4.40	4.50	4.30
14.....				5.00	6.00	5.00	4.20	4.00	4.10	4.40	4.30	4.30
15.....				5.00	6.20	4.90	4.20	4.00	4.10	4.40	4.30	4.30
16.....				5.00	6.10	4.90	4.20	4.00	4.10	4.40	4.30	4.30
17.....				5.00	6.10	4.90	4.20	4.00	4.10	4.50	4.30	4.30
18.....				5.40	6.20	4.90	4.10	4.00	4.10	4.50	4.30	4.30
19.....		4.80		5.40	6.30	4.90	4.10	4.00	4.10	4.50	4.30	4.30
20.....		4.60	4.40	5.60	6.30	4.80	4.10	4.00	4.10	4.50	4.30	4.30
21.....				5.60	6.40	4.80	4.10	4.00	4.10	4.50	4.40	4.30
22.....				5.40	6.50	4.60	4.10	4.00	4.10	4.50	4.40	4.30
23.....		4.30		5.00	6.50	4.50	4.10	4.00	4.10	4.50	4.40	4.30
24.....				5.00	6.60	4.40	4.10	4.00	4.10	4.50	4.40	4.30
25.....				5.10	6.60	4.30	4.10	4.00	4.10	4.50	4.40	4.30
26.....				5.20	6.50	4.30	4.10	4.00	4.10	4.50	4.40	4.30
27.....		4.40		5.30	6.50	4.30	4.10	4.00	4.10	4.50	4.40	4.30
28.....				5.40	6.40	4.30	4.10	4.00	4.20	4.50	4.40	4.30
29.....				5.50	6.40	4.30	4.10	4.00	4.20	4.50	4.40	4.30
30.....	4.30			5.60	6.10	4.30	4.10	4.00	4.40	4.50	4.40	4.30
31.....					6.00		4.10	4.00		4.50		4.30

GENEVA STATION ON UTAH LAKE.

This station, described in the Eighteenth Annual Report, Part IV, page 327, is located at Geneva, Utah, 3 miles south of American Fork, at the lower end of the lake. The gage consists of a vertical rod driven into the sand at the southern end of a bath-house, and nailed firmly to the floor of the house. The bench mark of the lake commissioners, a sandstone monument at the edge of the bluff and opposite the south end of the pavilion, is 18,644 feet above gage datum, which was placed 4 feet below "compromise point." The observer is John Dallin; post-office address, Pleasant Grove, Utah.

Daily gage height, in feet, of Utah Lake at Geneva, Utah, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.35	.....	1.90	1.80	.....	2.80	2.00	.....	0.80	.....	0.55	0.70
2.....	.....	1.55	.....	.....	.....	.....	.....	1.40	.....	.....	.....	.....
3.....	.....	.....	1.90	1.80	2.05	2.45	2.00	.....	.80	.....	.55	.....
4.....	1.35	1.58	.....	.....	.....	.....	.....	1.40	.75	0.40	.....	.75
5.....	.....	.....	.....	1.85	2.30	2.70	2.00	.....	.....	.....	.....	.....
6.....	1.40	1.68	.....	.....	.....	.....	.....	.....	.75	.40	.60	.80
7.....	.....	.....	.....	1.90	.....	2.70	1.90	1.30	.....	.35	.....	.....
8.....	1.40	1.40	.....	.....	2.40	.....	.....	.....	.70	.....	.60	.85
9.....	1.40	.....	.....	1.90	.....	.....	.....	1.30	.....	.40	.....	.....
10.....	.....	1.40	.....	.....	2.50	2.65	1.90	.....	.....	.....	.60	.....
11.....	1.40	.....	.....	.....	.....	.....	.....	.....	.60	.40	.....	.90
12.....	.....	1.40	.....	1.90	2.55	2.65	1.80	1.30	.....	.....	.....	.....
13.....	1.40	.....	.....	.....	.....	.....	.....	.....	.55	.35	.60	.90
14.....	.....	.....	.....	1.90	.....	2.40	1.75	1.20	.....	.....	.....	.....
15.....	1.40	1.40	.....	.....	2.60	.....	.....	.....	.50	.....	.55	.....
16.....	1.40	.....	.....	1.90	2.40	2.40	.....	1.15	.....	.40	.....	.90
17.....	.....	1.45	.....	1.95	2.65	2.50	1.70	.....	.....	.....	.....	.....
18.....	1.40	.....	.....	2.00	2.40	.....	1.65	1.10	.50	.45	.55	.90
19.....	.....	1.80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20.....	1.42	1.85	.....	.....	.....	.....	1.65	1.10	.50	.50	.60	.90
21.....	.....	.....	.....	2.00	.....	2.40	1.65	1.00	.....	.....	.....	.....
22.....	1.45	1.82	.....	.....	2.45	.....	.....	.....	.....	.....	.60	.95
23.....	1.45	.....	.....	.....	.....	2.40	.....	1.00	.40	.55	.....	.....
24.....	.....	1.82	.....	2.10	2.80	.....	1.55	.....	.....	.....	.....	.95
25.....	1.45	.....	.....	.....	.....	.....	.....	.95	.40	.50	.....	.....
26.....	.....	1.88	1.70	2.10	2.80	2.35	1.55	.....	.....	.....	.65	.....
27.....	1.45	1.88	1.75	.....	.....	.....	.....	.....	.40	.50	.70	.95
28.....	.....	.....	.....	2.15	.....	2.35	1.50	.90	.....	.....	.....	.....
29.....	.....	.....	1.80	.....	2.80	.....	.....	.....	.40	.50	.70	.95
30.....	1.50	.....	.....	2.20	.....	2.20	.....	.....	.40	.....	.....	1.00
31.....	.....	.....	1.80	.....	.....	.....	1.40	.....	.....	.....	.....	.....

POCATELLO STATION ON PORTNEUF RIVER.

This station is located at the wagon bridge, one-eighth of a mile below plant of the Pocatello Electric Power Company at Pocatello, Idaho. It was established May 18, 1897, by G. H. Nickerson. The rod is vertical and securely spiked to center pier of bridge. The bench mark is a spike driven into the end of a log in the east abutment of bridge and is opposite the 13-foot mark. The channel above the station is curved, while below it is straight. The right bank is high, but the left is liable to overflow at a 12-foot gage height. The bed of the stream is rocky. The current is sluggish at low stages. The observer is John A. Lillibridge, engineer at the power-house. The following discharge measurements were made by G. H. Nickerson and F. J. Mills in 1897:

May 20, gage height, 12.70 feet; discharge, 1,847 second-feet.

July 29, gage height, 6.95 feet; discharge, 123 second-feet.

Daily gage height, in feet, of Portneuf River at Pocatello, Idaho, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1		10.70	7.80	6.90	6.80	17		8.20	7.40	6.80	7.00
2		10.00	7.70	6.90	6.80	18	12.80	8.00	7.50	6.80	7.00
3		10.50	7.80	6.90	6.80	19	12.70	8.00	7.30	7.10	7.00
4		10.30	7.70	6.90	7.00	20	12.70	8.00	7.30	7.00	7.00
5		10.10	7.70	6.90	7.10	21	12.70	8.00	7.20	7.00	6.90
6		9.80	7.70	6.90	7.10	22	12.70	7.90	7.20	7.00	6.90
7		9.70	7.90	6.90	7.10	23	12.70	8.00	7.00	6.90	6.90
8		9.50	7.80	6.80	7.00	24	12.50	8.10	7.00	6.90	7.00
9		9.30	7.70	7.00	6.90	25	12.40	8.00	7.00	6.60	7.00
10		9.30	7.50	6.90	7.10	26	12.20	8.00	7.00	6.70	7.00
11		9.10	7.50	6.90	7.00	27	11.90	8.00	6.90	6.80	7.00
12		9.00	7.50	6.90	7.00	28	11.60	8.00	7.00	6.80	7.10
13		8.90	7.40	6.90	7.00	29	11.40	8.00	6.90	6.80	7.10
14		8.80	7.40	6.90	7.00	30	11.20	7.90	6.90	6.80	7.20
15		8.60	7.40	6.90	7.00	31	10.90		6.90	6.80	
16		8.40	7.40	6.80	7.00						

MONTGOMERY STATION ON SNAKE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 334, is located at Montgomerys Ferry, 12 miles from Minidoka, Idaho, from which it is reached by stage. The gage is inclined and fastened to posts set in the ground. The bench mark is the head of a spike in the east post of the tool house, 1.2 feet above the ground and 52 feet west of the gage. Its elevation is 17.50 feet above datum. The letters "B. M." are marked in black paint on the post. The river is 800 feet wide at the section, with a hard gravel bottom. The observer is George Montgomery, the ferryman. The following are the discharge measurements as made from the ferryboat in 1897 by Cyrus C. Babb and G. H. Nickerson:

April 29, gage height, 4.63 feet; discharge, 9,473 second-feet.

June 8, gage height, 9.90 feet; discharge, 36,276 second-feet.

Daily gage height, in feet, of Snake River at Montgomerys Ferry, Idaho, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1.	5.15	12.15	6.00	3.25	2.60	17.	3.20	9.75	8.90	4.70	2.80	2.70
2.	5.45	12.05	5.90	3.20	2.60	18.	3.30	10.20	8.85	4.60	2.70	2.70
3.	5.70	12.00	5.80	3.20	2.60	19.	3.45	10.45	8.75	4.50	2.70	2.70
4.	6.05	12.15	5.80	3.20	2.50	20.	3.75	10.65	8.60	4.45	2.70	2.70
5.	6.45	12.10	5.90	3.20	2.60	21.	3.95	10.85	8.15	4.35	2.70	2.70
6.	7.20	11.60	6.05	3.10	2.60	22.	4.30	11.05	7.65	4.25	2.70	2.70
7.	7.75	10.80	6.15	3.00	2.70	23.	4.55	11.45	7.25	4.15	2.70	2.70
8.	8.25	9.95	5.95	3.00	2.80	24.	4.60	11.85	7.05	4.00	2.70	2.70
9.	8.80	9.40	5.65	3.00	2.70	25.	4.45	12.10	6.85	3.85	2.70	2.70
10.	9.15	9.15	5.45	3.00	2.70	26.	4.30	12.25	6.70	3.75	2.65	2.70
11.	9.15	9.35	5.30	2.90	2.70	27.	4.20	12.45	6.55	3.70	2.60	2.70
12.	8.85	9.50	5.15	2.90	2.70	28.	4.30	12.55	6.35	3.65	2.60	2.70
13.	8.75	9.35	5.05	2.90	2.70	29.	4.60	12.60	6.15	3.60	2.60	2.70
14.	8.95	9.05	4.95	2.80	2.70	30.	4.95	12.60	6.10	3.50	2.60	2.75
15.	3.10	8.15	8.90	4.80	2.80	2.70	31.	.....	12.35	.....	3.40	2.60	.....
16.	3.20	9.35	8.90	4.70	2.80	2.70							

TOPONIS STATION ON MALAD AND LITTLE WOOD RIVERS.

This station, described in the Eighteenth Annual Report, Part IV, page 336, was established on June 2, 1896, on Malad and Little Wood rivers, at the wagon bridges near the railroad station of Toponis, Idaho. On the Malad River the rod of the wire gage is fastened to the stringer of the bridge, upper side. The 5-foot mark is opposite the center vertical. The distance from the end of the weight to the index marker is 13.60 feet. The outside edge of the pulley wheel is 1 foot from the zero of the rod. The bed of the river is of gravel, and not liable to change. During low stages the water is confined under the south span, but in floods it is under the two spans. The banks are not subject to overflow. The bridge over the Malad is one-half mile north of railroad station.

On the Little Wood River the station is one-half mile south of the railroad. The rod is fastened to the floor of the bridge, the 1.8-foot mark being opposite the iron vertical on the upper side of the bridge. The distance from the end of the weight to the index marker is 10.37 feet. The distance from the end of the rod to the outside edge of the pulley wheel is 1.97 feet. The channel is good and not obstructed by piers, but the banks overflow during flood stages. The observer is Will Hickman. The following discharge measurements were made by G. H. Nickerson and F. J. Mills in 1897:

Malad River:

May 21, gage height, 7.50 feet; discharge, 4,437 second-feet.

July 31, gage height, 2.80 feet; discharge, 81 second-feet.

Little Wood River:

May 21, gage height, 7.30 feet; discharge, 487 second-feet.

Daily gage height, in feet, of Malad River at Toponis, Idaho, for 1897.

Day.	June.	July.	Aug.	Sept.	Oct.	Day.	June.	July.	Aug.	Sept.	Oct.
1 .....	.....	.....	2.80	.....	2.40	17	4.00	3.30	2.60	2.00	.....
2 .....	.....	.....	2.80	.....	2.50	18 .....	.....	3.80	3.40	2.50	2.10
3 .....	.....	.....	2.80	.....	.....	19	3.50	3.30	2.50	2.30	.....
4 .....	.....	4.00	2.80	.....	.....	20 .....	.....	3.20	2.50	2.30	.....
5 .....	.....	4.20	2.80	.....	.....	21 .....	.....	3.30	2.50	2.30	.....
6	5.60	4.30	2.70	.....	.....	22 .....	.....	3.30	2.40	2.20	.....
7	5.60	4.10	2.70	.....	.....	23 .....	.....	3.20	2.30	2.30	.....
8	5.60	3.90	2.60	.....	.....	24 .....	.....	3.30	2.20	2.20	.....
9	5.50	3.70	2.60	.....	.....	25 .....	.....	3.20	2.00	2.40	.....
10	5.20	3.50	2.60	.....	.....	26 .....	.....	3.00	2.00	2.40	.....
11	5.00	3.50	2.60	.....	.....	27 .....	.....	3.00	2.00	2.40	.....
12	4.90	3.50	2.50	.....	.....	28 .....	.....	2.90	2.00	2.50	.....
13	4.50	3.50	2.50	.....	.....	29 .....	.....	2.90	.....	2.50	.....
14	4.20	3.40	2.40	.....	.....	30 .....	.....	2.90	.....	2.40	.....
15	4.40	3.30	2.60	.....	.....	31 .....	.....	2.80	.....	.....	.....
16	4.20	3.30	2.50	.....	.....				

Daily gage height, in feet, of Little Wood River at Toponis, Idaho, for 1897.

Day.	June.	July.	Aug.	Sept.	Oct.	Day.	June.	July.	Aug.	Sept.	Oct.
1 .....	.....	2.30	1.20	2.60	3.70	17	4.80	1.30	1.20	2.90	.....
2 .....	.....	2.20	1.10	2.30	3.80	18	3.60	1.10	1.20	3.00	.....
3 .....	.....	2.40	1.00	2.40	.....	19	3.80	1.20	1.40	3.10	.....
4 .....	.....	2.20	1.00	2.40	.....	20	3.20	1.30	1.40	3.00	.....
5 .....	.....	2.00	1.00	2.30	.....	21	3.00	1.20	1.40	3.20	.....
6	6.50	1.90	1.00	2.20	.....	22	3.40	1.20	1.40	3.30	.....
7	6.50	1.90	1.00	2.20	.....	23	3.70	1.20	1.30	3.30	.....
8	5.50	1.70	1.00	2.30	.....	24	3.90	1.10	1.40	3.30	.....
9	4.80	1.50	1.20	2.40	.....	25	4.00	1.30	1.50	3.40	.....
10	4.60	1.30	1.20	2.50	.....	26	4.10	1.20	2.00	3.40	.....
11	4.20	1.20	1.30	2.60	.....	27	4.20	1.20	2.00	3.50	.....
12	4.00	1.20	1.20	2.60	.....	28	4.40	1.20	2.20	3.40	.....
13	4.00	1.10	1.20	2.70	.....	29	3.50	1.20	2.80	3.50	.....
14	3.80	1.10	1.10	2.80	.....	30	2.50	1.20	2.90	3.60	.....
15	4.20	1.00	1.30	2.90	.....	31 .....	.....	1.30	2.80	.....	.....
16	4.00	1.00	1.30	2.90	.....					

GRANDVIEW STATION ON BRUNEAU RIVER.

This station is described in the Eighteenth Annual Report, Part IV, page 339. The point of measurement is 10 miles east of Grandview, Idaho, below the head of the Bruneau ditch. Observations of gage height are regularly kept, and estimates of discharge are made from them by A. J. Wiley, chief engineer of the Owyhee Land and Irrigation Company. C. C. Gregg is the observer.

Daily gage height, in feet, of Bruneau River at Grandview, Idaho, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.60	1.65	1.70	2.30	4.80	4.45	2.40	1.40	1.15	1.30	1.60	1.75
2.....	1.60	1.65	1.70	2.25	4.75	4.20	2.40	1.40	1.15	1.30	1.65	1.70
3.....	1.55	1.65	1.70	2.30	4.90	4.00	2.40	1.50	1.15	1.30	1.70	1.70
4.....	1.55	1.65	1.70	2.25	5.00	3.65	2.35	1.50	1.15	1.35	1.65	1.65
5.....	1.55	1.70	1.70	2.65	5.10	3.60	2.35	1.40	1.15	1.35	1.60	1.65
6.....	1.55	1.95	1.70	3.50	5.30	3.50	2.30	1.35	1.15	1.35	1.60	1.65
7.....	1.60	2.70	1.75	3.75	5.50	3.40	2.20	1.35	1.15	1.40	1.70	1.75
8.....	1.55	2.20	1.75	3.45	5.60	3.50	2.15	1.30	1.15	1.40	1.65	1.80
9.....	1.55	2.05	1.70	3.10	5.25	3.45	2.15	1.30	1.20	1.40	1.65	1.80
10.....	1.55	1.95	1.65	3.60	4.70	3.60	2.10	1.30	1.20	1.50	1.60	1.75
11.....	1.50	1.80	1.65	4.40	4.50	3.45	2.10	1.30	1.20	1.55	1.65	1.80
12.....	1.50	1.80	1.65	5.00	4.45	3.35	2.00	1.30	1.20	1.55	1.70	1.80
13.....	1.50	1.80	1.60	4.50	4.35	3.30	1.95	1.30	1.20	1.60	1.70	1.80
14.....	1.60	1.70	1.50	4.60	4.40	3.30	2.00	1.30	1.20	1.55	1.70	1.85
15.....	1.60	1.60	1.55	4.60	4.55	3.30	2.00	1.35	1.25	1.60	1.70	1.85
16.....	1.60	1.80	1.60	4.65	4.60	3.25	2.00	1.25	1.25	1.60	1.70	1.80
17.....	1.60	1.70	1.65	4.80	4.65	3.15	1.95	1.25	1.25	1.65	1.70	1.70
18.....	1.60	1.65	1.65	5.10	4.80	3.10	1.90	1.25	1.25	1.65	1.70	1.75
19.....	1.50	1.65	1.65	5.50	5.00	3.00	1.90	1.25	1.30	1.60	1.70	1.70
20.....	1.50	1.65	1.65	6.00	5.15	2.90	1.90	1.25	1.30	1.60	1.75	1.80
21.....	1.60	1.65	1.65	5.75	5.35	2.80	1.85	1.05	1.30	1.60	1.75	1.70
22.....	1.70	1.65	1.60	5.15	5.65	2.65	1.80	1.10	1.30	1.60	1.75	1.75
23.....	1.70	1.70	1.60	4.50	5.50	2.60	1.65	1.10	1.30	1.60	1.85	1.70
24.....	1.65	1.65	1.60	4.00	5.65	2.60	1.60	1.10	1.30	1.65	1.85	1.70
25.....	1.65	1.65	1.65	3.70	5.45	2.60	1.60	1.10	1.30	1.65	1.80	1.70
26.....	1.60	1.65	7.00	3.80	5.10	2.50	1.65	1.10	1.30	1.65	1.80	1.75
27.....	1.60	1.65	7.00	4.00	4.70	2.50	1.55	1.15	1.30	1.65	1.75	1.70
28.....	1.50	1.65	4.00	4.60	5.10	2.50	1.50	1.10	1.30	1.65	1.70	1.80
29.....	1.55	-----	3.60	4.80	4.70	2.55	1.45	1.15	1.30	1.65	1.65	1.75
30.....	1.60	-----	2.80	5.00	4.50	2.20	1.45	1.15	1.30	1.65	1.70	1.70
31.....	1.70	-----	2.55	-----	4.50	-----	1.45	1.15	-----	1.65	-----	1.70

BOISE STATION ON BOISE RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 340, is located about 9 miles above Boise, Idaho, at the mouth of the canyon. April 18 the river cut into the right bank of the station, carrying out the cable and leaving the gage on a small island, so that the record after that date is unreliable. A temporary gage was therefore established May 12 at the Broadway Bridge, at Boise, and a record kept by it until June 17, when a new gage was again placed in the canyon 1 mile above the old location. The inclined rod is firmly attached to a cottonwood tree. The bench mark is a 20-penny spike in the upstream face of the 6 by 8 cable support, about 2 feet above the ground. Its elevation is 15.00 feet above datum; also two spikes in same post are 14.00 feet above datum. Discharge measurements are made from a cable and car, 50 feet below the gage. An auxiliary cable for flood measurements is placed 117 feet above the main cable. The observer is Mrs. Ed. Marnell. The following are the discharge measurements made on the Boise River by F. J. Mills and others in 1897:

April 21, at Star bridge, discharge, 24,312 second-feet.

May 18, at Broadway bridge, gage height, 4.30 feet; discharge, 23,522 second-feet.

June 29, gage height, 3.25 feet; discharge, 3,526 second-feet.

August 6, gage height, 1.60 feet; discharge, 1,357 second-feet.

September 18, gage height, 1.30 feet; discharge, 987 second-feet.

October 25, gage height, 1.50 feet; discharge, 1,256 second-feet.

Daily gage height, in feet, of Boise River at Boise, Idaho, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	2.00	1.90	1.70	3.60	7.30	-----	3.20	1.60	1.20	1.20	1.35
2	1.90	1.80	1.70	3.30	8.00	-----	3.60	1.60	1.30	1.25	-----
3	1.90	1.60	1.90	3.20	8.20	-----	3.30	1.50	1.30	1.25	-----
4	1.80	1.60	2.00	3.30	8.00	-----	3.05	1.55	1.30	1.25	1.30
5	1.80	1.90	2.00	3.20	8.00	-----	3.05	1.55	1.40	1.25	-----
6	1.70	2.00	1.90	3.50	7.50	-----	2.90	1.55	1.40	1.25	-----
7	1.70	1.90	2.00	3.50	7.00	-----	2.75	1.55	1.40	1.30	-----
8	1.80	2.40	2.10	3.40	7.00	-----	2.70	1.50	1.30	1.25	1.30
9	1.80	2.40	2.00	3.90	-----	-----	2.40	1.50	1.30	1.25	-----
10	1.90	2.20	1.90	4.30	-----	-----	2.30	1.45	1.40	1.30	-----
11	1.70	2.10	1.90	5.00	-----	-----	2.35	1.45	1.40	1.35	1.35
12	1.60	2.10	1.70	5.60	-----	-----	2.35	1.45	1.40	1.40	-----
13	1.40	2.00	1.50	6.00	-----	-----	2.30	1.40	1.50	1.40	-----
14	1.20	2.00	1.70	6.20	-----	-----	2.30	1.40	1.50	1.35	-----
15	1.20	2.00	1.70	7.30	-----	-----	2.30	1.40	1.50	1.35	1.30
16	1.20	1.90	1.70	8.00	-----	-----	2.20	1.35	1.40	1.35	-----
17	1.10	1.90	2.00	8.90	-----	4.00	2.20	1.30	1.40	1.30	-----
18	1.10	1.80	2.00	9.00	-----	3.80	2.20	1.30	1.30	1.30	1.50
19	1.10	1.80	1.90	9.30	-----	3.50	2.20	1.25	1.30	1.35	-----
20	1.40	1.70	1.80	8.90	-----	3.50	2.00	1.25	1.30	1.25	-----
21	1.60	1.60	1.80	6.80	-----	3.40	1.95	1.20	1.40	1.30	-----
22	1.60	1.70	1.90	6.70	-----	3.50	1.80	1.15	1.40	1.30	1.40
23	1.80	1.70	2.20	6.60	-----	3.80	2.00	1.20	1.40	1.30	-----
24	1.50	1.70	2.60	6.70	-----	3.40	1.95	1.20	1.40	1.40	-----
25	1.40	1.60	3.00	6.90	-----	3.50	1.90	1.20	1.40	1.50	1.50
26	1.40	1.50	4.00	7.40	-----	3.30	1.80	1.30	1.20	1.50	-----
27	1.20	1.50	4.20	7.40	-----	3.40	1.80	1.30	1.20	1.40	-----
28	1.20	1.60	4.00	7.50	-----	3.30	1.75	1.30	1.20	1.35	-----
29	1.60	-----	3.90	7.00	-----	3.20	1.70	1.30	1.20	1.35	1.30
30	1.80	-----	3.70	6.50	-----	3.20	1.60	1.30	1.20	1.35	-----
31	1.90	-----	3.50	-----	-----	-----	1.65	1.20	-----	-----	-----

VALE STATION ON MALHEUR RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 345, is located at the iron highway bridge at Vale, Oregon. The observer is E. R. Murray, postmaster. The station is distant from the observer's house about one-fourth of a mile. The gage is inclined, and is in two parts. The lower part is graduated from 1.6 to 9.1 feet, the distance between the footmarks being 1.95 feet. The upper part is graduated from 9.1 to 11.7 feet, the distance between the footmarks being 3 feet. The channel is composed of earth and sand and is shifting. The bench mark is on a flat rock, nearly buried, above the right bank of the river, 50 feet southeast of south abutment of new bridge, and is 12.32 feet above the zero of the gage. Measurements are made from the iron highway bridge. The following discharge measurements were made in 1897 by Frank Shirley and G. H. Nickerson:

April 17, gage height, 7.15 feet; discharge, 4,857 second-feet.

May 15, gage height, 4.75 feet; discharge, 1,883 second-feet.

May 28, gage height, 4.37 feet; discharge, 1,694 second-feet.

Daily gage height, in feet, of Malheur River at Vale, Oregon, for 1897.

Day.	Apr.	May.	June.	July.	Day.	Apr.	May.	June.	July.	Day.	Apr.	May.	June.	July.
1..	6.10	3.75	2.43	12..	.....	5.05	2.65	2.10	23...	7.70	4.50	2.40	1.45
2..	6.10	3.55	2.40	13..	.....	4.95	2.55	2.00	24...	7.20	4.45	2.40	1.40
3..	6.10	3.45	2.40	14..	.....	4.80	2.50	1.98	25...	6.60	4.40	2.38	1.40
4..	5.95	3.25	2.35	15..	6.55	4.70	2.50	1.90	26...	6.45	4.35	2.85	1.40
5..	5.95	3.10	2.30	16..	6.75	4.70	2.50	1.90	27...	6.65	4.35	2.68	1.38
6..	5.90	3.20	2.30	17..	7.25	4.80	2.45	1.87	28...	7.00	4.35	2.65	1.33
7..	6.05	3.05	2.28	18..	8.30	5.00	2.40	1.75	29...	7.10	4.15	2.60	1.30
8..	6.10	3.00	2.20	19..	8.95	4.90	2.40	1.65	30...	6.60	3.95	2.55	1.25
9..	5.80	2.90	2.20	20..	9.30	4.90	2.50	1.55	31...	.....	3.80	.....	1.20
10..	5.40	2.95	2.18	21..	10.10	4.85	2.43	1.50					
11..	5.15	2.75	2.13	22..	8.50	4.60	2.40	1.50					

PAYETTE STATION ON PAYETTE RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 350, is located at the highway bridge at Payette, Idaho. The observer is J. A. Ballinger, the town marshal at Payette. The station is distant from the observer's house about one-half mile. The gage is vertical, of pine plank, spiked to a wooden pier, graduated from 0 to 12.5 feet. It is easily read from the bridge. The character of the channel is sandy and shifting. The point 12.5 on the gage is level with the top of the pier, on which is the mark "B. M." Measurements of discharge were made as follows by G. H. Nickerson in 1897:

May 14, gage height, 7.40 feet; discharge, 19,422 second-feet.

May 27, gage height, 8.20 feet; discharge, 26,707 second-feet.

Daily gage height, in feet, of Payette River at Payette, Idaho, for 1897.

Day.	May.	June.	July.	Day.	May.	June.	July.	Day.	May.	June.	July.
1.....		7.50	3.80	12.....		5.30	2.80	23.....	8.50	4.10	1.90
2.....		7.00	3.90	13.....		5.30	2.70	24.....	8.40	4.00	1.90
3.....		6.80	3.90	14.....	7.40	5.30	2.60	25.....	8.50	4.00	1.80
4.....		6.10	3.90	15.....	7.60	5.20	2.50	26.....	8.60	3.90	1.80
5.....		5.90	3.70	16.....	7.80	5.00	2.40	27.....	8.20	3.80	1.70
6.....		6.10	3.60	17.....	8.00	4.90	2.30	28.....	7.90	3.80	1.70
7.....		5.90	3.50	18.....	8.30	4.70	2.20	29.....	7.80	3.80	1.60
8.....		5.60	3.30	19.....	8.40	4.60	2.20	30.....	7.80	3.90	1.60
9.....		5.60	3.20	20.....	8.60	4.40	2.10	31.....	7.60		1.50
10.....		5.50	3.00	21.....	8.70	4.30	2.10				
11.....		5.40	2.90	22.....	8.50	4.20	2.00				

WEISER STATION ON WEISER RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 352, is about 10 miles above the town of Weiser, Idaho, at the mouth of the canyon. The gage is firmly fastened to posts driven into the ground. The 6-foot mark is 13.46 feet below a bench mark on a large bowlder 30 feet south of the gage. The observer is J. W. Lane, whose house is about one-fourth of a mile from the gage. The channel is straight for some distance above and below the section, the banks are high, and the bed is gravelly. The following discharge measurements were made in 1897 by F. J. Mills, Cyrus C. Babb, and others:

May 26, gage height, 4.95 feet; discharge, 5,026 second-feet.

August 5, gage height, 0.70 foot; discharge, 100 second-feet.

October 23, gage height, 0.95 feet; discharge, 153 second-feet.

Daily gage height, in feet, of Weiser River at Weiser, Idaho, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1....	5.10	5.60	3.70	1.80	0.80	0.70	17.....	7.10	6.00	2.30	1.30	0.60	0.80
2....	5.85	5.80	3.40	1.80	.80	.70	18.....	7.50	6.00	2.30	1.20	.60	.80
3....	6.00	5.90	3.20	2.00	.80	.70	19.....	7.90	5.90	2.20	1.20	.60	.80
4....	6.10	6.00	3.10	1.90	.70	.70	20.....	8.30	5.90	2.10	1.20	.60	.80
5....	7.00	6.20	3.00	1.80	.70	.70	21.....	7.90	5.90	2.10	1.20	.60	.80
6....	6.90	6.40	3.00	1.70	.70	.70	22.....	7.60	5.80	2.00	1.10	.60	.80
7....	6.70	6.90	2.90	1.70	.70	.70	23.....	7.30	5.50	2.00	1.10	.60	.80
8....	6.50	6.40	2.90	1.70	.60	.80	24.....	5.70	5.00	2.00	1.10	.60	.90
9....	6.90	5.80	2.80	1.60	.60	.80	25.....	5.60	5.20	1.90	1.00	.60	.90
10....	7.00	5.40	2.70	1.60	.60	.80	26.....	6.00	5.00	1.90	1.00	.60	.90
11....	7.00	5.40	2.60	1.50	.60	.80	27.....	6.50	4.30	2.10	1.00	.60	.90
12....	6.50	5.40	2.60	1.50	.60	.80	28.....	6.90	4.20	2.00	1.00	.60	.90
13....	6.60	5.50	2.50	1.40	.60	.80	29.....	6.50	4.10	1.90	.90	.60	.90
14....	6.60	5.70	2.50	1.40	.60	.80	30.....	5.80	4.00	1.80	.90	.60	.90
15....	6.50	5.90	2.40	1.30	.60	.80	31.....	4.00	.....	.....	.90	.60	.....
16....	6.70	6.00	2.40	1.30	.60	.80							

HOOPER STATION ON PALOUSE RIVER.

This station is located on the Palouse River at Hooper, Washington. It was established April 1, 1897, by the land department of the Northern Pacific Railroad. September 9, 1897, this Survey took charge of the station, placing the gage rod 1 mile below the former location and opposite the water tank, and stretching a cable across the river for discharge measurements. The rod is inclined, fastened to posts driven into the right bank. The bench mark is a point of rock, marked with red paint, on a ledge on the left bank of the river opposite the gage, and its elevation is 7.60 feet above datum. When the new gage reads 2.1 feet the height on the Northern Pacific Railroad gage is 6.1 feet. The channel is gravelly and not liable to change. The left bank is high and can not overflow. The right bank overflows in extreme high water. The initial point for sounding is the cable post on left bank. The station is about 3 miles above the mouth of Cow Creek and 2 miles below the head of the ditch of the Palouse Irrigation Company, carrying 25 second-feet when full. The observer is Frank Hill, rancher. Discharge measurements were made by Cyrus C. Babb in 1897, as follows:

September 9, gage height, 2.10 feet; discharge 73 second-feet.

October 1, gage height, 1.90 feet; discharge, 50 second-feet.

Daily gage height, in feet, of Palouse River at Hooper, Washington, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.10	8.45	6.08	6.42	5.55	.....	1.90	2.00	3.20
2	9.85	8.20	6.08	5.42	5.52	.....	1.90	2.00	3.30
3	10.18	8.10	6.03	6.42	5.62	.....	1.95	2.05	3.60
4	10.11	8.12	6.01	6.42	5.68	.....	2.00	2.05	3.70
5	9.98	8.00	5.95	6.50	5.65	.....	2.00	2.05	3.60
6	9.98	7.98	5.94	6.50	5.65	.....	1.95	2.05	3.60
7	9.97	7.98	5.93	6.45	5.72	.....	1.95	2.20	5.00
8	10.22	8.12	6.02	6.36	5.82	.....	1.90	2.20	5.95
9	10.08	8.00	6.21	6.31	5.85	2.10	1.90	2.10	7.00
10	9.90	7.90	6.20	6.25	5.85	2.20	1.95	2.20	7.05
11	9.80	7.66	6.15	6.20	5.92	2.10	2.00	2.25	6.90
12	10.15	7.44	6.07	6.15	5.88	2.10	2.00	2.30	6.30
13	10.58	7.40	6.07	6.46	5.80	2.20	1.95	2.50	6.60
14	10.15	7.20	6.07	6.39	5.80	2.20	1.90	2.70	6.50
15	9.80	7.05	6.10	6.31	5.80	2.10	1.90	3.50	7.55
16	9.97	7.05	6.10	6.22	5.80	2.10	1.90	3.90	7.00
17	10.04	7.05	6.18	6.18	5.78	2.00	1.95	3.60	6.30
18	10.17	7.11	6.28	6.12	5.77	2.00	1.95	3.40	5.40
19	10.25	7.00	6.55	6.05	5.95	2.00	1.95	3.40	5.20
20	10.30	6.89	7.20	6.02	5.97	2.00	2.00	3.60	4.90
21	10.24	6.78	7.50	5.99	5.95	2.00	2.00	4.35	4.70
22	10.10	6.63	7.20	5.99	5.89	2.00	2.00	4.80	4.60
23	9.80	6.55	7.00	5.94	5.87	2.00	2.00	4.70	4.50
24	9.40	6.49	6.88	5.93	5.89	1.90	2.00	4.20	4.40
25	9.08	6.40	6.85	5.93	5.82	1.90	2.00	4.00	4.35
26	8.80	6.39	6.77	5.92	5.86	1.90	2.05	3.65	4.60
27	8.69	6.38	6.62	5.91	5.90	1.90	2.05	3.60	4.65
28	8.72	6.38	6.58	5.80	5.91	1.90	2.00	3.50	4.90
29	8.89	6.37	6.62	5.70	5.85	1.90	2.00	3.40	6.70
30	8.74	6.22	6.50	5.65	5.82	1.90	2.00	3.80	7.10
31 .....	.....	6.13	.....	5.60	5.80	.....	2.00	.....	7.40

Readings on Northern Pacific Railroad gage April 1 to August 31. United States Geological Survey gage established September 9 and located 1 mile below Northern Pacific Railroad gage, and also made to read 4 feet lower.

SELAH STATION ON YAKIMA RIVER.

This station is located on the Yakima River at the Northern Pacific Railway bridge, or first crossing of the Yakima, 7 miles above the town of North Yakima, Washington. It was established by Cyrus C. Babb, May 19, 1897, after the Naches station had been discontinued, with the idea that the difference in discharge between this station and the one at Union Gap would give approximately the discharge of the Naches River. The gage is the wire type, the rod being fastened to the guard rail of the bridge, west span, lower side. The length of gage wire is 39 feet. The pulley distance is 2 feet. The bench mark is the top of the north sill of the clearance posts, about 150 feet west of the bridge, and its elevation is 35.21 feet above gage datum. During the months of September and October the bridge was undergoing repairs, and gage records could not be kept. The observer is Pat Gallagher, section foreman. The following measurements were made in 1897 by Cyrus C. Babb:

May 19, gage height, 10.77 feet; discharge, 13,904 second-feet.
 May 26, gage height, 8.88 feet; discharge, 7,424 second-feet.
 June 10, gage height, 7.60 feet; discharge, 4,859 second-feet.
 June 18, gage height, 6.90 feet; discharge, 3,185 second-feet.
 July 3, gage height, 7.10 feet; discharge, 3,636 second-feet.
 July 10, gage height, 6.28 feet; discharge, 2,300 second-feet.
 July 17, gage height, 5.81 feet; discharge, 1,751 second-feet.
 July 29, gage height, 5.15 feet; discharge, 1,019 second-feet.
 August 13, gage height, 4.91 feet; discharge, 810 second-feet.

Daily gage height, in feet, of Yakima River at Selah, Washington, for 1897.

Day.	May.	June.	July.	Aug.	Oct.	Nov.	Dec.
1		8.40	6.90			4.90	6.20
2		8.20	6.90	5.00		4.90	6.20
3		8.10	7.20	5.00		4.90	6.20
4		7.80		5.00		4.90	6.20
5		7.60	7.10	4.90		4.90	
6			6.90	4.90		4.90	6.20
7		7.50	6.80	4.90			6.20
8		7.70	6.60			4.90	6.60
9		7.80	6.50	4.90		4.90	6.80
10		7.50	6.30	4.90		4.90	6.80
11		7.30		4.90		5.70	6.80
12		7.20	6.10	4.90		6.50	
13			6.10	4.80		7.60	6.80
14		7.20	6.10	4.80			6.40
15		7.20	6.00			7.30	6.40
16		7.00	5.90	4.80		7.00	6.30
17		7.00	5.90	4.80		6.60	6.10
18		7.00		4.80		7.00	6.10
19	10.80	6.90	5.80	4.70		12.30	
20	10.60	6.80	5.70	4.70	4.90	11.60	6.00
21	10.40	6.70	5.60	4.70	4.90		5.90
22	10.30	6.90	5.60		4.90	9.10	5.90
23		7.30	5.60		4.90	8.40	5.70
24	9.70	7.30	5.60			7.90	5.60
25	9.20	7.20			4.90	7.40	5.60
26	8.90	7.20	5.40		4.90	6.90	
27	8.70		5.30		4.90	6.30	5.60
28	8.50	7.10	5.30		4.90		6.00
29	8.30	7.00	5.20		4.90	6.20	8.60
30		6.90	5.10		4.90	6.20	9.20
31	8.30		5.10				8.80

NORTH YAKIMA STATION ON NACHES RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 355, is located at the highway bridge, 2 miles from North Yakima, Washington, at the mouth of the river. The rod, a 2 by 6 inch timber, is fastened to the crib bulwark, just below the highway bridge. The flood of November, 1896, modified the channel very greatly, depositing a large mass of coarse gravel and small bowlders along the right side of the channel at the section, so that the rod was 50 feet, more or less, from the edge of the water at low stages. The current is swift, even at low water. On account of the instability of the channel the station was abandoned in February, 1897, although a number of discharge measurements were made during the season. The station was located below the heads of a number of ditches. May 19, 1897, a station was established on the Yakima River, 5 miles above the mouth of the Naches, at the Northern Pacific Railway bridge near Selah, Washington, with the idea that the difference in discharge between this station and the one at Union Gap would give approximately the discharge of the Naches River. Two ditches, those of the Moxee Valley, are taken out between the two points, but their amount is about counter-balanced by that received from Ahtanum Creek and the wastage at Old Town. The following discharge measurements were made in 1897 by Cyrus C. Babb and Sydney Arnold:

June 10, discharge, 3,178 second-feet.

June 18, discharge, 1,993 second-feet.

July 29, discharge, 781 second-feet.

September 22, discharge, 385 second-feet.

November 15, discharge, 1,500 second-feet.

Daily gage height, in feet, of Naches River at North Yakima, Washington, for 1897.

Day.	Jan.	Feb.	Day.	Jan.	Feb.	Day.	Jan.	Feb.	Day.	Jan.	Feb.
1.....	3.00	3.00	9.....	3.00	2.80	17.....	2.70	2.50	25.....	3.50	.....
2.....	3.00	3.00	10.....	2.90	2.70	18.....	2.70	2.50	26.....	3.40	.....
3.....	2.90	3.00	11.....	2.90	2.70	19.....	2.80	2.40	27.....	3.30	.....
4.....	2.90	2.90	12.....	2.90	2.70	20.....	3.10	2.40	28.....	3.20	.....
5.....	3.00	2.90	13.....	2.80	2.60	21.....	3.30	.....	29.....	3.10	.....
6.....	3.00	2.90	14.....	2.80	2.60	22.....	3.60	.....	30.....	3.10	.....
7.....	3.00	2.90	15.....	2.70	2.60	23.....	3.60	.....	31.....	3.10	.....
8.....	3.00	2.80	16.....	2.70	2.50	24.....	3.50	.....		

UNION GAP STATION ON YAKIMA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 356, is located at Union Gap, 6 miles below North Yakima, Washington, and 1,000 feet below the highway bridge. The gage rod is inclined and is attached to a willow stump and to posts set into the ground and loaded with rock. The bench mark is a stone, marked "B. M.," 39 feet west of the gage and 8.5 feet east of the railroad track. It is 29.85 feet above gage datum. The gaging cable and car is about 50 yards above the rod. The channel of the river is straight for several hundred feet, both above and below the cable. During floods a portion of the water passes through a depression in the left bank, and this must be measured from the bridge. The right bank is high and will not overflow. The observer is Ed. Farmer, section foreman. The following measurements were made in 1897 by Cyrus C. Babb:

May 15, gage height, 10.90 feet; discharge, 19,234 second-feet.

May 25, gage height, 9.40 feet; discharge, 15,543 second-feet.

June 9, gage height, 8.15 feet; discharge, 8,938 second-feet.

June 16, gage height, 7.25 feet; discharge, 5,901 second-feet.

July 2, gage height, 7.35 feet; discharge, 6,275 second-feet.

July 9, gage height, 6.45 feet; discharge, 3,973 second-feet.

July 15, gage height, 6.05 feet; discharge, 3,097 second-feet.

July 23, gage height, 5.48 feet; discharge, 2,361 second-feet.

August 7, gage height, 4.80 feet; discharge, 1,314 second-feet.

September 6, gage height, 4.55 feet; discharge, 1,140 second-feet.

September 21, gage height, 4.26 feet; discharge, 683 second-feet.

Daily gage height, in feet, of Yakima River at Union Gap, Washington, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	5.60			6.80	9.00	8.70	7.20	4.90	4.40	4.30	4.40	6.30
2.				6.90	9.20	8.60	7.40	4.80	4.30	4.30	4.40	6.30
3.				6.80	9.40	8.50	7.35	4.80	4.30	4.30	4.40	6.20
4.				7.40	9.60	8.30	7.20	4.80	4.40	4.30	4.40	6.10
5.			5.60	7.60	9.80	8.20	7.10	4.80	4.40	4.20	4.40	6.00
6.				7.90	9.60	8.10	6.90	4.80	4.40	4.20	4.40	6.80
7.				7.90	9.00	8.00	6.70	4.80	4.40	4.30	4.40	6.90
8.				7.90	9.00	8.30	6.60	4.80	4.40	4.20	4.40	7.10
9.				8.70	9.10	8.20	6.50	4.80	4.40	4.20	4.50	7.00
10.			5.40	9.40	9.20	7.90	6.30	4.70	4.40	4.20	4.80	6.90
11.				8.40	9.20	7.80	6.30	4.70	4.40	4.20	5.60	6.80
12.				9.60	9.10	7.60	6.20	4.70	4.40	4.20	6.50	6.70
13.				9.60	9.40	7.70	6.10	4.70	4.30	4.20	7.20	6.70
14.				5.20	10.00	9.90	7.50	6.00	4.70	4.30	7.00	6.60
15.	5.40	5.50	5.10	10.60	10.00	7.40	6.00		4.30	4.20	6.80	6.50
16.			5.10	10.90	11.40	7.30	6.00		4.30	4.20	5.90	6.40
17.			5.10	11.40	11.40	7.20	5.90		4.20	4.20	5.80	6.30
18.			5.30		11.40	7.20	5.80		4.20	4.20	6.10	6.10
19.			5.30	11.00	11.20	7.00	5.80		4.30	4.20	11.00	6.10
20.		6.70	5.20	12.00	10.90	6.90	5.70	4.60	4.30	4.20	11.60	5.90
21.			5.10	11.60	10.80	6.80	5.60	4.60	4.30	4.30	9.60	5.80
22.			5.10	11.00	10.40	7.10	5.50	4.60	4.30	4.40	9.00	5.60
23.			5.20	10.60	10.20	7.40	5.50	4.50	4.20	4.40	8.30	5.70
24.			6.00	9.00	10.00	7.40	5.40	4.50	4.20	4.50	7.70	5.70
25.			6.80	9.40	9.80	7.30	5.40	4.50	4.20	4.50	7.30	5.60
26.		6.00	6.40	9.60	9.60	7.20	5.30	4.50	4.30	4.50	6.90	5.60
27.			6.20	9.80	9.40	7.10	5.30	4.50	4.20	4.40	6.70	5.70
28.			6.40	9.70	9.20	7.30	5.20	4.40	4.20	4.40	6.60	5.70
29.			6.80	9.40	9.10	7.20	5.10	4.40	4.20	4.50	6.60	5.70
30.			6.60	9.10	9.00	7.10	5.10	4.40	4.30	4.50	6.30	8.80
31.			6.60		8.90		5.10	4.40		4.40		8.20

KIONA STATION ON YAKIMA RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 358, is located at the highway bridge at Kiona, Washington. The rod of the wire gage is placed on the lower side of the bridge. The distance from the end of the weight to the index marker is 27.21 feet. From the end of the rod to the outside edge of the pulley wheel it is 2 feet. The section is an excellent one for measurements. The channel is straight for some distance above and below. The banks are medium high and the bed is composed of a firm gravel. The observer is W. A. Kelso. The following discharge measurements were made in 1897 by Cyrus C. Babb and Sydney Arnold:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
May 8....	11.50	16,557	June 15...	8.05	6,908	Aug. 5...	4.61	1,217
May 24...	11.52	16,344	July 7.....	7.15	5,118	Aug. 30..	4.10	762
May 29...	9.74	11,338	July 13....	6.30	3,475	Nov. 6...	4.08	839
June 8...	8.75	8,868	July 21....	5.55	2,318	Dec. 29..	8.54	7,459

Daily gage height, in feet, of Yakima River at Kiona, Washington, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	7.00	7.15	6.08	6.81	10.48	10.67	7.52	4.80	4.00	3.90	.....	6.53
2.....	6.87	.....	6.27	6.68	10.40	10.16	7.42	.....	4.05	.....	4.12	6.50
3.....	.....	6.94	6.31	6.69	10.36	9.60	7.80	4.70	4.10	3.90	4.10	.....
4.....	.....	.....	6.30	7.05	10.22	9.30	7.80	4.68	4.12	3.90	4.09	6.24
5.....	6.55	6.82	.....	7.16	10.34	8.84	7.64	4.61	4.16	3.87	4.08	6.15
6.....	6.45	6.88	.....	7.22	10.48	8.67	7.42	4.55	4.18	3.86	4.08	6.71
7.....	6.52	.....	.....	7.42	11.22	8.61	7.15	4.50	4.18	3.85	4.12	7.50
8.....	6.50	.....	.....	7.75	11.50	8.80	6.98	4.50	4.16	3.84	4.15	8.22
9.....	.....	.....	.....	7.69	11.34	8.90	6.85	4.48	4.10	3.80	4.18	8.21
10.....	6.54	6.41	.....	7.98	10.79	8.75	6.64	4.41	4.06	3.78	4.19	7.95
11.....	.....	6.38	5.85	9.14	10.42	8.42	6.35	4.40	4.00	3.78	4.21	7.82
12.....	.....	6.85	5.78	10.01	10.26	8.08	6.32	4.40	4.00	.....	4.44	7.77
13.....	6.44	6.84	5.56	10.04	10.54	8.15	6.30	4.38	3.98	3.76	5.85	7.70
14.....	.....	.....	5.60	10.17	11.14	8.12	6.25	4.38	3.97	3.76	7.51	7.50
15.....	.....	.....	5.71	10.62	11.92	8.05	6.07	4.35	3.95	3.76	7.42	7.55
16.....	6.13	6.95	5.68	11.18	12.56	7.78	6.00	4.28	3.90	3.77	6.60	7.50
17.....	.....	.....	5.70	11.74	12.85	7.58	5.85	4.27	3.94	3.80	6.48	7.30
18.....	6.04	.....	5.75	12.40	13.08	7.50	5.80	4.27	3.94	3.82	6.34	6.95
19.....	6.07	.....	5.80	13.17	13.30	7.41	5.76	4.23	3.91	3.85	8.97	6.68
20.....	6.00	6.50	5.80	13.92	13.14	7.25	5.58	4.20	3.89	3.88	11.67	6.40
21.....	.....	.....	5.72	14.42	12.81	7.10	5.54	4.20	3.90	3.90	12.50	6.30
22.....	6.78	.....	5.69	13.49	.....	7.11	5.50	4.22	3.90	3.98	11.66	6.15
23.....	8.82	.....	5.62	12.85	12.30	7.45	5.45	4.15	3.90	.....	10.82	6.10
24.....	.....	.....	.....	11.93	11.50	7.80	5.33	4.15	3.91	4.10	9.42	6.00
25.....	.....	.....	5.84	11.24	10.86	7.86	5.27	.....	3.94	4.16	8.38	5.95
26.....	8.15	.....	7.02	11.10	10.70	7.77	5.27	4.14	3.90	4.18	8.00	5.92
27.....	.....	6.00	7.76	11.32	10.50	7.62	5.16	4.14	3.83	4.17	7.58	5.90
28.....	.....	.....	7.42	11.50	10.00	7.60	5.07	4.10	3.83	4.17	7.02	6.00
29.....	7.55	.....	7.44	11.35	9.75	7.72	4.97	4.08	3.84	.....	6.95	7.90
30.....	7.50	.....	7.26	10.72	9.86	7.55	4.90	4.04	3.86	.....	6.63	10.39
31.....	7.35	.....	6.95	.....	10.60	.....	4.80	4.00	.....	.....	.....	10.55

SPOKANE STATION ON SPOKANE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 359, is located at the bridge of Oregon Railway and Navigation Company at Spokane, Washington. The rod of the wire gage is fastened to the upper guard rail in the west span of the bridge. The distance from the end of the weight to the index is 22.0 feet, and from the zero of the rod to the outside edge of the pulley 1.80 feet. The gage was connected with a bench mark of the city engineering department and referred to sea level, the rod datum being 1,880 feet above sea level. The channel is straight for some distance above and below the section. The bed is gravelly and is practically unchangeable. The banks are high and are only overflowed during extraordinary floods. The velocity is quite swift, even during low water. The observer is Z. Taylor, telegraph operator, residing within 400 feet of the bridge. The following discharge measurements were made in 1897 by Cyrus C. Babb and others:

May 20, gage height, 10.80 feet; discharge, 29,084 second-feet.

June 29, gage height, 5.16 feet; discharge, 9,026 second-feet.

July 21, gage height, 4.05 feet; discharge, 7,893 second-feet.

September 11, gage height, 1.92 feet; discharge, 2,575 second-feet.

October 20, gage height, 1.50 feet; discharge, 2,011 second-feet.

Daily gage height, in feet, of Spokane River at Spokane, Washington, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	5.50	4.00	3.20	4.75	11.10	8.60	5.00	3.20	1.90	1.70	1.45	5.00
2.....	5.40	4.00	3.15	4.80	10.90	8.40	4.95	3.10	1.90	1.70	1.45	4.90
3.....	5.30	4.00	3.15	4.90	10.50	8.20	4.95	3.05	1.90	1.65	1.45	4.80
4.....	5.20	4.00	3.15	4.90	10.50	7.85	4.95	3.00	1.85	1.65	1.45	4.60
5.....	5.20	3.90	3.15	5.05	10.40	7.60	5.00	3.00	1.85	1.60	1.45	4.50
6.....	5.00	3.80	3.15	5.20	10.40	7.10	5.00	2.95	1.85	1.60	1.45	4.60
7.....	5.00	3.75	3.15	5.30	10.60	6.70	5.00	2.85	1.85	1.60	1.45	4.70
8.....	4.80	3.75	3.15	5.45	10.90	6.50	5.00	2.75	1.90	1.60	1.45	5.00
9.....	4.80	3.70	3.15	5.50	11.20	6.30	5.00	2.70	1.95	1.55	1.50	5.40
10.....	4.70	3.70	3.10	5.70	11.20	6.20	5.00	2.65	1.95	1.55	1.50	5.70
11.....	4.60	3.65	3.10	6.10	10.90	6.15	4.90	2.65	1.90	1.50	1.50	5.90
12.....	4.50	3.60	3.10	6.70	10.60	6.05	4.90	2.60	1.90	1.50	1.60	6.00
13.....	4.35	3.60	3.00	7.00	10.40	5.90	4.80	2.50	1.90	1.50	1.80	6.00
14.....	4.30	3.60	2.95	7.30	10.30	5.70	4.70	2.50	1.90	1.50	2.45	6.00
15.....	4.25	3.60	2.90	7.60	10.20	5.50	4.60	2.45	1.90	1.50	2.80	6.00
16.....	4.20	3.55	2.90	8.00	10.30	5.40	4.50	2.40	1.85	1.50	3.00	6.00
17.....	4.20	3.55	2.90	8.50	10.50	5.35	4.40	2.35	1.80	1.50	3.05	5.90
18.....	4.00	3.55	2.90	8.90	10.70	5.30	4.30	2.30	1.80	1.50	3.20	5.80
19.....	4.00	3.50	2.90	9.40	10.80	5.40	4.20	2.25	1.80	1.50	3.40	5.70
20.....	3.90	3.50	2.90	10.20	10.95	5.40	4.15	2.25	1.75	1.50	3.90	5.50
21.....	3.80	3.50	2.85	11.00	10.95	5.40	4.05	2.20	1.75	1.50	4.90	5.35
22.....	3.90	3.50	2.85	11.60	10.85	5.45	4.00	2.20	1.75	1.50	5.40	5.20
23.....	3.80	3.50	2.90	11.80	10.70	5.45	3.90	2.15	1.75	1.50	5.60	5.00
24.....	3.85	3.45	2.90	11.80	10.50	5.40	3.80	2.10	1.75	1.45	5.70	4.90
25.....	4.00	3.30	2.90	11.60	10.30	5.40	3.70	2.05	1.70	1.45	5.70	4.80
26.....	4.05	3.25	3.15	11.40	10.10	5.40	3.60	2.05	1.70	1.45	5.65	4.70
27.....	4.00	3.25	3.60	11.15	9.80	5.30	3.50	2.00	1.70	1.45	5.60	4.55
28.....	3.90	3.20	4.10	11.30	9.50	5.30	3.45	2.00	1.70	1.45	5.40	4.60
29.....	4.00	.....	4.10	11.30	9.25	5.20	3.35	1.95	1.70	1.45	5.25	4.65
30.....	4.00	.....	4.60	11.30	9.05	5.10	3.20	1.95	1.70	1.45	5.10	5.00
31.....	4.00	.....	4.65	.....	8.80	.....	.....	1.90	.....	1.45	.....	5.40

WENATCHEE STATION ON WENATCHEE RIVER.

This station is located on the Wenatchee River at the wagon bridge, 6 miles above its mouth and 7 miles from Wenatchee, Washington. It was established November 1, 1897. The rod is vertical and fastened to the face of the second wooden pier from the north. Observations of heights were taken at the bridge site of the Wenatchee Waterpower Company by C. Nasten, engineer in charge, 5 miles below the station, and reduced to the station gage by having simultaneous readings at both points on September 13, November 1, 14, and 20, respectively. Both banks of the river at the station are high and not liable to overflow. The bed of the river is composed of boulders and the current is quite swift, even at low stages. The canal of the Wenatchee Waterpower Company is taken out about 1 mile above the station. The following are the discharge measurements made in 1897 by Cyrus C. Babb and C. Nasten:

September 13, gage height, 0.30 foot; discharge, 900 second-feet.

November 1, gage height, 0.00 feet; discharge, 706 second-feet.

November 14, gage height, 1.24 feet; discharge, 2,770 second-feet.

November 20, gage height, 5.10 feet; discharge, 13,280 second-feet.

Daily gage height, in feet, of Wenatchee River at Wenatchee, Washington, for 1897.

Day.	Aug.	Sept.	Oct.	Nov.	Day.	Aug.	Sept.	Oct.	Nov.	Day.	Aug.	Sept.	Oct.	Nov.
1..	0.22	0.00	12..	.....	.....	0.00	2.18	23..	.....	0.36	0.30	.....
2..15	.00	13..	.....	0.30	.35	1.65	24..	.....	.35	.....	.....
3..00	14..	.....	.....	.30	1.25	25..	.....	.52	.22	.....
4..00	.00	15..	.....	.....	.20	.....	26..	0.82	.....	.12	.....
5..00	.00	16..	0.95	.15	.00	.....	27..	.....	.38	.08	.....
6..00	.00	17..	.....	.15	.....	.....	28..	.....	.38	.....	.....
7..	1.22	.....	.00	.00	18..	.....	.15	.00	.....	29..	.....	.36	.00	.....
8..	0.45	.....	.....	19..	.....	.....	.00	.....	30..	.....	.30	.00	.....
9..00	.....	20..	.....	.25	.00	5.10	31..	.....	.....	.....	.....
10..	21..	.....	.32	.00	.....				
11..00	.....	22..	.....	.35	.22	.....				

WHITMAN STATION ON WALLAWALLA RIVER.

This station, located on Wallawalla River, 7 miles below Wallawalla, Washington, was established July 19, 1897, for the purpose of determining the amount of water available for the several canals taken out below. The gage is an unusual form, consisting of a horizontal timber 4 inches square by 14 feet long, fastened to two vertical posts 6 feet apart and set in the ground at the edge of the bank of the river, with one end of the timber projecting out over the water. On this horizontal timber is then placed a wire gage. The distance from the end of the weight to the wire index is 19.62 feet and the outside edge of the pulley at the end of the timber is 4.27 feet from the zero. The bench mark is a nail driven into the southwest corner of the barn, 70 feet north of the gage, and 1 foot above the sill. Its elevation is 11.00 feet above datum. Discharge measurements are to be taken from a foot suspension bridge, near by. The channel is gravelly and the banks medium high. The observer is Mrs. W. F. York, post office, Wallawalla, Washington. A gaging on August 26, 1897, was made by Sydney Arnold; gage height, 0.86 feet; discharge, 78 second-feet.

Daily gage height, in feet, of Wallawalla River at Whitman, Washington, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		0.90	0.95	1.20	1.30	2.35	17.....		0.88	1.15	1.25	1.90	2.55
2.....		.88	.98	1.20	1.30	2.22	18.....		.88	1.15	1.20	2.08	2.35
3.....		.88	1.00	1.20	1.30	2.12	19.....	1.00	.82	1.15	1.20	2.32	2.20
4.....		.88	1.00	1.20	1.30	2.02	20.....	1.00	.82	1.15	1.20	2.35	2.20
5.....		.88	1.05	1.20	1.30	2.18	21.....	1.00	.88	1.15	1.20	2.28	2.15
6.....		.88	1.15	1.20	1.30	2.35	22.....	1.00	.82	1.15	1.20	2.15	2.10
7.....		.88	1.15	1.20	1.30	2.92	23.....	1.00	.82	1.15	1.25	2.15	2.05
8.....		.88	1.20	1.20	1.30	3.05	24.....	1.00	.82	1.15	1.25	2.12	2.05
9.....		.88	1.20	1.20	1.30	2.88	25.....	1.00	.82	1.15	1.25	2.05	2.05
10.....		.88	1.18	1.20	1.38	2.68	26.....	.98	.82	1.15	1.25	1.98	2.12
11.....		.88	1.15	1.20	1.95	2.80	27.....	.95	.82	1.15	1.30	1.90	2.25
12.....		.88	1.15	1.20	1.90	2.88	28.....	.92	.82	1.15	1.30	1.85	2.75
13.....		.88	1.15	1.22	2.05	2.80	29.....	.88	.82	1.15	1.30	1.85	3.20
14.....		.88	1.15	1.30	2.02	3.00	30.....	.88	.85	1.20	1.30	2.20	3.75
15.....		.88	1.15	1.30	1.92	2.88	31.....	.88	.90	.....	1.30	.....	3.28
16.....		.88	1.15	1.25	1.90	2.72							

GIBBON STATION ON UMATILLA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 361, is located about one-half mile west of the railroad station at Gibbon, Oregon. The lower section of the old gage rod was carried out by the floods in March, but a temporary rod was used until a permanent one was placed June 12, 400 feet downstream. It consists of a substantial rod 4 inches square by 14 feet long fastened to a rock by two one-half-inch bolts, soldered into holes, drilled into the rock. The bench mark for this new gage is a cross in black paint on the highest point of the rock to which the rod is fastened. Its elevation is 4.40 feet above datum, also marked on the rock. One foot in elevation on the rod is equal to 2.71 feet along its length. The section under the cable, at which discharge measurements were made, was also so modified by the March freshets that it was found necessary to remove the cable and car to a better location one-quarter of a mile below. The channel here is straight for a distance above and below. The bed of the river is gravelly. The initial point for soundings is on the right bank. The observer is W. Swart, telegraph operator at Gibbon. The following discharge measurements were made in 1897 by Cyrus C. Babb:

May 5, gage height, 4.10 feet; discharge, 2,141 second-feet.

May 22, gage height, 2.05 feet; discharge, 624 second-feet.

May 27, gage height, 1.36 feet; discharge, 448 second-feet.

June 7, gage height, 1.00 foot; discharge, 233 second-feet.

June 12, gage height, 0.80 foot; discharge, 168 second-feet.

July 5, gage height, 1.16 feet; discharge, 265 second-feet.

July 20, gage height, 0.59 foot; discharge, 118 second-feet.

August 27, gage height, 0.30 foot; discharge, 83 second-feet.

Daily gage height, in feet, of Umatilla River at Gibbon, Oregon, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.80	1.80	1.80	3.05	3.40	1.20	0.85	0.45	0.40	0.35	0.40	2.00
2.....	1.75	2.00	2.00	3.05	3.40	1.15	1.05	.45	.35	.35	.40	1.90
3.....	1.70	2.60	1.90	3.00	3.50	1.10	1.30	.45	.35	.35	.40	1.80
4.....	1.70	2.80	1.90	3.00	3.75	1.10	1.20	.45	.35	.35	.40	1.70
5.....	1.65	2.90	1.90	3.20	4.10	1.00	1.15	.45	.35	.35	.40	1.80
6.....	1.65	2.90	1.80	3.40	4.40	1.00	1.10	.45	.50	.35	.40	2.00
7.....	1.60	2.80	1.80	3.50	3.55	1.00	1.00	.45	.45	.35	.40	2.85
8.....	1.60	2.50	1.70	3.70	3.20	1.00	.95	.45	.45	.35	.45	2.90
9.....	1.60	2.40	1.70	4.00	3.00	.90	.90	.45	.40	.35	.50	2.60
10.....	1.60	2.90	1.60	5.00	3.00	.85	.85	.45	.40	.35	.80	2.60
11.....	1.55	2.80	1.55	4.90	3.10	.85	.80	.45	.40	.35	.90	2.50
12.....	1.55	2.90	1.55	4.80	3.10	.80	.80	.45	.40	.40	.95	2.50
13.....	1.55	3.10	1.50	4.70	3.20	.80	.75	.45	.35	.40	1.30	2.50
14.....	1.55	3.10	1.50	5.05	3.10	.80	.70	.45	.35	.40	1.20	2.45
15.....	1.55	2.95	1.50	5.38	3.05	1.10	.70	.40	.35	.40	1.05	2.20
16.....	1.50	2.80	1.60	5.50	3.00	1.25	.65	.40	.35	.40	1.05	1.90
17.....	1.50	2.50	1.70	6.00	3.15	1.15	.65	.40	.35	.35	1.20	1.70
18.....	1.50	2.40	1.70	6.05	2.90	1.10	.60	.40	.35	.35	2.00	1.70
19.....	1.70	2.20	1.70	5.65	2.60	1.00	.60	.35	.30	.35	1.90	1.70
20.....	1.65	2.20	1.65	4.70	2.40	.95	.60	.35	.30	.40	2.00	1.65
21.....	1.65	1.90	1.65	3.95	2.20	.95	.55	.35	.30	.40	1.80	1.50
22.....	1.65	1.80	1.65	3.70	2.02	.90	.55	.35	.30	.40	1.60	1.40
23.....	1.65	1.65	1.60	3.70	1.80	.85	.50	.35	.30	.40	1.60	1.40
24.....	1.60	1.60	3.05	3.60	1.85	.85	.50	.35	.30	.45	1.50	1.30
25.....	1.60	1.50	5.65	3.60	1.50	.85	.50	.35	.30	.45	1.40	1.25
26.....	1.60	1.60	5.05	4.40	1.35	1.00	.50	.35	.30	.40	1.30	1.80
27.....	1.60	1.60	4.20	4.40	1.25	.95	.45	.30	.35	.40	1.30	2.20
28.....	1.65	1.65	3.80	3.90	1.25	.90	.45	.30	.35	.40	1.20	2.80
29.....	1.65	.....	3.60	3.60	1.20	.85	.45	.30	.35	.40	1.40	3.50
30.....	1.70	.....	3.35	3.50	1.20	.85	.45	.30	.35	.40	2.00	3.70
31.....	1.75	.....	3.15	.....	1.20	.....	.45	.50	.....	.40	.....	3.40

MORO STATION ON DESCHUTES RIVER.

This station is located on the Deschutes River, near Moro, Oregon, 16 miles east of The Dalles, Oregon, at the ranch of the observer, J. E. Harris, 3 miles above what is known as the "free bridge." The rod is inclined. The bench mark is the head of a nail, at elevation 8.41 feet, in the large alder tree to which the rod is spiked. The discharge measurements are taken at the iron bridge below. The section here is poor, owing to the swift current. The bed is rocky and uneven. A measurement made on September 27, 1897, by Cyrus C. Babb, gave gage height, 2.10 feet; discharge, 5,962 second-feet.

Daily gage height, in feet, of Deschutes River at Moro, Oregon, for 1897.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1.....		2.00	2.20	12.....		2.50	3.40	23.....	2.10	2.50	2.50
2.....		2.00	2.20	13.....		2.50	3.20	24.....	2.00	2.40	2.40
3.....		2.00	2.10	14.....		2.40	4.10	25.....	2.00	2.30	2.40
4.....		2.00	2.10	15.....		2.40	3.40	26.....	2.00	2.30	2.40
5.....		2.10	2.10	16.....		2.40	3.20	27.....	2.00	2.20	2.80
6.....		2.20	2.30	17.....		2.50	3.10	28.....	2.00	2.20	2.70
7.....		2.30	3.30	18.....		2.60	3.00	29.....	2.00	2.20	3.10
8.....		2.30	3.40	19.....	2.00	2.80	2.80	30.....	2.00	2.10	3.00
9.....		2.30	3.40	20.....	2.10	3.10	2.60	31.....	2.10	2.10	2.10
10.....		2.40	3.20	21.....	2.00	2.80	2.60				
11.....		2.40	3.20	22.....	2.10	2.50	2.50				

TUCKERS STATION ON HOOD RIVER.

This station is located at Tuckers, 5 miles south of Hood River, Oregon. It was established October 20, 1897, by Cyrus C. Babb. The gage is of the wire type. The rod is nailed to a wooden member of the bridge. The length of the gage wire is 33.85 feet, and the pulley is 2 feet from end of rod. At gage height 1.50 the water is 30.10 feet below edge of floor at side of inner inclined wooden brace at station 4.5 feet from east end, lower side. The bottom is a rock ledge and the sides are precipitous. The observer is B. R. Tucker, proprietor of a saw-mill. Measurements were made as follows in 1897 by Cyrus C. Babb:

September 28, gage height, 1.70 feet; discharge, 541 second-feet.

October 20, gage height, 1.50 feet; discharge, 459 second-feet.

Daily gage height, in feet, of Hood River at Tuckers, Oregon, for 1897.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1.....		1.60	3.40	12.....		5.20	5.10	23.....	1.80	3.50	2.90
2.....		1.50	3.00	13.....		5.70	5.00	24.....	1.90	3.10	2.90
3.....		1.50	2.80	14.....		3.80	6.50	25.....	1.80	2.90	3.40
4.....		1.50	2.70	15.....		3.20	5.40	26.....	1.70	2.90	4.00
5.....		1.70	6.70	16.....		3.00	5.00	27.....	1.60	2.60	5.00
6.....		1.80	7.50	17.....		4.20	4.50	28.....	1.60	2.50	8.97
7.....		1.60	7.30	18.....		9.00	3.90	29.....	1.60	2.70	7.60
8.....		1.70	7.00	19.....		7.80	3.90	30.....	1.60	4.00	6.00
9.....		2.10	5.50	20.....	1.50	5.60	3.50	31.....	1.60		5.40
10.....		4.60	5.60	21.....	1.90	5.20	3.50				
11.....		4.80	4.90	22.....	1.80	4.10	3.10				

SEGUIN STATION ON DUNGENESS RIVER.

This station is located at a county bridge near Seguin Post-office, 18 miles southeast of Port Angeles, Washington, and 9 miles above the mouth of the river. It was established July 5, 1897, by A. Judson Adams. The gage consists of a vertical rod fastened to the downstream side of the crib abutment on the right bank of the river. The bench mark is a spike in the root of a fir stump 4 feet in diameter, about 20 feet north of north end of bridge, the elevation being 12.75 feet above gage datum. The initial point for sounding is on the right bank. The channel is straight for some distance above and below the station. The right bank is high and not liable to overflow. The left bank is low and is flooded during freshets. The observer is David Duncan, farmer. Discharge measurements were made as follows by A. Judson Adams in 1897:

July 5, gage height, 5.06 feet; discharge, 546 second-feet.

August 17, gage height, 4.81 feet; discharge, 357 second-feet.

November 4, gage height, 4.36 feet; discharge, 165 second-feet.

Daily gage height, in feet, of Dungeness River at Seguin, Washington, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....		4.70	4.60	4.30	4.50	4.20	17.....	4.95	4.80	4.35	4.20	5.80	4.20
2.....		4.70	4.50	4.25	4.40	5.20	18.....	4.90	4.80	4.40	4.20	8.10	4.10
3.....		4.70	4.55	4.25	4.40	5.10	19.....	4.90	4.85	4.40	4.20	6.60	4.00
4.....		4.75	4.55	4.30	4.35	5.10	20.....	5.00	4.85	4.30	4.30	5.90	4.00
5.....	5.05	4.80	4.50	4.25	4.35	5.70	21.....	4.95	4.90	4.35	4.25	5.70	3.90
6.....	5.10	4.80	4.50	4.25	4.40	6.25	22.....	4.90	4.80	4.40	4.75	5.50	3.90
7.....	5.05	4.80	4.40	4.20	4.40	7.40	23.....	4.90	4.80	4.40	5.05	5.40	3.90
8.....	5.00	4.80	4.40	4.20	4.30	6.10	24.....	4.90	4.75	4.40	4.70	5.35	3.95
9.....	5.00	4.80	4.40	4.20	4.40	5.50	25.....	4.85	4.70	4.40	4.60	5.30	3.90
10.....	5.00	4.80	4.35	4.25	4.85	5.20	26.....	4.80	4.55	4.40	4.50	5.20	3.80
11.....	5.10	4.80	4.35	4.30	5.05	5.20	27.....	4.80	4.55	4.40	4.50	5.20	7.90
12.....	5.20	4.75	4.35	4.40	5.05	5.00	28.....	4.80	4.60	4.40	4.45	5.10	5.80
13.....	5.05	4.70	4.40	4.30	4.85	8.00	29.....	4.80	4.55	4.40	4.45	5.20	5.50
14.....	5.05	4.70	4.40	4.25	4.85	5.20	30.....	4.80	4.55	4.35	4.45	5.30	5.00
15.....	5.05	4.70	4.40	4.20	4.60	4.60	31.....	4.75	4.75	.....	4.40	.....	4.80
16...	5.00	4.80	4.35	4.20	4.60	4.35							

MCDONALD STATION ON ELWHA RIVER.

This station is located 9 miles southwest of Port Angeles at McDonald, Clallam County, Washington, at the new county bridge and was established October 8, 1897, by A. Judson Adams. The horizontal rod of the wire gage is nailed to the railing of the north side of the bridge, the 9-foot mark being opposite the fourth upright post counting from the east end of the bridge. The length of the gage wire is 49.26 feet, and the distance from the end of the rod to outside edge of pulley is 7.92 feet. The bench mark is the top edge of the top side-rail on the north side of the bridge at the third upright post from the east end of the bridge, and its elevation is 41.34 feet above gage datum. The initial point for soundings is on the right bank. The channel is straight for some distance above and below the station. Both banks are high and rocky and will not overflow. The bed of the stream is rocky. The observer is Thomas H. Stringham, postmaster at McDonald. The following measurements of discharge were made by A. Judson Adams in 1897:

October 8, gage height, 0.95 foot; discharge, 406 second-feet.

December 28, gage height, 8.00 feet; discharge, 4,623 second-feet.

Daily gage height, in feet, of Elwha River at McDonald, Washington, for 1897.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1.....		1.20	2.40	12.....	1.10	2.40	3.45	23.....	2.50	2.55	2.00
2.....		1.15	2.00	13.....	1.22	2.20	3.60	24.....	1.60	2.35	2.10
3.....		1.15	1.45	14.....	.95	2.15	4.60	25.....	1.85	2.10	2.35
4.....		1.20	2.50	15.....	.90	2.05	3.80	26.....	1.35	1.95	2.55
5.....		1.25	2.85	16.....	.85	1.95	3.20	27.....	1.30	1.90	6.90
6.....		1.22	4.50	17.....	.85	2.05	3.50	28.....	1.30	1.45	8.95
7.....		1.22	6.40	18.....	.80	14.50	2.50	29.....	1.25	2.50	6.87
8.....	1.00	1.25	5.20	19.....	1.25	5.40	2.45	30.....	1.25	2.90	4.55
9.....	1.00	3.30	4.30	20.....	1.45	4.00	2.40	31.....	1.20		
10.....	1.00	2.45	4.25	21.....	2.65	3.80	2.50				
11.....	1.00	3.60	3.95	22.....	2.20	3.05	2.10				

FORKS STATION ON CALOWA RIVER.

This station is located at the county highway bridge in the southwestern part of Clallam County near Forks, Washington, and is reached by steamer to Clallam Bay, thence overland 30 miles by wagon. It was established November 12, 1897, by A. Judson Adams. The horizontal rod of the wire gage is nailed to the railing of the wagon bridge. Both banks are high and rocky and do not overflow. The bed of the stream is gravelly. The observer is H. C. Whittier, a farmer, post-office, Forks, Washington. The following discharge measurements were made by A. Judson Adams in 1897:

September 6, gage height, — feet; discharge, 467 second-feet.

November 12, gage height, 3.66 feet; discharge, 1,494 second-feet.

Daily gage height, in feet, of Calowa River at Forks, Washington, for 1897.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1.....	4.00	9.....	.....	6.45	17.....	10.60	3.75	25.....	3.00	3.95
2.....	3.80	10.....	.....	6.50	18.....	17.00	3.30	26.....	2.15	4.70
3.....	3.00	11.....	.....	7.10	19.....	7.25	2.90	27.....	3.00	15.90
4.....	3.85	12.....	3.85	5.70	20.....	5.00	2.70	28.....	2.80	10.50
5.....	6.70	13.....	3.90	10.25	21.....	4.70	2.55	29.....	3.00	6.65
6.....	6.45	14.....	3.40	8.00	22.....	4.05	2.40	30.....	6.40	5.00
7.....	9.60	15.....	2.95	5.40	23.....	5.55	2.35	31.....	.....	4.10
8.....	9.40	16.....	2.70	4.30	24.....	3.10	2.40			

QUILLAYUTE STATION ON SOLDUCK RIVER.

This station is located at the county highway bridge about 9 miles northeast of Lapush, in southwestern part of Clallam County, near Quillayute, Washington, and was established November 13, 1897, by A. Judson Adams. The horizontal rod of the wire gage is fastened to the railing of the wagon bridge. The channel is straight for some distance above and below the station. The banks are high and rocky and do not overflow. The bed of the stream is composed of rocks and gravel. The observer is Peter Van Bossche, a farmer, address Quillayute, Washington. The following measurements were made by A. Judson Adams in 1897:

September 7, gage height, — feet; discharge, 858 second-feet.

November 13, gage height, 4.00 feet; discharge, 1,898 second-feet.

Daily gage height, in feet, of Solduck River at Quillayute, Washington, for 1897.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1.....	4.95	9.....	.....	7.15	17.....	3.95	4.75	25.....	3.75	4.20
2.....	4.30	10.....	.....	6.45	18.....	11.90	4.35	26.....	3.65	4.60
3.....	3.90	11.....	.....	7.10	19.....	8.35	4.05	27.....	3.60	9.80
4.....	3.65	12.....	.....	6.35	20.....	5.90	3.80	28.....	3.40	14.30
5.....	6.80	13.....	4.00	7.55	21.....	5.40	3.60	29.....	3.50	8.40
6.....	5.45	14.....	3.45	8.90	22.....	4.90	3.45	30.....	5.55	6.35
7.....	9.10	15.....	3.10	6.30	23.....	4.40	3.30	31.....	.....	5.50
8.....	8.95	16.....	2.90	5.40	24.....	4.00	3.30			

JELLYS FERRY STATION ON SACRAMENTO RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 365, is located about 12 miles above the town of Redbluff, California, at a crossing of a county road at Jellys Ferry. The observer, Fred Lemstrom, is the ferryman. The ferry cable is used in the discharge measurements. The gage consists of a vertical rod marked to tenths of a foot. It is made in three sections and nailed firmly to trees. Besides the gage rod at this point, another rod is located 1,206 feet upstream from the gage and another 350 feet downstream, in order to determine the slope of the water surface. Bench mark No. 1 is on an oak tree on the left bank 1,206 feet upstream from the ferry and 65 feet north of the upper rod, and is 22.724 feet above gage datum. Bench mark No. 2 is on an oak tree on the left bank of the river 300 feet below the cable, and is 22.429 feet above gage datum. The channel for 1,000 feet above and below the station is nearly straight. The right bank is high, but the left bank is liable to overflow when the water rises above the 25-foot mark. The bed of the stream consists of gravel, and changes slightly. The following discharge measurements were made in 1897 by J. B. Lippincott and Fred Lemstrom:

Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.	Date.	Gage height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>		<i>Feet.</i>	<i>Sec. ft.</i>
Mar. 13...	10.30	18,568	June 28...	6.42	6,493	Oct. 28...	5.70	4,202
Mar. 29...	14.40	28,319	July 13...	5.95	5,032	Nov. 13..	5.70	4,196
Apr. 3...	10.85	21,519	July 28...	5.70	5,082	Nov. 28..	5.95	6,179
Apr. 16...	12.20	25,806	Aug. 13...	5.60	4,285	Dec. 13...	7.40	10,151
Apr. 30...	10.30	18,544	Aug. 28...	5.50	4,490	Dec. 17...	6.85	8,195
May 14...	9.00	14,719	Sept. 13...	5.50	4,257	Dec. 17...	6.85	8,802
May 28...	7.50	10,193	Sept. 28...	5.50	4,418	Dec. 28...	5.95	6,105
June 11..	6.50	7,277	Oct. 13....	5.60	4,591			

REDBLUFF STATION.

This station, as described in the Eighteenth Annual Report, Part IV, page 362, is located at the wagon bridge in the town of Redbluff, California. The observations of gage heights are maintained by the Weather Bureau and are taken by Maurice Connell. The vertical rod, 30 feet long, is nailed to a large sycamore tree on the left bank of the river about 25 feet above the bridge.

Daily gage height, in feet, of Sacramento River at Jellys Ferry, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.10	19.75	16.45	12.65	10.20	7.15	6.25	5.70	5.50	5.50	5.70	5.90
2	11.25	19.20	13.45	11.35	10.05	7.10	6.20	5.70	5.50	5.60	5.70	5.90
3	10.25	18.70	12.35	10.85	9.90	7.00	6.20	5.70	5.50	5.60	5.70	5.80
4	9.50	20.53	11.60	10.55	9.90	6.95	6.20	5.70	5.50	5.50	5.70	5.80
5	9.00	23.77	11.90	10.50	9.95	6.90	6.15	5.60	5.50	5.50	5.70	5.80
6	8.65	22.60	11.75	10.70	9.95	6.80	6.10	5.60	5.50	5.50	5.70	6.00
7	8.45	20.30	12.20	11.20	9.60	6.70	6.10	5.60	5.50	5.50	5.70	6.50
8	8.25	16.90	11.95	11.25	9.25	6.70	6.10	5.60	5.50	5.50	5.70	9.70
9	8.05	15.40	11.75	11.35	9.00	6.60	6.10	5.60	5.50	5.50	5.70	7.80
10	7.85	14.00	11.20	11.55	8.95	6.50	6.00	5.60	5.50	5.50	5.70	7.20
11	7.75	12.75	10.60	12.00	9.20	6.50	6.00	5.60	5.50	5.50	5.70	8.40
12	7.60	12.25	10.30	12.05	9.05	6.50	6.00	5.60	5.50	5.50	5.70	8.30
13	7.65	11.55	9.85	12.00	9.05	6.40	6.00	5.60	5.50	5.60	5.70	7.40
14	7.60	11.15	9.55	11.95	9.00	6.40	5.90	5.60	5.50	5.60	5.70	8.90
15	7.50	11.00	9.45	12.10	8.85	6.55	5.90	5.60	5.50	5.60	5.70	7.60
16	7.40	13.10	9.65	12.20	8.80	6.50	5.90	5.60	5.50	5.60	5.70	7.20
17	7.25	12.00	9.75	12.15	8.65	6.40	5.90	5.60	5.50	5.60	5.70	6.80
18	7.10	11.30	9.60	12.25	8.50	6.30	5.80	5.50	5.50	5.60	5.70	6.60
19	7.00	13.90	9.55	12.45	8.30	6.35	5.80	5.50	5.50	5.60	5.70	6.50
20	7.00	13.20	9.55	13.05	8.30	6.80	5.80	5.50	5.50	5.60	6.10	6.40
21	6.95	11.55	9.10	12.10	8.20	7.20	5.80	5.50	5.50	5.70	6.30	6.30
22	6.90	10.65	8.85	11.55	8.10	6.95	5.80	5.50	5.50	5.70	6.00	6.10
23	6.90	10.15	8.65	11.15	8.00	6.85	5.80	5.50	5.50	6.00	7.00	6.10
24	6.95	9.85	8.50	10.85	8.00	6.65	5.80	5.50	5.50	6.30	6.60	6.10
25	7.00	9.90	8.70	10.80	7.90	6.55	5.80	5.50	5.50	5.80	6.30	6.00
26	6.90	10.00	10.15	11.00	7.70	6.50	5.70	5.50	5.50	5.80	6.10	6.00
27	6.90	10.10	10.10	11.20	7.50	6.50	5.70	5.50	5.50	5.70	6.00	5.90
28	7.45	10.00	15.90	11.00	7.45	6.40	5.70	5.50	5.50	5.70	5.90	5.90
29	17.45	-----	14.55	10.65	7.30	6.40	5.70	5.50	5.50	5.70	5.90	5.90
30	13.95	-----	13.10	10.30	7.30	6.30	5.70	5.50	5.50	5.70	5.90	5.90
31	13.80	-----	12.15	-----	7.20	-----	5.70	5.50	-----	-----	-----	5.90

Daily gage height, in feet, of Sacramento River at Redbluff, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.2	16.0	13.6	7.9	6.0	2.3	1.0	0.1	0.6	0.0	0.3	0.4
2	6.1	15.6	11.0	7.6	6.1	2.3	1.0	.1	.7	.2	.3	.4
3	5.7	14.0	8.6	7.4	6.9	2.3	1.0	.1	.3	.3	.5	.6
4	5.2	17.7	8.0	6.5	6.8	2.0	1.0	.1	.2	.2	.5	.7
5	4.9	20.7	7.8	6.1	6.6	2.0	1.0	.1	.1	.1	.5	1.3
6	4.4	21.6	7.8	6.1	6.3	2.0	.9	.1	.1	.1	.4	3.2
7	4.3	15.5	7.0	5.8	5.9	1.9	.9	.1	.1	.1	.3	3.4
8	4.1	13.2	6.0	7.1	5.0	1.9	.9	.1	.1	.1	.3	7.2
9	3.9	11.6	7.6	7.0	5.0	1.7	.9	.1	.1	.1	.3	6.5
10	3.6	10.0	6.0	7.4	5.0	1.7	.8	.1	.1	.0	.3	5.3
11	3.4	9.6	6.0	7.8	5.0	1.6	.7	.1	.1	.0	.3	4.4
12	3.0	8.6	6.0	8.0	5.0	1.5	.7	.1	.1	.1	.3	5.0
13	3.2	7.5	5.6	8.0	4.9	1.3	.7	.1	.1	.3	.3	4.9
14	3.0	7.0	5.2	7.8	4.9	1.0	.6	.1	.1	.5	.3	3.9
15	3.1	7.1	5.0	8.0	4.8	1.0	.5	.1	.1	.4	.3	4.0
16	2.4	8.5	5.0	8.0	4.6	1.0	.5	.1	.1	.3	.4	2.0
17	2.2	8.2	5.3	8.1	4.3	1.0	.5	.1	.1	.2	.4	1.9
18	2.1	7.4	5.3	8.1	4.2	1.0	.3	.1	.0	.1	.6	1.6
19	2.0	10.0	5.1	8.1	4.2	1.8	.3	.1	.0	.1	.8	1.6
20	2.0	11.0	4.9	8.0	4.0	2.0	.2	.1	.0	.2	1.0	1.4
21	2.0	7.6	4.6	8.0	4.0	2.9	.2	.1	.0	.4	1.3	1.0
22	2.0	6.7	5.0	8.0	4.0	1.9	.2	.1	.0	1.0	1.4	1.0
23	2.0	6.0	5.2	7.6	4.1	2.0	.1	.1	.0	1.2	.9	1.0
24	2.0	5.9	6.1	7.4	4.1	2.0	.1	.1	.0	1.0	.9	1.0
25	2.0	5.8	6.1	7.1	4.1	1.4	.1	.1	.0	1.0	.4	1.0
26	2.0	5.9	8.6	7.0	4.1	1.4	.1	.1	.0	.8	.4	1.0
27	2.0	5.6	10.7	6.9	3.8	1.0	.1	.1	.0	.7	.4	1.0
28	2.4	6.9	9.0	6.8	3.7	1.0	.1	.0	.0	.6	.4	1.0
29	14.0	-----	8.6	6.6	3.7	1.0	.1	.0	.0	.5	.4	1.0
30	11.1	-----	8.1	6.0	3.7	1.0	.1	.0	.0	.5	.4	1.0
31	10.0	-----	8.4	-----	3.7	-----	.1	.0	-----	.3	-----	.9

OAKDALE STATION ON STANISLAUS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 371, is located at the wagon bridge one-half mile north of the town of Oakdale, California. One gage rod is set between the south or left hand piers of the wagon bridge on the side toward the water, and can be read from the bridge. The datum is 27.92 feet below the top of the southeast iron pier of the wagon bridge. A rod for the lowest readings of the river is 125 feet below the wagon bridge on the left bank and referred to the same datum. A secondary gage for determining the slope of the river is attached to the crib abutment of the Southern Pacific Railroad bridge, 1,071 feet below the wagon bridge and referred to the same datum as the upper gage. Its zero is 5.92 feet below the top of the cap on the piles of the south crib pier of the railroad bridge. This pier has settled during the last year. The channel of the river is uniform and straight above and below the station, and both banks are high enough to prevent overflow in all except extreme conditions of flood. The bed of the stream at this point is of sand and gravel and changes only slightly. The observer is Frank Templin. The following discharge measurements were made in 1897 by J. B. Lippincott and A. Q. Campbell:

February 16, gage height, 4.22 feet; discharge, 1,346 second-feet.

May 30, gage height, 8.60 feet; discharge, 6,754 second-feet.

July 14, gage height, 3.20 feet; discharge, 1,015 second-feet.

September 5, gage height, 2.00 feet; discharge, 144 second-feet.

October 29, gage height 2.40 feet; discharge, 223 second-feet.

December 19, gage height 3.00 feet; discharge, 429 second-feet.

Daily gage height, in feet, of Stanislaus River at Oakdale, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	3.60	8.66	5.00	5.60	8.40	6.60	3.80	2.40	2.20	1.90	2.20	2.50
2.....	3.30	8.52	4.70	5.00	9.53	6.20	3.90	2.40	2.20	2.00	2.20	2.50
3.....	3.10	6.10	4.60	4.90	10.11	6.00	4.00	2.40	2.10	2.00	2.30	2.50
4.....	3.10	11.20	4.50	4.80	10.80	6.00	3.90	2.40	2.10	2.00	2.30	2.40
5.....	3.00	9.50	4.40	4.90	10.50	5.90	3.80	2.30	2.00	2.00	2.20	2.40
6.....	3.00	10.00	4.90	5.10	9.53	5.90	3.80	2.30	2.00	2.00	2.20	2.30
7.....	3.00	6.90	5.50	5.50	8.80	6.00	3.70	2.30	2.00	2.00	2.30	2.40
8.....	3.00	6.20	5.10	5.60	8.20	6.40	3.50	2.30	2.00	2.00	2.30	2.70
9.....	3.00	5.50	4.90	5.90	8.50	6.50	3.50	2.30	2.00	2.00	2.20	4.40
10.....	3.00	5.10	4.60	6.50	8.40	5.80	3.30	2.30	2.00	2.00	2.20	3.40
11.....	2.90	4.80	4.40	7.00	9.20	5.40	3.10	2.30	2.00	2.00	2.20	3.10
12.....	2.90	4.80	4.30	7.40	9.42	5.10	3.20	2.20	2.00	2.00	2.30	3.00
13.....	3.00	4.50	4.30	7.60	9.13	5.20	3.20	2.20	2.00	2.00	2.30	3.40
14.....	3.33	4.30	4.10	8.20	9.07	5.40	3.20	2.20	2.00	2.00	2.20	3.60
15.....	3.10	4.20	4.10	8.70	8.77	4.90	3.20	2.20	2.00	2.20	2.20	3.20
16.....	3.00	4.10	4.10	9.20	8.62	4.50	3.20	2.10	2.00	2.30	2.20	3.00
17.....	2.90	6.07	4.40	9.80	8.45	4.10	3.20	2.10	1.90	2.20	2.20	2.90
18.....	2.90	5.00	5.15	10.30	8.20	3.90	3.00	2.10	2.00	2.10	2.20	2.80
19.....	2.90	5.47	5.13	9.00	8.90	3.90	2.90	2.10	1.90	2.10	2.20	2.80
20.....	2.90	5.63	4.60	7.90	9.53	3.90	2.80	2.20	1.90	2.10	2.20	2.60
21.....	2.90	5.00	4.50	7.20	9.03	4.10	2.80	2.30	1.90	2.10	2.10	2.80
22.....	2.90	4.60	4.30	7.20	9.23	4.00	2.80	2.30	1.90	2.20	3.00	2.70
23.....	2.90	4.40	4.30	6.80	10.60	3.90	2.70	2.20	1.90	2.20	3.10	2.60
24.....	2.90	4.30	4.30	6.80	10.10	3.90	2.70	2.20	2.00	2.40	3.50	2.40
25.....	2.90	4.30	4.50	7.50	9.10	3.90	2.60	2.20	2.00	2.50	3.00	2.70
26.....	2.90	4.40	4.80	8.70	8.00	3.90	2.60	2.20	2.00	2.40	2.80	2.60
27.....	2.90	4.50	4.80	9.20	8.00	3.70	2.50	2.20	2.00	2.30	2.60	2.50
28.....	2.90	5.50	7.40	9.60	8.20	3.60	2.50	2.20	2.00	2.30	2.50	2.80
29.....	5.15	.....	6.00	8.90	8.20	3.70	2.50	2.20	2.00	2.30	2.40	2.90
30.....	4.53	.....	5.40	8.80	8.00	3.80	2.50	2.20	1.90	2.20	2.40	2.70
31.....	4.40	.....	5.10	.....	7.70	.....	2.50	2.20	.....	2.20	.....	2.70

LAGRANGE STATION ON TUOLUMNE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 378, is located at the bridge in the town of Lagrange, California, 32 miles from Modesto. The vertical gage rod is fastened to timbers between the two iron piers on the right bank of the river. The bench mark is a nail driven into the bottom of the west post of the fifth bent south of the south iron cylinder and is 15.31 feet above the zero of the rod. The channel both above and below the bridge is straight for several hundred feet and the velocity of the stream is quite uniform. Both banks are high and not subject to overflow. The bed is of gravel. The observer is Cleo Pereira. The following is a list of discharge measurements made by J. B. Lippincott and A. Q. Campbell in 1897:

February 15, gage height, 5.80 feet; discharge, 1,864 second-feet.

May 29, gage height, 9.25 feet; discharge, 11,594 second-feet.

July 12, gage height, 5.70 feet; discharge, 1,839 second-feet.

September 7, gage height, 4.00 feet; discharge, 95 second-feet.

October 30, gage height, 4.73 feet; discharge, 534 second-feet.

December 20, gage height, 4.85 feet; discharge 614 second-feet.

Daily gage height, in feet, of Tuolumne River at Lagrange, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	5.55	8.95	6.30	6.50	8.70	8.30	6.60	4.70	4.10	3.80	4.70	5.30
2.....	5.25	8.85	6.40	6.40	8.90	8.00	6.70	4.60	4.10	3.80	4.70	5.10
3.....	5.15	9.05	6.40	6.30	9.30	7.90	6.80	4.60	4.10	3.80	4.80	5.00
4.....	5.20	9.80	6.20	6.40	9.50	8.00	6.80	4.50	4.00	3.80	4.70	4.90
5.....	5.10	8.95	6.10	6.60	9.70	8.00	6.90	4.50	4.00	3.90	4.70	4.90
6.....	5.10	8.10	6.80	6.90	9.80	8.20	6.70	4.50	4.00	3.90	4.60	4.80
7.....	5.10	8.30	6.80	7.00	9.90	8.50	6.50	4.50	4.00	3.90	4.70	4.80
8.....	5.10	7.10	6.30	7.20	9.50	8.20	6.20	3.80	4.00	3.80	4.60	6.60
9.....	5.10	6.90	6.30	7.30	9.80	8.20	6.00	4.80	3.90	3.80	4.60	6.30
10.....	5.00	6.35	6.20	7.40	9.70	8.50	6.40	4.50	4.00	3.80	4.60	5.90
11.....	5.00	6.20	6.20	7.60	9.00	8.00	6.30	4.50	4.00	4.70	4.60	5.60
12.....	5.00	6.20	6.10	7.90	9.30	7.60	6.10	4.50	4.00	4.00	4.60	5.80
13.....	5.05	6.20	6.10	8.20	9.20	7.50	6.20	4.30	4.00	3.80	4.70	5.70
14.....	5.40	5.95	6.00	8.50	9.10	7.30	5.80	4.30	3.90	3.90	4.60	5.40
15.....	5.10	5.80	6.00	8.90	9.70	7.00	5.60	4.30	3.90	3.90	4.60	5.50
16.....	5.10	5.70	6.00	9.30	9.00	6.90	5.50	4.30	3.90	4.40	4.60	5.30
17.....	5.10	7.00	6.00	9.60	8.80	6.40	5.40	4.10	3.80	4.80	4.60	5.10
18.....	5.00	6.90	6.70	9.80	8.60	6.20	5.40	4.10	3.80	4.70	4.50	5.10
19.....	4.90	6.70	7.80	9.90	8.90	6.00	5.40	4.20	3.90	4.30	4.50	5.00
20.....	4.90	6.80	6.50	8.70	9.20	6.30	5.50	4.30	3.40	3.80	4.40	5.40
21.....	4.90	6.50	6.60	8.60	9.60	6.40	5.40	4.30	3.40	3.90	6.40	4.80
22.....	4.95	6.30	6.20	8.40	10.00	6.50	5.30	4.20	3.50	3.90	6.40	4.80
23.....	5.00	6.10	6.10	8.30	10.10	6.40	5.20	4.20	3.60	3.90	5.70	4.80
24.....	5.00	6.00	6.30	8.10	10.20	6.20	5.00	4.10	3.80	5.00	5.10	4.80
25.....	5.00	6.00	6.40	7.50	10.30	6.40	5.00	4.10	3.80	4.70	5.20	4.80
26.....	5.35	6.20	6.70	7.80	9.00	6.50	4.90	4.10	3.80	4.50	5.20	4.80
27.....	5.45	6.30	6.70	7.90	9.20	6.50	5.00	4.20	3.80	4.50	5.00	4.80
28.....	6.40	6.30	9.00	8.20	9.10	6.60	4.90	4.10	3.80	4.50	5.00	4.80
29.....	6.40	.....	8.70	8.30	9.20	6.70	4.80	4.20	3.80	4.50	5.00	4.80
30.....	6.55	.....	7.40	8.50	9.30	6.70	4.90	4.10	3.80	4.70	5.00	4.80
31.....	6.20	.....	6.60	.....	9.00	.....	4.70	4.10	.....	4.70	.....	4.80

MODESTO STATION ON TUOLUMNE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 384, is located one-half mile south of the depot and at the wagon-road bridge at Modesto, California. The gage is a vertical rod 2 by 6 inches, fastened on the south side of the central railroad pier. The top of the rail at the central pier is 46.05 feet above the datum of the gage. The discharge measurements are made from the wagon bridge, 100 feet west of the railroad bridge. The initial point for sounding is at the pier on the right bank. The channel above and below the station is straight, but in the summer stages of the stream the current is very sluggish. The right bank shows indications of overflow. The observer is J. T. Reed. No discharge measurements were made in 1897.

Daily gage height, in feet, of Tuolumne River at Modesto, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	6.50	11.97	7.42	7.92	13.42	14.37	8.17	4.66	3.70	3.13	4.12	4.58
2.....	5.63	18.00	8.38	8.25	13.46	13.00	8.42	4.58	3.66	3.21	4.25	4.75
3.....	5.17	11.79	7.58	7.50	12.33	11.96	8.58	4.54	3.58	3.25	4.37	4.58
4.....	4.83	9.17	7.46	7.46	14.17	12.04	8.62	4.50	3.54	3.25	4.08	4.54
5.....	4.79	13.88	6.96	7.71	15.92	12.08	8.17	4.46	3.50	3.17	4.33	4.50
6.....	4.71	19.25	7.33	7.88	16.54	12.25	7.70	4.37	3.46	3.13	4.12	4.25
7.....	4.63	12.25	9.83	8.46	16.35	12.62	7.54	4.29	3.38	3.25	4.12	4.48
8.....	4.67	12.50	8.17	8.92	15.08	12.83	7.12	4.21	3.38	3.17	4.04	4.21
9.....	4.58	9.29	7.50	9.21	14.54	12.43	6.75	4.12	3.33	3.29	4.04	9.66
10.....	4.56	8.25	7.25	9.83	13.33	12.08	6.58	4.08	3.33	3.25	4.04	7.33
11.....	4.48	7.63	7.13	10.46	13.29	12.17	6.50	4.08	3.33	3.21	3.96	6.12
12.....	4.44	7.33	6.83	11.21	14.29	10.87	6.50	4.17	3.33	3.29	4.08	5.62
13.....	4.19	7.13	6.63	11.83	15.00	10.66	6.87	4.17	3.25	3.37	4.04	5.54
14.....	4.75	6.92	6.54	11.96	15.21	11.25	6.83	4.08	3.25	3.37	3.96	6.04
15.....	5.79	6.46	6.46	11.50	15.79	10.92	6.83	3.96	3.25	3.29	4.12	5.87
16.....	5.04	6.46	6.54	12.96	15.04	9.42	6.58	3.92	3.25	3.37	4.12	5.58
17.....	4.88	8.83	6.73	13.54	14.67	8.83	6.70	3.92	3.17	3.62	4.04	5.17
18.....	4.56	8.63	7.42	14.21	14.04	8.33	6.37	3.83	3.17	3.79	3.92	5.00
19.....	4.46	8.88	9.86	14.25	13.58	7.92	6.54	3.83	3.17	3.96	3.87	4.87
20.....	4.38	9.78	8.04	13.04	14.79	7.66	5.83	3.92	3.25	3.87	3.83	4.54
21.....	4.29	8.58	7.50	11.42	15.79	8.08	5.83	3.83	3.25	3.66	2.92	4.46
22.....	4.21	7.71	7.08	11.08	16.33	8.12	5.42	3.83	3.17	3.58	8.08	4.37
23.....	4.13	7.42	6.75	10.50	17.29	8.04	5.25	3.83	3.17	3.54	7.87	4.50
24.....	4.17	7.21	6.81	9.92	17.75	8.12	5.17	3.96	3.17	3.37	7.08	4.50
25.....	4.17	7.00	7.08	9.83	17.92	8.17	5.12	4.08	3.17	3.96	7.29	4.33
26.....	4.13	7.00	7.67	10.83	16.96	8.04	5.00	4.17	3.13	4.50	6.25	4.25
27.....	4.13	7.25	7.88	11.92	15.46	7.42	4.96	3.96	3.17	4.42	5.58	4.12
28.....	4.04	7.50	7.75	13.21	14.54	7.58	4.88	3.87	3.17	4.42	5.12	4.04
29.....	8.45	-----	12.67	13.42	15.08	7.66	4.79	3.79	3.17	4.25	5.04	4.04
30.....	6.50	-----	9.42	13.25	15.00	7.92	4.75	3.75	3.17	4.12	4.75	4.04
31.....	6.54	-----	8.25	-----	15.04	-----	4.66	3.75	-----	4.08	-----	4.04

HERNDON STATION ON SAN JOAQUIN RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 385, is located at the wagon bridge half a mile north of Herndon and 12 miles north of Fresno, California, on the Southern Pacific Railroad. The gage consists of a vertical rod fastened to the lower side of the south central railroad bridge pier. The bench mark is at the south end of the wagon bridge trestle on the west side, on a nail in a post 0.2 of a foot above the ground and marked by a "B. M." cut in the post. The elevation above rod datum is 24.12 feet. A gage on the same datum is also painted on the southwest cylinder. The initial point for soundings is on the left bank at the south cylinder. The channel for 900 feet above and 3,000 feet below the bridge is straight and the water has a uniform and moderate velocity. There are no piers in the bed of the stream to disturb the current and the section is a satisfactory one. The right bank is high, rocky, and steep. The bed of the stream is sandy and gravelly. The observer is G. G. Nelson. The following discharge measurements were made by J. B. Lippincott and A. Q. Campbell in 1897:

February 14, gage height, 3.58 feet; discharge, 1,117 second-feet.

May 31, gage height, 8.60 feet; discharge, 10,774 second-feet.

July 16, gage height, 4.50 feet; discharge, 3,223 second-feet.

September 8, gage height, 2.66 feet; discharge, 271 second-feet.

November 2, gage height, 2.92 feet; discharge, 515 second-feet.

December 21, gage height, 3.00 feet; discharge, 699 second-feet.

Daily gage height, in feet, of San Joaquin River at Herndon, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.17	4.38	4.00	4.13	7.50	8.37	4.92	3.50	2.83	2.33	2.92	3.00
2	3.00	9.33	4.54	4.38	7.46	7.42	5.21	3.50	2.83	2.50	2.92	8.17
3	3.00	5.17	4.00	4.13	7.67	7.12	5.21	3.42	2.83	2.50	2.92	8.20
4	2.92	4.54	4.00	4.17	8.79	7.29	5.25	3.42	2.83	2.50	2.92	8.20
5	2.96	4.13	4.00	4.21	9.13	7.12	5.00	3.42	2.83	2.50	2.75	8.17
6	3.00	6.46	3.75	4.17	9.25	7.25	5.00	3.29	2.83	2.50	2.75	3.08
7	2.92	5.00	5.29	4.33	9.21	7.12	4.79	3.25	2.75	2.50	2.75	3.00
8	2.92	4.58	4.79	4.46	8.38	7.29	4.50	3.25	2.67	2.50	2.75	3.00
9	2.92	4.13	4.17	5.29	8.25	7.12	4.25	3.37	2.67	2.42	2.66	5.12
10	2.92	4.00	4.00	5.63	8.25	7.04	4.12	3.33	2.54	2.42	2.66	4.75
11	2.92	3.79	4.00	5.71	8.42	6.42	4.12	3.25	2.50	2.42	2.66	3.87
12	3.00	3.67	3.92	6.50	8.58	6.37	4.29	3.25	2.50	2.42	2.66	3.87
13	3.00	3.54	3.83	6.71	9.08	6.50	4.37	3.12	2.50	2.42	2.79	3.04
14	3.00	3.58	3.83	6.83	9.25	6.92	4.79	3.08	2.50	2.50	2.85	3.17
15	3.08	3.50	3.83	7.13	8.96	6.54	4.58	3.00	2.42	2.50	2.75	3.08
16	3.00	3.50	3.75	7.75	8.67	6.21	4.50	3.08	2.33	2.75	2.66	3.12
17	3.00	3.42	3.92	7.79	8.13	5.46	4.33	3.08	2.33	2.75	2.50	3.17
18	3.00	4.13	3.83	8.17	8.21	5.04	4.25	3.08	2.33	2.50	2.50	3.20
19	2.92	4.00	4.75	7.66	8.13	4.70	4.12	3.00	2.33	2.50	2.50	3.08
20	2.92	4.13	4.08	6.87	7.92	4.70	3.96	3.08	2.42	2.50	2.42	3.08
21	2.92	3.96	4.00	6.42	8.83	4.54	3.92	3.08	2.42	2.50	2.42	3.00
22	2.83	3.79	3.92	6.46	9.50	4.42	3.87	3.00	2.33	2.50	5.25	2.92
23	2.83	3.75	3.83	6.29	9.96	4.29	3.83	3.00	2.33	2.50	4.08	2.11
24	2.83	3.58	4.00	6.17	10.17	4.29	3.66	3.00	2.33	2.54	3.50	2.11
25	2.83	3.50	3.92	6.00	9.70	4.33	3.50	3.08	2.33	2.87	4.33	2.83
26	2.83	3.50	4.00	6.71	9.12	4.46	3.50	3.08	2.33	3.08	3.92	2.83
27	2.83	3.42	4.50	7.46	8.58	4.21	3.50	3.08	2.33	3.08	4.54	2.83
28	2.83	3.96	4.29	7.67	8.79	4.21	3.50	3.00	2.33	3.00	3.48	3.17
29	2.83	-----	5.38	7.67	8.87	4.37	3.50	3.00	2.33	2.92	3.04	3.08
30	3.17	-----	4.29	7.54	8.70	4.54	3.50	3.00	2.33	2.92	3.25	3.08
31	3.38	-----	4.08	-----	8.54	-----	3.50	2.92	-----	2.92	-----	3.17

RED MOUNTAIN STATION ON KINGS RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 390, is located 15 miles east of Sanger, California, southwest of Red Mountain and 3 miles below Jarrett's place, and may be reached by roads on either side of the river from Sanger. The station is on what is called "Lower Section of No. 9" of the lumber flume. The gage is made of two 4 by 8-inch timbers 14 and 20 feet long, respectively, laid on the ground under a rock and bolted to a tree. The bench mark is a cross cut in the top of a granite boulder 11 feet northwest of a blazed sycamore tree at top of rod and 18.045 above the zero of the rod. The initial point of measurement is on the left bank, the "deadman" being at station 50. The channel above and below the station is quite straight. The right bank is high and rocky, but the left is subject to overflow in extreme high water. The bed of the stream is of large gravel and boulders. The observer is Mrs. Alice House. The following discharge measurements were made by J. B. Lippincott and A. Q. Campbell in 1897:

February 13, gage height, 5.18 feet; discharge, 1,021 second-feet.

April 5, gage height, 6.82 feet; discharge, 2,071 second-feet.

June 1, gage height, 10.02 feet; discharge, 8,838 second-feet.

July 15, gage height, 7.17 feet; discharge, 3,313 second-feet.

September 9, gage height, 4.10 feet; discharge, 295 second-feet.

November 1, gage height, 4.57 feet; discharge, 552 second-feet.

December 22, gage height, 4.70 feet; discharge, 515 second-feet.

Daily gage height, in feet, of Kings River at Red Mountain, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.30	9.10	6.00	6.60	9.90	10.20	7.40	5.50	4.30	4.00	4.60	4.90
2			6.02	6.60	9.10	10.40	7.80	5.30	4.30	4.00	4.60	4.90
3			6.03	6.50	9.90	10.20	8.00	5.30	4.40	4.00	4.60	5.00
4		5.90	6.00	6.60	10.50	10.20	7.70	5.30	4.30	3.90	4.50	4.90
5		5.80	5.90	6.80	10.90	10.30	7.50	5.10	4.20	3.90	4.40	4.90
6			7.70	7.50	11.30	10.40	7.40	5.10	4.20	3.90	4.30	4.70
7			8.20	7.20	11.00	10.30	7.30	5.00	4.10	3.90	4.30	4.70
8			6.80	7.50	10.90	10.00	6.70	5.20	4.10	3.90	4.30	9.80
9			6.40	7.90	11.00	10.20	6.60	5.00	4.10	3.80	4.40	6.30
10		5.60	6.40	8.00	11.00	10.20	6.70	5.00	4.00	3.80	4.40	5.70
11			6.20	8.30	11.30	10.00	6.50	4.90	4.10	3.80	4.30	5.30
12	4.30		6.20	8.80	11.40	9.80	7.00	4.90	4.00	3.90	4.30	5.00
13			6.00	9.00	11.40	9.70	7.00	4.80	4.00	4.00	4.30	5.00
14			5.90	9.30	11.60	9.60	7.20	4.80	4.00	4.00	4.40	5.20
15	4.30		5.80	9.60	11.30	9.00	7.20	4.70	4.00	4.60	4.30	5.10
16			5.90	9.70	10.60	8.40	7.20	4.70	4.00	4.00	4.20	4.70
17			6.00	9.90	10.50	7.60	6.80	4.70	3.80	4.30	4.20	4.80
18			5.80	10.10	10.60	7.40	6.50	4.70	3.90	4.30	4.10	4.80
19	4.10	6.30	6.30	9.50	10.90	7.30	6.30	4.80	3.70	4.30	4.10	4.70
20		6.00	6.10	8.80	11.00	7.00	6.20	4.80	3.70	4.30	4.10	4.70
21		5.90	5.90	8.40	11.10	7.00	6.10	4.90	3.80	4.20	6.50	4.70
22		5.70	5.90	8.80	11.60	7.30	6.10	5.10	3.80	4.10	5.10	4.70
23		5.50	5.70	8.30	12.30	7.30	5.90	5.00	3.80	4.10	5.40	4.80
24	4.30	5.50	6.00	8.20	12.40	7.40	6.00	5.00	3.90	4.30	7.00	4.80
25		5.50	6.20	8.40	12.00	7.30	6.00	4.90	3.90	4.50	5.90	4.80
26		5.80	6.80	9.20	11.50	7.30	5.90	4.80	3.80	4.50	5.40	4.60
27		6.00	6.70	9.50	11.40	7.30	5.90	4.70	3.90	4.50	5.00	4.70
28	4.30	6.00	7.80	9.70	11.50	7.20	5.50	4.70	3.90	4.60	5.00	4.60
29			7.20	9.60	11.50	7.10	5.50	4.60	3.90	4.60	4.90	4.60
30			6.90	9.70	11.10	7.20	5.40	4.50	3.90	4.60	4.70	4.60
31	4.70		6.50		11.10		5.40	4.30		4.60		4.60

KINGSBURG STATION ON KINGS RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 393, is located at the Southern Pacific Railway bridge, approximately 1 mile south of Kingsburg, California. The vertical gage, the property of the railway company, is nailed to the south central railroad pier, with the zero 31.66 feet below the top of the rail of the bridge. The channel of the stream at the wagon bridge, 200 feet below the railroad bridge, where discharge measurements were first made, is badly broken by the piers of both bridges. The direction of the flow is oblique to both, and the channel contains shifting sand bars. The right bank is not subject to overflow except in very high water, but the left bank is low. Discharge measurements subsequent to April 7, 1897, were made 2 miles above the railroad bridge at Clark's bridge which crosses the river in one span. The section here is uniform and does not change. The water is very deep and slow. The observer is Alf. Thompson. The following discharge measurements were made in 1897 by J. B. Lippincott and A. Q. Campbell:

February 11, gage height, 5.58 feet; discharge, 905 second-feet.

April 6, gage height, 5.20 feet, discharge, 825 second-feet.

June 3, gage height, 8.60 feet, discharge, 5,959 second-feet.

July 17, gage height, 5.02 feet; discharge, 503 second-feet.

September 10, gage height, 3.20 feet; discharge, 221 second-feet.

November 3, gage height, 4.84 feet; discharge, 465 second-feet.

December 23, gage height, 4.80 feet; discharge, 522 second-feet.

Daily gage height, in feet, of Kings River at Kingsburg, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	4.08	5.54	5.63	5.33	8.04	8.83	5.21	4.00	3.17	3.29	5.00	5.04
2.....	4.00	8.58	6.21	5.79	7.50	8.25	5.37	3.88	3.29	3.33	4.96	5.12
3.....	3.79	6.63	5.79	5.21	8.08	8.08	5.58	3.75	3.25	3.33	4.83	4.96
4.....	3.67	6.21	5.92	4.92	8.83	8.12	5.62	3.75	3.25	3.13	4.83	4.92
5.....	4.08	6.08	5.54	5.08	9.42	8.12	5.50	3.75	3.25	3.08	4.75	4.87
6.....	4.00	7.13	5.58	5.21	9.58	8.33	5.46	3.66	3.25	5.21	4.70	4.83
7.....	4.00	6.42	7.58	5.50	9.54	8.37	5.33	3.50	3.25	3.33	4.66	4.75
8.....	3.67	6.04	6.67	5.75	9.33	8.21	5.12	3.46	3.25	3.50	4.66	4.83
9.....	3.25	5.88	6.00	5.83	9.17	7.96	4.66	3.50	3.25	3.54	4.37	7.08
10.....	3.25	5.83	5.92	6.13	9.38	8.00	4.33	3.42	3.17	3.67	4.17	6.08
11.....	3.17	5.54	5.58	6.54	9.75	7.62	4.54	3.46	3.17	3.67	4.17	5.62
12.....	3.25	5.33	5.54	6.58	9.71	7.37	4.42	3.50	3.17	3.71	4.17	5.50
13.....	3.38	5.21	5.46	6.92	9.88	7.42	4.62	3.42	3.00	3.67	4.17	5.50
14.....	3.92	5.04	5.29	7.33	10.04	7.29	4.79	3.37	3.04	3.75	4.12	5.46
15.....	4.50	4.92	5.17	7.67	9.83	7.12	5.25	3.25	3.25	4.08	4.08	5.37
16.....	4.08	4.83	5.00	7.88	10.04	6.92	5.21	3.25	3.25	4.79	4.00	5.29
17.....	3.88	4.63	5.00	7.88	9.04	6.17	5.04	3.25	3.25	4.62	3.83	5.17
18.....	3.58	5.75	5.50	8.13	8.79	5.75	4.62	3.21	3.25	4.50	3.75	5.08
19.....	3.42	5.96	5.67	8.00	8.92	5.54	4.21	3.00	3.25	4.46	3.75	5.08
20.....	3.42	6.08	5.71	7.54	9.29	5.46	4.08	3.33	3.25	4.50	3.75	4.92
21.....	3.46	6.00	5.71	6.92	9.75	5.17	3.70	3.33	3.25	4.33	3.75	4.83
22.....	3.50	5.92	5.38	6.71	10.04	5.04	3.54	3.58	3.37	4.29	6.54	4.75
23.....	3.50	5.63	4.83	6.54	10.79	5.29	3.29	3.50	3.33	4.33	5.92	4.75
24.....	3.50	5.42	4.58	6.29	11.33	5.37	3.54	3.25	3.00	4.50	5.75	4.66
25.....	3.58	5.42	4.58	6.38	10.37	5.46	3.33	3.25	3.04	5.12	6.58	4.83
26.....	3.50	5.50	4.96	6.71	9.92	5.54	3.50	3.25	3.25	5.08	5.66	4.79
27.....	3.33	5.50	5.71	7.04	9.54	5.29	3.50	3.96	3.25	5.25	5.46	4.96
28.....	3.29	5.50	5.46	7.54	9.66	5.25	3.46	3.08	3.33	5.21	5.33	4.96
29.....	3.58	.....	7.04	7.75	9.70	5.21	3.42	3.25	3.33	5.08	5.12	4.83
30.....	3.54	.....	6.08	7.83	9.70	5.17	3.50	3.33	3.25	5.00	5.08	4.83
31.....	4.79	.....	5.50	.....	9.54	.....	3.92	3.17	.....	5.00	.....	4.83

PALMDALE STATION ON LITTLE ROCK CREEK.

This station, as described in the Eighteenth Annual Report, Part IV, page 402, is located about 8 miles southeast of West Palmdale, California, at the headworks of the South Antelope Valley Canal. The creek is diverted through a tunnel into a flume at the headworks, which at the normal stage of the stream will carry all of the water. A gage has been placed in this flume, in which the discharge measurements are made at low stages. During high water a second gaging will be made from the bridge, where the flume crosses the creek, one-half mile below the headworks, and a gage rod will be placed there for that station. The flume is straight. The channel of the stream is crooked and the bed is full of boulders. The banks are high, and the creek will not leave its present channel at the bridge. The observer is Burt Cole. The following discharge measurements were made in 1897 by J. B. Lippincott and Burt Cole:

February 9, at long flume, gage height, 0.56 foot; discharge, 20 second-feet.

February 9, at headworks flume, gage height, 0.91 foot; discharge, 21 second-feet.

February 9, at long chute, gage height, 0.34 foot; discharge, 21 second-feet.

February 9, at box flume, gage height, 2.00 feet; discharge, 126 second-feet.

March 7, gage height, 1.17 feet; discharge, 26 second-feet.

March 7, gage height, 2.00 feet; discharge, 69 second-feet.

April 7, gage height, 2.80 feet; discharge, 126 second-feet.

April 16, gage height, 0.70 foot; discharge, 14 second-feet.

May 3, gage height, 1.47 feet; discharge, 47 second-feet.

May 15, gage height, 0.45 foot; discharge, 7 second-feet.

Daily gage height, in feet, of Little Rock Creek at Palmdale, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.40	2.10	2.25	2.80	2.05	0.40	0.05	0.00	0.00	0.00	0.40	0.35
2.....	.30	2.50	2.10	2.80	1.95	.40	.05	.00	.00	.00	.40	.30
3.....	.25	2.25	2.15	2.80	1.80	.40	.05	.00	.00	.05	.40	.30
4.....	.20	1.70	2.10	2.80	2.00	.40	.03	.00	.00	.10	.40	.30
5.....	.30	1.75	2.10	2.80	2.00	.40	.03	.00	.00	.10	.40	.30
6.....	.30	2.05	2.00	2.80	1.85	.40	.03	.00	.00	.15	.40	.30
7.....	.30	1.60	2.00	2.80	1.80	.40	.03	.00	.00	.20	.40	.30
8.....	.30	1.50	1.75	2.80	1.65	.40	.02	.00	.00	.20	.40	.30
9.....	.32	1.22	1.40	2.50	1.65	.40	.02	.00	.00	.25	.40	.35
10.....	.35	1.15	1.40	2.60	1.55	.40	.00	.00	.00	.30	.40	.35
11.....	.45	1.00	1.45	2.70	1.45	.40	.00	.00	.00	.40	.40	.35
12.....	.48	.80	1.45	2.70	1.40	.40	.00	.00	.00	.40	.40	.35
13.....	.52	.90	1.40	2.70	1.35	.40	.00	.00	.00	.40	.40	.35
14.....	.42	.80	1.40	2.70	1.25	.40	.00	.00	.00	.40	.40	.35
15.....	.50	.80	1.40	2.70	1.25	.40	.00	.00	.00	.40	.40	.35
16.....	.60	.70	1.40	2.70	1.10	.40	.00	.00	.00	.40	.40	.35
17.....	.62	.70	1.40	2.70	1.00	.40	.00	.00	.00	.40	.40	.35
18.....	.65	1.55	1.60	2.70	.90	.40	.00	.00	.00	.40	.40	.35
19.....	.60	1.35	1.60	2.70	.80	.40	.00	.00	.00	.40	.40	.35
20.....	.55	1.00	1.90	2.35	.70	.40	.00	.00	.00	.40	.40	.35
21.....	.65	1.00	1.60	2.45	.70	.40	.00	.00	.00	.40	.40	.35
22.....	.82	1.00	1.60	2.25	.70	.40	.00	.00	.00	.40	.40	.35
23.....	.80	.90	1.35	2.25	.70	.40	.00	.00	.00	.40	.40	.35
24.....	.80	.90	1.45	2.20	.70	.40	.00	.00	.00	.40	.40	.35
25.....	.80	1.00	1.90	2.30	.65	.40	.00	.00	.00	.40	.40	.35
26.....	.75	1.15	2.60	2.00	.60	.40	.00	.00	.00	.40	.40	.35
27.....	.60	1.80	2.35	2.15	.55	.35	.00	.00	.00	.40	.40	.35
28.....	.60	1.70	2.40	2.25	.55	.30	.00	.00	.00	.40	.40	.35
29.....	.70	.....	2.70	2.25	.60	.25	.00	.00	.00	.40	.35	.35
30.....	1.10	.....	2.80	2.20	.55	.15	.00	.00	.00	.40	.35	.35
31.....	1.35	.....	2.80	.....	.45	.....	.00	.00	.....	.40	.....	.35

AZUSA STATION ON SAN GABRIEL RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 405, is located at the mouth of the San Gabriel River canyon, 2 miles northeast of Azusa, California. During the greater portion of the year all the water of the San Gabriel River is diverted into canals and the measurements of discharge are then made at the division box of the Azusa-Duarte canal. The gage rod is vertical and nailed to the inside of the box, with the zero of the rod at the bottom of the flume, or 1.335 feet below the knife edge of the weir. At times, during the winter season, water flows past the diversion points down the river, and in order to measure this amount a gage rod has been placed in the right bank of the river at a point near the division box. A few hundred feet above is a cable, car, and tag-wire for measuring the floods. R. M. Fellows and H. F. Parkinson are the observers. The bench mark to which both rods are referred is a cross in the wooden sill at the head of the lowest Azusa tunnel. It is 7.97 feet above the zero of the river rod. The channel of the river for 200 feet above and below the cable is straight. The banks are not liable to change. The bed of the stream is full of bowlders embedded in sand. June 4 a diversion dam was placed just below the river gage backing the water up above it. Readings on this rod were then discontinued. The rod and cable were moved up the river later in the season.

The following discharge measurements were made in 1897 by J. B. Lippincott and A. Q. Campbell:

On the river:

January 10, gage height, 1.28 feet; discharge, 4.5 second-feet.
January 25, gage height, 2.00 feet; discharge, 58 second-feet.
February 1, gage height, 5.10 feet; discharge, 1,725 second-feet.
February 2, gage height, 3.40 feet; discharge, 422 second-feet.
March 12, gage height, 3.30 feet; discharge, 410 second-feet.
April 29, gage height, 2.60 feet; discharge, 162 second-feet.
May 24, gage height, 2.08 feet; discharge, 76 second-feet.
November 13, discharge, 8 second-feet.
November 27, discharge, 3.5 second-feet.

In the Division Box.

January 10, gage height, 2.10 feet; discharge, 22 second-feet.
April 29, gage height, 2.88 feet; discharge, 71 second-feet.
May 24, gage height, 2.93 feet; discharge, 68 second-feet.
June 30, gage height, 2.76 feet; discharge, 56 second-feet.
July 5, gage height, 2.72 feet; discharge, 54 second-feet.
August 7, gage height, 2.33 feet; discharge, 31 second-feet.
September 1, gage height, 2.20 feet; discharge, 24 second-feet.
September 29, gage height, 2.10 feet; discharge, 19 second-feet.
November 13, gage height, — feet; discharge, 25 second-feet.
November 27, gage height, — feet; discharge, 33 second-feet.

Daily gage height, in feet, of San Gabriel River at Azusa, California, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1.....		5.01	3.00	3.10		1.80	17.....		2.10	3.50	3.05		
2.....		4.00	3.00	3.00			18.....	2.00	5.00	3.00	3.05	2.20	
3.....		3.00	3.10	3.10	2.50		19.....		3.90	3.20	3.00	2.15	
4.....		2.90	3.05	3.00		1.80	20.....		3.60	3.15	2.90		
5.....	1.25	2.55	3.05	3.00	2.50		21.....		3.20	3.10	2.90		
6.....	1.25	2.60	4.60	3.10			22.....	2.00	3.00	3.00	2.80	2.05	
7.....		2.50	5.15	3.10			23.....	2.00	2.95	3.00	2.70		
8.....		2.45	4.30	3.10	2.50		24.....		2.90	3.00	2.65	2.10	
9.....		2.40	3.80	3.10			25.....		3.00	3.10			
10.....	1.30	2.35	3.50	3.15			26.....		3.05	3.10	2.57		
11.....	1.90	2.25	3.45	3.10			27.....	1.98	3.00	3.10		1.90	
12.....		2.20	3.40	3.15	2.38		28.....		3.00	3.00			
13.....		2.15	3.30	3.20			29.....			3.10		1.85	
14.....		2.10	3.20	3.20			30.....	2.10		3.10		1.80	
15.....		2.10	3.20	3.20	2.25		31.....	2.05		3.10			
16.....		2.00	3.20	3.07									

WARM SPRINGS STATIONS ON SANTA ANA RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 411, is located 5 miles northeast of Mentone, California, three-fourths of a mile below the headworks of the Santa Ana Canal and opposite the Warm Springs in the canyon. The gage is an inclined timber, the lower end of which has been set under the projecting edge of a large boulder and fastened to upright posts at its upper end. August 31, 1897, a second gage was placed 1 mile above this location and above the headworks of the Santa Ana Canal. The record as published in this report is for the lower gage. The observer is A. Laird, ditch watchman and water divider on the Bear Valley system. The following discharge measurements were made in 1897 by J. B. Lippincott and A. Q. Campbell:

January 27, gage height, — feet; discharge, 44 second-feet.
 March 4, gage height, 1.45 feet; discharge, 101 second-feet.
 May 3, gage height, 1.50 feet; discharge, 96 second-feet.
 May 4, gage height, 1.50 feet; discharge, 98 second-feet.
 June 15, gage height, 1.15 feet; discharge, 64 second-feet.
 July 5, gage height, 1.20 feet; discharge, 72 second-feet.
 July 6, gage height, 1.11 feet; discharge, 60 second-feet.
 August 8, gage height, 1.32 feet; discharge, 56 second-feet.
 August 31, gage height, 1.35 feet; discharge, 60 second-feet.
 September 30, gage height, 1.13 feet; discharge, 43 second-feet.
 November 14, gage height, 1.25 feet; discharge, 40 second-feet.

At new station, 1 mile above old one:

August 31, gage height, 1.00 foot; discharge, 78 second-feet.
 September 30, gage height, 0.83 foot; discharge, 65 second-feet.
 November 14, gage height, 0.35 foot; discharge, 47 second-feet.

Daily gage height, in feet, of Santa Ana River at Warm Springs, California, for 1897.¹

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Oct.	Nov.	Dec.
1	1.25	2.70	1.60	1.60	1.50	1.10	1.15	1.30	1.30	1.15	1.10
2	1.23	2.10	1.60	1.60	1.50	1.05	1.05	1.35	1.17	1.15	1.05
3	1.00	1.85	1.55	1.55	1.50	1.10	1.10	1.35	1.15	1.15	1.05
4	1.00	1.85	1.50	1.60	1.50	1.15	1.15	1.35	1.15	1.15	1.05
5	1.00	1.65	1.45	1.60	1.50	1.10	1.10	1.35	1.20	1.15	1.05
6 .....	.96	1.65	1.60	1.65	1.50	1.05	1.10	1.30	1.25	1.15	1.05
7 .....	.92	1.65	2.50	1.70	1.50	1.05	1.10	1.30	1.23	1.15	1.05
8 .....	.92	1.80	1.65	1.70	1.45	1.05	1.15	1.35	1.30	1.15	1.05
9 .....	.92	1.85	1.65	1.65	1.40	1.05	1.20	1.35	1.23	1.20	1.05
10 .....	.92	1.65	1.60	1.65	1.30	1.10	1.15	1.35	1.12	1.20	1.05
11	1.12	1.50	1.50	1.75	1.30	1.10	1.20	1.35	1.20	1.30	1.05
12	1.10	1.50	1.50	1.75	1.30	1.10	1.20	1.40	1.20	1.30	1.05
13	1.16	1.50	1.50	1.80	1.30	1.15	1.15	1.40	1.23	1.30	1.05
14	1.21	1.40	1.40	1.80	1.30	1.15	1.25	1.40	2.60	1.27	1.05
15	1.37	1.40	1.50	1.75	1.25	1.20	1.15	1.40	1.25	1.25	1.15
16	1.21	1.35	1.60	1.75	1.25	1.20	1.30	1.30	1.15	1.25	1.05
17	1.40	1.40	1.50	1.75	1.20	1.20	1.20	1.30	1.10	1.20	.95
18	1.40	2.90	1.45	1.80	1.15	1.20	1.20	1.30	.90	1.20	1.00
19	1.35	2.10	1.40	1.80	1.10	1.20	1.20	1.30	.90	1.20	1.00
20	1.35	2.05	1.60	1.80	1.10	1.20	1.15	1.35	.90	1.20	.90
21	1.40	1.70	1.45	1.70	1.10	1.20	1.10	1.45	.90	1.17	.80
22	1.40	1.70	1.40	1.65	1.10	1.20	1.15	1.25	.90	1.15	.80
23	1.45	1.65	1.40	1.60	1.10	1.15	1.15	1.15	.90	1.15	.90
24	1.45	1.60	1.30	1.60	1.15	1.15	1.20	1.25	.95	1.15	.90
25	1.45	1.60	1.35	1.60	1.10	1.15	1.20	1.35	.95	1.25	1.00
26	1.45	1.65	1.35	1.60	1.05	1.20	1.25	1.35	1.05	1.15	1.00
27	1.45	1.55	1.40	1.55	1.00	1.20	1.35	1.30	1.05	1.15	1.00
28	1.45	1.55	1.75	1.60	1.00	1.20	1.30	1.30	1.10	1.15	1.00
29	1.45	-----	1.60	1.55	1.00	1.10	1.30	1.35	1.25	1.15	1.00
30	1.50	-----	1.55	1.50	.95	1.15	1.30	1.35	1.25	1.15	1.00
31	1.45	-----	1.60	-----	.95	-----	1.30	1.35	1.25	-----	1.00

¹ No record for September on lower rod.

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