UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

OPERATIONS AT RIVER STATIONS, 1897

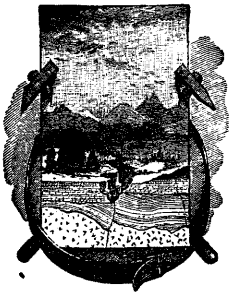
A REPORT OF THE

DIVISION OF HYDROGRAPHY

OF THE

UNITED STATES GEOLOGICAL SURVEY

PART I



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CONTENTS.

LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF HYDROGRAPHY,
Washington, February 10, 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.

LAMBERTVILLE STATION ON DELAWARE RIVER.

Observations of height of Delaware River were begun on July 23, 1897, at the covered toll bridge at Lambertville, New Jersey, a town on the Belvidere Division of the Pennsylvania Railroad, 16 miles above Trenton. When visited, there was found to be an old gage on the bridge pier; later in the season the water receded below the end of this scale. A new gage was therefore put in place, consisting of a stamped link brass chain 33 feet long with a 6-pound sash weight attached. The chain runs over a pulley, the scale being a horizontal board 22 feet in length, graduated to tenths of a foot, fastened to the studding of the bridge and inclosed in a wooden cover. The zero of the gage chain is marked by a copper rivet. It reads 2 feet when the water is at zero on the old gage of the bridge pier. The observer is Charles H. Naylor, collector of toll. Measurements are made from the windows of this covered bridge. The initial point for soundings is on the left bank. The channel above and below is nearly straight, the water being sluggish for a short space on the left side. The right bank is high and the bed of the stream is of gravel and sand. A measurement was made on July 22, 1897, by Arthur P. Davis, when the water stood at 5.50 feet on the new gage, the discharge being 21,831 second-feet; and another on September 14, 1897, by E. G. Paul, when the gage height was 3.42 feet and the discharge 5,308 second-feet.

Daily gage height, in feet, of Delaware River at Lambertville, New Jersey, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	6.70	3.74	2.75	2.35	5.35	17	.....	4.45	2.95	3.35	4.40	9.00
2	.....	6.13	3.83	2.60	3.90	5.00	18	.....	4.25	2.75	3.05	4.50	7.60
3	.....	5.58	4.00	2.65	5.40	4.75	19	.....	4 16	2.85	2.75	4.45	6.85
4	.....	5.17	3.95	2.50	5.15	4.55	20	.....	4.04	2.50	2.50	4.35	6.20
5	.....	5.74	4.08	2.40	4.90	5.35	21	.....	3.91	2.55	2.45	4.25	5.60
6	.....	5.87	3.91	2.30	4.40	6.00	22	.....	3.87	2.60	2.40	4.20	5.40
7	.....	5.37	3.87	2.20	4.15	7.00	23	5.50	4.00	2.65	2.45	4.10	5.25
8	.....	5.04	3.70	2.20	3.95	6.10	24	5.25	4.17	2.75	2.60	4.10	5.25
9	.....	4.78	3.38	2.20	3.90	5.60	25	5.00	4.33	3.05	2.60	4.05	4.90
10	.....	4.52	3.00	2.20	4.15	5.40	26	4.92	5.20	3.25	2.55	3.95	4.50
11	.....	4.70	3.00	2.20	4.45	5.20	27	4.83	5.08	3.10	2.70	4.75	4.60
12	.....	4.83	3.87	2.30	4.60	5.20	28	6.12	4.69	3.40	2.55	6.20	4.50
13	.....	4.91	3.63	2.65	4.65	5.45	29	7.46	4.25	3.10	2.35	6.35	Frozen.
14	.....	4.95	3.41	3.20	4.70	6.35	30	8.75	3.95	2.85	2.30	5.65	4.20
15	.....	4.70	*a*3.17	3.35	4.50	8.25	31	7.75	3.74	.....	2.25	.....	4.25
16	.....	4.81	2.90	3.45	4.35	10.15							

a New gage erected. Former reading changed to refer to new datum.

HARRISBURG STATION ON SUSQUEHANNA RIVER.

Observations of the height of water in the Susquehanna River have been made for several years at the pump house of the waterworks, located in the western part of the city of Harrisburg, Pennsylvania. This well is connected directly with the river by means of large water mains. A float in this well is attached to a cable and counterweight, the height of water being indicated upon a painted scale. The datum is the low-water mark of 1804. Observations are made by the engineer, C. M. Nagle, each morning before starting the pumps. The record since 1890 has been furnished by Mr. E. Mather, president of the Harrisburg Water Company. Measurements of the discharge are made from the open iron bridge on Second street. The initial point for sounding is the iron upright at the east end of the bridge. The channel above and below the station is straight for about 2,500 feet. The banks are high and the current has moderate velocity. The stream is divided into two channels, with a large island between. The first measurement was made on March 31, 1897, by E. G. Paul.

The results of measurements during 1897 are as follows:

March 31, gage height, 5.42 feet; discharge, 58,859 second-feet.
May 15, gage height, 7.83 feet; discharge, 105,888 second-feet.
August 31, gage height, 1.50 feet; discharge, 9,568 second-feet.
September 16, gage height, 0.58 feet; discharge, 3,962 second-feet.
November 17, gage height, 2.50 feet; discharge, 17,824 second-feet.

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pennsylvania, for 1891.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.83	10.58	11.00	8.25	3.58	2.00	2.75	3.25	4.67	1.75	2.50	4.25
2	3.00	11.50	9.00	9.00	3.50	1.92	2.50	3.17	4.00	1.67	2.50	4.00
3	3.33	11.50	7.33	8.58	3.42	2.00	2.58	3.08	3.67	1.67	2.33	3.67
4	4.50	11.17	6.67	8.75	3.42	2.00	3.17	2.92	3.33	1.58	2.25	3.50
5	5.25	10.17	5.67	8.42	3.25	2.00	4.08	3.00	3.00	1.58	2.25	4.58
6	5.00	8.92	5.67	8.00	3.08	2.00	3.50	3.08	3.00	1.58	2.25	8.75
7	5.50	7.67	5.25	7.17	3.00	2.08	3.08	3.00	3.83	1.58	2.17	9.50
8	5.42	7.50	5.00	6.42	3.00	2.17	2.67	3.33	4.67	1.75	2.17	8.33
9	4.92	7.50	4.67	6.00	2.92	2.58	2.75	3.08	4.50	2.58	2.00	7.00
10	4.50	7.42	4.67	5.67	2.75	2.75	2.67	2.83	4.08	3.00	2.00	6.00
11	4.08	7.50	6.17	5.33	2.67	3.00	2.92	2.75	3.83	2.83	2.00	5.42
12	4.25	7.42	7.08	6.08	2.67	2.75	2.83	2.58	3.50	2.67	2.67	5.00
13	6.00	7.00	8.50	7.33	2.58	2.67	2.75	2.58	3.08	2.67	3.67	4.17
14	8.75	6.42	9.67	9.00	2.50	2.67	2.50	2.58	3.00	2.58	4.00	4.33
15	7.92	5.92	10.75	8.50	2.50	2.58	2.25	2.50	3.00	2.42	4.25	4.00
16	7.50	5.58	10.00	8.00	2.42	2.50	2.17	2.50	2.67	2.33	4.08	3.83
17	6.67	5.92	8.83	7.67	2.42	2.42	2.00	2.50	2.67	2.08	3.75	3.75
18	6.00	14.25	7.75	7.42	2.33	2.33	1.83	2.42	2.58	2.00	4.00	3.67
19	5.67	19.00	6.83	6.83	2.25	2.33	1.92	2.25	2.58	1.83	4.83	4.58
20	5.08	17.83	6.17	6.75	2.25	2.33	2.08	2.42	2.50	1.92	4.75	5.00
21	4.83	13.25	5.92	6.33	2.04	3.33	2.08	2.25	2.25	2.17	4.67	4.75
22	4.50	11.75	6.33	5.92	2.00	3.58	2.08	2.08	2.17	2.50	4.25	4.17
23	7.08	11.50	6.67	5.50	2.13	5.42	2.00	2.00	2.08	3.25	4.17	3.83
24	9.17	10.25	8.08	5.17	2.25	6.17	2.00	3.08	2.08	4.67	4.08	3.92
25	9.50	9.00	10.33	5.00	2.33	5.58	4.33	6.50	2.00	4.17	5.42	4.58
26	9.42	8.25	10.83	4.75	2.29	4.58	4.00	6.58	1.92	3.67	6.42	6.33
27	8.42	11.33	10.08	4.67	2.25	4.33	3.83	5.25	1.83	3.17	6.17	8.25
28	7.50	13.08	8.92	4.25	2.21	3.75	3.33	5.67	1.75	3.00	5.42	9.33
29	7.00	.....	7.83	4.08	2.17	3.50	3.00	6.00	1.75	2.83	5.00	8.58
30	7.08	.....	7.50	3.83	2.08	3.50	2.75	5.33	1.75	2.67	4.67	7.83
31	9.83	.....	7.67	.....	2.00	.....	3.92	5.17	.....	2.58	.....	8.50

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pennsylvania, for 1892.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.50	2.83	4.50	9.75	3.00	5.92	4.67	1.92	2.92	1.08	0.50	1.92
2	8.25	2.92	4.00	9.00	2.83	5.50	4.33	2.00	2.50	1.25	.50	1.83
3	8.75	2.92	3.58	8.50	2.83	5.17	3.75	1.83	2.33	1.42	.50	1.75
4	9.33	3.08	3.25	11.75	2.83	7.58	3.67	2.00	2.17	1.25	.50	1.58
5	8.83	3.08	3.00	14.33	4.50	12.50	3.50	3.00	2.00	1.08	.50	1.58
6	8.00	3.00	2.67	14.67	5.83	12.00	3.58	2.83	1.83	1.08	.50	1.50
7	7.83	3.00	2.83	13.17	7.58	11.25	3.42	2.83	1.83	1.00	.50	1.50
8	6.83	2.92	2.83	11.33	7.58	9.00	3.42	3.00	1.75	1.00	.50	1.50
9	5.33	2.75	3.83	9.50	7.83	7.67	3.42	2.67	1.67	1.00	.75	1.58
10	5.67	2.50	5.25	7.83	6.67	7.00	3.00	2.42	1.50	1.00	.92	1.67
11	4.17	2.58	6.17	7.00	5.58	7.42	2.83	2.17	1.50	1.00	1.00	2.42
12	3.67	2.50	5.92	6.42	5.00	7.00	2.50	2.08	1.42	.92	1.17	4.25
13	3.75	2.00	5.67	5.67	4.75	6.42	2.17	2.42	1.42	.92	1.17	4.00
14	5.50	1.08	5.00	5.33	4.25	5.42	2.17	2.50	1.50	.83	1.17	8.50
15	11.83	1.75	4.42	4.75	4.17	4.67	2.33	3.50	2.33	.83	1.25	3.08
16	13.17	1.83	4.00	4.75	4.17	4.17	2.42	4.17	2.33	.83	1.25	2.83
17	10.83	1.67	3.50	4.33	4.42	3.75	2.42	4.00	2.08	.83	1.25	2.92
18	9.08	1.75	3.33	4.33	4.83	3.58	2.25	3.50	1.83	.83	1.25	2.67
19	7.75	2.00	3.08	4.00	4.92	3.50	2.25	2.83	1.67	.83	1.92	2.58
20	7.67	2.33	3.00	3.83	5.67	3.50	2.08	2.67	1.50	.83	2.50	2.50
21	7.00	2.17	2.92	3.67	7.25	3.67	2.00	2.33	1.50	.83	2.50	2.42
22	6.17	2.50	2.67	3.50	8.25	4.00	1.75	2.17	1.50	.83	2.92	2.08
23	5.33	2.67	2.50	3.42	8.83	3.67	1.67	1.92	1.33	.83	3.58	1.50
24	4.75	3.17	2.50	3.50	8.75	3.50	1.67	1.83	1.17	.83	3.33	.92
25	4.50	3.50	2.67	3.50	8.25	3.67	1.67	1.92	1.17	.75	2.92	1.08
26	4.33	4.33	3.50	3.58	7.33	4.17	1.58	2.17	1.25	.58	2.50	2.58
27	3.58	4.50	4.50	3.58	6.67	3.58	1.50	2.00	1.25	.58	2.08	2.00
28	2.50	4.83	10.83	3.50	6.50	3.25	1.50	2.00	1.25	.58	2.00	2.25
29	2.08	4.67	13.00	3.33	6.33	3.50	1.50	2.00	1.08	.58	2.00	2.25
30	2.83	.....	12.00	3.17	7.08	4.83	1.42	2.25	1.08	.58	1.92	2.25
31	2.83	.....	10.58	.....	6.42	.....	1.67	3.00	.....	.50	.....	2.17

Daily gage height, in feet, of Susquehanna River, at Harrisburg, Pennsylvania, for 1893.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.00	2.67	2.58	6.08	4.92	3.67	2.33	0.92	3.58	2.00	2.17	4.00
2	2.50	3.00	2.58	6.00	4.83	3.67	2.17	.83	4.17	2.00	2.17	3.83
3	2.83	4.00	2.75	6.42	5.50	3.50	2.08	.83	3.92	1.83	2.17	3.67
4	2.83	4.17	2.75	7.50	6.83	3.58	1.92	.83	3.50	1.67	2.17	3.67
5	2.75	5.00	2.75	7.92	16.17	3.58	1.92	.75	2.67	1.50	2.33	3.67
6	2.67	5.08	2.50	8.92	16.50	3.17	1.67	.75	2.25	1.50	3.00	3.50
7	2.50	5.00	2.50	9.50	14.58	3.00	1.67	.67	2.00	1.42	3.25	3.17
8	2.50	5.33	2.67	8.83	12.00	3.00	1.58	.67	1.75	1.42	2.83	3.00
9	2.50	5.42	3.08	8.00	9.92	3.00	1.50	.58	1.67	1.42	2.75	3.00
10	2.50	6.42	6.50	8.42	8.25	2.83	1.50	.58	1.50	1.33	2.50	2.92
11	2.25	7.75	12.50	10.00	7.00	2.67	1.50	.50	1.50	1.33	2.50	2.83
12	2.25	11.58	13.83	9.42	6.17	2.58	1.50	.50	1.67	1.33	2.42	2.83
13	2.08	7.50	14.50	8.42	5.50	2.50	1.50	.42	2.00	1.25	2.33	2.83
14	2.08	6.50	14.58	7.75	5.00	2.33	1.50	.42	2.00	1.67	2.17	2.50
15	2.08	5.58	13.00	7.42	4.75	2.08	1.75	.42	1.83	4.67	2.08	2.00
16	2.00	5.25	12.25	8.08	4.58	2.00	1.83	.33	2.00	5.33	2.00	2.25
17	2.00	7.75	10.50	8.83	5.92	1.92	1.83	.33	2.50	5.25	1.92	2.42
18	2.00	6.75	8.83	8.92	8.50	1.83	1.67	.33	2.67	4.25	1.83	5.75
19	2.00	5.83	7.33	7.75	9.75	1.75	1.67	.33	4.42	3.83	1.75	8.83
20	2.00	5.33	6.67	6.92	9.00	1.75	1.67	.67	3.67	3.42	1.75	7.08
21	2.00	4.67	5.92	7.00	7.58	1.75	1.67	.58	3.25	3.00	1.67	6.00
22	2.00	4.25	5.58	10.00	7.00	1.58	1.50	.50	2.83	2.50	1.58	5.92
23	2.00	3.50	5.67	10.92	6.25	1.58	1.42	.42	2.50	2.50	1.58	4.42
24	2.00	3.00	6.83	10.50	5.58	1.75	1.33	.42	2.33	2.33	1.67	3.92
25	2.00	3.00	7.25	8.92	5.42	1.75	1.25	.33	2.33	2.25	1.67	3.83
26	2.00	3.00	7.75	7.67	4.92	2.00	1.17	.42	2.17	2.25	1.58	3.83
27	2.00	2.92	9.42	6.83	4.50	2.25	1.08	.50	2.00	2.25	1.58	4.83
28	2.00	2.75	8.67	6.17	4.33	2.50	1.08	.50	2.00	2.00	1.75	5.92
29	2.00	.....	7.83	5.67	4.17	2.75	1.83	1.00	2.00	2.00	2.83	5.83
30	2.33	.....	7.83	5.17	3.92	2.50	.92	3.00	2.00	2.00	3.67	5.17
31	2.50	.....	6.50	.....	3.67	.....	.92	3.08	.....	2.17	.....	4.67

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pennsylvania, for 1894.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	2.41	3.16	3.83	4.58	9.50	2.58	1.08	0.33	1.91	5.08	2.41
2	4.5	2.33	3.33	3.66	4.50	9.66	2.41	1.08	.33	1.83	5.25	2.33
3	4.0	2.25	3.50	3.50	4.16	9.16	2.33	1.33	.33	1.58	5.41	2.50
4	3.66	2.16	3.75	3.25	3.83	8.58	2.25	1.50	.33	1.58	7.50	2.91
5	3.5	2.08	4.08	3.16	3.50	8.41	2.00	1.66	.25	1.41	7.66	3.50
6	3.33	2.00	5.66	3.00	3.16	7.91	2.00	1.58	.25	1.41	7.58	3.58
7	3.41	2.00	7.66	2.91	3.25	6.75	1.83	1.50	.33	1.33	7.16	3.58
8	5.16	2.00	11.33	2.83	3.33	6.00	1.83	1.50	.33	1.33	7.00	3.33
9	5.25	2.08	12.16	2.75	3.50	5.50	1.75	1.08	.41	1.25	6.50	3.00
10	4.58	3.50	10.83	2.75	3.50	5.00	1.66	1.08	1.00	1.33	6.00	3.00
11	3.75	5.00	8.50	2.83	3.50	4.66	1.58	1.08	1.91	2.08	5.50	3.33
12	3.33	6.00	9.83	3.00	3.08	4.00	1.50	1.00	1.50	4.91	5.33	4.00
13	2.50	5.66	7.16	3.25	2.91	3.75	1.41	1.00	1.33	5.58	4.66	4.33
14	3.16	4.58	7.00	3.66	2.75	3.66	1.41	1.00	1.25	5.08	4.50	5.75
15	3.16	4.33	6.41	6.33	2.50	3.66	1.33	1.00	1.25	4.66	4.00	6.16
16	2.83	3.66	5.83	7.58	2.50	3.58	1.33	1.00	1.16	4.16	3.91	6.33
17	2.66	3.33	5.50	9.08	2.33	3.41	1.25	1.00	1.08	3.83	3.66	5.75
18	2.83	3.33	5.08	9.08	2.33	3.16	1.16	1.00	1.08	3.66	3.50	5.16
19	2.83	3.33	4.83	8.50	2.33	3.00	1.08	.91	2.16	3.41	3.25	4.66
20	3.00	4.16	4.58	7.50	5.33	3.50	1.08	.91	4.08	3.00	3.16	4.33
21	2.83	5.66	4.50	6.75	16.33	3.41	1.08	.83	5.00	2.75	3.08	4.08
22	2.83	5.33	4.33	8.50	25.58	3.08	1.08	.83	5.50	2.50	3.25	3.83
23	2.58	5.16	4.50	9.41	21.41	2.83	1.00	.75	5.66	2.33	3.16	3.58
24	2.41	4.33	4.66	9.58	15.25	2.50	1.08	.75	4.83	2.16	3.00	3.50
25	2.41	3.33	5.50	9.91	11.83	2.50	1.25	.75	4.00	2.33	3.00	3.33
26	2.41	2.91	7.00	9.00	11.33	2.66	1.41	.75	3.41	3.58	2.83	3.08
27	2.41	2.33	6.33	7.25	11.66	2.58	1.50	.66	3.00	4.75	2.66	3.00
28	2.50	2.50	5.50	6.00	9.50	2.66	1.50	.66	2.58	4.83	2.58	3.00
29	2.58	.....	4.91	5.41	7.91	2.41	1.41	.58	2.25	4.33	2.58	4.00
30	2.58	.....	4.33	5.00	7.00	2.75	1.16	.50	2.08	4.00	2.50	3.66
31	2.50	.....	4.00	.....	7.50	.....	1.08	.41	.....	3.75	.....	3.66

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pennsylvania, for 1895.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.92	2.92	6.00	5.75	3.42	2.67	2.83	0.58	0.75	0.42	0.21	3.08
2	4.00	2.83	8.58	5.67	3.33	2.58	2.67	.67	.75	.42	.21	3.08
3	4.25	3.00	8.08	6.17	3.25	2.50	2.92	.67	.67	.33	.25	2.75
4	4.33	3.00	10.50	6.83	3.00	2.25	2.50	.67	.67	.33	.25	2.50
5	4.33	7.00	7.83	6.67	2.75	2.08	2.25	.58	.58	.33	.33	2.25
6	4.33	5.67	7.67	6.17	2.67	1.92	2.00	.50	.58	.33	.38	2.00
7	4.33	5.75	6.67	6.00	2.50	1.83	1.92	.50	.75	.33	.38	1.92
8	4.50	5.67	6.25	5.75	2.42	1.75	1.75	.83	.75	.25	.42	1.92
9	4.75	5.50	5.83	8.08	2.25	1.75	1.58	.75	.67	.25	.42	1.92
10	6.17	5.50	6.17	12.00	2.75	1.58	1.50	1.00	.50	.21	.42	1.83
11	7.42	5.58	6.17	13.67	3.00	1.33	1.50	1.08	1.00	.21	.42	.50
12	7.83	5.92	6.33	12.50	3.33	1.42	1.42	1.08	1.50	.21	.46	1.50
13	8.50	5.83	6.17	10.92	3.67	1.33	1.33	1.08	1.58	.33	.50	.96
14	7.83	5.83	6.00	9.50	4.33	1.25	1.33	.92	1.42	.29	.58	.75
15	6.75	5.67	6.50	10.00	4.33	1.25	1.25	1.33	1.00	.29	.58	1.00
16	6.25	5.58	6.75	9.75	4.17	1.25	1.25	1.33	.83	.25	.58	1.00
17	5.75	5.50	6.67	8.75	4.08	1.25	1.08	1.08	.67	.25	.67	1.33
18	5.42	5.50	6.33	7.58	3.67	1.25	1.00	1.00	.58	.42	.83	1.33
19	5.00	5.33	5.67	6.67	3.50	1.25	.92	1.00	.67	.58	1.00	1.33
20	4.50	5.25	5.50	6.00	3.33	1.25	.92	.92	.67	.50	1.00	1.33
21	4.42	5.17	5.33	5.50	3.17	1.17	.83	.83	.67	.42	.92	1.50
22	4.33	5.08	5.17	5.00	3.08	1.00	.83	.58	.58	.42	.79	1.83
23	4.00	5.00	5.00	4.58	2.92	.75	.83	.50	.58	.33	.67	2.00
24	4.00	4.92	5.00	4.33	2.75	.75	.83	.50	.58	.25	.75	2.67
25	3.33	4.75	5.00	4.00	2.58	.75	.83	.42	.58	.25	.75	2.75
26	3.25	4.58	5.83	3.75	2.50	1.50	.83	.33	.50	.21	.75	2.83
27	3.08	4.50	8.00	3.58	2.50	1.50	.83	.33	.50	.13	.75	3.33
28	3.08	4.75	9.00	3.75	2.42	1.50	.83	.33	.42	.08	2.67	3.50
29	3.08	.....	8.00	3.75	2.42	2.00	.75	.33	.42	.08	2.83	5.08
30	3.25	.....	7.17	3.50	3.08	3.50	.58	.33	.42	.04	2.83	5.67
31	3.00	.....	6.33	.....	3.00	.....	.42	.50	.....	.04	.....	5.67

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pennsylvania, for 1896.

Day.	Jan.	Feb.	Mar.	Apr.	May.	Jnne.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.92	4.50	7.17	14.58	3.00	1.50	2.67	4.67	0.33	5.42	2.08	3.92
2	9.17	3.75	9.17	14.58	3.00	1.50	2.42	4.33	.33	4.25	1.92	3.92
3	8.42	3.58	9.75	13.75	2.83	1.75	2.08	3.83	.33	4.00	1.83	3.83
4	6.50	3.58	8.42	12.33	2.83	1.83	1.83	3.75	.33	3.17	1.83	3.33
5	5.08	3.50	7.17	10.50	2.67	1.67	1.75	3.67	.25	2.67	1.83	3.00
6	4.00	4.00	5.50	8.83	2.50	1.67	1.67	3.58	.25	2.08	7.25	2.75
7	3.83	11.50	5.00	7.25	2.42	1.67	2.17	2.50	.25	1.83	10.08	2.67
8	3.00	12.50	4.75	6.50	2.17	1.58	2.00	2.33	.25	1.67	7.75	2.50
9	4.67	10.33	4.50	6.17	2.08	1.42	1.92	2.33	.25	1.50	6.50	2.50
10	4.33	8.50	4.83	5.83	2.00	1.75	2.33	2.25	.25	1.50	5.67	2.67
11	4.08	6.83	5.08	5.50	2.00	2.50	2.75	2.25	.25	1.50	4.75	3.42
12	4.00	5.33	4.67	5.50	1.92	2.58	2.75	2.00	.25	1.50	4.42	3.75
13	3.92	4.92	4.00	6.00	1.75	3.42	2.50	1.83	.25	1.92	4.17	4.00
14	4.00	4.25	3.50	6.42	1.67	3.25	2.17	1.67	.33	7.33	4.00	4.25
15	3.83	3.75	2.67	8.00	1.67	2.92	2.00	1.67	.33	7.00	3.83	3.83
16	3.83	3.75	2.67	8.42	1.75	2.58	1.83	1.58	.33	9.50	3.67	3.67
17	3.75	3.83	2.33	8.17	1.58	2.58	1.67	1.58	.50	7.67	3.50	3.42
18	3.58	3.58	2.50	7.33	1.50	2.83	1.58	1.58	.50	5.58	3.33	3.08
19	3.67	2.92	3.17	6.83	1.50	2.67	1.67	1.33	.58	4.83	3.17	2.92
20	4.00	3.00	4.00	6.33	1.50	3.00	1.67	1.25	.58	4.08	3.00	2.58
21	3.67	2.33	6.00	5.75	1.50	3.17	1.92	1.00	.67	3.58	2.83	2.33
22	3.50	3.67	5.75	5.25	1.42	3.00	1.67	.83	.83	3.42	2.67	2.00
23	3.50	5.42	5.75	4.83	1.42	2.42	1.58	.83	1.17	3.25	2.58	2.00
24	3.50	5.42	6.25	4.58	1.42	2.33	1.67	.83	1.17	3.00	2.50	1.50
25	4.00	3.42	5.58	4.33	1.33	2.25	1.67	.83	.92	3.00	2.50	1.50
26	7.25	3.50	5.00	4.08	1.25	2.67	1.75	.75	.75	3.00	2.33	1.50
27	7.33	3.67	5.25	4.00	1.17	4.75	1.92	.75	.58	2.75	2.33	1.50
28	6.17	3.17	6.08	3.58	1.25	4.00	2.50	.67	.50	2.67	2.42	1.50
29	6.00	3.17	6.50	3.42	1.50	3.50	2.50	.58	.42	2.50	2.67	1.33
30	5.75	.....	9.25	3.25	1.50	3.08	3.75	.50	.83	2.42	3.50	1.58
31	5.42	.....	12.50	.....	1.50	.....	4.33	.33	.....	2.25	.....	1.75

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pennsylvania, for 1897

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.83	3.33	4.25	5.00	3.08	2.92	1.42	4.00	1.25	1.75	0.67	5.00
2	2.00	3.17	3.67	4.67	3.08	2.83	1.33	4.33	1.08	1.50	1.17	4.50
3	2.00	3.17	3.25	4.33	5.50	2.67	1.25	3.83	1.00	1.33	3.08	4.00
4	2.08	3.17	3.83	4.17	6.50	2.58	1.25	3.25	1.00	1.17	4.08	3.75
5	2.50	3.08	4.92	4.00	7.50	2.67	1.25	2.83	1.00	1.08	3.50	3.33
6	3.00	3.00	5.92	3.83	7.08	3.00	1.25	2.67	.92	1.00	3.08	4.75
7	3.67	4.25	7.67	3.75	7.00	2.67	1.42	2.42	.83	1.00	3.00	5.17
8	3.67	7.50	8.58	3.75	6.33	2.50	1.42	2.67	.83	.92	2.75	5.08
9	3.67	6.58	8.00	3.75	5.50	2.67	1.25	2.50	.83	.83	2.50	5.42
10	3.33	5.42	6.92	5.92	4.83	2.67	1.25	2.08	.83	.67	2.50	4.92
11	3.08	4.83	6.50	9.00	4.50	2.67	1.17	2.08	.75	.67	2.67	4.33
12	2.83	4.50	7.25	9.50	4.00	2.67	1.08	2.00	.67	.58	2.67	4.17
13	2.42	3.92	8.67	8.00	4.00	3.00	1.00	1.83	.67	.75	2.50	4.17
14	2.00	3.83	8.42	6.83	6.00	3.50	1.08	1.75	.67	.75	2.50	4.33
15	2.00	3.83	7.75	6.00	7.75	3.25	1.00	1.58	.50	.75	2.50	4.58
16	2.00	3.50	7.00	6.00	7.92	2.92	1.00	1.58	.58	.75	2.50	6.58
17	2.00	3.50	6.92	6.58	7.33	2.67	1.17	1.50	.67	.67	2.50	7.67
18	2.17	3.33	5.50	7.00	6.50	2.50	1.17	1.50	.75	.67	2.67	8.17
19	2.33	3.58	5.00	6.58	5.75	2.25	1.08	1.42	.75	.58	2.92	7.33
20	2.00	4.08	5.33	6.00	5.00	2.17	1.08	1.42	.67	.58	3.42	6.33
21	1.83	4.00	7.42	5.50	4.25	2.17	1.50	1.33	.58	.50	3.25	5.58
22	1.83	4.25	8.25	4.92	4.00	2.17	1.50	1.17	.58	.58	3.17	5.00
23	1.92	5.92	9.75	4.50	3.58	2.00	1.33	1.17	.58	.75	2.83	4.08
24	1.67	7.92	9.50	4.17	3.50	1.83	1.33	1.25	1.00	.75	2.50	3.83
25	1.67	7.50	10.17	3.83	3.75	1.75	1.58	1.67	1.50	1.00	2.50	3.42
26	.50	6.50	11.50	3.67	3.75	1.75	1.75	2.67	1.50	1.00	2.50	2.83
27	3.33	5.50	10.67	3.58	3.50	1.67	1.75	2.08	1.83	1.00	2.33	2.75
28	3.33	4.50	8.00	3.50	3.58	1.58	2.17	1.75	1.92	.92	2.50	2.67
29	3.00	.....	7.42	3.33	3.92	1.58	3.83	1.58	2.25	.83	3.50	2.67
30	3.25	.....	6.33	3.17	3.50	1.50	4.50	1.50	2.00	.75	4.92	2.58
31	3.33	.....	5.58	.....	3.25	.....	4.08	1.33	.....	.75	.....	2.50

ROWLANDSVILLE STATION ON OCTORARO CREEK.

This station, described on page 16 of the Eighteenth Annual Report of this Survey, Part IV, was established November 21, 1896, at the wagon bridge in the village of Rowlandsville, Maryland. A wire gage was attached to the floor timber on the upper side of the bridge. The observer is Hugh W. Caldwell. The bench mark for the gage is a cross cut in top of capstone on the lower side of the bridge abutment on the left bank of the stream, and is 18.83 feet above the zero of the gage. Observations of height of water were begun at this point on November 22, 1896, the height during the remainder of that year ranging from 3 to 3.20 feet, except in the case of a flood on November 29 rising to 4.30 feet. The following measurements have been made by Hugh W. Caldwell:

November 21, 1896, gage height, 3.00 feet; discharge, 138 second-feet.
January 23, 1897, gage height, 3.42 feet; discharge, 248 second-feet.
July 21, gage height, 3.45 feet; discharge, 264 second-feet.
August 16, gage height, 3.10 feet; discharge, 175 second-feet.
August 31, gage height, 2.80 feet; discharge, 138 second-feet.
September 18, gage height, 2.90 feet; discharge, 136 second-feet.
October 22, gage height, 3.10 feet; discharge, 138 second-feet.
November 2, gage height, 6.00 feet; discharge, 1,843 second-feet.
November 3, gage height, 4.00 feet; discharge, 444 second-feet.

Daily gage height, in feet, of Octoraro Creek at Rowlandsville, Maryland, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.10	3.20	3.45	3.30	3.40	3.40	3.00	3.40	2.80	2.80	3.10	3.30
2	3.10	3.20	3.60	3.30	3.40	3.40	3.00	3.30	2.80	2.80	6.00	3.40
3	3.10	4.80	3.50	3.30	3.60	3.40	3.00	3.30	2.80	2.80	4.15	3.45
4	3.10	3.55	3.50	3.30	3.50	3.40	3.00	3.30	2.80	2.80	3.70	3.60
5	3.15	3.45	3.50	3.30	3.40	5.45	3.00	3.30	2.80	2.80	3.40	4.35
6	3.10	8.68	3.45	3.30	3.30	3.70	2.90	3.20	2.80	2.80	3.40	3.70
7	3.10	10.10	3.40	3.30	3.30	3.70	2.90	3.20	2.80	2.80	3.30	3.45
8	3.10	9.20	3.40	3.30	3.30	3.45	2.90	3.20	2.80	2.80	3.65	3.30
9	3.10	7.50	3.30	4.60	3.20	3.40	2.90	3.30	2.80	2.80	3.50	3.30
10	3.10	5.40	3.30	5.50	3.20	3.30	2.90	3.30	2.80	2.80	3.60	3.30
11	3.10	3.50	3.30	6.15	3.20	3.30	2.90	5.10	2.80	2.90	3.70	3.60
12	3.10	3.35	3.20	5.65	3.20	3.30	2.90	3.40	2.80	2.85	3.45	3.40
13	3.10	3.30	3.20	4.55	4.85	3.30	2.90	3.30	2.80	2.80	3.35	3.30
14	3.10	3.30	3.20	3.85	5.00	3.20	2.90	3.20	2.80	2.80	3.30	4.65
15	3.10	3.40	3.20	3.60	5.00	3.20	2.90	3.10	2.80	2.80	3.20	4.90
16	3.10	4.55	3.20	3.50	3.75	3.20	2.90	3.10	2.80	2.80	3.20	3.95
17	3.10	4.05	3.20	3.50	3.55	3.20	2.90	3.10	3.05	2.80	3.20	3.70
18	3.10	3.55	3.40	3.45	3.40	3.20	2.90	3.00	2.90	2.80	3.30	3.60
19	3.10	3.60	4.15	3.45	3.30	3.20	3.10	2.90	2.90	2.90	3.30	3.60
20	3.10	3.40	3.60	3.40	3.30	3.20	3.10	2.90	2.90	2.90	3.30	3.50
21	6.70	3.45	3.40	3.30	3.40	3.20	3.75	3.05	2.80	3.00	3.20	3.50
22	6.65	3.45	3.40	3.30	3.65	3.20	3.85	3.05	2.80	3.05	3.20	3.40
23	4.45	6.00	3.40	3.20	3.40	3.10	3.55	3.00	3.20	3.20	3.20	3.30
24	3.30	3.80	4.20	3.20	3.40	3.10	3.40	3.00	3.20	3.20	3.20	3.30
25	3.20	3.45	3.95	3.20	5.05	3.10	3.30	3.00	3.10	3.20	3.20	3.30
26	3.20	3.35	3.55	3.20	4.80	3.10	3.30	3.00	3.00	3.20	3.20	3.35
27	3.20	3.40	3.40	3.20	3.90	3.10	4.25	2.90	3.00	3.20	4.85	3.50
28	3.20	3.40	3.30	3.20	3.50	3.10	3.95	2.90	3.00	3.10	4.10	3.50
29	3.20	.....	3.30	3.20	3.40	3.00	3.65	2.80	2.90	3.10	3.65	3.40
30	3.20	.....	3.30	3.20	3.40	3.00	3.50	2.80	2.80	3.00	3.40	3.40
31	3.20	.....	3.30	.....	3.40	.....	3.40	2.80	.....	3.00	.....	3.50

WOODSTOCK STATION ON PATAPSCO RIVER.

This station, described on page 16 of the Eighteenth Annual Report, Part IV, is located on the county bridge on the road from Woodstock to Granite, Maryland, a mile and a half below the junction with the North Branch. The pulley of the wire gage is fastened to the floor timber of the upper side of the bridge 40 feet from the initial point established for making soundings. The scale is a board spaced to tenths of a foot with small nails and nailed to the guard timber of the bridge. The channel at this point is rough and rocky, and is also liable to change in extreme high water. The bench mark is a United States Geological Survey standard copper bolt set in the face of the retaining wall of the entrance to the college grounds at the north end of the bridge. It is 22.06 feet above gage datum. The gage wire was renewed October 14, 1897. The observer is David Donovan.

The following measurements were made by E. G. Paul in 1897:

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec. ft.*		*Feet.*	*Sec. ft.*		*Feet.*	*Sec. ft.*
Feb. 10	4.20	345	July 13	4.20	397	July 22	6.10	2,417
Mar. 9	4.10	297	July 20	3.80	239	Oct. 14	3.35	151
Apr. 10	4.60	582	July 22	9.30	5,466	Nov. 29	3.50	202
May 13	7.30	2,934	July 22	8.10	4,139	Dec. 15	4.70	714

Daily gage height, in feet, of Patapsco River at Woodstock, Maryland, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.80	3.60	4.05	3.85	3.90	4.05	3.75	3.85	3.35	3.20	3.80	3.80
2	3.70	3.60	4.05	3.85	4.00	4.05	3.75	3.95	3.25	3.25	10.70	3.75
3	3.50	5.00	4.15	3.90	4.15	4.20	3.75	3.95	3.30	3.15	3.75	3.75
4	3.60	4.60	4.05	3.70	4.30	4.15	3.70	3.75	3.20	3.15	4.00	4.05
5	3.85	4.70	4.05	4.70	4.25	5.05	3.70	3.70	3.35	3.25	3.85	5.00
6	3.90	9.60	4.15	4.40	4.10	4.05	3.75	3.75	3.30	3.20	3.80	4.35
7	3.90	6.45	4.15	4.15	4.00	.....	3.75	3.70	3.20	3.30	3.70	4.10
8	3.85	4.70	4.05	4.15	4.00	4.15	3.90	3.50	3.05	3.05	3.80	4.05
9	3.95	4.50	4.05	4.80	3.85	4.25	3.80	3.65	3.15	3.15	4.10	3.95
10	3.85	4.45	4.05	4.50	3.85	4.00	3.65	7.30	3.15	3.00	3.80	3.95
11	3.80	4.20	4.05	4.50	3.90	3.95	3.65	4.55	3.10	3.05	3.80	3.95
12	3.85	4.20	4.00	4.30	4.15	3.95	7.05	3.90	2.95	3.05	3.80	4.50
13	3.85	4.05	4.05	4.10	6.60	4.05	4.45	3.90	3.35	3.20	3.70	4.10
14	3.80	4.05	4.05	4.15	5.00	3.95	4.25	3.90	3.20	3.40	3.65	4.80
15	3.65	4.20	4.15	4.30	4.85	3.90	4.00	3.80	3.10	3.35	3.80	5.55
16	3.70	4.50	4.15	4.30	4.35	3.90	3.70	6.05	3.15	3.30	3.75	4.50
17	3.80	4.30	4.05	4.10	4.30	3.90	4.10	4.00	3.25	3.15	3.70	4.30
18	3.85	4.25	3.95	4.30	4.20	3.95	4.15	3.95	3.45	3.35	3.70	4.15
19	3.80	4.05	4.00	4.05	4.20	3.90	4.00	3.85	3.30	3.30	3.65	4.05
20	3.75	4.05	4.75	4.05	4.20	3.90	3.90	3.75	3.30	3.35	3.60	4.10
21	3.90	4.55	4.35	3.90	4.15	3.90	3.80	3.70	3.30	3.50	3.60	4.00
22	4.45	5.95	4.15	3.90	4.15	3.75	7.50	3.85	3.20	3.35	3.65	4.00
23	8.50	5.80	4.20	3.90	3.95	3.70	4.30	4.00	3.25	3.50	3.85	3.90
24	3.95	4.75	4.40	3.90	5.77	3.75	3.90	7.15	3.30	3.15	3.80	3.60
25	3.95	4.40	4.20	3.85	4.63	3.75	3.80	4.00	3.35	3.55	3.60	3.90
26	4.05	4.30	4.10	3.95	4.20	3.80	3.80	4.70	3.25	3.70	3.60	4.00
27	3.60	4.35	4.10	3.90	4.15	3.70	4.25	4.00	3.40	3.45	4.55	4.00
28	3.60	4.10	4.05	3.90	4.15	3.80	6.65	3.50	3.20	3.40	3.90	3.80
29	3.60	.....	3.95	3.80	4.05	3.75	5.10	3.25	3.25	3.40	3.85	3.80
30	3.60	.....	3.90	3.80	3.85	3.70	4.10	3.40	3.20	3.35	3.85	3.80
31	3.60	.....	3.95	.....	4.55	.....	4.00	3.45	.....	3.15	.....	3.90

LAUREL STATION ON PATUXENT RIVER.

This station, described on page 18 of the Eighteenth Annual Report of this Survey, Part IV, was established August 3, 1896, on the bridge on the main cross street of the town of Laurel, Maryland. The initial point for soundings is the end of iron truss, upper side. A wire gage with metal weight was attached to the lower side of the bridge, the scale being a 14-foot board spaced to tenths of a foot with small nails and fastened to the floor timber of the bridge. The bench mark is a copper bolt set in large capstone of the retaining wall on the lower side of the bridge abutment on the left bank of the stream. It is 21.22 feet above zero of gage height. The flow of water past this station in time of dry weather is confined to certain hours of the day, owing to a dam at the large cotton mill situated about 1 mile up the stream from the station. The observer is John H. Phair.

The following discharge measurements were made by E. G. Paul and others during 1897:

February 11, gage height, 5.40 feet; discharge, 184 second-feet.
February 23, gage height, 8.50 feet; discharge, 612 second-feet.
March 12, gage height, 4.40 feet; discharge, 155 second-feet.
May 25, gage height, 8.70 feet; discharge, 734 second-feet.
July 13, gage height, 7.85 feet; discharge, 539 second-feet.
July 22, gage height, 13.70 feet; discharge, 6,144 second-feet.
September 3, gage height, 4.10 feet; discharge, 63 second-feet.

Daily gage height, in feet, of Patuxent River at Laurel, Maryland, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.00	5.15	5.15	4.65	4.85	4.80	4.50	5.60	4.20	4.15	4.55	4.95
2	4.90	5.75	5.05	4.65	5.75	4.80	4.35	5.05	4.20	4.25	10.50	4.90
3	3.90	9.10	5.00	4.60	4.85	4.80	3.80	4.75	4.20	3.25	6.30	4.85
4	4.75	7.50	4.85	4.60	4.85	5.05	6.60	4.60	4.00	4.45	5.35	5.50
5	4.70	6.30	5.00	5.20	4.75	5.10	3.55	4.85	4.00	4.30	4.95	7.80
6	4.75	9.05	5.10	5.30	4.80	4.45	3.85	4.65	4.00	4.10	4.85	5.65
7	4.55	10.80	(a)	4.95	4.75	4.75	3.80	4.30	4.00	3.60	4.65	5.35
8	4.45	7.95	(a)	4.85	4.45	4.75	4.65	4.30	3.95	4.30	5.00	5.10
9	4.05	5.50	(a)	6.50	4.25	5.00	4.45	4.40	3.95	4.25	5.55	5.15
10	3.75	5.25	(a)	6.35	4.65	4.75	4.40	4.40	3.80	3.45	5.75	4.85
11	4.20	5.30	(a)	5.00	4.70	4.55	3.70	4.35	3.80	4.45	4.95	4.85
12	4.45	5.30	4.50	5.00	4.85	4.20	4.60	4.35	4.15	4.60	5.00	4.80
13	4.60	5.30	4.95	4.95	7.65	4.20	8.10	4.30	4.25	4.60	4.95	5.15
14	4.90	5.10	4.75	4.90	7.35	4.50	5.05	4.20	4.55	4.55	4.45	5.55
15	5.15	6.30	5.20	4.85	5.85	4.70	4.60	4.20	4.05	4.25	5.00	8.70
16	4.25	6.35	4.70	5.05	5.40	4.00	4.25	8.15	3.60	4.15	4.90	6.05
17	3.70	6.35	4.95	4.95	4.85	4.50	4.25	4.60	3.80	3.15	4.70	5.50
18	4.25	5.35	5.45	4.75	5.00	4.45	4.80	4.35	4.60	4.35	4.90	4.35
19	4.75	5.15	5.45	4.75	4.80	4.30	5.55	4.30	3.30	4.25	4.75	4.90
20	4.65	5.05	5.65	4.65	4.50	4.15	6.00	4.20	4.15	4.15	4.75	5.00
21	4.70	4.80	5.50	4.65	4.80	4.55	4.75	4.15	4.35	4.75	4.40	4.95
22	5.20	8.65	5.20	4.80	5.05	4.40	12.25	7.30	4.30	4.45	4.70	5.15
23	5.00	9.10	5.00	4.45	4.50	4.45	6.45	4.60	4.50	4.45	4.75	5.00
24	4.25	6.55	5.05	3.90	5.30	4.40	5.50	4.70	5.90	3.95	4.55	5.15
25	4.00	5.60	5.15	4.40	9.75	4.00	4.95	4.45	4.50	4.55	4.45	5.10
26	4.75	5.30	4.95	4.55	5.25	4.35	5.15	6.90	3.90	4.90	4.80	5.25
27	5.00	5.20	4.70	4.60	5.30	3.70	5.45	4.45	4.50	4.70	9.60	4.95
28	4.05	4.85	4.50	4.60	4.90	4.55	9.20	4.35	4.25	4.70	5.45	4.60
29	5.20	.....	4.75	4.80	4.65	4.50	5.90	4.20	4.30	4.45	5.30	4.75
30	5.20	.....	4.80	4.55	4.35	4.40	5.30	4.20	4.15	4.45	4.95	5.00
31	4.25	.....	4.50	.....	4.80	.....	4.95	4.90	.....	3.60	.....	4.95

(a) Gage down.

CUMBERLAND STATION ON POTOMAC RIVER.

This station, described on page 22 of the Eighteenth Annual Report of this Survey, Part IV, is 1,000 feet below the mouth of Wills Creek at Cumberland, Maryland. The river gage consists of a vertical rod 10 feet long, bolted to the east side of the abutment of the head gate of the eastern feeder of the Chesapeake and Ohio Canal just above the dam. The top of the rod, or the 10-foot mark, is 5.40 feet below the top of the abutment. Measurements of the river are made from the West Virginia Central Railroad bridge, about 200 yards below the dam across the Potomac. At high water the section is fairly smooth and the velocity high. At low water, rocks, riffles, and angular currents appear. Measurements of the canal feeders have also been made near the head gates.

The following discharge measurements were made by A. P. Davis, E. G. Paul, and G. H. Matthes during 1897:

February 10, gage height, 3.75 feet; discharge, 1,307 second-feet.
March 27, gage height, 3.93 feet; discharge, 1,995 second-feet.
June 25, gage height, 3.00 feet; discharge, 425 second-feet.
September 1, gage height, 2.60 feet; discharge, 86 second-feet.
September 22, gage height, 2.70 feet; discharge, 92 second-feet.

Daily gage height, in feet, of Potomac River at Cumberland, Maryland, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.20	3.40	4.00	3.50	3.50	2.90	2.70	3.00	2.60	2.20	2.80	.....
2	3.20	3.50	3.80	3.40	7.50	2.80	2.70	3.00	2.50	2.00	3.00	.....
3	3.30	3.60	3.90	3.40	5.50	2.80	2.70	2.90	2.50	1.90	3.00	.....
4	3.30	3.40	5.20	3.70	5.00	2.80	2.70	2.90	2.50	1.70	3.10	.....
5	4.00	3.40	4.90	3.80	4.60	2.80	2.70	3.50	2.40	1.70	3.00	.....
6	4.00	3.50	6.00	3.70	4.10	2.80	2.60	3.20	2.40	1.60	2.90	.....
7	3.70	4.50	5.00	3.60	4.10	2.80	2.60	3.10	2.20	1.50	2.90	.....
8	3.40	4.20	4.40	5.20	3.90	2.80	2.70	3.20	1.90	1.40	3.00	.....
9	3.30	4.00	4.60	5.40	3.70	2.90	2.70	3.10	1.80	1.40	4.00	.....
10	3.40	3.70	4.20	4.50	3.70	2.70	2.70	3.00	1.80	1.50	3.40	.....
11	3.20	3.60	4.00	4.50	3.60	2.70	2.80	3.00	1.70	1.30	3.40	.....
12	3.20	3.50	4.00	4.10	4.00	2.70	2.90	2.90	1.60	1.30	3.30	.....
13	3.20	3.70	3.90	4.00	4.40	2.60	2.90	2.90	1.50	1.30	3.20	.....
14	3.20	4.00	3.80	3.80	5.40	2.50	2.80	2.80	1.40	1.40	3.20	.....
15	3.20	4.20	4.00	3.90	4.60	2.50	2.80	3.00	1.30	1.50	3.50	.....
16	3.20	4.70	3.80	3.90	4.30	3.00	2.80	3.00	1.20	1.50	3.50	.....
17	3.40	4.50	3.70	3 70	3.90	3.00	2.70	2.90	1.20	1.40	3.40	.....
18	3.70	5.00	4.00	3.70	3.80	2.90	2.80	2.80	3.20	1.40	3.30	.....
19	3.50	4.80	4.50	3.60	3.70	2.90	2.80	2.90	3.00	1.40	3.30	.....
20	3.40	3.50	4.80	3.70	3.50	2.90	2.90	2.90	2.90	1.40	3.20	.....
21	3.40	3.50	4.60	3.50	3.30	3.00	3.20	2.90	2.80	1.40	.....	.....
22	3.50	10.50	4.20	3.30	3.30	3.00	3.00	2.90	2.70	1.30	.....	.....
23	3.40	8.70	4.00	3.30	3.30	2.90	3.00	2.90	2.60	1.30	.....	.....
24	3.40	6.20	4.20	3.30	3.00	2.90	3.00	2.90	2.80	1.50	.....	.....
25	3.30	5.10	4.10	3.20	3.00	3.00	3.00	2.90	3.00	1.60	.....	.....
26	3.30	4.50	4.00	3.10	3.00	2.90	2.90	3.00	3.00	1.60	.....	.....
27	3.30	4.30	3.90	3.00	3.00	2.90	3.20	3.00	2.90	1.70	.....	.....
28	3.30	4.00	3.80	3.00	3.00	2.90	3.10	3.00	2.80	1.70	.....	.....
29	3.30	.....	3.70	3.00	2.90	2.90	3.10	2.90	2.80	2.40	.....	.....
30	3.30	.....	3.60	2.90	2.90	2.80	3.10	2.80	2.70	2.70	.....	.....
31	3.30	.....	3.60	.....	2.90	.....	3.00	2.60	.....	2.70	.....	.....

SHARPSBURG STATION ON ANTIETAM CREEK.

The station is at Myers's mill, 1 mile east of Sharpsburg, Maryland, on the road to Keedysville, Maryland. It was established on June 24, 1897, by Arthur P. Davis. The observer is Evans M. Myers, a farmer living near the bridge. The equipment consists of a three-quarters inch steel cable with 85-foot span supported by large trees. The gage is driven into the gravel of the stream bed and bolted to an overhanging tree. The initial point for soundings is on the left bank. The channel both above and below the station is nearly straight for 300 feet, and the water moves with moderate velocity. The right bank is low and liable to overflow; the left is high and rocky. A measurement on June 24, 1897, with a gage height of 2.00 feet, gave a discharge of 251 second-feet; July 2, with a gage height of 2.05 feet, gave a discharge of 240 second-feet; September 3, with a gage height of 1.60 feet, gave a discharge of 122 second-feet; October 12, with a gage height of 1.70 feet, gave a discharge of 120 second-feet.

Daily gage height, in feet, of Antietam Creek at Sharpsburg, Maryland, from July to December, 1897.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.90	1.50	1.70	1.50	1.45	1.70	17.....	1.75	1.80	1.60	1.60	1.70	2.20
2.....	2.10	1.70	1.70	1.60	2.70	1.60	18.....	1.70	1.70	1.60	1.40	1.60	2.10
3.....	1.85	1.70	1.60	1.40	2.05	1.60	19.....	1.75	1.60	1.60	1.50	1.50	2.00
4.....	1.70	1.75	1.60	1.60	1.90	1.70	20.....	1.75	1.50	1.50	1.70	1.60	2.10
5.....	1.75	1.60	1.50	1.70	1.60	2.25	21.....	1.85	1.50	1.60	1.70	1.70	2.00
6.....	1.80	1.70	1.70	1.60	1.60	2.45	22.....	1.85	1.55	1.60	1.60	1.60	2.00
7.....	1.70	1.70	1.70	1.70	1.70	2.05	23.....	1.70	1.60	1.70	1.60	1.50	2.10
8.....	1.70	1.50	1.60	1.60	1.75	2.00	24.....	1.70	3.00	1.90	1.65	1.70	2.50
9.....	1.70	1.40	1.65	1.50	1.80	1.80	25.....	1.55	2.90	1.80	1.65	1.80	2.20
10.....	1.70	1.70	1.60	1.40	1.60	1.90	26.....	1.65	2.00	1.50	1.80	1.80	2.00
11.....	1.55	1.90	1.60	1.50	1.55	1.90	27.....	1.75	1.75	1.70	1.70	1.90	2.00
12.....	1.75	1.85	1.50	1.60	1.50	1.90	28.....	1.80	1.70	1.60	1.60	2.00	1.90
13.....	1.95	1.60	1.40	1.70	1.60	2.05	29.....	1.85	1.55	1.60	1.60	1.90	1.80
14.....	1.80	1.70	1.50	1.50	1.40	2.00	30.....	1.80	1.80	1.50	1.60	1.80	1.80
15.....	1.80	2.45	1.60	1.60	1.50	2.35	31.....	1.70	1.70	.....	1.50	.....	1.90
16.....	1.80	1.90	1.70	1.65	1.75	2.40							

PORT REPUBLIC STATION ON NORTH AND SOUTH RIVERS.

This locality is described in the Eighteenth Annual Report of this Survey, Part IV, page 25. The gage for the North River is located on the county highway bridge at Port Republic, Virginia, and 500 feet above the mouth of South River. A painted rod is fastened to the third panel of the first span on the lower side of the bridge. It is nailed to the wooden uprights and fastened by wire to the iron diagonals. The zero of the rod is opposite the middle of the third upright, and is 4.50 feet from the outside edge of the pulley. The distance from the end of the weight to the marker is 31.98 feet. From the top of the lower end of the third floor beam from the right bank to the zero of the gage is 24.97 feet. The bridge seat on lower end of right-bank abutment is 24.60 feet above the datum of gage.

The gage for the South River is located on the county iron bridge, just east of the town, and 300 feet above the mouth of North River. It is a wire gage. The edge of the pulley is 2.54 feet from the north edge of the third vertical. The marks on the gage are made by tacks driven into the rail on the upper side of the bridge at the fourth panel. The zero is 1 foot from the edge of the pulley. The distance from the bottom of the weight to the wire marker or zero point is 26.12 feet. The top of the third floor beam from right bank, upper side of bridge, is 22.52 feet above gage datum. The zero of North River gage is 2.56 feet below the zero of South River gage. The observer is T. S. Davis.

All gagings of South River include discharge of mill race.

The following dicharge measurements were made by D. C. Humphreys and G. H. Matthes during the year 1897:

On North River:
March 23, gage height, 3.54 feet; discharge, 1,466 second-feet.
April 19, gage height, 2.60 feet; discharge, 712 second-feet.
June 1, gage height, 2.60 feet; discharge, 552 second-feet.
July 24, gage height 2 30 feet; discharge, 431 second-feet.
November 7, gage height, 2.00 feet; discharge, 245 second-feet.
On South River:
March 23, gage height, 2.30 feet; discharge, 426 second-feet.
April 19, gage height, 1.88 feet; discharge, 202 second-feet.
June 1, gage height, 1.87 feet; discharge, 182 second-feet.
July 24, gage height, 1.40 feet; discharge, 132 second-feet.
November 7, gage height, 1.80 feet; discharge, 173 second-feet.

Daily gage height, in feet, of North River at Port Republic, Virginia, for 1897:

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.35	2.35	3.60	2.70	2.40	2.60	2.35	2.15	2.00	1.80	2.20	1.85
2	2.35	2.35	3.50	2.70	11.50	2.55	2.45	2.15	2.00	1.80	2.00	1.85
3	2.35	2.35	3.40	2.60	7.30	2.50	2.45	2.15	2.00	1.80	2.60	1.85
4	2.35	2.35	3.40	2.60	5.15	2.50	2.40	2.15	2.00	1.80	2.00	1.85
5	2.35	2.35	3.35	2.60	4.30	3.00	2.35	2.15	1.95	1.80	2.00	2.00
6	2.30	2.55	3.30	2.90	3.80	2.85	2.25	2.15	1.95	1.80	2.00	2.00
7	2.30	7.00	3.30	2.90	3.50	2.60	2.20	2.10	1.90	1.80	2.00	1.95
8	2.30	5.50	3.30	2.90	3.30	2.55	2.40	2.10	1.90	1.80	1.95	1.95
9	2.30	4.80	3.25	2.90	3.10	2.50	2.30	2.10	1.90	1.80	1.90	1.90
10	2.30	4.30	3.25	3.00	3.00	2.50	2.20	2.10	1.85	1.80	1.90	1.85
11	2.30	4.00	3.25	3.00	3.00	2.45	2.15	2.05	1.85	1.80	1.90	1.85
12	2.30	3.90	3.25	3.00	3.00	2.40	2.50	2.05	1.85	1.80	1.85	1.85
13	2.30	5.45	3.20	2.90	4.90	2.40	2.40	2.05	1.85	2.00	1.85	1.85
14	2.30	4.70	3.30	2.90	7.50	2.40	2.40	2.05	1.85	2.00	1.80	1.85
15	2.25	5.00	3.50	2.90	5.20	2.40	2.30	2.00	1.85	2.00	1.80	2.65
16	2.25	5.30	3.50	2.90	4.40	2.40	2.20	2.00	1.85	1.95	1.90	2.45
17	2.25	5.20	3.70	2.90	4.00	2.40	2.20	2.00	1.85	1.95	1.90	2.25
18	2.25	4.60	3.70	2.80	3.60	2.40	2.15	2.00	1.85	1.95	1.90	2.10
19	2.25	4.50	3.70	2.65	3.45	2.40	3.50	2.00	1.80	1.95	1.90	2.25
20	2.25	4.30	3.70	2.60	3.25	2.50	3.50	2.00	1.80	1.95	1.90	2.25
21	2.25	4.20	3.90	2.55	3.15	2.45	2.50	.....	1.80	2.00	1.85	2.25
22	2.25	4.80	3.60	2.50	3.10	2.40	2.40	2.00	1.80	2.00	1.85	2.25
23	2.25	9.85	3.35	2.50	3.00	2.40	2.35	2.00	1.80	2.00	1.85	2.25
24	2.25	6.70	3.40	2.50	2.95	2.40	2.35	2.00	1.80	2.00	1.85	2.25
25	2.25	5.40	3.30	2.50	2.90	2.40	2.30	2.00	1.80	2.00	1.85	2.25
26	2.25	4.50	3.20	2.50	2.85	2.40	2.25	2.00	1.80	2.00	1.85	2.25
27	2.25	4.40	3.10	2.45	2.80	2.35	2.20	2.00	1.80	2.00	1.85	2.25
28	2.25	3.80	3.00	2.45	2.75	2.35	2.15	2.00	1.80	2.10	1.85	2.25
29	2.25	.....	2.90	2.45	2.70	2.35	2.15	2.00	1.80	2.05	1.85	2.25
30	2.25	.....	2.80	2.40	2.65	2.35	2.15	2.00	1.80	1.95	1.85	2.20
31	2.35	.....	2.70	.....	2.60	.....	2.15	2.00	.....	1.95	.....	2.15

Daily gage height, in feet, of South River at Port Republic, Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.45	1.85	2.60	2.00	1.75	1.85	1.60	1.50	1.20	1.30	1.75	1.50
2	1.45	1.85	2.50	2.00	9.30	1.80	1.65	1.50	1.20	1.30	2.80	1.50
3	1.45	1.85	2.40	2.00	4.50	1.75	1.65	1.50	1.20	1.30	2.50	1.50
4	1.45	1.85	2.40	2.00	3.30	1.75	1.60	1.50	1.20	1.30	2.10	1.50
5	1.45	1.85	2.35	2.00	3.00	1.90	1.55	1.50	1.20	1.30	2.00	1.50
6	1.45	1.95	2.30	2.10	2.80	1.75	1.55	1.50	1.20	1.30	2.00	1.50
7	1.45	5.00	2.30	2.10	2.50	1.70	1.55	1.50	1.20	1.30	1.80	1.50
8	1.45	4.10	2.30	2.10	2.50	1.65	1.55	1.45	1.20	1.30	1.75	1.50
9	1.45	3.20	2.25	2.10	2.40	1.60	1.55	1.40	1.20	1.30	1.70	1.50
10	1.45	3.05	2.25	2.10	2.30	1.55	1.55	1.40	1.20	1.30	1.70	1.50
11	1.45	2.95	2.25	2.00	2.30	1.50	1.55	1.40	1.20	1.30	1.70	1.50
12	1.45	2.90	2.25	2.00	2.30	1.50	1.55	1.40	1.30	1.30	1.65	1.50
13	1.45	3.15	2.20	1.90	3.20	1.65	1.50	1.40	1.30	1.45	1.65	1.50
14	1.45	3.15	2.30	1.90	4.80	1.65	1.50	1.40	1.30	1.45	1.65	1.50
15	1.45	3.15	2.40	1.90	3.20	1.65	1.50	1.35	1.30	1.45	1.65	1.45
16	1.45	3.40	2.60	1.90	2.85	1.65	1.50	1.35	1.30	1.45	1.65	2.40
17	1.45	3.40	2.60	1.90	2.70	1.60	1.50	1.35	1.30	1.45	1.65	2.00
18	1.45	3.20	2.60	1.85	2.50	1.60	1.50	1.30	1.30	1.45	1.65	1.90
19	1.45	3.20	2.60	1.85	2.40	1.60	1.70	1.25	1.30	1.45	1.65	1.90
20	1.45	3.10	2.60	1.80	2.35	1.65	1.60	1.20	1.30	1.45	1.65	1.85
21	1.45	3.10	2.70	1.80	2.30	1.80	1.55	1.20	1.30	1.50	1.60	1.80
22	1.45	3.60	2.50	1.80	2.25	1.70	1.50	1.20	1.30	1.50	1.55	1.80
23	1.45	6.75	2.30	1.80	2.20	1.65	1.50	1.20	1.30	1.50	1.55	1.80
24	1.65	4.10	2.35	1.80	2.20	1.60	1.50	1.20	1.30	1.50	1.55	1.80
25	1.85	3.30	2.25	1.80	2.20	1.60	1.45	1.20	1.30	1.50	1.50	1.80
26	1.85	3.20	2.15	1.80	2.15	1.60	1.40	1.20	1.30	1.50	1.50	1.80
27	1.85	3.10	2.05	1.80	2.15	1.60	1.40	1.20	1.30	1.50	1.50	1.80
28	1.85	2.80	2.10	1.80	2.10	1.60	1.40	1.20	1.30	2.00	1.50	1.80
29	1.85	.....	2.10	1.80	2.10	1.60	1.40	1.20	1.30	1.90	1.50	1.80
30	1.85	.....	2.10	1.75	2.00	1.60	1.40	1.20	1.30	1.85	1.50	1.80
31	1.85	.....	2.00	.....	1.95	.....	1.40	1.20	.....	1.75	.....	1.80

MILLVILLE STATION ON SHENANDOAH RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 26, is located at a point 4 miles above Harpers Ferry, at Millville, West Virginia. A vertical gage was placed in the river and secured to the trunk of a tree. A deep notch was cut in the tree opposite the 8-foot mark. Bench mark 2 is a copper bolt driven into an auger hole in the foot of a large sycamore (buttonwood) tree on the left bank of the river, about 150 feet below the gage rod, and it is 6.78 feet above the zero mark on the gage. A new three-fourths inch galvanized steel wire cable was stretched across the river on June 23, 1897, the old one having been carried out by the flood of October 1, 1896. The cable, which is about 500 feet long, is supported on either bank by a large sycamore tree, and is securely anchored on both sides. The observer is H. C. Nisewaner. The following discharge measurements were made by E. G. Paul and others, in 1897:

June 24, gage height, 1.20 feet; discharge, 1,371 second-feet.
July 23, gage height, 1.80 feet; discharge, 2,791 second-feet.
September 7, gage height, 0.50 foot; discharge, 632 second-feet.
October 25, gage height, 0.70 foot; discharge, 814 second feet.

Daily gage height, in feet, of Shenandoah River at Millville, West Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.60	1.10	3.70	2.00	1.40	1.50	1.00	1.00	0.60	0.40	0.80	0.70
2	1.50	1.10	3.50	2.00	1.70	1.50	.90	.90	.60	.40	.80	.70
3	1.40	1.60	3.50	1.90	9.25	1.40	.90	.80	.60	.40	.80	.60
4	1.40	2.00	3.50	1.90	7.10	1.60	.90	.80	.50	.40	1.00	.70
5	1.30	2.20	3.50	2.10	5.10	1.60	1.00	.80	.50	.40	1.30	.90
6	1.30	2.20	3.50	2.30	4.60	1.90	.90	1.40	.50	.40	1.00	1.70
7	1.30	(a)	3.40	2.30	3.60	1.80	.80	.90	.50	.35	.80	1.20
8	1.20	(a)	3.30	2.40	3.20	1.70	.80	.90	.50	.35	.80	1.10
9	1.20	(a)	3.00	2.40	2.90	1.60	.80	.90	.50	.35	.70	.90
10	1.10	6.00	2.80	2.40	2.50	1.60	.80	.80	.40	.35	.80	.90
11	1.10	5.30	2.70	2.40	2.40	1.40	.....	1.20	.40	.40	.70	.80
12	1.10	4.70	2.60	2.40	2.40	1.40	1.10	1.00	.40	.50	.70	.90
13	1.40	4.00	2.60	2.30	2.50	1.40	1.00	.90	.40	.50	.50	.90
14	1.40	6.00	2.80	2.30	4.35	1.30	1.00	.80	.40	.50	.50	1.00
15	1.30	4.70	2.80	2.30	6.60	1.30	1.20	.70	.40	.50	.70	1.70
16	1.20	5.75	3.50	2.20	4.90	1.30	.90	.70	.40	.50	.65	2.40
17	1.10	5.90	3.60	2.20	3.90	1.30	.90	.70	.40	.50	.70	2.70
18	1.10	5.30	3.40	2.10	3.50	1.20	.90	.70	.40	.45	.60	2.20
19	1.10	4.90	3.20	2.10	3.20	1.20	.80	.60	.40	.40	.60	1.80
20	1.10	4.60	3.20	2.00	2.90	1.60	1.90	.60	.40	.40	.50	1.60
21	1.10	4.50	3.60	1.90	2.60	1.60	2.60	.60	.40	.45	.60	1.30
22	1.20	6.45	3.40	1.80	2.40	1.40	2.60	.60	.40	.50	.60	1.30
23	1.20	10.05	3.30	1.80	2.30	1.30	1.80	.60	.40	.50	.60	1.30
24	1.20	10.05	3.20	1.70	2.20	1.20	1.50	1.00	.60	.55	.55	1.30
25	1.10	6.70	3.00	1.70	2.20	1.10	1.30	1.30	1.20	.70	.50	1.30
26	1.10	5.50	2.90	1.60	2.20	1.10	1.20	1.00	.50	.80	.50	2.00
27	1.10	4.60	2.70	1.50	1.80	1.10	1.10	.90	.50	.90	.80	1.50
28	1.10	4.60	2.50	1.50	1.60	1.00	1.20	.80	.50	.80	.90	1.60
29	1.10	.....	2.40	1.40	1.60	1.00	1.50	.70	.40	.80	.70	1.50
30	1.10	.....	2.10	1.40	1.60	.90	1.30	.70	.40	.80	.60	1.20
31	1.00	.....	2.00	.....	1.60	.....	1.10	.80	.....	.90	.....	1.10

a Gage washed out.

FREDERICK STATION ON MONOCACY RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 34, is at the county iron bridge on the turnpike 4 miles northeast of Frederick, on the road leading from Frederick to Mount Pleasant, Maryland. A wire gage is attached to the floor timber on the lower side of the bridge. The length of the gage wire from bottom of weight to end of handle is 35.20 feet.

The bench mark is a cross cut in the top face of a capstone on the lower retaining wall of the bridge abutment on the right bank of the stream. It is 24.97 feet above the surface of the water when the gage reads 4.2 feet. The observer is E. L. Derr. The stream at this station has two channels, being divided by a small, low island, which serves as a foundation for the middle pier of the bridge.

On January 26, 1898, the gage was compared with the bench mark, and the wire found to have stretched 0.37 foot. The gage wire was corrected and the gage heights of the preceding months reduced by this amount, those in July and August, when the stretching is supposed to have occurred, being approximated only. The following discharge measurements were made by E. G. Paul and others during the year 1897:

February 9, gage height, 6.00 feet; discharge, 1,019 second-feet.
February 24, gage height, 8.95 feet; discharge, 3,569 second-feet.
March 9, gage height, 6.00 feet; discharge, 1,085 second-feet.
April 10, gage height, 7.55 feet; discharge, 2,264 second-feet.
July 3, gage height, 4.30 feet; discharge, 220 second-feet.
September 3, gage height, 4.15 feet; discharge, 182 second-feet.

Daily gage height, in feet, of Monocacy River at Frederick, Maryland, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.[a]	Aug.[a]	Sept.	Oct.	Nov.	Dec.
1	4.20	4.40	5.70	5.00	4.60	5.00	4.20	4.90	4.15	3.95	4.15	5.25
2	4.20	4.40	5.50	5.00	6.30	4.80	4.20	4.70	4.05	3.95	14.85	5.15
3	4.20	5.00	5.60	4.90	6.20	4.70	4.30	4.50	4.15	3.85	8.15	5.15
4	4.20	6.00	7.50	4.90	6.20	5.00	4.20	4.40	4.05	3.85	6.55	8.15
5	4.20	5.50	7.50	6.90	6.00	7.50	4.20	4.40	4.05	3.75	5.35	12.40
6	4.30	8.40	8.00	5.90	5.90	5.60	4.20	4.30	3.95	3.85	5.05	8.65
7	4.30	15.00	7.60	5.60	5.60	5.40	4.20	4.30	3.95	3.75	4.85	7.20
8	4.50	8.45	6.20	5.40	5.40	4.95	4.20	4.20	3.95	3.75	4.75	6.55
9	4.40	6.00	6.00	9.30	5.10	6.15	4.90	4.20	3.95	3.75	5.55	5.95
10	4.30	5.60	6.50	8.55	5.00	5.80	4.50	4.20	3.95	3.85	5.55	5.75
11	4.20	5.20	6.20	6.55	5.10	5.30	4.20	10.60	3.95	3.85	4.85	5.55
12	4.30	5.20	5.80	6.60	5.10	5.00	4.20	8.50	3.95	3.85	4.75	6.85
13	4.30	4.90	5.80	5.70	15.60	4.90	7.00	5.45	3.95	4.25	4.65	6.65
14	4.30	4.60	5.70	5.80	15.60	4.70	5.20	4.45	3.85	4.15	4.55	11.65
15	4.00	4.60	5.70	5.90	10.90	4.70	4.60	4.25	3.85	4.05	5.15	14.95
16	4.00	5.70	5.80	6.20	7.40	4.70	4.30	5.35	3.85	3.95	5.55	13.85
17	4.00	7.40	5.40	5.80	6.80	4.80	4.30	4.85	4.45	3.95	4.95	7.15
18	4.00	7.40	6.60	5.80	6.50	4.80	5.10	4.30	4.45	3.85	4.75	6.65
19	4.30	6.70	7.00	5.50	6.10	4.70	4.95	4.10	4.05	3.75	4.65	6.15
20	4.70	6.10	9.80	5.30	5.80	4.70	5.25	4.10	3.85	3.75	4.55	5.95
21	4.50	5.70	7.80	5.10	5.90	4.90	4.95	4.10	3.85	3.85	4.65	5.85
22	5.50	12.13	6.60	5.00	6.00	4.70	6.40	5.50	3.95	3.95	4.55	6.55
23	5.40	14.60	6.50	5.00	5.50	4.50	5.65	4.80	3.95	3.95	4.75	6.05
24	4.80	8.85	7.40	5.00	5.30	4.50	4.95	16.20	5.65	3.95	5.60	5.65
25	5.20	8.30	7.30	4.90	6.70	4.40	4.45	6.75	5.15	4.05	4.85	5.15
26	5.00	7.00	6.10	4.90	6.00	4.40	4.35	5.75	4.65	4.35	6.55	5.55
27	5.00	6.50	5.80	4.90	5.30	4.40	7.70	5.10	3.95	4.25	7.05	5.45
28	5.00	6.00	5.60	4.80	5.20	4.40	9.90	4.70	3.95	4.15	6.55	5.45
29	5.00	.....	5.40	4.70	5.00	4.20	7.80	4.25	3.95	4.05	5.85	5.35
30	4.80	.....	5.30	4.60	4.90	4.20	6.10	4.15	3.95	4.05	5.65	5.35
31	4.50	.....	5.20	.....	5.00	.....	5.30	4.15	.....	3.95	.....	5.45

[a] Approximate.

POINT OF ROCKS STATION ON POTOMAC RIVER.

This station, described in the Eighteenth Annual Report of this Survey, Part IV, page 29, is about 6 miles above the mouth of Monocacy River, at Point of Rocks, Maryland. At this point a toll bridge crosses the stream 1,000 feet below the mouth of Catoctin Creek. A wire gage has been established on the east side of the first span; the scale is marked with nails on the hand rail. Bench mark 1 is a copper bolt fastened in a hole drilled in a large capstone on the lower wing wall of the north abutment, a short distance from the north end of the first iron truss, and is 41.30 feet above the datum of the gage. Bench mark 2, top of second floor beam from left bank, lower end, is 39.28 feet above datum. The distance from the end of the weight to the wire index is 44.22 feet. On January 25, 1898, a comparison with the bench mark revealed that the gage wire had stretched 1.78 feet. A new wire was substituted and the gage heights of the preceding months were reduced to the correct datum; those in August and September, when the stretching is supposed to have occurred, being approximated only. The observer is G. H. Hickman. During the year 1897 discharge measurements were made by E. G. Paul and G. H. Matthes, as follows:

February 9, gage height, 7.95 feet: discharge, 40,654 second-feet.
February 23, gage height, 21.70 feet; discharge, 169,913 second-feet.
March 8, gage height, 5.70 feet; discharge, 27,383 second-feet.
March 27, gage height, 4.05 feet; discharge, 17,121 second-feet.
July 23, gage height, 2.85 feet; discharge, 8,130 second-feet.
October 29, gage height, 0.20 foot; discharge, 2,141 second-feet.

Daily gage height, in feet, of Potomac River at Point of Rocks, Maryland, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.[a]	Sept.[a]	Oct.	Nov.	Dec.
1	0.80	2.00	5.30	2.80	2.20	2.50	1.80	1.80	0.30	0.00	0.20	0.90
2	.80	1.90	4.40	2.70	2.40	2.40	1.70	1.70	.20	.00	.30	.90
3	.80	2.50	4.20	2.60	7.00	2.30	1.80	1.50	.20	.00	1.00	.90
4	.90	2.00	4.10	2.60	14.50	2.40	1.80	1.40	.20	.00	1.40	1.00
5	.90	2.10	4.60	2.70	9.00	2.50	1.70	1.30	.20	.00	1.00	1.10
6	1.00	5.10	4.40	3.00	6.50	2.50	1.70	1.70	.20	— .10	.80	3.20
7	1.40	8.00	6.00	3.30	5.90	2.40	1.70	1.20	.20	— .10	.70	3.60
8	1.70	10.50	5.80	3.50	5.10	2.50	1.70	1.10	.10	— .10	.50	3.20
9	1.50	7.90	5.00	3.40	4.50	2.50	1.60	1.10	.00	— .10	.50	2.40
10	1.30	5.80	4.50	4.20	4.00	2.30	1.50	1.10	.00	— .10	.50	1.50
11	1.10	4.60	4.20	6.20	3.70	2.20	1.90	1.10	— .10	.00	.70	1.30
12	1.10	4.00	4.00	5.10	3.50	2.20	1.80	1.00	— .10	.10	1.20	1.10
13	1.10	3.90	3.90	4.40	3.80	2.10	1.80	1.00	— .10	— .10	.80	1.00
14	.90	4.60	3.70	4.00	9.40	2.10	1.90	.80	— .10	.00	.50	.90
15	.90	5.70	3.70	3.80	13.10	2.20	1.90	.80	— .10	.00	.50	1.50
16	1.00	7.00	3.80	3.60	8.50	2.20	2.00	.80	— .10	— .10	.60	4.10
17	.90	7.40	4.20	3.50	5.50	2.10	1.80	.60	— .10	— .10	1.10	4.30
18	.90	7.70	4.40	3.40	4.90	2.10	1.60	.50	— .10	— .10	.90	3.30
19	.90	7.60	4.70	3.30	4.60	2.20	1.90	.40	— .10	— .10	.70	2.60
20	1.50	7.20	5.30	3.10	4.40	2.20	1.90	.30	— .10	— .10	.70	2.20
21	1.50	6.40	6.20	3.00	4.00	2.60	2.60	.30	— .10	— .10	.60	2.10
22	1.40	6.70	6.00	2.80	3.70	2.50	3.10	.30	— .10	.00	.60	1.60
23	1.40	21.15	5.55	2.70	3.40	2.30	3.20	.30	.00	— .10	.60	1.50
24	1.40	24.60	4.80	2.60	3.30	2.20	2.60	.30	.20	— .10	.40	1.40
25	1.50	16.10	4.70	2.60	3.40	2.10	2.40	.90	.00	.00	.40	1.30
26	1.80	9.30	4.60	2.50	3.50	2.10	2.40	.80	.00	.00	.40	1.30
27	2.00	7.30	4.10	2.40	3.30	2.10	2.60	.40	.00	.00	1.00	1.20
28	2.30	6.00	3.80	2.40	3.00	2.00	2.70	.40	.00	.10	.60	1.20
29	2.20	.....	3.60	2.30	2.70	1.90	2.60	.40	.00	.20	.50	1.10
30	2.10	.....	3.30	2.20	2.60	1.80	2.40	.40	.00	.20	.60	1.10
31	2.00	.....	2.90	.....	2.50	.....	2.30	.40	.....	.20	.....	1.10

[a] Approximate.

PARK STATION ON ROCK CREEK.

A station was established on Rock Creek January 18, 1897, at the Park bridge, near the eastern entrance of the National Zoological Park, in the city of Washington, District of Columbia. The upper part of the gage is vertical and is fastened to the bridge abutment, the lower portion being inclined and fastened to iron rods. The bench mark consists of an X on the stone of the bridge pier. It is 9.13 feet above the zero of the gage. The observer is W. V. Kramer, one of the watchmen in the park. A measurement on August 18, 1897, at a gage height of 2.90 feet gave a discharge of 26 second-feet, and on November 21, at a gage height of 3.00 feet a discharge of 37 second-feet.

A study of the discharge of Rock Creek was begun in July, 1892, at the request of the Commissioners of the District of Columbia. In July, 1892, a gage rod was established by Cyrus C. Babb at Lyon's Mill, and fastened to the downstream face of the right abutment of the bridge. On August 18, 1892, a self-registering gage was placed at the bridge, and the record continued until November 30, 1894.

The following are the discharge measurements made at this point:

July 28, 1892, gage height, 0.00 foot; discharge, 89 second-feet.
August 2, 1892, gage height, —0.30 foot; discharge, 49 second-feet.
August 3, 1892, gage height, —0.3 foot; discharge, 48 second-feet.
August 5, 1892, gage height, 0.19 foot; discharge, 102 second-feet.
April 11, 1893, gage height, —0.12 foot; discharge, 58 second-feet.
May 4, 1893, gage height, 4.14 feet; discharge, 959 second-feet.

Daily gage height, in feet, of Rock Creek at Zoological Park Bridge, District of Columbia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.90	2.35	2.30	2.30	2.30	3.10	3.05	2.85	2.80	3.10	3.05
2	.....	3.50	2.35	2.25	2.40	2.50	3.10	3.00	2.85	2.85	3.50	3.05
3	.....	4.15	2.35	2.25	2.45	2.65	3.10	3.00	2.85	2.85	3.30	3.05
4	.....	3.45	2.40	2.25	2.55	2.95	3.05	2.95	2.85	2.85	3.10	3.25
5	.....	3.15	2.35	2.50	2.50	3.15	3.05	2.95	2.85	2.85	3.05	3.90
6	.....	3.25	2.35	2.65	2.35	3.10	3.05	3.00	2.85	2.85	3.00	3.35
7	.....	4.25	2.40	2.45	2.30	3.25	3.05	2.95	2.80	2.85	2.95	3.20
8	.....	2.70	2.35	2.40	2.20	3.40	3.60	2.95	2.80	2.85	3.00	3.15
9	.....	2.50	2.35	3.15	2.20	3.45	3.15	2.95	2.80	2.85	3.20	3.10
10	.....	2.40	2.35	2.90	2.15	3.40	3.10	2.95	2.80	2.85	3.35	3.10
11	.....	2.30	2.30	2.60	2.20	3.40	3.10	3.00	2.80	2.85	3.10	3.10
12	.....	2.45	2.30	2.50	2.50	3.35	3.25	3.00	2.80	3.15	3.05	3.10
13	.....	2.60	2.35	2.45	3.70	3.35	3.30	2.95	2.80	2.85	3.05	3.10
14	.....	2.60	2.45	2.45	2.65	3.35	3.30	2.90	2.80	2.85	3.00	3.25
15	.....	2.65	2.60	2.40	2.95	3.35	3.10	2.90	2.80	2.85	3.05	4.30
16	.....	2.45	2.40	2.45	2.60	3.35	3.00	2.95	2.80	2.85	3.10	3.35
17	.....	2.40	2.35	2.45	2.50	3.35	3.10	3.00	2.80	2.85	3.05	3.20
18	3.00	2.30	2.95	2.40	2.40	3.35	2.10	2.90	2.90	2.90	3.05	3.15
19	2.95	2.30	2.85	2.35	2.40	3.20	3.45	2.90	2.85	2.90	3.05	3.10
20	2.90	2.25	3.05	2.30	2.35	3.30	3.25	2.90	2.80	3.00	3.05	3.10
21	3.15	2.40	2.90	2.30	2.30	3.25	3.25	2.90	2.80	3.00	3.00	3.15
22	3.30	3.75	2.65	2.30	2.30	3.15	4.00	2.90	2.80	2.95	3.00	3.20
23	3.35	4.10	2.55	2.30	2.25	3.15	3.40	2.90	2.90	2.95	3.05	3.20
24	3.05	2.85	2.50	2.30	2.60	3.15	3.10	2.95	3.20	3.00	3.05	3.30
25	2.90	2.60	2.55	2.30	3.45	3.25	3.05	2.90	2.90	3.10	3.00	3.05
26	3.00	2.50	2.40	2.25	2.55	3.15	3.00	2.90	2.80	3.10	3.05	3.10
27	2.90	2.45	2.40	2.25	2.40	3.10	3.45	2.90	2.80	3.00	3.95	3.10
28	2.90	2.45	2.35	2.20	2.35	3.10	4.30	2.85	2.80	2.95	3.30	3.05
29	2.95	.....	2.30	2.25	2.30	3.10	3.10	2.85	2.80	2.90	3.15	3.00
30	2.90	.....	2.30	2.25	2.30	3.10	3.10	2.85	2.80	2.90	3.10	3.10
31	2.90	.....	2.30	.....	2.25	.....	3.10	2.85	.....	2.90	.....	3.10

GLASGOW STATION ON NORTH RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 36, is at the Glasgow, Virginia, county bridge about 1 mile above the mouth of North River. The height of water is observed by means of a wire gage, the board being placed on the guard rail on the lower side of the bridge and graduated in feet and tenths. The distance from the top of the bridge over the gage to the zero is 32.24 feet, and that from the end of the weight to the marker of the gage is 27.86 feet. The observer is B. G. Baldwin. Discharge measurements are made at the bridge. The initial point for sounding is on the left bank. The channel is straight for about 200 feet above and below the station, but farther downstream it is curved, and the water moves with moderate velocity. The stream is confined within its channel by the bridge abutments, except at very high water, when it may overflow the left bank. The bed is composed of rock and gravel and is fairly permanent. The following discharge measurements were made by Prof. D. C. Humphreys and F. H. Anschutz during 1897:

May 29, gage height, 1.91 feet; discharge, 546 second-feet.
August 14, gage height, 1.17 feet; discharge, 208 second-feet.
October 14, gage height, 1.30 feet; discharge, 223 second-feet.

Daily gage height, in feet, of North River at Glasgow, Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.52	1.70	2.85	2.22	1.78	1.85	1.35	.....	1.17	1.08	1.40	1.40
2	1.51	1.74	2.68	2.21	5.80	1.78	2.65	1.20	1.14	1.05	1.65	1.42
3	.....	1.76	2.58	2.22	4.70	1.75	1.95	1.20	1.10	1.05	1.60	1.38
4	1.55	1.80	2.50	2.27	3.52	1.75	1.88	1.14	1.10	1.02	1.50	1.41
5	1.60	1.92	2.46	2.38	3.05	1.85	1.80	1.52	1.08	1.02	1.41	1.60
6	1.75	4.70	2.40	2.58	2.76	.....	1.73	1.32	1.05	1.03	1.30	1.80
7	1.65	6.05	2.40	2.55	2.58	1.87	1.66	1.25	1.08	1.03	1.20	1.75
8	1.60	4.86	2.42	2.50	2.40	1.85	1.60	1.18	1.07	1.02	1.41	1.68
9	1.65	4.50	2.40	2.52	.....	1.80	1.52	1.18	1.05	1.02	1.25	1.60
10	1.65	3.62	2.48	2.62	2.20	1.75	1.45	1.15	1.00	1.00	1.23	1.52
11	1.60	3.51	2.48	.....	2.20	1.70	1.38	1.18	1.00	1.10	1.20	1.50
12	1.60	3.32	2.58	2.52	2.22	1.63	1.30	1.15	.....	1.20	1.18	1.45
13	1.58	4.40	3.00	2.38	4.70	.....	1.25	1.12	1.05	1.18	1.18	1.45
14	1.58	4.05	.....	2.30	7.30	1.65	1.20	1.17	1.10	1.15	1.18	1.56
15	1.55	3.81	4.26	2.27	4.42	1.72	1.20	.....	1.08	1.20	1.20	2.62
16	1.52	4.00	3.70	2.25	.....	1.66	1.18	1.20	1.10	1.18	1.18	2.65
17	1.53	3.90	3.27	2.14	3.20	1.67	1.12	1.20	1.08	1.20	1.20	2.15
18	1.55	3.50	3.33	2.08	2.93	1.66	1.40	1.16	1.10	1.18	1.15	2.00
19	1.55	3.40	.....	2.00	2.77	1.65	1.30	1.10	1.10	1.20	1.21	1.85
20	1.52	3.40	3.72	2.00	2.56	.....	1.30	1.10	1.05	1.20	1.15	1.70
21	1.70	.....	3.46	1.90	2.50	1.90	1.35	1.08	1.08	1.20	1.16	1.65
22	1.90	5.10	3.20	1.88	2.35	1.70	1.70	.....	1.10	1.25	1.15	1.80
23	2.02	7.72	3.00	1.88	.....	1.62	(a)	1.14	1.10	1.20	1.15	1.75
24	1.98	5.35	3.00	1.87	2.23	1.60	(a)	1.40	1.12	1.18	1.20	1.70
25	1.90	4.75	2.90	1.86	2.20	1.60	(a)	1.30	1.11	1.20	1.12	1.68
26	1.85	3.36	2.70	1.86	2.10	1.50	1.25	1.30	1.10	1.20	1.15	1.75
27	1.75	3.15	2.60	1.80	2.02	1.45	1.25	1.42	1.10	1.18	1.20	1.80
28	1.70	2.95	2.54	1.75	2.00	1.40	1.26	1.27	1.09	1.22	1.20	1.80
29	1.60	.....	2.42	1.75	1.95	1.40	1.23	.....	1.10	1.15	1.40	1.75
30	1.60	.....	2.31	1.75	.....	1.38	1.23	1.20	1.10	1.25	1.42	1.68
31	1.65	.....	2.30	.....	1.90	.....	1.24	1.18	.....	1.28	.....	1.60

a Gage broken.

July 4–14 interpolated by D. C. Humphreys.

BUCHANAN STATION ON JAMES RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 39, is on James River, about 20 miles above the mouth of North River and one-half mile above the mouth of Purgatory Creek, at the new iron bridge at Buchanan, Virginia. The gage is of wire, and the scale is painted in feet and tenths. The bench mark at this point is the top of a stone post under the southwest corner of the porch of the Chesapeake and Ohio passenger station; the elevation of the bench mark is 24.68 feet above the zero of the gage. The highest point on a prominent ledge of rock on the left bank, about 500 feet above the bridge, is 17.48 feet above the zero of the gage. On April 3, 1897, the zero of this gage was lowered 2 feet to avoid negative readings. The published gage readings for 1897 are referred to this new gage. A new iron bridge was erected at this point in November, and future discharge measurements will be made at this bridge, on which the gage is located. Discharge measurements were made at a bridge three-fourths of a mile above, as the old covered bridge was not suited to the purpose. The initial point was taken on the right bank; the channel is nearly straight both above and below, and the bed of the stream is mostly solid rock and is subject to but little change. The following measurements were made by D. C. Humphreys and others during 1897:

April 1, gage height, 3.30 feet; discharge, 2,007 second-feet.
May 30, gage height, 2.70 feet; discharge, 994 second-feet.
October 13, gage height, 1.70 feet; discharge, 578 second-feet.

Daily gage height, in feet, of James River at Buchanan, Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.10	2.70	4.25	3.30	2.60	2.50	2.10	2.20	1.80	1.30	1.60	1 70
2	2.10	2.80	4.10	3.30	6.40	2.50	2.20	2.10	1.80	1.30	1.80	1.80
3	2.10	2.90	3.85	3.00	7.75	2.50	3.05	2.00	1.70	1.30	1.80	1.90
4	2.10	2.90	3.70	3.00	5.85	3.00	2.70	2.00	1.70	1.30	1.80	2.10
5	2.10	2.90	3.60	3.15	5.20	2.65	2.45	2.40	1.70	1.30	1.70	2.20
6	2.10	8.00	3.50	4.15	5.15	2.50	2.30	2.10	1.70	1.30	1.70	2.20
7	2.10	12.15	3.50	4.00	4.85	2.50	2.30	2.00	1.70	1.30	1.60	2.20
8	2.10	8.80	3.75	3.75	4.60	2.50	2.50	2.00	1.60	1.30	1.60	2.20
9	2.10	7.25	3.70	3.60	4.15	2.50	2.45	2.00	1.60	1.30	1.60	2.20
10	2.10	6.75	3.70	4.10	3.95	2.40	2.30	1.90	1.60	1.30	1.60	2.20
11	2.10	6.10	4.45	4.20	3.85	2.40	2.20	1.90	1.60	1.30	1.60	2.20
12	2.10	5.80	4.90	3.95	3.35	2.35	2.20	1.90	1.60	1.75	1.50	2.20
13	2.10	8.15	6.25	3.70	6.15	2.30	2.20	1.90	1.60	1.75	1.50	2.20
14	2.10	6.50	5.85	3.60	10.45	2.30	2.20	1.90	1.60	1.70	1.40	2.20
15	2.10	6.20	7.90	3.60	7.30	2.40	2.20	1.90	1.60	1.70	1.35	2.55
16	2.10	6.25	6.45	3.50	5.90	2.40	2.20	1.80	1.60	1.70	1.30	2.85
17	2.10	6.50	5.60	3.35	5.00	2.40	2.20	1.80	1.50	1.70	1.30	2.90
18	2.10	5.55	5.10	3.20	4.55	2.40	2.10	1.80	1.50	1.60	1.30	2.70
19	2.10	5.30	6.00	3.10	4.10	2.40	2.20	1.80	1.50	1.60	1.30	2.70
20	2.10	5.30	6.75	3.00	3.80	3.10	2.20	1.80	1.50	1.50	1.30	2.70
21	2.30	6.05	6.35	3.00	3.55	2.50	2.30	1.80	1.50	1.50	1.30	2.70
22	2.30	11.50	5.65	2.90	3.35	2.50	3.35	1.80	1.50	1.50	1.30	2.70
23	2.30	14.00	5.00	2.80	3.15	2.50	3.30	1.80	1.55	1.70	1.30	2.60
24	2.70	11.65	4.65	2.80	3.15	2.40	3.05	2.25	1.90	1.70	1.30	2.85
25	2.90	7.50	4.45	2.70	3.20	2.30	3.05	2.10	1.60	1.70	1.30	2.90
26	2.80	6.10	4.15	2.70	3.10	2.20	2.75	2.00	1.50	1.70	1.30	2.90
27	2.60	5.35	3.95	2.70	3.00	2.40	2.55	2.00	1.50	1.70	1.30	2.90
28	2.90	4.75	3.80	2.60	2.90	2.30	2.50	1.90	1.50	1.60	1.30	2.85
29	2.90	.....	3.65	2.60	2.75	2.20	2.45	1.90	1.40	1.60	1.40	2.70
30	2.90	.....	3.50	2.60	2.70	2.10	2.40	1.90	1.40	1.60	1.50	2.60
31	2.70	.....	3.40	.....	2.55	.....	2.30	1.80	.....	1.60	.....	2.60

ROANOKE STATION ON ROANOKE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 42, is located in the edge of the town of Roanoke, Virginia., at the Walnut-street bridge. The gage is of wire, and the scale is painted in feet and tenths on a horizontal rod fastened to the floor of the bridge. The distance from the end of weight to marker is 24.39 feet. The top of lower end of first floor beam is 21.99 feet above datum of gage. The right bank is above high water, but the left may overflow at extreme high water. The channel is nearly straight and the current good. The observer is A. B. Rawn. A discharge measurement was made on April 2, 1897, by F. H. Anschutz, when the water stood at a height of 1.52 feet, giving a discharge of 320 second-feet.

Daily gage height, in feet, of Roanoke River at Roanoke, Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.75	0.45	1.75	1.55	1.55	1.30	0.70	0.75	0.75	1.50	0.85	0.50
2	.70	.45	1.55	1.55	4.00	1.30	.70	.75	.70	1.45	.85	.50
3	.70	.45	1.20	1.50	3.85	1.75	.75	.80	.65	1.40	.80	.50
4	.65	.45	1.00	1.85	3.45	1.70	.72	.80	.65	1.30	.80	.90
5	.63	.50	.95	1.80	2.95	1.65	.72	1.75	.65	1.25	.80	1.30
6	.60	6.82	.90	1.75	2.75	1.60	.72	1.70	.65	1.20	.75	1.15
7	.55	3.78	1.85	1.70	2.60	1.55	.72	1.65	.65	1.10	.75	1.10
8	.50	2.60	1.25	1.65	2.50	1.55	.70	1.40	.60	1.00	.75	1.00
9	.45	2.20	1.00	1.60	2.25	1.50	.70	1.20	.60	.90	.75	.95
10	.45	1.95	.95	1.55	1.90	1.50	.65	1.00	.60	.90	.70	.95
11	.45	1.90	.90	1.50	1.60	1.50	.62	.80	.55	.85	.70	.90
12	.45	3.00	1.95	1.50	1.58	1.45	1.00	.75	.45	.85	.65	.85
13	.45	2.90	2.20	1.50	1.55	1.45	1.00	.75	.45	1.90	.60	.85
14	.45	2.50	3.60	1.50	1.55	1.40	.95	.75	.45	1.95	.60	.80
15	.50	2.20	3.85	1.50	1.75	1.45	.90	.70	.40	1.85	.60	.80
16	.60	2.00	3.30	1.60	1.70	1.40	.85	.70	.40	1.70	.60	.80
17	.65	1.95	3.00	1.55	1.65	1.40	1.00	.70	.40	1.45	.60	.80
18	.60	1.80	3.00	1.50	1.60	1.35	1.10	.70	.35	1.20	.60	.80
19	.60	1.55	2.90	1.45	1.55	1.75	1.00	.70	.35	1.00	.60	.85
20	.65	1.45	2.75	1.45	1.55	1.75	1.10	.65	.35	1.20	.55	.85
21	.68	4.50	2.60	1.40	1.55	1.70	1.55	.65	.35	1.10	.55	.90
22	.70	4.40	2.45	1.40	1.50	1.65	1.45	.65	.35	1.00	.55	.90
23	.70	8.30	2.10	1.40	1.50	1.60	1.95	.90	1.85	.90	.55	.90
24	.65	3.50	1.95	1.40	1.50	1.55	1.85	1.10	1.85	.90	.55	.95
25	.65	2.60	1.75	1.40	1.45	1.50	1.70	.....	1.75	.85	.50	.95
26	.60	2.20	1.45	1.35	1.45	1.40	1.55	.....	1.70	1.10	.50	.95
27	.50	1.90	1.25	1.30	1.40	1.00	1.40	.....	1.65	1.10	.50	.95
28	.50	1.85	1.65	1.30	1.40	.72	1.25	.....	1.60	1.00	.50	1.00
29	.50	.....	1.63	1.25	1.40	.72	1.00	.75	1.55	.95	.50	1.00
30	.50	.....	1.60	1.20	1.35	.72	.80	.75	1.55	.90	.50	1.10
31	.45	.....	1.58	.....	1.35	.....	.75	.80	.....	.85	.....	1.10

CLARKSVILLE STATION ON DAN AND STAUNTON RIVERS.

This station, described in the Eighteenth Annual Report, Part IV, page 42, is a short distance above the junction of the Dan and Staunton rivers, which unite to form the Roanoke River. On Dan River the rod is fastened to the inside of the guard rail of the fourth panel of the third span west of the Southern Railroad bridge. The distance from the zero of the rod to the outside of the pulley wheel is 3 feet; the length of the wire rope is 33.17 feet. The water power from Dan River has been developed to a considerable extent at Danville. An examination at points above showed that the dams at Danville pond the water, and as a result modify the natural characteristics of the stream. The gage on Staunton River is fastened to the inside of the guard rail of the fourth panel of the third span from the west. The distance from the zero to the outside of the pulley wheel is 3 feet; the length of the wire gage is 33.0 feet; the distance of the water surface below the top and upper end of the third-floor beam of the second span from the west was 27.15 feet when the gage height was 0.25 foot. The distance from the east abutment of the Dan River bridge to the west abutment of the Staunton River bridge is 165 feet. The observer is Lucius Wootton. About 4 miles above the junction of the Dan and Staunton rivers is a cut-off, apparently occupying an old channel, diverting water from the Dan to the Staunton. This cut-off, by carrying water from the Dan, vitiates the separate computations of discharge made at the stations below, but does not affect the total discharge for the Roanoke. The following measurements were made during 1897 by E. W. Myers:

On Dan River:
February 25, gage height, 12.33 feet; discharge, 26,015 second-feet.
March 18, gage height, 4.20 feet; discharge, 7,755 second-feet.
September 29, gage height, 0.10 foot; discharge, 856 second-feet.
On Staunton River:
February 25, gage height, 11.95 feet; discharge, 29,259 second-feet.
March 18, gage height, 3.67 feet; discharge, 8,326 second-feet.
September 29, gage height, —0.25 foot; discharge, 763 second-feet.

Daily gage height, in feet, of Dan River at Clarksville, Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.75	2.70	2.90	1.98	1.72	1.60	1.10	0.71	0.23	0.05	1.55	2.75
2	1.75	3.20	2.75	1.95	2.85	1.56	1.03	.67	.20	.05	1.92	2.35
3	1.74	4.05	2.67	2.00	5.30	1.55	.98	.55	.15	.03	2.45	2.05
4	1.74	2.70	2.35	2.15	4.80	1.63	.95	.48	.15	.01	2.05	1.90
5	1.75	1.85	3.55	2.35	3.25	1.70	.90	.42	.00	— .03	1.60	1.85
6	1.77	2.35	4.65	2.85	3.10	1.08	.87	.38	.00	— .05	1.20	1.65
7	1.75	6.35	4.75	3.15	3.70	1.06	.83	.35	.00	— .09	.98	1.40
8	1.71	12.29	4.60	3.45	3.45	1.04	.98	.35	.00	— .15	.85	1.18
9	1.68	9.20	4.47	3.25	3.05	1.04	.90	.37	.00	— .02	.68	1.05
10	1.65	4.75	3.98	4.10	2.75	1.03	.85	.73	.00	+ .05	.55	.85
11	1.62	3.15	4.03	3.72	3.25	1.02	.80	.79	.00	.05	.42	.70
12	1.60	2.70	4.78	3.45	3.95	1.00	.70	.68	.00	1.10	.35	.65
13	1.58	3.95	4.90	3.15	4.25	.98	1.75	.65	.00	1.95	.25	.60
14	1.65	3.35	5.70	2.95	4.98	.98	1.30	.48	.00	1.25	.25	.65
15	1.68	3.15	4.95	2.70	5.30	.96	1.18	.42	.00	1.10	.18	.85
16	1.65	3.70	4.10	2.45	4.65	.95	.90	.48	.00	.95	.14	.95
17	1.68	4.05	3.45	2.17	4.15	.94	.75	.55	.00	1.65	.10	1.25
18	2.50	3.25	4.30	2.05	3.75	.92	.88	.75	.00	2.10	.05	1.55
19	3.45	2.85	3.95	1.98	3.15	.90	1.98	.85	.00	2.48	.25	1.40
20	4.05	3.35	3.62	1.90	2.85	.95	1.85	.95	.00	3.00	.23	1.10
21	3.50	4.10	3.40	1.86	2.25	.90	2.25	1.08	.00	1.55	.23	1.70
22	2.65	6.70	3.22	1.78	1.90	.88	1.48	.70	.00	.75	.22	2.35
23	2.05	8.45	3.03	1.75	1.88	.90	1.25	.89	.00	1.10	.20	4.10
24	1.85	11.52	2.70	1.75	1.85	.95	1.17	.75	.00	.88	.18	3.45
25	1.75	12.80	2.55	1.72	1.83	.93	.98	.58	.05	.65	.30	2.65
26	1.55	4.64	2.35	1.68	1.79	.90	.79	.42	.25	.85	.35	2.18
27	1.25	3.25	2.28	1.63	1.77	.88	.70	.35	.40	1.15	.58	1.80
28	.85	3.05	2.25	1.60	1.73	.95	.68	.30	.25	2.25	2.10	1.45
29	1.15	.....	2.15	1.57	1.66	.88	1.15	.28	.10	2.85	5.40	1.20
30	1.25	.....	2.08	1.55	1.63	.80	1.08	.28	.08	2.10	3.35	1.10
31	2.10	.....	2.03	.....	1.60	.....	.77	.25	.....	1.85	.....	.95

Daily gage height, in feet, of Staunton River at Clarksville, Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.75	3.60	2.25	1.60	1.15	1.00	.....	0.35	0.30	—0.31	1.00	2.20
2	2.75	4.10	2.12	1.55	2.48	.98	.....	.31	.20	— .31	1.50	1.85
3	2.74	4.92	2.05	1.60	4.72	.96	.....	.28	.00	— .35	2.12	1.63
4	2.74	3.55	1.93	1.70	4.30	1.03	0.65	.20	.00	— .40	1.55	1.47
5	2.75	2.68	2.85	1.92	2.70	1.11	.60	.14	.00	— .45	.95	1.30
6	2.77	3.23	4.02	2.52	2.52	1.09	.57	.10	.00	— .48	.78	1.18
7	2.75	6.05	4.20	2.75	3.10	1.06	.54	.08	.00	— .52	.59	1.02
8	2.71	11.85	4.05	2.95	2.98	1.05	.51	.08	.00	— .58	.43	.84
9	2.68	8.85	3.85	2.72	2.60	1.05	.66	.09	.00	— .65	.25	.70
10	2.65	4.25	3.35	3.55	2.28	1.02	.59	.40	.00	— .40	.12	.52
11	2.62	2.58	3.45	3.15	2.85	1.98	.48	.46	.00	+ .40	.05	.40
12	2.60	2.20	4.20	2.85	3.45	1.96	.34	.31	.00	.60	.02	.37
13	2.58	3.50	4.35	2.53	3.73	.....	1.15	.29	.00	1.55	— .05	.35
14	2.65	2.85	5.15	2.30	4.43	.....	.80	.20	.00	.66	— .10	.37
15	2.68	2.55	4.37	2.05	4.72	.....	.61	.14	.00	.60	— .20	.52
16	2.65	3.15	3.60	1.75	4.10	.....	.50	.20	.00	.53	— .24	.57
17	2.68	3.70	2.97	1.46	3.65	.....	.40	.28	.00	1.05	— .30	.65
18	3.51	2.90	3.78	1.45	3.28	.....	.48	.40	.00	1.33	— .38	1.00
19	4.47	2.35	3.40	1.38	2.75	.....	1.43	.59	.00	1.79	— .10	1.02
20	5.07	2.85	3.15	1.33	2.58	.....	1.35	.65	.00	2.30	— .13	.72
21	4.52	2.90	2.90	1.28	1.70	.....	1.65	.71	.00	1.00	— .13	1.25
22	3.66	6.07	2.77	1.20	1.57	.....	1.15	.34	.00	.25	— .14	1.85
23	3.06	7.75	2.50	1.15	1.33	.....	.87	.48	.00	.60	— .16	4.50
24	2.85	10.70	2.30	1.15	1.29	.....	.84	.40	.00	.30	— .20	2.88
25	1.74	12.04	2.05	1.15	1.26	.....	.51	.30	.00	.07	— .05	2.08
26	1.54	3.05	1.98	1.12	1.21	.....	.46	.16	.00	.28	— .02	1.68
27	1.24	2.65	1.83	1.08	1.18	.....	.34	.09	.05	.62	+ .17	1.35
28	.83	2.35	1.80	1.05	1.13	.....	.32	.07	.00	1.85	1.33	1.05
29	1.14	.....	1.72	1.01	1.05	.....	.78	.30	—.25	2.40	4.70	.80
30	1.24	.....	1.68	.95	1.02	.....	.58	.80	—.28	1.33	2.77	.70
31	2.85	.....	1.65	.....	1.00	.....	.45	.50	.....	1.30	.....	.57

June 13 to July 3 no reports; repairing bridge.

NEAL STATION ON ROANOKE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 47, is on the Norfolk and Carolina Railroad bridge near Neal, North Carolina. The zero of the gage rod is over the center of the fourth floor beam of the second span from the north end of the bridge. The distance from the zero of the rod to the outer rim of the pulley is 2.47 feet, and the distance from the end of the weight to the pointer on the wire is 44.66 feet. The section is a fairly good one, for the course of the river is straight for some distance above and below the station, and the bottom is smooth. Being muddy, however, the bottom is apt to cut out in seasons of high water, and both banks are liable to overflow. The observer is W. M. Adams, Neal, North Carolina. The following measurements were made during 1897 by E. W. Myers:

January 23, gage height, 12.65 feet; discharge, 13,155 second-feet.
February 27, gage height, 27.95 feet; discharge, 64,132 second-feet.
March 17, gage height 24.71 feet; discharge, 37,659 second-feet.
May 17, gage height, 18.40 feet; discharge, 19,219 second-feet.
October 1, gage height, 1.00 feet; discharge, 1,928 second-feet.

Daily gage height, in feet, of Roanoke River at Neal, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.40	3.40	24.20	9.30	6.40	5.90	3.90	3.90	2.20	1.20	3.10	11.00
2	4.70	4.30	23.70	9.00	6.40	5.50	3.40	3.20	2.10	.80	3.40	10.10
3	5.00	11.50	19.10	8.70	6.80	5.90	3.10	2.60	2.90	.60	4.20	8.70
4	4.90	20.25	16.90	8.50	12.60	5.90	6.80	2.10	3.90	.50	5.50	7.30
5	4.90	21.50	14.90	8.40	17.10	5.30	6.90	2.00	3.40	.40	8.10	6.30
6	4.60	20.90	13.60	9.40	14.90	4.90	5.30	2.10	2.60	.30	7.50	6.90
7	4.40	21.10	15.20	11.00	12.40	5.70	3.90	1.90	2.00	.30	5.80	7.70
8	4.40	22.80	21.05	14.10	10.60	7.40	3.30	1.90	1.50	.20	4.50	7.80
9	4.50	24.30	22.25	13.40	9.10	7.50	3.30	2.40	1.10	.10	3.60	7.20
10	4.50	26.30	22.70	14.10	8.10	6.20	5.00	3.10	.90	.10	3.00	6.50
11	4.20	26.55	22.20	19.90	7.40	5.60	5.20	3.00	.80	.10	2.67	5.70
12	3.90	24.65	21.60	19.60	6.90	6.00	4.80	3.20	.60	.20	2.50	4.80
13	3.80	22.70	22.30	17.00	7.00	5.60	5.40	4.30	.50	.20	2.40	4.48
14	4.00	21.20	23.40	14.40	8.90	5.30	5.80	3.30	.50	.30	2.20	4.10
15	4.20	20.60	23.90	12.50	17.30	4.70	6.20	2.90	.40	.30	2.15	4.10
16	4.20	19.20	24.40	11.10	19.40	4.40	6.90	2.60	.30	6.40	2.10	4.15
17	4.10	18.00	24.70	10.20	19.10	4.10	6.10	2.10	.10	5.60	2.00	6.00
18	4.20	17.90	24.40	9.70	16.70	4.00	4.40	1.80	.10	3.90	1.93	7.40
19	4.60	16.70	23.40	9.40	13.70	3.90	3.40	1.40	.00	2.50	1.93	7.30
20	4.70	14.70	22.00	9.00	11.20	3.60	3.30	3.00	.10	1.80	1.93	6.20
21	5.00	14.20	20.70	8.40	9.50	5.30	5.10	2.60	.00	2.10	1.90	5.50
22	7.00	20.15	20.40	7.80	8.40	11.40	8.30	2.40	.00	2.30	1.90	5.20
23	12.65	22.45	19.30	7.40	7.80	11.50	9.90	2.30	.10	2.10	1.90	6.83
24	13.90	24.05	17.60	7.10	7.40	8.10	9.10	2.70	.20	3.70	1.80	11.00
25	13.00	25.80	15.90	6.80	7.30	5.80	7.10	4.20	.40	4.40	1.80	12.50
26	10.80	27.25	14.50	6.70	7.40	4.40	5.70	4.90	.30	4.10	1.90	4.30
27	8.60	28.00	13.40	6.60	11.00	4.10	4.90	4.20	.30	3.80	2.00	9.60
28	7.50	26.40	12.20	6.50	11.40	4.60	4.70	3.10	.80	3.70	2.00	9.30
29	5.90	.....	11.30	6.50	9.37	4.75	4.00	2.60	1.90	3.60	3.90	11.00
30	3.40	.....	10.40	6.50	7.40	4.50	3.90	2.40	1.60	3.70	11.18	11.80
31	3.10	.....	9.80	.....	6.30	.....	4.40	2.40	.....	3.40	.....	10.20

TARBORO STATION ON TAR RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 50, is on the Atlantic Coast Line bridge crossing the river at Tarboro, North Carolina. The zero of the gage is over the center of the fifth floor beam from the east end of the bridge. The outer rim of the pulley is 3 feet from the zero of the gage, and the distance from the end of the weight to the pointer on the wire is 38.30 feet. The gage reading is zero when the weight touches the bottom of the stream. The river here is a little obstructed by sand bars. The observer is R. H. Williams. The following discharge measurements were made by E. W. Myers during 1897:

January 23, gage height 6.64 feet; discharge, 3,520 second-feet.
February 26, gage height 13.51 feet; discharge, 8,106 second-feet.
March 15, gage height, 18.13 feet; discharge, 12,993 second-feet.
May 17, gage height, 6.30 feet; discharge, 3,058 second-feet.
July 29, gage height, 2.25 feet; discharge, 1,079 second-feet.
October 2, gage height, — 0.65 feet; discharge, 192 second-feet.

Daily gage height, in feet, of Tar River at Tarboro, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.50	3.10	11.90	4.35	2.65	1.50	0.70	1.80	0.90	—0.60	0.80	2.20
2	3.55	5.50	10.00	4.30	4.10	1.40	.50	1.25	3.00	— .65	1.40	3.10
3	3.60	7.40	8.00	4.00	5.10	2.70	.40	1.20	5.00	— .70	2.00	3.00
4	3.31	8.90	6.90	4.30	5.90	2.20	.30	.70	3.60	— .62	4.60	2.50
5	3.25	10.20	6.20	4.95	5.10	1.75	.20	.50	2.10	— .64	4.40	2.30
6	3.22	10.22	5.60	6.10	3.80	1.50	.40	.45	1.35	— .40	3.00	2.80
7	3.15	9.60	6.60	7.50	3.30	1.35	.30	.40	1.40	— .50	2.10	3.20
8	3.00	10.10	8.55	8.50	3.10	2.00	1.05	1.30	1.00	— .60	1.50	2.80
9	2.90	11.38	10.30	7.40	2.70	2.02	.60	1.00	.70	— .70	1.65	2.40
10	2.60	12.35	11.80	7.80	2.50	1.55	.50	.90	.40	— .60	1.20	2.20
11	2.50	11.10	11.70	11.00	2.40	1.30	1.50	.50	.10	— .50	.80	1.90
12	2.45	8.09	11.10	13.40	2.25	1.35	1.63	.40	— .05	— .52	.90	1.90
13	2.55	7.00	12.80	14.90	2.35	1.15	2.50	.85	— .07	— .50	.70	1.60
14	2.60	6.98	15.00	14.50	3.80	1.10	7.20	.60	— .02	— .51	.50	1.70
15	3.00	7.51	16.50	13.60	5.40	1.10	5.80	.20	.02	— .63	.60	1.90
16	3.35	6.70	17.90	11.50	7.50	1.05	4.70	.15	— .05	— .71	.70	2.10
17	3.43	6.15	19.20	8.60	7.00	.80	2.80	.35	— .21	— .90	.50	2.20
18	3.50	6.30	19.60	6.70	4.60	1.50	2.00	.10	— .20	—1.00	.40	2.90
19	3.40	6.20	19.70	5.70	3.50	.90	1.33	— .10	— .20	— .90	.45	2.60
20	3.35	5.55	18.15	5.00	3.00	.60	1.28	— .08	— .30	— .80	.50	2.00
21	3.40	6.00	16.00	4.30	2.70	.40	1.20	— .08	— .50	— .50	.40	2.10
22	4.30	7.95	13.60	3.90	2.30	2.60	3.70	— .05	— .30	— .55	.45	2.20
23	6.25	9.62	11.30	3.70	1.80	2.10	6.05	— .15	— .40	+ .50	.65	3.30
24	8.30	11.25	9.10	3.50	1.70	1.40	5.80	.50	— .35	.80	.45	5.30
25	6.45	12.15	7.80	3.40	1.80	1.00	4.50	.60	— .40	.70	.40	6.10
26	4.80	13.30	7.00	3.10	1.60	.80	3.30	.62	— .50	.90	.35	4.20
27	4.30	13.75	6.26	3.20	1.50	.70	2.80	.40	— .60	.50	.45	4.00
28	4.40	13.00	5.40	3.00	1.90	.65	2.60	.23	— .65	.70	1.00	4.10
29	4.10	.....	4.90	2.80	2.00	1.10	2.25	.05	— .55	1.50	1.80	5.00
30	3.90	.....	4.70	2.70	1.60	1.09	2.60	.02	— .50	1.60	2.10	4.60
31	3.05	.....	4.50	.....	1.40	.....	2.30	.65	.....	1.30	.....	3.90

SELMA STATION ON NEUSE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 52, is located on the Southern Railway bridge about 3 miles from Selma, North Carolina. The zero of the gage rod is over the center of the fifth floor beam of the first span from the south end of the bridge. The distance from the zero of the gage to the outer rim of the pulley is 4 feet, and the distance from the end of the weight to the pointer on the wire is 41.05 feet. The bed of the river here is sandy and muddy and is liable to change in high water. The course of the river is straight and there is only one pier obstruction. The observer is C. Richardson, Selma, North Carolina. The following discharge measurements were made by E. W. Myers during 1897:

January 24, gage height, 6.45 feet; discharge, 1,810 second-feet.
February 23, gage height, 10.60 feet; discharge, 4,052 second-feet.
March 10, gage height, 7.95 feet; discharge, 2,639 second-feet.
May 18, gage height, 2.40 feet; discharge, 789 second-feet.
July 28, gage height, 1.60 feet; discharge, 694 second-feet.
October 1, gage height, —0.30 foot; discharge, 109 second-feet.

Daily gage height, in feet, of Neuse River at Selma, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.30	1.70	3.90	2.60	2.20	6.00	0.80	0.70	0.10	—0.30	0.00	1.80
2	1.40	2.80	3.70	2.50	3.20	4.50	1.20	.60	.10	— .30	.00	1.70
3	1.30	6.70	3.40	2.40	4.00	2.90	.80	.50	.10	— .30	.00	1.50
4	1.20	7.40	3.10	2.90	5.90	2.30	.60	.40	.10	— .30	.45	1.40
5	1.20	8.60	2.80	3.40	3.80	1.70	.50	.20	.20	— .30	.50	2.30
6	1.20	5.00	2.80	10.10	2.20	1.80	.40	.20	.20	— .30	.60	2.30
7	1.20	12.40	5.20	9.70	2.00	3.20	.70	.20	.10	— .30	1.00	2.00
8	1.10	13.20	9.90	5.80	1.90	2.60	.60	.20	.10	— .30	1.00	1.70
9	1.10	13.20	10.50	4.70	1.80	1.90	.60	.20	.10	— .30	1.00	1.30
10	1.10	7.50	8.80	14.50	1.60	1.60	1.20	.20	.10	— .30	.80	1.00
11	1.10	5.70	9.00	13.90	1.60	1.40	1.30	.20	.10	— .30	.80	1.00
12	1.10	4.40	11.20	10.50	2.20	2.10	2.20	.10	.10	— .30	.70	1.20
13	1.20	4.20	15.80	7.00	2.00	1.10	5.50	.10	.10	— .30	.40	1.10
14	1.30	4.40	14.70	5.20	5.00	1.00	5.30	.10	.10	— .30	.40	1.00
15	1.60	4.50	16.50	3.80	8.80	.90	4.80	.10	.10	— .30	.40	1.10
16	1.70	4.80	16.80	3.70	9.60	.80	2.30	.10	.10	— .30	.40	3.00
17	1.70	4.70	15.70	3.50	4.30	.70	1.20	.20	.10	— .40	.40	2.70
18	1.80	4.50	15.00	3.20	2.60	.60	1.10	.20	.10	— .40	.40	1.90
19	2.20	4.40	11.70	2.90	2.30	1.10	1.00	.10	—.10	— .30	.30	1.20
20	2.50	3.00	8.30	2.60	2.00	.50	1.30	.10	—.10	— .30	.30	1.30
21	2.90	3.50	8.20	2.40	1.90	2.20	4.10	.10	—.10	+ .10	.30	2.30
22	8.30	5.50	6.20	2.20	1.80	1.40	5.50	.80	—.10	.40	.30	4.20
23	9.30	10.60	4.60	2.10	1.60	1.10	5.60	1.40	—.10	.10	.20	5.80
24	8.00	11.40	4.20	2.00	1.60	.90	2.50	1.80	—.10	.20	.20	6.00
25	4.30	11.30	3.70	2.00	1.80	2.00	1.50	1.40	—.10	.20	.20	4.50
26	4.00	7.70	3.40	1.90	2.00	1.30	2.30	.90	—.30	.30	.20	3.00
27	3.80	7.30	3.10	1.90	2.40	.80	1.90	.50	—.30	.40	.20	3.50
28	3.40	4.50	3.00	1.90	1.80	.60	1.60	.30	—.30	.30	.20	4.10
29	2.80	.....	2.70	1.80	1.40	.70	1.60	.10	—.30	.30	1.90	4.50
30	2.50	.....	2.60	1.80	1.60	1.30	1.10	.10	—.30	.20	2.30	4.20
31	2.20	.....	2.60	.....	1.50	.....	.80	.10	.....	.00	.....	3.10

FAYETTEVILLE STATION ON CAPE FEAR RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 54, is at the bridge of the Cape Fear and Yadkin Valley Railroad, about a mile east of Fayetteville, North Carolina. The Weather Bureau has a gage fastened to the lower side of the east abutment of the covered highway bridge, this being about 400 feet above the railroad bridge, from which discharge measurements are made. For the lower 29 feet this gage consists of a rod divided into tenths and firmly fastened to the abutment. Above the 29-foot mark a scale is painted on the rock. The observer is Frank Glover, who has charge of the steamboat landing just below the railroad bridge. For his convenience he has placed a subsidiary gage at the steamboat landing reading about the same as the official gage, and from this observations are taken. The following discharge measurements were made by E. W. Myers during 1897:

March 12, gage height, 23.00 feet; discharge, 16,777 second-feet.
July 27, gage height, 7.00 feet; discharge, 2,682 second-feet.
September 30, gage height, 0.70 foot; discharge, 424 second-feet.

Daily gage height, in feet, of Cape Fear River at Fayetteville, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.20	5.50	13.40	7.70	6.10	7.00	5.00	4.70	2.20	0.70	1.90	5.50
2	6.00	5.90	11.70	8.00	10.00	8.60	3.20	3.20	4.60	.70	5.50	6.00
3	5.50	25.00	10.20	7.30	14.40	6.50	2.50	3.00	3.50	.80	9.70	5.10
4	5.50	27.00	9.00	8.00	13.20	5.00	2.00	2.70	3.00	.60	9.30	4.60
5	5.30	19.70	8.50	9.30	9.30	4.20	1.90	2.20	2.50	.70	7.20	4.30
6	5.00	15.00	7.60	27.00	8.00	4.30	3.90	2.60	2.10	.50	5.00	5.10
7	4.80	29.10	9.20	28.30	6.30	7.00	4.20	4.10	1.80	.30	4.00	5.20
8	4.60	36.50	25.60	22.00	5.60	5.50	4.80	6.80	1.50	.20	3.50	4.70
9	4.60	32.00	26.20	15.40	5.00	7.00	4.20	6.20	1.10	.20	2.90	4.10
10	4.40	24.30	20.00	23.50	4.60	7.80	4.00	6.20	1.10	.30	2.60	3.70
11	4.20	17.60	21.40	28.00	4.20	5.50	4.00	5.40	1.10	.60	2.40	3.40
12	4.10	13.00	22.00	22.70	5.20	4.40	3.90	4.30	1.10	.60	2.50	3.30
13	4.00	18.20	29.70	18.30	6.00	4.20	6.00	3.50	.90	.60	2.40	3.30
14	4.50	19.00	32.00	14.30	10.00	3.50	11.10	3.00	.80	.60	2.30	3.00
15	6.00	16.30	36.40	12.80	17.40	3.20	6.00	2.40	.70	.40	2.00	3.00
16	6.40	12.80	37.60	10.20	14.00	3.00	4.60	3.80	.60	.30	2.00	4.00
17	7.80	13.20	37.60	10.00	10.30	2.70	3.20	3.00	.30	.30	1.80	4.90
18	7.00	15.00	29.00	9.80	8.30	3.00	3.20	2.50	.80	.30	1.60	5.20
19	3.50	12.90	23.80	8.40	6.70	3.50	3.80	2.20	.80	.30	1.90	4.50
20	9.60	10.80	19.20	7.70	5.50	4.50	5.50	3.00	.90	.40	1.90	3.90
21	7.80	14.00	18.00	7.00	4.80	4.30	16.50	3.20	1.40	.90	1.70	3.50
22	20.40	24.30	16.60	6.70	4.50	3.50	25.30	5.00	1.40	1.50	1.70	3.50
23	24.55	23.50	13.70	6.30	4.30	3.00	16.40	5.20	1.10	1.60	1.70	4.80
24	16.80	23.50	11.20	5.80	4.20	2.40	12.70	6.50	1.10	1.70	1.50	9.00
25	12.60	24.20	10.00	5.50	4.30	1.80	8.50	5.60	1.10	2.00	1.40	7.80
26	8.50	23.30	9.30	5.50	4.60	4.80	6.10	4.90	1.10	2.20	1.60	5.70
27	7.20	20.40	8.40	5.20	4.50	3.40	7.00	4.00	.90	1.90	1.70	6.00
28	7.00	16.60	8.00	4.70	4.40	2.80	7.30	3.50	1.10	1.90	1.90	10.00
29	6.60	.....	7.40	4.50	4.00	3.70	6.90	2.90	.80	1.70	2.30	9.50
30	5.90	.....	7.20	4.40	4.40	4.00	5.60	2.50	.70	1.90	3.50	7.10
31	5.60	.....	7.20	.....	4.30	.....	5.00	2.50	.....	1.70	.....	5.00

SALISBURY STATION ON YADKIN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 57, is at the Southern Railway bridge near Holtsburg, below the mouth of Grants Creek, about 4 miles from Salisbury, North Carolina. The 10-foot mark of the gage rod is opposite the center of the sixth floor beam on the lower side of the first span from the west end. The distance from the zero of the rod to the outside of the pulley wheel is 1.85 feet. The length of the wire rope and weight is 55.10 feet. The post office address of the observer, H. A. Ragle, is Sapona, North Carolina, the nearest railroad station, Holtsburg, being merely a siding. The locality is reached by wagon from Salisbury. Discharge measurements are made from the lower side of the deck bridge, the zero point being on the left bank. The channel is obstructed by three piers, with large rafts of driftwood lodged against each and sand bars below each. There are also some rocks in the river, and the bottom is rough. The following discharge measurements were made by E. W. Myers during 1897:

February 13, gage height, 4.20 feet; discharge, 10,141 second-feet.
March 20, gage height, 4.45 feet; discharge, 11,837 second-feet.
April 8, gage height, 3.90 feet; discharge, 9,992 second-feet.
August 4, gage height, 2.18 feet; discharge, 3,422 second-feet.
October 6, gage height, 1.40 feet; discharge, 1,300 second-feet.

Daily gage height, in feet, of Yadkin River at Salisbury, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.05	2.50	2.90	2.80	3.50	2.80	2.00	1.90	2.10	1.30	2.10	2.00
2	2.04	2.90	2.80	2.70	4.50	2.70	2.00	1.70	2.10	1.40	2.20	2.00
3	2.02	5.80	2.70	2.80	4.00	2.20	1.90	1.90	2.00	1.30	2.10	2.10
4	2.01	4.30	2.70	3.00	3.20	2.20	2.00	2.10	1.90	1.30	2.30	2.00
5	2.00	3.00	2.60	5.50	2.70	2.60	2.00	2.00	1.90	1.20	2.10	2.60
6	2.00	3.50	2.50	10.20	2.50	2.40	2.10	1.90	1.80	1.40	2.10	2.80
7	2.00	11.10	8.30	6.50	2.40	2.50	2.00	2.50	1.80	1.40	2.10	2.70
8	2.00	7.57	7.50	4.20	2.40	6.80	2.60	1.90	1.80	1.40	2.00	1.80
9	2.00	5.20	5.60	4.30	2.40	5.00	2.90	1.90	1.60	1.40	1.80	1.90
10	2.00	3.75	5.90	4.00	2.30	5.30	2.40	1.90	1.60	1.40	1.80	1.80
11	2.00	3.00	6.10	4.00	2.40	5.00	2.40	1.90	1.60	1.40	1.70	1.80
12	2.00	3.70	5.10	3.20	2.40	4.10	2.00	1.80	1.50	2.00	1.70	1.80
13	2.00	4.20	5.10	3.00	3.00	2.80	4.50	1.80	1.50	8.50	1.70	1.80
14	2.00	3.70	5.10	3.00	5.20	2.80	3.00	1.80	1.50	4.10	1.60	1.80
15	2.08	3.20	6.40	3.10	3.90	2.60	2.40	1.70	1.40	2.30	1.60	2.20
16	2.10	2.79	5.30	3.20	3.10	2.40	2.10	1.70	1.40	2.30	1.60	2.50
17	2.12	2.90	5.20	2.80	2.50	2.20	1.90	2.00	1.30	1.90	1.50	2.20
18	2.50	2.60	4.40	2.80	2.50	2.20	2.40	2.80	1.30	1.80	1.50	2.10
19	2.52	2.60	4.00	2.90	2.50	2.20	3.40	2.30	1.30	1.80	1.50	1.80
20	2.55	.....	4.40	2.80	2.40	2.70	3.70	1.90	1.20	2.10	1.40	1.80
21	3.40	.....	4.30	2.70	2.40	2.30	3.00	1.60	1.30	4.10	1.40	2.00
22	4.60	5.60	3.90	2.60	2.20	2.10	3.20	1.80	1.40	3.00	1.20	2.10
23	3.65	5.00	3.40	2.60	2.10	2.10	2.10	2.30	1.50	2.10	1.40	2.00
24	2.85	9.50	3.00	2.40	2.20	1.90	2.30	2.20	1.80	1.90	1.40	2.00
25	2.58	6.70	3.00	2.30	3.60	1.90	3.00	2.10	1.50	1.90	1.40	2.00
26	2.45	4.70	2.90	2.40	3.00	1.80	2.10	2.10	1.50	1.90	1.20	1.90
27	2.30	3.50	2.80	2.40	2.70	1.90	3.40	2.00	1.50	1.90	3.10	2.00
28	2.22	3.00	3.00	2.40	2.30	1.90	3.30	1.90	1.30	1.80	3.20	2.00
29	1.90	.....	2.80	2.40	2.40	2.00	2.50	2.20	1.30	1.80	3.00	2.00
30	1.88	.....	2.70	2.50	2.40	2.00	2.10	2.20	1.30	1.70	2.70	1.90
31	2.13	.....	2.80	.....	2.30	.....	1.90	2.10	.....	1.90	.....	1.90

NORWOOD STATION ON YADKIN (PEEDEE) RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 60, is near Blalocks Ferry, 1 mile above Richland Creek and about 2 miles from Norwood, North Carolina. The gage is a vertical rod divided into feet and tenths, and is securely spiked and braced to an overhanging tree near the ferry. The rod is referred to a bench mark consisting of a large nail driven into a notch cut in the root of a birch tree about 50 feet northwest of the rod, and the tree is immediately in front of the turn of the road that leads to the ferry. The zero of the gage rod is 5.93 feet below the elevation of the bench mark. The river here is broad and shallow, with smooth bottom of sand and small rocks, giving a good section for discharge measurements, which are taken from the ferryboat. The observer is W. B. Nichols, Norwood, North Carolina. The banks and bed are, for the most part, hard and permanent and the depth and current of the water very uniform. The chief variation is at a point about 100 feet from the right bank, where the water is deep and very sluggish. The following discharge measurements were made by E. W. Myers and others during 1897:

February 10, gage height, 3.32 feet; discharge, 9,607 second-feet.
March 21, gage height, 3.80 feet; discharge, 11,710 second-feet.
August 4, gage height, 1.65 feet; discharge, 3,392 second-feet.
October 6, gage height, 1.00 feet; discharge, 1,508 second-feet.
October 25, gage height, 1.48 feet; discharge, 2,715 second-feet.

Daily gage height, in feet, of Yadkin River at Norwood, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.70	1.90	2.50	2.40	2.40	2.10	1.70	1.70	1.30	1.00	1.60	2.20
2	1.70	2.70	2.30	2.30	3.80	2.10	1.60	1.50	1.50	1.00	1.70	2.00
3	1.60	3.30	2.30	2.40	4.30	1.90	1.60	1.60	1.30	1.10	1.80	1.80
4	1.60	3.50	2.20	2.60	2.90	1.80	1.90	1.60	1.30	1.10	1.80	1.70
5	1.50	2.60	2.20	6.70	2.60	1.90	1.70	1.70	1.20	1.00	1.70	2.00
6	1.50	5.50	2.60	8.50	2.30	2.40	1.40	1.50	1.20	1.00	1.50	2.00
7	1.70	8.20	6.90	6.00	2.20	2.30	1.90	2.10	1.20	1.00	1.50	2.00
8	1.70	9.20	6.80	3.80	2.10	2.40	2.10	2.50	1.10	1.00	1.40	1.80
9	1.60	4.30	4.80	4.20	2.10	4.30	1.80	2.20	1.20	1.10	1.40	1.80
10	1.50	3.40	4.30	4.20	2.10	3.40	1.70	2.00	1.20	1.00	1.30	1.70
11	1.50	2.80	5.20	3.50	2.30	3.40	1.90	1.70	1.20	1.00	1.30	1.70
12	1.50	3.10	5.40	2.90	2.50	2.50	1.80	1.60	1.10	1.10	1.40	1.40
13	1.50	3.90	4.90	2.70	2.90	2.30	3.10	1.50	1.10	3.70	1.30	1.40
14	1.60	3.40	5.40	2.50	3.50	2.20	2.80	1.50	1.00	3.80	1.30	1.30
15	1.60	2.80	6.50	2.50	3.60	2.10	2.50	1.40	1.00	2.20	1.30	1.80
16	1.70	2.60	5.00	2.40	2.80	2.10	1.70	1.40	.90	1.90	1.30	1.90
17	1.70	2.70	4.90	2.70	2.40	2.10	1.60	1.50	.80	1.60	1.20	2.00
18	2.00	2.40	3.90	2.50	2.30	1.80	2.10	2.30	.90	1.30	1.40	1.80
19	2.30	2.30	3.50	2.30	2.10	1.90	1.80	2.00	1.00	1.20	1.30	1.70
20	2.50	2.10	3.60	2.20	2.10	1.90	2.50	1.70	1.10	1.20	1.30	1.70
21	4.50	3.70	3.80	2.30	2.00	1.80	4.50	1.50	1.20	1.40	1.30	1.60
22	4.40	3.40	3.30	2.20	2.00	2.10	3.50	2.40	1.10	2.30	1.20	1.80
23	3.50	4.30	3.00	2.10	2.10	2.10	2.70	1.50	1.10	1.90	1.30	1.40
24	2.50	7.70	2.80	2.20	2.00	2.00	2.40	2.00	1.00	1.60	1.20	1.70
25	2.30	6.20	2.60	2.10	2.20	1.90	2.00	1.90	1.20	1.50	1.20	1.70
26	2.10	3.50	2.60	2.10	3.10	1.80	2.10	1.80	1.50	1.50	1.20	2.00
27	2.00	2.90	2.50	2.30	2.20	1.60	2.40	1.90	1.30	1.40	1.50	2.40
28	1.90	2.50	2.50	2.20	2.00	1.60	3.50	1.70	1.20	1.40	3.00	2.70
29	1.80	.....	2.30	2.10	1.90	1.90	2.30	1.60	1.10	1.40	2.50	2.40
30	1.80	.....	2.30	2.30	2.00	1.70	1.90	1.40	1.10	1.30	2.40	2.00
31	.....	.....	2.40	.....	2.00	.....	1.70	1.40	.....	1.40	.....	1.90

CATAWBA STATION ON CATAWBA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 64, is located at the Southern Railway bridge about one-half a mile from Catawba, North Carolina. The zero of the gage rod is 23 feet east of the west end of the second span of the bridge, and the distance from the zero of the gage rod to the outer rim of the pulley is 3 feet. The distance from the end of the weight to the marker on the wire is 35.58 feet, the reading being zero when the weight touches bottom. The river is straight for several hundred yards above and below the bridge, and the current velocity is evenly distributed across the stream. The observer is E. M. Brawley, Catawba, North Carolina. Discharge measurements are made from a plank walk underneath the bridge. The channel is obstructed by three piers and riprap and by two trestles of false work. The section is otherwise good. The following discharge measurements were made by E. W. Myers and others during 1897:

February 8, gage height, 5.51 feet; discharge, 9,711 second-feet.
August 3, gage height, 1.90 feet; discharge, 1,358 second-feet.
October 5, gage height, 1.60 feet; discharge, 775 second-feet.
October 26, gage height, 1.82 feet; discharge, 1,279 second-feet.

Daily gage height, in feet, of Catawba River at Catawba, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.82	2.25	2.75	2.85	6.00	2.15	2.00	1.95	1.70	1.60	2.00	2.15
2	1.85	4.00	2.45	2.90	4.00	2.10	2.00	1.85	1.70	1.60	3.00	2.10
3	1.88	3.65	2.35	4.00	3.90	2.05	2.00	1.80	1.65	1.60	2.50	2.05
4	1.82	3.10	2.30	4.25	3.45	2.00	2.00	2.30	1.65	1.60	2.00	2.05
5	2.22	2.60	2.25	16.00	3.20	2.75	2.05	2.90	1.70	1.60	1.90	2.00
6	2.00	15.90	8.27	8.20	2.90	2.50	2.30	3.00	1.70	1.60	1.85	2.00
7	1.95	9.62	4.50	5.75	2.80	2.90	2.20	2.60	1.70	1.60	1.85	1.95
8	1.90	5.82	2.90	3.90	2.70	3.40	3.30	2.50	1.70	1.60	1.85	1.90
9	1.90	3.90	5.50	4.00	2.70	3.40	2.80	2.60	1.70	1.60	1.75	1.90
10	1.95	3.60	6.00	3.80	2.75	2.90	2.50	2.50	1.70	1.70	1.75	1.90
11	1.95	3.40	5.50	3.60	2.80	2.65	2.30	2.40	1.70	3.00	1.70	1.90
12	1.95	4.65	5.00	3.25	2.80	2.40	2.25	2.25	1.70	8.00	1.70	1.90
13	1.95	4.10	6.20	3.02	4.20	2.35	2.40	2.10	1.70	4.00	1.70	1.85
14	1.95	3.50	6.00	3.00	3.30	2.30	2.30	2.00	1.70	2.50	1.70	1.85
15	1.95	3.40	5.90	3.05	2.90	2.25	2.25	2.00	1.70	2.00	1.70	1.85
16	2.00	4.20	5.80	3.02	2.50	2.20	2.25	1.90	1.70	1.90	1.70	1.85
17	2.00	3.80	5.50	3.00	2.45	2.35	2.30	1.85	1.70	1.90	1.70	1.85
18	2.20	7.80	4.40	2.95	2.45	2.40	2.30	1.80	1.70	2.50	1.70	1.85
19	2.00	2.75	4.00	2.85	2.40	2.50	2.25	1.80	1.70	2.40	1.70	1.85
20	2.20	2.85	4.75	2.85	2.40	2.30	2.30	1.80	1.70	2.25	1.70	1.90
21	4.45	3.20	4.30	2.80	2.40	2.20	2.90	1.80	1.70	2.00	1.70	2.50
22	3.80	3.10	3.70	2.82	2.30	2.15	2.75	1.75	1.80	1.90	1.70	2.50
23	3.25	10.10	3.40	2.80	2.25	2.10	2.75	1.75	2.10	1.80	1.70	2.40
24	2.45	7.60	3.20	2.78	2.20	2.10	2.80	1.75	2.05	1.75	1.70	2.30
25	2.30	4.25	3.00	2.75	2.20	2.10	2.75	1.75	2.00	1.75	1.70	2.25
26	2.20	3.60	2.95	2.75	2.50	2.05	2.60	1.70	2.00	1.80	2.50	2.25
27	2.15	3.05	2.85	2.75	2.30	2.05	2.70	1.70	1.95	1.80	3.00	2.20
28	2.00	2.90	2.80	2.75	2.25	2.00	2.60	1.70	1.90	1.80	2.50	2.20
29	1.85	.....	2.82	2.80	2.20	2.00	2.50	1.70	1.80	1.80	2.25	2.15
30	2.50	.....	2.85	3.90	2.20	2.00	2.35	1.70	1.70	1.75	2.20	2.15
31	2.35	.....	2.85	.....	2.15	.....	2.15	1.70	.....	1.70	.....	2.00

ROCKHILL STATION ON CATAWBA RIVER.

This station, described in the Eighteen Annual Report, Part IV, page 61, is located at the bridge of the Southern Railway 3 miles south of Fort Mill, South Carolina. The gage is fastened to the upper side of the guard rail, the 2-foot mark of the rod being about the center of the second vertical of the second truss from the south end of the bridge. The distance from the zero of the rod to the outside edge of the pulley wheel is 1.30 feet, and the length of wire rope to the end of the weight is 52.96 feet. The observer is W. A. Morris, Rockhill, South Carolina. This station is reached from Rockhill by team. The bridge is high and long; the bed of the stream is on solid rock and is very rough. The current is at an angle with the bridge, and is swift, so that altogether the section is very poor. The following discharge measurements were made by E. W. Myers and others during 1897:

February 9, gage height, 5.00 feet; discharge, 9,711 second-feet.
April 6, gage height, 12.10 feet; discharge, 46,040 second-feet.
August 15, gage height, 1.55 feet; discharge, 2,006 second-feet.
October 8, gage height, 1.21 feet; discharge, 1,532 second-feet.
November 1, gage height, 1.45 feet; discharge, 2,619 second-feet.

Daily gage height, in feet, of Catawba River at Rockhill, South Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.80	1.85	2.60	2.50	2.70	2.00	1.70	1.45	1.40	1.20	1.40	1.85
2	1.75	2.70	2.50	2.40	2.90	1.90	1.60	1.45	1.40	1.20	1.50	1.60
3	1.70	3.30	2.40	2.40	4.40	1.90	1.50	1.50	1.40	1.20	1.55	1.70
4	1.70	3.30	2.30	2.60	3.20	1.80	1.50	1.60	1.40	1.20	1.95	1.80
5	1.70	2.70	2.30	10.30	2.70	2.60	1.60	1.60	1.40	1.20	1.70	1.85
6	1.70	8.50	2.30	13.30	2.50	2.40	1.80	1.90	1.30	1.20	1.60	1.90
7	1.90	14.75	7.70	7.00	2.40	2.20	1.60	2.20	1.30	1.20	1.50	1.80
8	1.80	10.20	7.60	4.00	2.30	4.30	2.30	2.45	1.30	1.20	1.50	1.70
9	1.80	5.00	4.50	3.50	2.30	3.60	2.30	2.10	1.30	1.20	1.50	1.70
10	1.70	3.60	4.80	3.30	2.20	3.00	2.20	1.90	1.30	1.20	1.50	1.60
11	1.70	3.20	5.70	3.50	2.20	2.70	2.00	4.70	1.25	1.30	1.50	1.60
12	1.70	3.50	5.30	3.00	2.20	2.30	1.80	2.50	1.20	1.65	1.45	1.60
13	1.70	3.70	5.60	2.90	2.40	2.30	2.40	1.80	1.20	4.80	1.40	1.60
14	1.70	3.50	6.40	2.80	4.20	2.00	2.30	1.65	1.20	2.90	1.40	1.55
15	1.70	3.20	7.10	2.70	2.90	2.00	2.10	1.60	1.20	2.00	1.40	1.60
16	1.80	3.00	5.10	2.80	2.45	2.00	1.70	1.90	1.20	1.65	1.40	1.70
17	1.80	2.90	5.00	2.80	2.25	1.90	1.55	1.70	1.20	1.50	1.40	1.90
18	1.90	2.70	4.50	2.60	2.20	2.00	1.70	1.60	1.20	1.45	1.40	1.75
19	1.90	2.50	3.70	2.50	2.20	2.00	1.60	1.70	1.20	1.40	1.40	1.70
20	2.00	2.50	4.20	2.45	2.10	1.90	2.00	1.60	1.20	1.45	1.40	1.65
21	3.60	3.30	4.10	2.40	2.20	2.20	2.35	1.50	1.50	1.50	1.40	1.70
22	3.70	3.00	3.60	2.35	2.00	1.90	5.25	1.60	1.30	2.30	1.40	1.90
23	3.10	3.00	3.20	2.30	2.00	1.70	2.60	1.60	1.25	1.80	1.40	2.00
24	2.50	7.80	3.00	2.30	2.00	1.65	2.00	1.80	1.25	1.60	1.40	2.00
25	2.30	4.80	2.90	2.30	2.10	1.60	1.70	2.00	1.50	1.50	1.40	1.90
26	2.10	3.50	2.70	2.20	2.10	1.90	1.60	1.70	1.60	1.50	1.40	1.85
27	2.00	3.10	2.60	2.30	2.00	1.70	2.30	1.60	1.40	1.50	2.40	2.10
28	2.00	2.70	2.50	2.40	1.90	1.70	2.00	1.50	1.35	1.45	2.70	2.20
29	1.90	.....	2.50	2.20	1.90	1.70	1.80	1.50	1.30	1.45	2.15	2.10
30	1.70	.....	2.40	2.20	2.00	1.70	1.60	1.45	1.30	1.45	2.10	1.90
31	1.70	.....	2.55	.....	1.90	.....	1.50	1.45	.....	1.40	.....	1.80

GAFFNEY STATION ON BROAD RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 65, is at the Southern Railway bridge about 3 miles from Gaffney, South Carolina. The zero of the gage is 18 feet east of the west end of the third span of the bridge from the east. The distance from the zero of the gage to the rim of the pulley is 2.5 feet, and that from the end of the weight to the pointer on the wire is 50.71 feet. The river here is straight for several hundred yards above and below the bridge, but the section is not a good one, as the right bank is subject to overflow in very high water. This station is reached from Blacksburg, South Carolina. The readings of river heights are made at the railroad bridge, where the section is poor. Measurements of discharge are made from the ferryboat located one-fourth mile above. There the section is very good. The bottom is sandy, but the current is sluggish at the left bank. The observer is J. M. Gaffney. The following discharge measurements were made by E. W. Myers and others during 1897:

March 9, gage height, 2.85; discharge, 4,364 second-feet.
April 7, gage height, 3.49 feet; discharge, 5,324 second-feet.
August 6, gage height, 1.65 feet; discharge, 1,297 second-feet.
October 9, gage height, 0.92 foot; discharge, 829 second-feet.
October 31, gage height, 1.38 feet; discharge, 861 second-feet.

Daily gage height, in feet, of Broad River at Gaffney, South Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.84	1.25	1.19	2.25	3.24	3.09	3.13	1.89	1.79	0.95	1.03	2.43
2	.89	2.12	1.87	2.09	4.32	3.05	3.11	1.79	1.74	.92	1.69	2.44
3	.87	2.59	1.88	2.07	4.01	3.31	3.05	2.25	1.33	1.08	1.85	2.46
4	.88	2.12	1.94	2.11	3.69	3.33	3.17	2.32	1.31	.92	1.25	2.52
5	.87	1.82	1.95	8.97	3.55	3.26	3.46	2.19	1.25	1.03	1.21	1.93
6	.93	8.69	3.87	5.95	3.27	3.45	3.21	2.25	1.23	1.05	1.19	1.92
7	.94	7.48	6.00	3.85	3.29	3.51	4.09	2.32	1.21	.89	1.25	1.42
8	.91	4.05	3.32	3.29	3.28	5.45	3.68	2.75	1.03	1.02	1.08	1.23
9	.87	3.19	2.87	3.09	3.64	3.29	4.01	2.22	1.01	.92	1.06	1.46
10	.91	2.82	3.39	3.25	3.61	3.09	3.64	2.09	1.12	.79	1.04	1.31
11	.87	2.55	3.69	2.81	3.71	3.03	3.37	2.07	1.02	.81	1.03	1.21
12	.96	2.75	3.94	2.54	3.60	3.09	3.01	2.19	.95	4.19	1.01	1.35
13	.92	2.97	4.65	2.49	3.69	3.14	4.07	2.08	.80	2.91	1.02	1.19
14	.87	2.69	4.52	2.31	3.80	3.29	3.28	1.82	1.00	1.59	1.11	1.21
15	.89	2.45	4.81	2.39	3.55	2.89	3.11	1.91	.89	1.39	1.13	1.59
16	.85	2.28	3.64	2.54	3.73	2.81	3.09	1.99	.82	1.18	1.25	1.35
17	.86	2.24	3.77	2.31	3.39	2.65	3.02	2.01	.92	1.29	1.41	1.25
18	.92	2.11	3.11	2.28	3.09	3.05	3.11	1.69	.96	1.31	1.31	1.38
19	1.15	1.99	2.81	2.05	3.19	3.41	3.05	1.55	.95	1.28	1.28	1.36
20	1.09	1.92	3.81	2.07	3.39	3.61	2.08	1.57	.89	1.25	1.32	1.41
21	2.05	2.27	3.22	2.02	3.24	3.59	2.49	1.41	1.19	1.52	1.01	1.38
22	2.32	2.11	2.85	1.98	3.33	3.42	3.54	1.51	.92	1.41	.98	1.42
23	1.79	2.24	2.62	1.97	3.20	3.28	2.29	1.59	1.39	1.15	1.02	1.68
24	1.58	3.73	2.52	2.14	3.09	3.19	2.08	2.39	1.30	1.25	1.29	1.79
25	1.62	2.67	2.39	2.98	3.25	3.11	2.21	1.61	1.09	1.23	1.41	1.59
26	1.47	2.33	2.29	2.92	3.35	3.02	2.04	1.38	1.02	1.22	1.35	1.87
27	1.39	2.16	2.21	3.02	3.11	3.04	2.29	1.85	.85	1.24	2.51	2.01
28	1.35	2.08	2.16	2.97	3.18	3.42	2.34	1.81	1.25	1.22	2.41	2.09
29	1.25	.....	2.09	2.91	3.21	3.43	2.05	1.82	1.08	1.21	2.39	1.62
30	1.36	.....	1.89	3.17	3.13	3.11	2.01	1.42	1.02	1.23	2.45	1.58
31	1.52	.....	2.13	.....	3.21	.....	2.02	1.81	.....	1.05	.....	1.51

ALSTON STATION ON BROAD RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 67, is located at the Southern Railway bridge, about 200 yards from Alston, South Carolina. The zero of the gage is over the center of the fourth floor beam of the second span from the east end of the bridge. The outer rim of the pulley is 4 feet from the zero of the gage, and the distance from the end of the weight to the pointer on the wire is 42.65 feet, the gage reading zero when the end of the weight touches bottom. The section here is not a very good one, being broken by the foundations of an old bridge crossing at the same place as the present one, and the bottom is soft and muddy. The river is straight for a long distance above and below the station, and the current velocity is fairly uniform all the way across. The observer is D. R. Elkin, Alston, South Carolina. The following discharge measurements were made by E. W. Myers and A. P. Davis during 1897:

August 17, gage height, 2.76 feet; discharge, 2,515 second-feet.
November 2, gage height, 2.90 feet; discharge, 2,729 second-feet.

Daily gage height, in feet, of Broad River at Alston, South Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.01	3.10	4.62	7.00	4.70	3.45	3.71	2.84	2.51	3.55	2.47	3.86
2	3.05	6.50	4.18	6.48	5.61	3.40	3.33	2.60	5.76	2.43	2.97	3.57
3	3.04	7.12	4.20	6.90	6.27	3.50	3.10	2.54	3.64	2.42	3.88	3.56
4	3.01	8.91	4.10	7.70	5.40	3.40	3.05	3.42	3.25	2.23	4.10	3.55
5	2.93	10.00	3.96	14.39	4.45	3.42	4.75	3.03	2.91	2.13	3.35	3.62
6	3.09	17.03	5.66	18.82	4.32	6.70	4.15	3.31	2.62	2.40	2.91	3.76
7	3.11	21.97	12.10	14.40	4.10	7.27	3.92	4.56	2.35	2.53	3.15	3.68
8	3.00	19.03	8.72	10.66	3.90	14.20	3.75	5.20	2.53	2.34	3.00	3.62
9	3.00	12.00	6.75	9.50	3.95	13.64	3.59	3.20	2.51	2.50	2.80	3.80
10	2.89	7.00	5.80	6.83	3.98	9.71	3.95	3.35	2.61	2.43	3.11	3.45
11	2.75	5.50	7.50	6.12	4.10	9.03	3.64	3.11	2.60	2.65	3.00	3.16
12	2.80	9.75	7.10	5.63	3.85	4.50	3.70	3.28	2.45	5.72	2.90	3.15
13	2.97	9.10	11.04	5.43	3.65	4.00	3.70	3.15	2.31	8.93	2.91	3.10
14	3.10	8.50	13.00	5.23	5.44	4.15	3.45	2.98	2.10	7.14	2.90	3.00
15	3.14	5.60	14.40	5.10	4.68	3.90	3.31	4.10	2.37	4.78	2.86	3.45
16	3.00	7.25	11.40	5.10	4.00	3.74	3.30	3.89	2.00	3.50	2.70	3.45
17	3.01	6.23	9.70	4.90	4.03	3.45	3.08	2.89	2.21	3.34	2.78	3.50
18	3.05	5.02	9.00	4.65	3.63	3.42	3.76	2.96	2.24	2.70	2.76	3.30
19	3.76	4.03	7.02	4.47	3.60	3.31	3.15	3.01	2.31	2.60	2.71	3.07
20	3.55	4.50	7.80	4.31	3.51	3.00	5.10	2.85	2.21	3.10	2.86	3.07
21	8.65	5.75	7.85	4.35	3.50	3.21	7.40	2.71	2.40	3.70	2.83	3.00
22	9.52	5.50	6.81	4.20	3.42	3.30	5.71	8.20	3.10	3.47	2.82	3.50
23	6.65	6.70	6.15	4.30	3.51	3.51	4.82	5.04	3.41	3.31	2.79	4.08
24	5.63	6.23	5.96	4.00	3.98	3.73	3.80	3.35	3.83	3.30	2.75	3.85
25	5.03	7.10	5.32	4.01	3.65	4.40	3.61	3.26	3.80	3.00	3.00	3.60
26	4.00	5.70	5.00	4.05	3.41	3.50	3.06	3.11	3.16	2.77	3.21	3.30
27	3.75	5.30	4.81	3.92	3.40	3.55	3.90	3.00	2.98	3.03	3.05	4.50
28	3.55	4.55	4.52	4.17	3.30	5.81	4.01	3.10	2.55	2.90	4.20	4.76
29	3.31	.....	4.23	3.89	3.21	3.70	3.65	2.85	2.58	2.77	5.56	4.12
30	3.02	.....	4.40	3.85	3.28	3.91	3.15	2.73	2.71	2.91	5.12	3.90
31	3.20	.....	4.90	.....	3.30	.....	2.95	2.30	.....	2.50	.....	3.74

WATERLOO STATION ON SALUDA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 68, is 1 mile below the mouth of Reedy River, at the Port Royal and Western Carolina Railroad bridge, about 3 miles from Coronaca station, South Carolina. The zero of the gage is over the center of the sixth floor beam of the first span from the east end of the bridge. The distance from the zero of the gage to the outer rim of the pulley is 2.75 feet, and that from the end of the weight to the pointer on the wire is 47.0 feet. The river here is straight for several hundred yards above and below the bridge. The bottom is of sand and mud and seemingly liable to change by high water, and the right bank is subject to overflow. The observer is R. N. Cunningham, Waterloo, South Carolina. The locality is reached from Greenwood, South Carolina. The channel is broken by one pier and the bottom is muddy, but with these exceptions the section is excellent. Discharge measurements are made from the railroad bridge. The following discharge measurements were made, the first by E. W. Myers and the next by A. P. Davis, during 1897:

August 17, gage height, 3.35 feet; discharge, 665 second-feet.
November 2, gage height, 4.31 feet; discharge, 1,242 second-feet.

Daily gage height, in feet, of Saluda River at Waterloo, South Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.35	4.75	4.30	6.25	8.35	3.55	4.75	2.80	3.75	3.30	3.20	4.85
2	4.50	7.35	4.80	6.00	9.30	3.70	4.65	2.68	3.75	4.05	4.50	4.75
3	3.70	7.70	5.25	6.55	6.05	5.70	4.30	3.50	3.50	2.85	5.13	4.25
4	4.00	6.20	5.25	8.00	5.50	4.85	3.70	3.60	4.35	2.30	4.77	4.80
5	4.35	5.35	5.05	12.10	5.30	5.25	6.20	3.50	3.20	3.95	4.60	4.00
6	4.40	15.70	8.30	13.95	5.20	6.57	4.15	4.05	2.50	3.80	4.60	4.40
7	4.35	16.58	10.05	17.00	5.00	5.75	4.20	3.75	3.40	2.64	3.60	4.10
8	4.35	14.30	7.75	8.70	5.20	10.35	4.82	3.35	4.00	3.58	2.85	3.95
9	4.40	7.95	6.20	8.05	5.65	12.25	3.85	3.05	3.55	3.00	4.50	3.95
10	3.55	6.40	5.80	7.80	5.15	6.40	4.85	3.55	3.10	3.45	4.35	4.58
11	3.75	8.90	6.00	7.15	4.60	5.55	4.10	3.85	3.25	3.95	4.35	4.68
12	4.30	9.05	9.30	6.75	4.50	5.25	3.10	4.30	3.18	4.50	4.10	3.60
13	4.40	8.25	10.35	6.25	5.10	5.50	5.70	4.20	2.40	7.30	4.30	3.80
14	4.95	7.25	12.60	6.20	5.00	4.20	3.90	4.25	4.00	5.15	4.00	4.75
15	5.85	5.50	12.40	5.70	5.35	4.00	3.75	3.15	3.90	4.85	2.85	4.65
16	4.60	6.35	9.50	6.00	5.60	7.35	3.75	2.55	3.17	4.55	4.15	4.50
17	3.95	6.00	8.35	5.80	4.40	4.15	5.00	4.15	2.90	3.40	4.35	4.75
18	4.65	5.65	7.55	6.25	4.25	4.90	3.90	4.25	2.72	2.50	4.30	4.70
19	4.95	5.60	6.80	5.70	4.15	4.85	3.70	3.75	3.10	3.75	4.15	3.65
20	5.10	5.35	8.40	5.40	4.45	5.00	4.00	4.40	2.40	4.40	3.95	3.40
21	10.80	6.15	8.10	5.15	4.90	3.50	3.70	6.10	3.45	4.55	3.95	4.00
22	8.55	5.80	7.00	5.10	4.85	3.75	3.90	5.35	3.35	4.50	2.70	4.20
23	5.70	7.45	6.45	5.07	5.20	4.10	4.05	3.20	4.75	4.45	3.85	4.90
24	5.60	6.50	6.15	5.40	3.55	4.10	4.05	4.40	4.90	3.55	4.28	3.95
25	4.80	6.55	6.00	6.35	4.00	4.10	4.15	3.35	4.52	3.40	4.20	3.45
26	4.40	6.00	5.60	4.90	4.85	4.15	3.30	4.20	3.58	4.50	4.12	3.65
27	4.35	5.60	9.55	4.80	3.95	3.20	4.00	4.35	2.75	4.20	5.76	3.55
28	3.95	6.70	6.35	4.75	4.80	3.30	3.65	3.50	3.78	3.80	5.75	4.85
29	4.05	.....	5.00	4.65	3.85	4.30	3.60	3.15	3.80	3.95	5.05	4.75
30	4.50	.....	5.10	4.85	5.10	3.75	4.60	2.50	3.55	3.50	5.25	4.65
31	4.20	.....	5.70	.....	3.25	.....	5.00	3.50	.....	3.25	.....	4.77

CALHOUN FALLS STATION ON SAVANNAH RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 73, is at the Seaboard Air Line bridge across the Savannah River above the mouth of Beaverdam Creek and below Rocky River, and about 3 miles west of the town of Calhoun Falls, South Carolina. The river here is divided into two channels by a large island, containing several hundred acres. The east channel is a good section at ordinary stages, but at lowest water the current is very sluggish. The west channel, which is the main river, is obstructed by some very small islands and old cofferdams about the two piers; otherwise the section is excellent. Peter Pfeiffer, a farmer, is the observer.

The wire gage is on the west channel, center span. The rod is 14 feet long, and is nailed to guard rail on east side of pulley on downstream side of bridge. The center of the 3-inch pulley is 193 feet from the initial point, and is 55.20 feet gage height. Zero point on the rod is 10 feet from the center of the pulley. The wire cable from bottom of weight to the index is 65.40 feet. One bench mark on the top of the iron stringer under the cross-ties near the gage is 54.0 feet above the datum of the gage. The other is on the top of the east end of the pier, west channel, and is 30.85 feet above zero of gage. The following discharge measurements were made by B. M. Hall and Max Hall during 1897:

January 20, gage height, 2.90 feet; discharge, 4,204 second-feet.
April 28, gage height, 3.21 feet; discharge, 6,446 second-feet.
June 12, gage height, 2.80 feet; discharge, 4,469 second-feet.
September 29, gage height, 1.90 feet; discharge, 1,693 second-feet.
November 3, gage height, 2.92 feet; discharge, 3,812 second-feet.

Daily gage height, in feet, of Savannah River at Calhoun Falls, South Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.50	2.80	3.00	5.40	3.80	2.20	2.80	2.50	2.20	1.80	2.55	2.80
2	2.40	5.20	2.95	6.90	5.65	2.15	2.65	2.40	2.40	1.80	3.40	2.70
3	2.40	4.00	2.80	5.20	4.30	3.05	2.55	2.35	2.30	1.85	3.05	2.85
4	2.40	3.60	2.80	4.75	3.95	4.40	2.40	2.25	2.25	1.85	2.70	3.00
5	2.35	3.25	2.75	11.65	3.85	4.10	2.30	2.10	2.05	1.80	2.55	2.90
6	2.35	6.00	2.65	13.35	3.80	3.10	3.05	2.65	2.00	1.75	2.45	2.75
7	2.30	8.55	6.80	8.15	3.70	2.95	2.50	2.95	1.95	1.75	2.35	2.70
8	2.25	7.20	4.65	4.95	3.65	3.05	2.40	2.90	1.95	1.70	2.25	2.60
9	2.25	5.05	4.20	4.05	3.40	3.25	2.65	2.70	1.90	1.65	2.20	2.55
10	2.25	4.10	4.00	4.00	3.25	3.05	2.45	2.60	1.85	1.75	2.20	2.55
11	2.20	3.85	4.40	4.15	3.15	2.95	2.50	2.40	1.80	2.25	2.15	2.50
12	2.20	5.15	5.50	4.10	3.05	2.80	2.55	2.30	1.80	2.65	2.10	2.40
13	2.30	4.40	7.75	4.00	3.00	3.00	3.25	2.25	1.85	2.40	2.10	2.35
14	3.05	4.10	7.25	3.95	3.05	2.85	2.65	2.20	1.80	2.25	2.05	2.95
15	2.75	4.00	6.00	3.95	3.10	2.80	2.55	2.15	1.80	2.20	2.00	2.80
16	2.60	4.05	5.20	3.85	3.15	3.00	2.45	2.20	1.75	2.15	2.00	2.70
17	2.55	3.95	4.15	3.80	3.10	3.05	2.50	2.25	1.75	2.10	2.05	2.65
18	3.35	3.80	3.85	3.75	3.05	2.95	3.90	2.20	1.70	2.15	2.00	2.55
19	3.10	3.65	3.50	3.65	3.00	2.85	3.30	2.30	1.70	2.40	2.00	2.50
20	2.90	3.70	4.00	3.50	2.95	2.80	3.10	2.25	1.75	3.05	1.95	2.45
21	5.40	3.50	5.35	3.40	2.90	2.70	4.05	2.20	1.75	2.60	1.95	2.50
22	3.95	3.35	4.40	3.35	2.90	2.65	3.45	2.70	1.85	2.40	1.90	2.65
23	3.60	4.05	4.10	3.30	2.85	2.55	3.00	2.60	2.75	2.35	1.90	2.60
24	3.20	3.80	4.00	3.25	2.75	2.55	2.75	2.40	2.25	2.30	1.85	2.55
25	3.10	4.00	3.90	3.25	2.70	2.45	2.65	2.30	2.05	2.25	1.85	2.50
26	3.00	3.90	3.65	3.30	2.60	2.50	2.95	2.25	2.00	2.30	2.00	2.50
27	2.95	3.45	3.05	3.25	2.55	2.40	3.50	2.20	2.00	2.25	3.25	2.40
28	2.95	3.20	3.40	3.20	2.40	2.30	3.00	2.15	1.95	2.20	3.05	2.40
29	2.90	.....	3.25	3.25	2.35	3.50	2.90	2.10	1.90	2.20	2.95	2.35
30	2.90	.....	3.25	3.40	2.25	2.95	2.70	2.00	1.85	2.15	2.85	2.35
31	2.75	.....	3.30	.....	2.20	.....	2.55	2.05	.....	2.10	.....	2.30

CARLTON STATION ON BROAD RIVER.

This station is located on the railroad bridge of the Seaboard Air Line, 3 miles east of Carlton, Georgia, and 3 miles above the mouth of South Fork. The iron bridge is 250 feet long and is approached on each side by wood trestles. The banks are both liable to overflow to the extent of the trestles. The initial point for sounding is the end of iron bridge at right bank, upstream. The rod of the wire gage is fastened to outside of guard rail on the upstream side of bridge. Its zero is 37.0 feet from initial point and 4.0 feet from center of pulley. Bench mark is top of upstream iron girder under cross-ties at 30 feet from initial point and is 51.0 feet above datum. Center of pulley is 52.20 feet above datum. Length of wire from index to bottom of weight is 56.30 feet. The observer is S. P. Power, jr.

The following discharge measurements were made during 1897 by Max Hall and others:

May 27, gage height, 2.10 feet; discharge, 596 second-feet.
June 22, gage height, 1.92 feet; discharge, 580 second-feet.
July 28, gage height, 2.24 feet; discharge, 920 second-feet.
August 17, gage height, 2.25 feet; discharge, 865 second-feet.
September 27, gage height, 1.60 feet; discharge, 358 second-feet.
October 29, gage height, 1.67 feet; discharge, 407 second-feet.
November 10, gage height, 1.70 feet; discharge, 395 second-feet.
December 10, gage height, 2.00 feet; discharge, 615 second-feet.

September 28, a measurement of Broad River, below mouth of South Fork, from a boat, gave a discharge of 472 second-feet. On same date a measurement of South Fork, just above mouth, gave a discharge of 150 second-feet.

Daily gage height, in feet, of Broad River at Carlton, Georgia, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1....	1.85	1.85	1.70	1.50	1.65	2.20	17.....	1.85	3.30	1.50	1.60	1.70	2.00
2....	1.85	1.85	2.00	1.50	2.40	2.10	18.....	3.60	2.00	1.50	1.80	1.70	2.00
3....	1.80	1.80	2.30	1.50	2.25	2.20	19.....	4.90	1.90	1.50	2.00	1.65	2.05
4....	1.80	1.80	1.85	1.50	1.95	2.70	20.....	6.30	2.00	1.50	2.40	1.65	2.10
5....	2.00	1.80	1.80	1.50	1.80	2.55	21.....	5.30	1.95	1.50	2.20	1.70	2.10
6....	2.00	1.75	1.70	1.50	1.80	2.50	22.....	3.85	2.15	1.50	2.10	1.70	2.15
7....	1.90	2.60	1.60	1.50	1.80	2.30	23.....	2.90	2.60	1.70	1.80	1.70	2.40
8....	2.10	2.20	1.55	1.50	1.75	2.10	24.....	2.30	1.95	1.70	1.80	1.70	2.20
9....	2.35	2.00	1.55	1.50	1.75	2.05	25.....	2.15	1.85	1.65	1.70	1.70	2.10
10....	2.05	2.00	1.55	1.50	1.70	2.00	26.....	2.25	1.80	1.65	1.65	1.70	2.30
11....	2.55	1.95	1.55	1.60	1.70	1.95	27.....	2.15	1.75	1.60	1.70	3.15	2.65
12....	2.35	1.90	1.55	2.45	1.70	1.95	28.....	2.30	1.75	1.60	1.65	2.75	2.30
13....	1.95	1.85	1.50	2.50	1.70	1.90	29.....	2.10	1.70	1.55	1.65	2.30	2.15
14....	1.85	1.80	1.50	2.05	1.70	2.10	30.....	1.95	1.70	1.50	1.65	2.70	2.10
15....	1.80	1.80	1.50	1.85	1.70	2.30	31.....	1.90	1.65	.....	1.65	.....	2.10
16....	1.75	4.55	1.50	1.70	1.70	2.10							

October 18–25, no readings taken; gage broken; gage heights estimated.

CAREY STATION ON OCONEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 78, is located at an iron girder deck bridge on the Georgia Railway at the station of Carey, 6 miles west of Greensboro, Georgia. It is just below the junction of the Appalachee and Oconee rivers. The observer is J. L. Carey, a farmer. The length of the wire of the gage from index to end of weight is 46.95 feet. The rod, 14 feet in length is nailed to the guard rail of the bridge on the downstream side. Its zero point is 24.8 feet from the initial point, which is the downstream end of the pier near the left bank at the end of the big iron girder. The top of the cord or iron girder 20 feet from the initial point on downstream side of bridge is 41.13 feet above datum of gage heights. Both banks are low and liable to overflow under the trestles to the end of embankments. The bed of the stream is rocky and not easily changed. The current is good. The following measurements were made by B. M. Hall and Max Hall during 1897:

January 18, gage height, 4.95 feet; discharge, 3,318 second-feet.
March 18, gage height, 5.15 feet; discharge, 4,257 second-feet.
April 29, gage height, 2.40 feet; discharge, 1,992 second-feet.
May 28, gage height, 2.10 feet; discharge, 1,047 second-feet.
June 9, gage height, 2.50 feet; discharge, 1,885 second-feet.
July 30, gage height, 1.80 feet; discharge, 1,103 second-feet.
October 4, gage height, 1.08 feet; discharge, 381 second-feet.
November 11, gage height, 1.92 feet; discharge, 678 second-feet.
December 14, gage height, 2.30 feet; discharge, 1,117 second-feet.

Daily gage height, in feet, of Oconee River at Carey, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.10	2.50	3.20	3.30	4.00	2.10	1.60	1.60	1.50	.....	2.00	2.70
2	1.90	3.80	3.20	4.90	3.80	2.10	1.50	1.50	1.20	1.50	2.20	2.40
3	2.10	3.70	3.10	6.10	3.30	2.10	1.10	1.50	1.20	1.40	2.40	2.20
4	2.00	3.60	3.90	5.60	2.80	2.20	1.10	1.50	1.40	1.10	2.00	2.60
5	2.10	3.30	3.00	8.80	2.60	2.20	1.50	1.40	1.30	1.20	1.90	2.80
6	2.00	4.60	2.90	14.40	2.50	2.30	2.70	1.90	1.20	1.40	1.80	2.70
7	2.10	5.00	6.40	12.40	2.30	2.20	2.60	2.40	.80	1.30	1.80	2.50
8	2.10	4.60	7.80	7.30	2.30	2.20	2.20	2.40	.50	1.20	1.80	2.50
9	1.80	3.80	6.80	5.40	2.30	2.50	1.60	2.20	.30	1.30	1.80	2.40
10	1.90	3.30	4.40	5.50	2.30	2.30	1.80	2.10	.30	2.90	1.90	2.30
11	2.00	3.10	4.00	4.50	2.20	2.20	1.80	2.00	.20	2.80	1.70	2.30
12	1.90	5.90	4.20	4.00	2.30	2.00	2.20	1.70	.20	2.70	1.80	2.10
13	2.00	6.60	7.70	3.50	2.30	1.80	1.70	1.50	.10	2.60	1.80	2.00
14	2.70	5.30	10.40	3.50	2.40	1.70	1.60	1.40	.30	2.30	1.70	2.30
15	4.30	4.40	12.20	3.30	2.30	1.70	1.10	1.20	.40	1.90	1.70	2.50
16	4.20	4.00	11.60	3.30	2.30	1.60	.70	1.10	.70	1.90	1.70	2.40
17	3.40	4.20	8.60	3.30	2.30	1.60	.70	2.90	1.50	1.80	1.80	2.30
18	4.50	3.60	5.50	3.00	2.20	1.60	1.80	3.10	1.40	1.60	1.90	2.10
19	4.80	3.30	4.20	2.90	2.20	1.80	3.70	3.20	1.80	1.90	1.60	2.00
20	4.00	3.00	5.30	2.80	2.20	2.40	5.60	4.10	1.50	2.10	1.80	2.00
21	6.00	3.80	5.50	2.70	2.00	2.10	5.60	3.00	1.40	2.10	1.80	2.20
22	7.80	4.00	4.60	2.70	1.90	2.00	5.80	3.70	1.40	2.00	1.80	2.30
23	6.80	3.80	4.60	2.60	2.00	1.70	5.10	2.80	1.90	2.00	1.90	2.40
24	4.30	4.70	4.70	2.60	2.20	1.50	3.10	2.60	1.80	2.10	1.80	2.40
25	3.30	5.30	4.20	2.70	2.10	2.20	2.40	2.10	1.80	2.00	1.80	2.40
26	3.10	5.20	3.70	2.50	2.10	2.00	2.40	1.80	1.70	2.00	1.70	2.40
27	2.80	4.20	3.20	2.50	2.10	1.80	2.60	1.70	1.70	1.80	2.80	2.50
28	2.80	3.50	3.20	2.50	2.00	1.60	2.30	1.60	1.70	1.80	3.50	2.60
29	2.60	.....	3.00	2.50	2.10	1.50	2.30	1.40	1.70	1.60	2.70	2.30
30	2.40	.....	3.00	2.90	2.10	1.60	1.80	1.40	1.70	1.60	2.70	2.40
31	2.50	.....	3.40	.....	2.20	.....	1.60	1.20	.....	1.80	.....	2.30

DUBLIN STATION ON OCONEE RIVER.

This station is located one-half mile east of Dublin, Georgia. The gage is vertical and is fastened to the lower side of the middle pier of the railroad bridge. Observations are taken under the direction of the Weather Bureau. The section is very good, although broken by three piers and some drift. The bed of the river is soft. The channel is straight for some distance above and below the section. The initial point for soundings is the end of iron bridge on right bank of river. The following discharge measurements were made in 1897 by B. M. Hall and P. A. Dallis:

May 5, gage height, 6.10 feet; discharge, 6,400 second-feet.
June 7, gage height, 1.90 feet; discharge, 2,861 second-feet.
June 8, gage height, 1.77 feet; discharge, 2,680 second-feet.
June 9, gage height, 1.50 feet; discharge, 2,488 second-feet.
June 10, gage height, 1.43 feet; discharge, 2,488 second-feet.
November 7, gage height, 0.40 foot; discharge, 1,644 second-feet.

Daily gage height, in feet, of Oconee River at Dublin, Georgia, from January to April, 1897.

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1	2.1	2.7	12.8	8.1	17	4.8	16.0	22.7	7.2
2	2.1	3.2	13.5	10.8	18	5.0	14.6	21.4	6.8
3	2.1	5.4	13.3	12.0	19	4.6	13.1	20.0	6.4
4	2.0	6.2	9.5	14.0	20	5.2	11.7	18.0	6.6
5	2.0	6.2	7.5	15.5	21	6.0	10.2	16.0	6.4
6	1.9	6.9	7.0	15.6	22	6.0	9.2	14.7	5.0
7	1.9	8.0	7.2	15.0	23	7.2	7.6	15.5	4.5
8	1.8	8.7	8.1	14.8	24	7.8	7.5	16.2	4.4
9	1.8	9.2	8.8	16.0	25	8.4	7.8	17.0	4.3
10	1.8	9.8	9.6	16.7	26	8.4	9.9	17.7	4.1
11	1.8	9.7	10.0	16.1	27	6.4	10.5	17.0	4.0
12	1.7	10.8	10.8	14.8	28	5.2	12.0	15.5	4.0
13	1.5	11.6	11.0	13.5	29	3.8	.....	13.4	3.9
14	1.5	13.0	13.0	12.1	30	3.0	.....	10.8	4.2
15	1.5	14.3	15.5	9.9	31	2.8	.....	8.5	.....
16	1.6	16.1	20.5	8.0					

ALMON STATION ON YELLOW RIVER.

This station is located one-quarter mile east of Almon, Georgia, and 3 miles west of Covington, Georgia. It is at the low wagon bridge crossing the stream 600 feet below the Georgia Railroad bridge. The observer is A. A. Almond. The following are the discharge measurements, made by B. M. Hall and Max Hall in 1897:

September 19, 1896, gage height, 0.75 foot; discharge, 62 second-feet.
March 27, 1897, gage height, 3.90 feet; discharge, 876 second-feet.
June 21, gage height, 2.50 feet; discharge, 287 second-feet.
September 7, gage height, 1.53 feet; discharge, 123 second-feet.
December 8, gage height, 2.10 feet; discharge, 227 second-feet.

Daily gage height, in feet, of Yellow River at Almon, Georgia, from September to December, 1897.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	1.20	1.60	2.20	17	1.25	1.50	1.68	2.00
2	.....	1.10	1.65	2.80	18	1.30	1.60	1.69	2.08
3	.....	1.15	1.98	2.70	19	1.30	1.70	1.65	1.98
4	.....	1.20	1.90	2.20	20	1.22	1.80	1.64	2.00
5	.....	1.10	1.88	2.80	21	1.20	1.70	1.68	2.08
6	.....	1.15	1.70	2.90	22	1.20	1.68	1.67	2.09
7	.....	1.10	1.50	2.10	23	1.28	1.66	1.66	2.20
8	.....	1.10	1.60	2.08	24	1.35	1.60	1.70	2.18
9	.....	1.15	1.75	2.06	25	1.25	1.58	1.68	2.10
10	.....	1.20	1.70	2.00	26	1.30	1.50	1.70	2.18
11	.....	1.35	1.68	.....	27	1.35	1.40	1.70	2.10
12	1.40	1.90	1.66	1.98	28	1.30	1.40	1.76	2.00
13	1.30	1.98	1.64	1.95	29	1.28	1.45	1.80	1.98
14	1.42	1.90	1.64	1.89	30	1.24	1.50	2.00	2.00
15	1.40	1.80	1.64	1.86	31	.....	1.50	.....	2.04
16	1.30	1.52	1.64	1.90					

MACON STATION ON OCMULGEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 79, is at Macon, Georgia. The wire gage on the Macon, Dublin and Savannah Railroad bridge having been twice stolen in the spring of 1897, observations were taken on the Weather Bureau gage referred to the same datum, which is a vertical rod bolted to stone pier of the Georgia Railroad bridge. The observer is W. T. Bass. A bench mark on the top and upper end of the triangular casting at the foot of the seventh tie rod of the first span from the south of the former bridge is 28.84 feet above datum of gage. Measurements of discharge are made from the wagon bridge a short distance above. The velocity of the water is gentle, but not too slow for accurate measurements. The section is broken by one pier. The following measurements were made by B. M. Hall and Max Hall during 1897:

March 15, gage height, 16.75 feet; discharge, 25,535 second-feet.
May 4, gage height, 4.30 feet; discharge, 2,750 second-feet.
May 5, gage height, 3.50 feet; discharge, 2,275 second-feet.
May 18, gage height, 2.10 feet; discharge, 1,592 second-feet.
June 11, gage height, 2.85 feet; discharge, 2,111 second-feet.
June 12, gage height, 1.85 feet; discharge, 1,479 second-feet.
June 29, gage height, 0.90 foot; discharge, 1,005 second-feet.
September 23, gage height, —0.35 foot; discharge, 504 second-feet.
September 23, gage height, —0.35 foot; discharge, 497 second-feet.
November 7, gage height, 0.06 foot; discharge, 735 second-feet.
December 6, gage height, 1.20 feet; discharge, 1,356 second-feet.

Daily gage height, in feet, of Ocmulgee River at Macon, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.68	2.00	4.00	5.57	1.95	1.22	1.08	1.08	1.10	—0.50	—0.12	1.22
2	.63	5.00	3.70	9.75	1.90	1.18	.75	.84	1.25	— .45	+ .35	.70
3	.60	8.00	3.20	10.05	1.87	3.15	.65	.72	.68	— .50	.48	.60
4	.58	6.00	2.00	10.00	2.15	3.20	2.15	.40	.62	— .54	.35	.62
5	.56	6.00	4.00	15.12	2.23	3.12	2.30	.38	.35	— .61	.25	1.48
6	.54	8.00	3.00	15.15	2.47	3.10	3.80	.42	.28	— .68	.12	1.30
7	.52	6.50	11.60	12.60	3.00	3.00	3.12	1.40	.22	— .52	.10	1.12
8	.50	5.00	12.70	10.48	3.00	2.54	1.62	3.22	.12	— .55	.50	1.48
9	.49	4.75	7.50	10.00	2.91	2.32	1.28	1.10	— .07	— .55	.20	.60
10	.49	4.55	5.00	10.80	2.72	2.26	.90	.80	— .03	— .58	.20	.52
11	.51	5.00	4.80	7.80	2.57	2.18	3.10	1.60	— .10	+ .12	.30	.48
12	.49	13.50	6.00	6.40	2.45	2.08	3.33	2.00	— .50	.10	.60	.43
13	.48	12.75	17.30	5.00	3.05	2.04	1.50	1.02	— .20	.12	.30	.41
14	.53	7.00	18.00	4.70	3.15	2.01	.90	.70	— .12	.80	— .20	.90
15	.46	5.00	17.70	4.00	3.28	1.89	.30	.40	— .20	.30	— .10	1.46
16	.44	5.00	13.00	4.00	3.00	1.73	.50	.32	— .18	.10	— .18	1.22
17	.44	5.12	9.45	3.70	2.50	1.52	.22	.20	— .22	— .20	— .10	.40
18	1.15	3.00	8.25	3.50	2.22	1.45	.40	2.60	— .33	— .18	— .20	.58
19	1.50	2.75	8.20	3.20	2.09	1.37	1.48	2.28	1.60	— .20	— .20	.52
20	2.10	2.62	9.57	3.00	1.84	3.25	4.50	8.18	.20	— .02	— .10	.47
21	1.25	2.65	10.00	2.90	1.81	3.12	9.82	8.80	— .12	.00	— .08	.47
22	7.00	2.71	9.00	2.80	1.78	2.80	8.40	8.10	— .14	.20	— .13	.51
23	5.50	2.00	15.50	2.70	1.71	2.62	5.52	6.48	— .35	.18	— .10	.70
24	3.00	1.90	14.00	2.60	1.68	2.70	3.05	4.70	— .28	.10	— .50	.68
25	2.25	6.00	10.60	2.40	1.60	3.00	1.70	2.10	— .30	.05	— .20	1.02
26	2.00	10.50	8.35	2.30	1.56	3.11	1.11	1.40	— .28	.02	— .10	.89
27	3.00	7.02	7.10	2.22	1.53	2.50	1.32	1.08	— .25	— .12	+ .10	.89
28	3.12	5.00	6.40	2.16	1.50	1.00	3.22	.80	— .32	— .16	.25	1.42
29	1.50	.....	5.57	2.08	1.47	.90	2.10	.58	— .35	— .20	3.10	1.08
30	1.25	.....	5.21	2.00	1.36	1.50	1.76	.52	— .42	— .20	1.40	.75
31	1.20	.....	5.20	.....	1.28	.....	1.12	.40	.....	— .20	.....	.65

MOLENA STATION ON FLINT RIVER.

This station is located at the bridge of the Georgia Midland Division of the Southern Railway 2 miles southwest of Molena, Georgia. The wire gage is attached to the stringer of the bridge. The bench mark is the top of the dowstream iron girder under the cross-ties, 90 feet from the end of the bridge on the left side of the river, and its elevation is 30.65 above the gage datum. The channel is straight for some distance above and below the bridge. The right bank is low and liable to overflow, with a long trestle approach to the bridge. The left bank is not so liable to overflow, and on that side the trestle approach is shorter. The current is sluggish. There is one pier in mid-channel, but the section is better at the railroad bridge than at the wagon bridge below. The observer is J. A. Moore. The following measurements were made in 1897 by B. M. Hall and others:

May 21, gage height, 1.50 feet; discharge, 641 second-feet.
June 7, gage height, 1.75 feet; discharge, 707 second-feet.
June 23, gage height, 1.70 feet; discharge, 697 second-feet.
August 25, gage height, 3.30 feet; discharge, 2,843 second-feet.
November 8, gage height, 1.70 feet; discharge, 264 second-feet.
December 7, gage height, 2.10 feet; discharge, 588 second-feet.

At Woodbury, 3 miles below station:

May 21, gage height, 1.50 feet; discharge, 642 second-feet.

Daily gage height, in feet, of Flint River at Molena, Georgia, for 1897.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.40	1.45	1.90	1.15	1.60	2.15
2	.....	1.30	1.25	1.70	1.15	1.65	2.10
3	.....	1.20	1.15	1.40	1.20	1.75	1.95
4	.....	1.35	1.10	1.25	1.20	1.70	1.95
5	.....	2.65	1.05	1.15	1.15	1.70	2.15
6	.....	2.45	1.00	1.10	1.20	1.80	2.15
7	1.75	2.25	1.25	1.05	1.25	1.70	2.10
8	2.00	1.90	1.15	1.05	1.30	1.70	2.05
9	2.00	1.75	1.10	1.00	1.30	1.65	1.95
10	1.75	1.80	1.20	1.05	1.40	1.90	1.90
11	1.30	4.05	1.50	1.00	1.45	1.90	1.90
12	1.15	3.05	1.70	1.05	1.50	1.95	1.90
13	1.50	2.55	1.55	.95	1.50	1.85	1.90
14	1.60	2.05	1.45	1.00	1.75	1.80	2.00
15	1.60	1.50	1.35	1.10	1.70	1.75	2.10
16	2.00	1.35	1.25	1.15	1.70	1.80	2.10
17	1.60	1.25	1.20	1.10	1.60	1.90	2.00
18	1.50	1.20	1.70	1.20	1.50	1.95	2.00
19	1.40	1.15	2.25	1.10	1.35	1.85	1.95
20	1.70	2.25	2.80	1.00	1.50	1.70	1.90
21	2.20	2.80	2.80	1.05	1.50	1.75	1.90
22	2.40	3.55	3.45	1.10	1.45	1.80	2.00
23	1.70	2.55	3.70	1.05	1.50	1.90	2.10
24	2.25	2.15	3.60	1.00	1.50	1.90	2.10
25	1.70	1.80	3.05	1.10	1.45	1.90	2.00
26	1.45	1.55	2.20	1.15	1.45	1.80	2.00
27	1.35	1.65	1.65	1.05	1.40	1.80	2.10
28	1.25	2.25	1.50	1.10	1.45	1.95	2.10
29	1.20	2.10	1.40	1.05	1.50	2.10	2.10
30	1.10	2.05	1.30	1.10	1.70	2.20	2.00
31	.....	1.95	3.00	.....	1.55	.....	2.00

OAKDALE STATION ON CHATTAHOOCHEE RIVER.

This station described in the Eighteenth Annual Report, Part IV, page 85, is located at the Southern Railroad bridge, 1 mile above the mouth of Proctor Creek, at Oakdale, Georgia. The pulley and rod of the wire gage is attached to the lower guard rail on the second panel of the second span from the east. The length of the wire gage is 58.85 feet. The distance from the pulley to the zero of the rod is 2.20 feet. Bench mark 1, a railroad spike in corner of stone pier, toward river, downstream side, is 12.39 feet above datum. Bench mark 2, center of pulley, is 56.36 feet above datum. The observer is J. H. Lowry. The following discharge measurements were made by B. M. Hall and others during 1897:

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec. ft.*		*Feet.*	*Sec. ft.*		*Feet.*	*Sec. ft.*
Apr. 24...	2.90	3,065	June 16 ...	0.94	1,523	Sept. 17 ..	—0.30	778
Apr. 27...	2.70	2,703	June 28 ...	.57	1,306	Oct. 2	— .50	659
May 22...	1.65	2,055	July 20....	12.9	15,617	Nov. 5....	.46	1,194
May 25...	1.50	2,014	Aug. 5.....	.84	1,276	Nov. 24...	— .05	879
May 31...	1.35	1,929	Aug. 27....	.33	1,196	Dec. 6	2.65	2,426
May 31...	1.35	2,003	Sept. 10 ...	— .12	849	Dec. 28 ...	1.70	1,926
June 9 ...	1.44	1,991						

Daily gage height, in feet, of Chattahoochee River at Oakdale, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	0.20	3.10	2.00	2.90	4.10	1.00	0.50	0.85	0.50	—0.50	0.00	1.10
2.....	.20	4.50	1.80	4.30	3.20	1.00	.45	.80	.35	— .50	.35	.85
3.....	.20	4.90	1.80	5.55	2.80	1.15	.55	.90	.10	— .50	.35	1.20
4.....	.30	3.25	2.00	8.00	2.50	1.35	.55	.80	.20	— .45	.95	1.90
5.....	.40	3.70	1.90	11.80	2.40	1.15	1.15	.70	.10	— .50	.35	2.65
6.....	.40	4.10	9.00	17.25	2.25	1.05	.65	.65	.00	— .50	.30	2.60
7.....	.35	5.50	9.20	8.75	2.15	1.00	2.50	1.60	.00	— .50	.15	1.50
8.....	.35	5.00	5.50	5.70	2.05	.85	1.80	1.35	—.05	— .40	.15	1.10
9.....	.30	3.10	4.45	6.12	2.00	1.10	1.32	1.40	—.15	— .45	.10	.75
10.....	.30	2.40	4.05	5.30	1.95	1.00	2.45	1.20	—.15	— .45	.15	.60
11.....	.20	3.40	3.60	4.50	1.90	1.00	2.45	.95	—.20	+1.35	.10	.55
12.....	.20	4.00	6.40	4.05	1.90	.85	1.60	.80	—.20	1.50	.05	.50
13.....	.40	5.30	12.60	4.00	1.85	.75	1.20	.65	—.15	1.40	.00	.50
14.....	3.00	4.00	10.00	4.55	1.90	.65	.85	.50	—.20	— .35	—.05	1.75
15.....	3.70	2.60	8.40	4.05	2.35	.55	.60	.45	—.25	+ .15	—.10	1.80
16.....	2.80	2.60	6.80	4.00	1.85	.50	.50	.40	—.25	.00	—.05	1.90
17.....	2.40	2.40	5.45	3.50	1.70	1.55	4.20	2.90	—.30	— .05	+.10	1.65
18.....	4.00	2.10	6.10	2.20	1.50	1.00	2.45	1.25	—.30	— .15	—.05	1.15
19.....	4.60	1.90	5.80	3.05	1.45	1.05	12.00	.95	—.30	— .15	—.05	.65
20.....	5.50	2.50	5.55	3.00	1.35	.55	13.25	.65	—.35	.00	—.05	.75
21.....	7.50	2.50	5.00	2.80	1.35	1.35	10.30	.55	—.35	1.45	—.05	.95
22.....	6.85	2.90	4.30	2.75	1.40	.75	6.10	1.15	—.35	.85	—.05	1.95
23.....	3.90	5.10	4.50	2.70	1.40	.55	4.35	1.10	—.35	.15	—.05	2.95
24.....	3.20	4.50	4.00	2.70	1.35	.45	2.20	1.00	—.30	.00	—.10	1.75
25.....	2.00	3.60	3.90	2.65	1.30	.90	1.65	.60	—.25	.05	—.10	1.70
26.....	1.65	2.90	3.35	2.60	1.20	.55	2.85	.50	—.30	.05	—.10	2.25
27.....	.45	2.40	3.10	2.40	1.10	.45	2.30	.25	—.35	— .05	+.50	1.95
28.....	1.10	2.05	3.00	2.10	1.05	.30	1.35	.20	—.35	— .05	1.35	1.85
29.....	1.25	.....	2.75	2.00	1.00	1.00	1.20	.20	—.35	— .05	1.85	1.35
30.....	1.50	.....	2.70	2.20	1.05	.75	1.10	.15	—.40	— .10	1.50	2.05
31.....	2.00	.....	2.15	.....	1.10	.....	.95	1.65	.....	— .10	.....	.95

WEST POINT STATION ON CHATTAHOOCHEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 90, is at the highway bridge in the city of West Point, Georgia, about 1,200 feet from the railroad passenger depot. The rod on the highway bridge is nailed to the floor of the downstream footway on the outside of the iron hand rail. The center of the 3-inch pulley is at gage height 25.38 feet and 7.9 feet from zero point of rod. The length of cable from bottom of weight to index is 33.46 feet. One bench mark on the highway bridge is the top of the first-floor beam from west end pier and is 24.01 feet above zero; the other is on the top of the second-floor beam from west end pier and is 24.19 feet above zero. The bottom is sandy and liable to change. The banks of the river at the ends of the bridge seldom, if ever, overflow, but the ground between the banks and the depot is lower and does overflow at high water. The observer is C. E. Melton. The following discharge measurements were made by B. M. Hall and Max Hall during 1897:

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec. ft.*		*Feet.*	*Sec. ft.*		*Feet.*	*Sec. ft.*
Jan. 23	6.66	11,921	June 19	2.59	2,934	Sept. 22	1.20	985
Apr. 26	3.70	5,448	July 8	3.03	3,470	Nov. 9	1.71	1,345
May 4	4.13	6,230	July 23	5.01	7,853	Nov. 23	1.60	1,322
May 19	3.00	3,557	Aug. 14	2.12	1,915	Dec. 17	3.14	3,989
June 5	2.90	3,253	Sept. 4	1.80	1,690			

Daily gage height, in feet, of Chattahoochee River at West Point, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.90	3.15	3.65	4.00	3.90	2.65	1.90	2.90	1.80	1.10	1.30	2.50
2	1.90	4.40	3.60	4.00	4.00	2.70	1.90	3.00	1.70	1.10	1.30	2.50
3	1.90	7.00	3.50	3.95	3.80	2.80	2.00	3.20	1.65	1.05	1.30	2.50
4	1.95	7.40	3.50	4.40	3.75	2.85	2.30	2.80	1.65	1.05	1.50	2.40
5	2.00	7.10	3.60	8.50	3.65	2.90	3.00	2.80	1.60	1.00	2.30	2.60
6	2.00	6.00	4.10	10.20	3.60	2.95	3.50	2.50	1.60	1.00	2.00	2.75
7	2.00	6.00	10.95	11.00	3.60	2.80	2.50	2.40	1.50	1.00	1.80	2.85
8	1.95	5.20	9.30	10.50	3.60	2.70	3.00	2.20	1.50	0.95	1.65	2.60
9	1.95	5.00	7.10	8.00	3.55	2.60	3.00	2.00	1.40	0.95	1.70	2.60
10	1.90	4.70	5.50	7.10	3.50	2.60	2.90	1.90	1.40	0.95	1.90	2.50
11	1.90	4.90	5.30	6.50	3.50	2.65	2.90	2.90	1.40	1.15	1.90	2.40
12	1.95	7.12	6.20	6.30	3.55	2.65	2.80	3.00	1.35	1.50	1.70	2.40
13	1.95	6.50	10.70	6.00	3.75	2.60	2.40	2.70	1.35	3.00	1.70	2.50
14	2.10	6.10	14.10	5.80	3.60	2.50	2.20	2.30	1.30	2.90	1.60	4.30
15	2.20	4.70	12.90	5.70	3.40	2.45	2.00	2.25	1.30	2.50	1.60	3.75
16	4.00	4.65	11.00	5.50	3.20	2.40	1.80	2.00	1.30	1.90	1.60	3.50
17	4.05	4.60	10.90	5.30	3.10	2.50	1.90	2.95	1.25	1.75	1.50	3.10
18	3.35	4.50	10.00	5.00	3.00	2.90	2.90	3.50	1.25	1.65	1.50	3.05
19	3.30	4.30	9.00	4.50	3.00	2.70	3.00	4.00	1.20	1.60	1.55	3.10
20	5.40	4.35	8.50	4.20	2.90	2.60	9.00	4.50	1.20	1.40	1.40	3.90
21	8.20	4.35	8.30	4.20	2.85	2.55	11.40	6.20	1.20	1.50	1.30	4.00
22	7.30	4.40	8.10	4.10	2.80	2.55	8.00	8.10	1.20	1.60	1.20	3.80
23	6.50	4.85	8.00	4.00	2.75	2.50	5.40	7.00	1.20	1.40	1.10	3.70
24	4.80	5.60	8.50	3.80	2.70	2.50	4.40	6.10	1.20	1.40	1.05	3.70
25	3.70	5.50	7.60	3.85	2.70	2.50	4.20	3.50	1.15	1.30	1.05	3.65
26	3.50	4.00	5.00	3.70	2.70	2.60	4.10	2.80	1.15	1.30	1.10	3.60
27	3.20	3.90	4.95	3.65	2.70	2.30	4.00	2.40	1.15	1.20	1.90	3.50
28	3.00	3.80	4.70	3.60	2.65	2.15	3.60	2.10	1.10	1.20	2.65	3.20
29	3.00	.....	4.50	3.60	2.65	2.00	3.50	2.10	1.10	1.40	2.60	2.80
30	2.95	.....	4.30	3.80	2.65	1.90	3.00	1.90	1.10	1.40	2.50	2.60
31	3.20	.....	4.00	.....	2.65	.....	2.80	1.90	.....	1.30	.....	2.50

CANTON STATION ON ETOWAH RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 94, is one-half mile above the mouth of Canton Creek, and is located at the iron highway bridge over Etowah River about 1,000 feet north of and upstream from the Atlanta, Knoxville and Northern Railroad depot at Canton, Georgia. The United States Weather Bureau gage rod is used. The observer is J. A. Low. The bench mark is on the left-bank pier. The iron bridge rests on four pieces of railroad track iron, forming a cap. Measuring from the end toward the river on one of these on the upstream side of the bridge, its top is 23.3 feet above the datum of the gage. Up to 3 feet gage height the river is only 116 feet wide, and flows between the piers on its lower banks. Up to about 14 feet it is confined between its upper banks, which are the abutments at outer end of approaches. Above this stage it begins to overflow the bottom lands. The initial point is the top of right-bank pier, at its edge toward the river. The following discharge measurements were made by B. M. Hall and Max Hall during 1897:

March 17, gagé height, 2.60 feet; discharge, 2,656 second-feet.
May 5, gage height, 0.75 foot; discharge, 1,264 second-feet.
June 16, gage height, 1.27 feet; discharge, 1,632 second-feet.
August 28, gage height, —0.30 foot; discharge, 449 second-feet.
September 21, gage height, —0.60 foot; discharge, 284 second-feet.
November 12, gage height, 0.23 foot; discharge, 346 second-feet.
December 13, gage height, 0.33 foot; discharge, 514 second-feet.

Daily gage height, in feet, of Etowah River at Canton, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	—0.10	0.60	0.80	1.60	2.00	0.10	0.00	0.20	0.80	—0.70	0.20	0.60
2	— .10	2.20	.60	2.00	1.80	.10	.00	.00	.00	— .70	.80	.60
3	— .10	1.00	.60	2.00	1.80	.70	.00	.00	—.30	— .70	.80	.60
4	— .10	.80	.60	2.60	1.60	.50	.00	.00	—.40	— .50	.60	.60
5	— .10	.80	0.60	11.20	.70	.50	.00	.00	—.40	— .40	.50	2.00
6	— .10	.90	3.60	5.00	.70	.50	.00	.60	—.50	— .30	.50	1.00
7	— .10	.80	4.00	3.00	.70	.40	.40	.80	—.50	— .30	.30	.90
8	— .10	.80	2.00	2.00	.60	.40	.40	.80	—.50	— .40	.30	.80
9	— .10	.80	1.80	3.00	.60	.30	.40	.60	—.60	— .40	.30	.80
10	— .10	.80	1.80	2.60	.50	.30	.30	.60	—.60	— .40	.20	.80
11	— .10	.80	1.80	2.40	.50	.20	.30	.60	—.60	+1.20	.20	.80
12	— .10	.80	2.80	2.20	.50	.10	.20	.40	—.60	1.00	.20	.60
13	— .10	1.80	7.20	2.00	.50	.10	.20	.40	—.60	.80	.20	.80
14	2.20	1.00	6.80	2.00	.40	.10	.20	.20	—.60	.80	.20	.90
15	1.80	.80	4.00	2.00	.40	.00	.10	.20	—.60	.60	.20	.90
16	.90	.80	3.60	1.80	.40	3.00	.10	.20	—.60	.60	.20	.80
17	.50	.70	2.60	1.80	.40	1.00	.90	1.00	—.60	.60	.20	.70
18	2.00	.60	2.40	1.40	.40	.80	.90	1.00	—.60	.40	.20	.70
19	1.60	.60	2.00	1.40	.40	.60	1.00	.80	—.60	.40	.10	.80
20	3.60	.60	2.80	1.20	.40	.40	2.00	.60	—.60	.60	.10	.80
21	3.00	.80	2.00	1.20	.30	.40	7.10	.40	—.60	.40	.20	.90
22	2.00	.80	1.00	1.00	.30	.30	2.50	.20	—.60	.40	.20	1.00
23	1.00	1.60	1.80	1.00	.20	.30	1.00	.00	—.50	.40	.20	.90
24	.80	1.00	1.80	1.00	.10	.30	.80	.00	—.50	.40	.20	.80
25	.70	1.00	1.60	1.00	.10	.30	.80	.00	—.50	.40	.80	.80
26	.70	.80	1.60	.80	.10	.20	.60	— .10	—.80	.40	.60	.80
27	.70	.80	1.40	.80	.10	.10	.60	— .20	—.60	.30	.60	.70
28	.60	.80	1.20	.80	.10	.10	.50	— .30	—.50	.30	.60	.60
29	.60	.....	1.20	1.00	.10	.10	.50	— .40	—.60	.30	.80	.60
30	.60	.....	1.20	1.00	.10	.10	.40	— .40	—.60	.30	.60	.60
31	.60	.....	1.20	.....	.10	.....	.20	+1.00	.....	.20	.....	.50

CARTERS STATION ON COOSAWATTEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 96, is at the iron highway bridge at Carters, Murray County, Georgia, about 20 miles northeast of Calhoun, the most convenient railroad station. The current is not uniform, being broken by a gravel bar above, but is a fairly good section for measurement. The bed is gravel and not apt to change. The banks are high, but are sometimes overflowed. The rod of the gage is nailed to the outside of the guard timber on downstream side of the bridge. Center of 3-inch pulley is 20 feet from initial point and is 32.05 feet above datum. The zero point of rod is 5 feet from center of pulley. The length of wire cable from bottom of weight to index marker is 37.24 feet. The top of the cylindrical iron pier at the right-bank downstream corner of bridge is 30.35 feet above gage datum. The observer is Col. S. M. Carter. The following measurements were made by Max Hall and others during 1897:

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.feet.*		*Feet.*	*Sec.feet.*		*Feet.*	*Sec.feet.*
May 22...	2.10	815	June 28....	1.33	474	Nov. 15...	0.77	243
May 24...	1.95	771	July 15....	1.50	545	Nov. 24...	.75	263
May 26...	1.88	712	July 22....	2.41	1,079	Dec. 14...	2.71	1,118
May 28...	1.85	698	Sept. 17 ...	.70	251	Dec. 22...	3.54	1,661
June 1....	1.90	724	Sept. 27 ...	.60	216			

Daily gage height, in feet, of Coosawattee River at Carters, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.30	1.40	2.05	4.05	4.00	1.90	1.40	1.35	1.00	0.60	0.80	0.75
2	1.25	4.00	1.95	4.10	3.25	1.90	1.40	1.35	1.00	.60	.80	.75
3	1.25	3.00	1.85	5.00	2.75	1.90	1.30	1.30	.95	.60	1.50	.90
4	1.25	2.15	1.85	9.00	2.50	2.20	1.30	1.30	.95	.60	1.00	2.20
5	1.20	2.40	1.80	15.00	2.40	2.00	1.30	1.40	.90	.55	.70	3.50
6	1.20	2.40	9.00	4.50	2.35	1.90	1.40	2.50	.90	.55	.60	1.90
7	1.20	2.50	5.10	4.00	2.30	1.80	1.70	2.00	.90	.55	.60	1.80
8	1.20	2.55	4.00	3.50	2.20	1.80	1.60	1.80	.80	.55	.70	1.80
9	1.15	2.55	3.50	5.50	2.15	1.70	1.60	1.60	.75	.55	.70	1.50
10	1.15	2.50	3.50	5.00	2.20	1.60	1.60	1.60	.75	.55	.80	1.50
11	1.15	2.50	3.60	4.50	2.50	1.60	1.70	1.50	.70	.55	.80	2.10
12	1.20	2.70	21.15	4.30	3.50	1.60	1.50	1.40	.70	2.50	.70	1.80
13	4.15	2.50	11.50	4.00	2.50	1.50	1.40	1.30	.70	1.10	.70	2.00
14	2.20	2.50	13.62	3.50	2.50	1.50	1.40	1.20	.70	1.00	.70	2.70
15	2.10	2.10	10.00	4.50	2.40	1.50	1.50	1.10	.70	1.00	.60	2.50
16	2.15	2.10	8.00	3.50	2.30	2.70	1.50	1.10	.65	.90	.60	2.40
17	2.20	2.05	5.50	3.30	2.30	1.80	1.50	1.10	.70	.80	.70	2.40
18	2.00	2.00	5.00	3.25	2.30	1.60	1.70	1.10	.65	.70	.70	2.60
19	2.00	2.00	6.00	3.20	2.20	1.50	9.90	1.05	.60	.70	.70	2.70
20	3.15	2.00	6.00	3.10	2.20	1.50	3.50	1.05	.60	1.45	.70	2.50
21	4.10	2.05	5.10	3.00	2.10	1.50	2.40	1.05	.60	1.40	.65	3.00
22	2.15	2.10	5.00	3.95	2.10	1.40	3.00	1.05	.60	1.10	.65	3.10
23	2.10	7.00	4.80	3.95	2.00	1.40	2.00	1.00	.60	.80	.65	2.90
24	2.00	3.50	4.50	3.90	2.00	1.50	1.50	1.00	.60	.80	.70	2.80
25	2.00	2.50	4.00	3.80	1.90	1.40	1.50	.90	.60	.70	.70	2.50
26	1.90	2.40	3.75	3.70	1.90	1.40	1.90	.90	.60	.70	.70	2.20
27	1.70	2.30	3.50	3.65	1.80	1.40	1.60	.80	.60	.60	.70	2.00
28	1.50	2.20	3.35	3.60	1.80	1.40	1.50	.80	.60	.60	.70	1.80
29	1.40	.....	3.25	3.50	1.80	2.50	1.40	.90	.60	.60	.75	1.50
30	1.30	.....	3.10	3.50	2.50	1.50	1.40	3.50	.65	.60	.75	1.40
31	1.20	.....	3.00	.....	2.00	.....	1.40	1.50	.....	.55	.....	1.30

RESACA STATION ON OOSTANAULA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 98, is at the iron railroad bridge of the Western and Atlantic Railroad, in the town of Resaca, Georgia, 1,000 feet from the depot. The river bed is probably soft and liable to change. The wire gage is adjusted to the same datum as the Weather Bureau gage at this point. The initial point is the first pin of bottom link cord at right-bank end of bridge, downstream side. The rod of the wire gage is nailed to the outside of the guard rail on the downstream side. The center of the 3 inch pulley is on the downstream side of the bridge 61.50 feet from initial point, and at 40.20 feet gage height. The end or zero point of the rod is 3 feet from the center of the pulley. The length from bottom of weight to index of gage cable is 43.40 feet. The first bench mark is on the top of capstone of center pier at 36.12 feet gage height. The second is the top of cross-tie near center at 40.12 feet gage height. The observer is S. M. Barnett, railroad agent at depot, who is also the observer for the Weather Bureau. The following discharge measurements were made by Olin P. Hall and Max Hall during 1897:

May 25, gage height, 3.48 feet; discharge, 1,535 second-feet.
May 29, gage height, 3.26 feet; discharge, 1,389 second-feet.
June 23, gage height, 2.44 feet; discharge, 972 second-feet.
September 23, gage height, 1.20 feet; discharge, 406 second-feet.
November 14, gage height, 1.46 feet; discharge, 510 second-feet.
December 24, gage height, 7.10 feet; discharge, 4,642 second-feet.
December 30, gage height, 3.42 feet; discharge, 1,630 second-feet.

Daily gage height, in feet, of Oostanaula River at Resaca, Georgia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.20	3.80	4.60	7.30	5.40	4.25	2.60	2.45	2.30	1.00	1.35	1.85
2	2.20	13.90	4.40	11.40	5.05	3.50	2.25	2.30	1.90	1.05	2.05	1.65
3	2.20	14.00	4.20	12.40	4.60	3.50	2.20	3.00	1.90	1.05	2.30	2.00
4	2.20	13.20	4.30	12.50	4.40	3.65	2.15	2.40	1.80	.95	2.10	4.65
5	3.00	8.70	5.90	18.50	4.25	3.35	2.20	2.50	1.80	.95	1.90	5.10
6	3.05	6.20	10.50	20.30	4.10	3.15	2.55	3.15	1.60	1.05	1.75	5.70
7	2.75	7.30	18.00	19.60	4.00	3.00	6.20	4.00	1.50	1.10	1.65	4.30
8	2.50	7.60	18.80	16.30	3.95	2.90	3.60	3.45	1.45	1.05	1.55	3.10
9	2.40	7.00	19.00	10.10	3.85	3.00	2.80	2.85	1.40	1.05	1.55	2.60
10	2.30	6.00	16.20	10.40	3.85	3.15	2.80	2.50	1.40	1.05	1.55	2.35
11	2.25	5.80	10.70	8.60	3.95	2.90	3.25	3.20	1.40	1.10	1.55	2.20
12	2.25	8.60	16.50	7.60	4.90	2.75	3.30	2.75	1.40	2.05	1.50	2.20
13	2.25	9.80	21.70	6.80	5.45	2.70	2.90	2.50	1.35	3.00	1.45	2.10
14	5.45	7.70	21.70	6.40	8.45	2.60	2.65	2.15	1.30	1.80	1.45	4.15
15	7.50	6.40	24.60	6.80	8.75	2.55	2.30	2.10	1.30	1.60	1.45	5.30
16	5.10	5.70	26.00	8.20	5.70	2.60	2.15	2.10	1.30	1.45	1.40	4.45
17	4.10	5.40	25.30	7.00	4.70	2.70	3.10	2.55	1.30	1.35	1.40	3.40
18	5.40	4.70	23.80	6.20	4.40	2.90	2.90	3.00	1.40	1.20	1.45	2.90
19	5.20	4.50	21.30	5.80	4.10	2.75	3.40	2.20	1.25	1.15	1.45	2.75
20	4.40	4.50	18.90	5.50	3.95	2.60	11.80	2.10	1.20	2.15	1.40	5.25
21	9.60	5.00	18.20	5.30	3.85	2.60	7.85	2.00	1.15	2.05	1.40	6.20
22	8.70	4.60	18.40	5.10	3.80	2.45	9.00	2.20	1.15	2.00	1.40	8.45
23	6.10	11.40	17.50	4.90	3.75	2.35	7.20	2.60	1.15	1.80	1.40	9.25
24	5.00	12.00	12.70	4.80	3.60	2.35	4.20	2.50	1.15	1.75	1.45	7.50
25	4.40	10.60	8.40	4.80	3.50	2.45	3.25	2.20	1.15	1.50	1.40	4.95
26	4.00	6.70	7.60	4.70	3.35	2.45	4.05	2.05	1.15	1.40	1.40	4.45
27	3.70	5.70	6.70	4.70	3.30	2.30	4.40	2.00	1.15	1.35	1.55	4.90
28	3.40	5.10	6.60	4.60	3.25	2.25	3.90	1.85	1.10	1.35	1.80	4.25
29	2.70	.....	6.00	4.40	3.25	3.50	3.20	1.75	1.20	1.35	1.75	3.75
30	3.10	.....	6.00	4.30	3.15	2.90	2.80	1.70	1.00	1.30	1.75	3.40
31	3.50	.....	6.00	.....	3.50	.....	2.55	1.85	.....	1.30	.....	3.20

RIVERSIDE STATION ON COOSA RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 99, is at the bridge of the Southern Railway across the Coosa River near Riverside, Alabama. The observer is J. W. Foster, who is employed at a large sawmill about 300 feet distant. The center of the 3-inch pulley is 5 feet east of zero of rod, and is 33.15 feet above gage datum. The length of wire cable from bottom of weight to index is 38.35 feet. The first bench mark is the top of capstone on the large circular center pier of turn span. It is 26.80 feet above datum of gage at downstream side of pier. The top of the first iron floor beam on stationary part east of the draw, near gage, downstream end, is 31.13 feet above gage datum. The following discharge measurements were made by B. M. Hall and Max Hall during 1897:

March 31, gage height, 4.53 feet; discharge, 12,515 second-feet.
June 17, gage height, 1.54 feet; discharge, 3,747 second-feet.
July 21, gage height, 5.55 feet; discharge, 16,925 second-feet.
August 20, gage height, 2.58 feet; discharge, 6,174 second-feet.
November 29, gage height, 0.80 foot; discharge, 1,854 second-feet.

LOCK NO. 4 AND LOCK NO. 5.

The station at Lock No. 4, described in Water Supply and Irrigation Paper No. 11, page 31, is located 2 miles above Riverside, Alabama. The first section of the vertical gage rod is fastened to the lower end of the cofferdam, 500 feet below the dam on the river. The second section is fastened to a sycamore tree 150 feet below rod 1. Zero of rod is 477.30 feet above the Mobile datum. The bench mark is a brass point in stone post 1,000 feet up river from lower gage, and is 510.55 feet above Mobile datum.

The station at Lock No. 5, described in the Eighteenth Annual Report, Part IV, page 101, is located one-half mile above the Birmingham and Atlantic Railroad crossing and about 20 miles below the gaging station at Riverside, Alabama. The gage is vertical, in two sections, fastened to trees, immediately above the landing at Collin's ferry. The zero of the gage is 460.37 feet above Mobile datum. Bench mark 1 is on the oak tree, to which one section of the rod is fastened, and is 471.80 feet above Mobile datum. Bench mark 2 is center of iron plate at top of cylindrical pier at right bank, upstream side of railroad bridge below, and it is at an elevation of 493.91 feet, Mobile datum. River height observations were continued at these stations in 1897 under the direction of the United States Engineer Corps.

Daily gage height, in feet, of Coosa River at Riverside, Alabama, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.10	2.00	5.00	4.30	3.40	1.90	1.45	2.00	1.20	0.50	0.70	0.80
2	1.10	2.50	4.50	4.45	3.10	1.90	1.45	1.80	1.10	.50	.70	.90
3	1.10	5 35	4.25	5.20	3.05	1.90	1.40	1.60	1.30	.50	.70	.95
4	1.10	7.35	3.90	7.00	3.60	1.85	1.40	1.50	1.60	.50	.65	1.20
5	1.10	7.70	4.20	8.60	3.20	1.85	1.45	1.45	1.30	.45	.80	2.50
6	1.20	7.90	5.80	9.50	3.00	1.80	1.50	1.40	1.20	.45	1.05	3.00
7	1.25	9.00	11.40	10.50	3.80	1.90	1.50	1.50	1.10	.45	1.15	2.90
8	1.30	7.70	13.30	11.15	3.70	2.15	2.40	1.50	1.00	.45	1.10	2.40
9	1.35	6.40	12.55	12.15	2.65	2.10	2.30	1.60	.90	.45	1.00	2.15
10	1.35	5.90	12.65	11.90	2.60	1.90	2.05	1.70	.85	.45	.95	2.00
11	1.35	5.20	12.70	10.70	2.50	1.90	2.50	1.70	.80	.40	.85	1.70
12	1.30	7.35	12.80	9.10	2.55	2.00	2.70	2.00	.80	.40	.85	1.60
13	1.40	8.30	13.45	7.30	2.65	1.90	2.50	2.50	.75	.45	.85	1.60
14	2.00	8.20	14.80	6.05	2.10	1.85	2.00	2.30	.75	.45	.85	2.00
15	3.50	7.50	14.60	5.60	3.90	1.60	1.80	2.00	.80	1.45	.80	2.50
16	4.00	6.60	14.80	5.30	4.00	1.70	1.70	1.80	.85	1.65	.75	3.00
17	4.90	5.70	14.70	5.60	4.00	1.50	1.80	1.60	.85	1.40	.70	3.30
18	5.35	5.00	14.70	5.40	3.60	1.60	1.95	1.50	.80	1.35	.70	3.15
19	5.00	4.50	14.50	5.00	3.20	1.90	2.00	1.90	.80	1.20	.70	2.65
20	4.80	4.00	15.30	4.60	3.00	2.00	3.00	2.60	.75	1.00	.65	2.10
21	6.50	4.60	14.90	4.30	2.70	1.80	5.20	2.00	.75	.90	.65	2.20
22	7.00	4.65	14.70	4.00	2.35	1.70	6.40	1.70	.70	.85	.65	2.80
23	7.35	6.00	14.50	3.80	2.30	1.60	8.00	1.60	.70	.80	.65	4.20
24	7.00	7.90	13.70	3.60	2.25	1.55	6.20	1.70	.70	.70	.65	4.85
25	5.40	9.00	12.20	3.40	2.25	1.50	4.50	1.75	.65	.80	.65	4.95
26	4.70	9.00	10.60	3.30	2.15	1.45	4.00	1.60	.65	.75	.65	4.55
27	3.80	8.00	8.50	3.25	2.05	1.45	3.00	1.60	.60	.60	.65	3.85
28	3.00	6.20	6.50	2.20	2.00	1.40	2.60	1.50	.55	.65	.65	3.20
29	2.70	.....	5.30	3.10	2.00	1.45	2.50	1.40	.55	.80	.70	2.95
30	2.50	.....	4.90	3.20	1.95	1.45	3.00	1.35	.55	.75	.75	2.85
31	2.20	.....	4.60	.....	1.90	.....	2.60	1.30	.....	.70	.....	2.50

Daily gage height, in feet, of Coosa River at Lock No. 4, Alabama, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.8	2.0	5.8	5.1	3.4	1.9	1.1	1.9	0.8	0.1	0.3	0.4
2	.8	2.8	4.9	5.6	3.3	1.9	1.1	1.6	.7	.1	.4	.6
3	.8	6.2	4.4	7.6	3.9	1.9	1.4	1.5	.7	.1	.3	.9
4	1.0	8.8	4.4	8.2	4.6	2.1	1.3	1.3	.8	.1	.3	1.2
5	.9	9.3	5.5	9.9	3.4	2.1	1.2	1.2	1.0	.0	.3	1.6
6	.9	9.7	6.5	11.0	3.2	2.4	1.3	1.4	.8	.0	.9	2.6
7	.9	10.2	13.0	12.0	3.0	2.3	1.8	1.3	.7	— .1	.9	.....
8	1.0	9.2	14.8	12.7	2.9	2.0	2.5	1.2	.6	— .2	.8	3.7
9	1.2	7.5	15.1	13.8	2.8	1.8	2.1	1.5	.5	— .2	.7	3.1
10	1.2	6.7	14.5	13.7	2.7	1.7	2.4	2.0	.4	— .2	.6	2.4
11	1.0	6.8	14.6	12.3	2.6	1.6	2.5	2.1	.4	.0	.5	2.0
12	.9	8.6	15.0	10.0	2.6	1.7	3.0	2.1	.4	.0	.4	1.4
13	.8	9.7	15.5	8.5	3.0	1.7	2.2	2.6	.4	.0	.4	1.1
14	1.0	9.7	15.9	7.5	3.5	1.6	2.2	2.1	.4	.0	.4	1.6
15	2.3	9.0	17.0	6.7	4.5	1.5	2.2	1.8	.4	1.0	.4	1.8
16	4.3	8.0	16.8	6.4	4.5	1.4	1.6	1.5	.3	1.6	.4	2.6
17	5.7	6.6	17.0	6.4	4.7	1.3	1.6	1.3	.3	1.2	.3	3.4
18	6.2	5.0	17.0	6.2	4.5	1.4	1.9	1.5	.3	.7	.3	3.3
19	6.0	5.0	16.9	6.0	3.6	1.8	3.8	1.5	.3	.5	.3	2.8
20	5.5	4.5	17.9	5.2	3.0	2.4	5.5	2.0	.3	.4	.3	2.6
21	7.6	5.2	17.1	4.8	2.7	1.8	6.0	2.4	.2	.3	.3	2.1
22	8.2	5.8	16.9	4.0	2.5	1.5	7.5	1.6	.2	.3	.3	3.1
23	8.7	7.2	16.7	4.2	2.4	1.3	8.9	1.5	.1	.4	.3	4.8
24	8.3	9.5	15.6	4.0	2.3	1.3	7.4	1.4	.1	.4	.3	5.7
25	6.5	10.1	13.8	3.8	2.2	1.4	5.3	1.6	.1	.4	.3	5.7
26	4.8	10.2	11.8	3.6	2.2	1.2	3.9	1.6	.1	.6	.3	5.3
27	3.9	9.3	10.0	3.6	2.1	1.1	2.9	1.6	.1	.5	.3	4.4
28	3.4	7.5	7.5	3.5	1.9	1.1	2.4	1.3	.1	.4	.3	3.7
29	2.9	.....	6.3	3.4	1.9	1.3	3.0	1.1	.1	.3	.4	3.3
30	2.6	.....	5.6	3.7	1.8	1.3	2.9	1.0	.1	.3	.4	3.0
31	2.4	.....	5.2	.....	1.8	.....	2.4	.9	.....	.3	.....	2.9

Daily gage height, in feet, of Coosa River at Lock No. 5, Alabama, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.2	0.9	4.6	2.9	1.7	0.7	0.3	0.8	0.2	—0.3	—0.1	—0.1
2	.2	1.2	3.6	3.2	1.6	.7	.3	.6	.1	— .3	— .1	.1
3	.2	3.1	2.2	4.5	1.9	.7	.3	.5	.1	— .3	— .1	.2
4	.2	5.2	2.9	5.2	2.0	.8	.5	.5	.4	— .3	— .1	.4
5	.2	5.8	3.1	6.8	1.9	.8	.4	.4	.4	— .3	— .1	.6
6	.2	5.8	3.7	7.6	1.5	1.0	.4	.4	.2	— .3	+ .1	1.0
7	.2	7.1	9.4	8.5	1.4	1.0	.6	.3	.1	— .3	.1	1.5
8	.3	6.0	11.1	9.0	1.3	.8	1.1	.4	.0	— .3	.1	1.5
9	.4	4.7	11.2	10.0	1.3	.7	.9	.6	.0	— .3	.1	1.4
10	.4	4.0	10.6	9.9	1.2	.6	.9	.8	— .1	— .3	.1	1.0
11	.3	3.6	10.8	8.9	1.1	.6	1.1	.9	— .1	— .3	.1	.8
12	.3	5.4	11.2	7.8	1.1	.6	1.4	.8	— .1	— .3	.1	.6
13	.2	6.4	12.2	6.6	1.3	.6	1.0	1.1	— .1	— .3	.1	.5
14	.2	6.4	12.4	4.4	1.6	.6	.9	.9	— .1	— .3	— .2	.7
15	.9	5.8	13.1	4.0	2.2	.6	.9	.7	— .1	+ .1	— .2	.8
16	.9	5.0	13.0	3.9	2.3	.5	.7	.6	— .1	.5	— .2	1.1
17	2.8	3.0	12.9	3.8	2.5	.5	.7	.5	— .1	.3	— .2	1.5
18	3.5	3.1	12.7	3.4	2.3	.5	.7	.6	— .2	.2	— .2	1.7
19	3.3	2.6	12.5	3.0	1.8	.5	1.6	.9	— .3	.1	— .2	1.2
20	3.0	2.3	13.2	2.8	1.3	1.0	3.0	1.3	— .3	— .1	— .2	.9
21	4.4	2.4	12.8	2.4	1.2	.7	3.3	1.0	— .3	— .1	— .2	.8
22	5.1	2.5	12.6	2.3	1.1	.6	4.6	.8	— .3	— .1	— .2	.8
23	5.3	4.1	12.6	2.2	1.1	.5	5.9	.6	— .3	— .1	— .2	2.4
24	5.1	6.0	11.7	2.0	1.0	.4	4.5	.5	— .3	+ .1	— .2	3.5
25	3.8	7.3	10.3	1.9	.9	.4	3.0	.5	— .3	.1	— .2	3.5
26	2.5	7.3	8.7	1.8	.9	.4	2.0	.5	— .3	.1	— .2	2.8
27	1.9	6.1	6.8	1.7	.8	.4	1.4	.5	— .3	.1	— .2	2.3
28	1.5	6.1	4.7	1.7	.7	.4	1.0	.4	— .3	.1	— .1	1.6
29	1.3	.....	3.7	1.6	.7	.4	1.3	.4	— .3	— .1	— .1	1.5
30	1.2	.....	3.3	1.7	.7	.4	1.5	.3	— .3	— .1	.....	1.4
31	1.0	.....	3.0	.....	.7	.....	1.0	.2	.....	— .1	.....	1.2

WETUMPKA STATION ON COOSA RIVER.

This station is located at gage No. 1, 3 miles above Wetumpka, Alabama. The vertical rod is in two sections of 2 by 8 timbers. Rod 1 is attached to a crib on right bank at foot of old sawmill slide. Rod 2 is attached to a tree on right bank about 150 feet upstream from rod 1. Zero of gage is 172.40 feet above mean low tide at Mobile, Alabama. The bench mark is on a black walnut tree on right bank about 250 feet upstream from gage rod No. 2; elevation, 213.88 feet, Mobile datum. It was established November 5, 1889, by the United States Engineer Corps, who have maintained daily gage readings since that date. A copy of these readings has kindly been furnished by Capt. Philip M. Price, U. S. A., and are on file in this office. The following discharge measurements were made by Charles Firth, United States assistant engineer. They were begun in December, 1890, and continued through the high water of February and March, 1891:

Measurement.	Gage height.	Discharge.	Measurement.	Gage height.	Discharge.	Measurement.	Gage height.	Discharge.
	Feet.	*Sec. ft.*		*Feet.*	*Sec. ft.*		*Feet.*	*Sec. ft.*
No. 1	2.2	8,033	No. 16	9.5	38,116	No. 31	18.6	73,380
2	2.5	8,598	17	10.0	38,414	32	19.5	79,011
3	3.2	10,126	18	10.7	47,530	33	20.0	85,549
4	4.7	15,426	19	10.8	43,608	34	21.0	73,159
5	4.9	16,569	20	11.0	46,347	35	21.7	85,794
6	5.5	18,835	21	11.2	47,923	36	22.0	80,182
7	6.1	21,750	22	12.6	53,690	37	23.0	84,688
8	6.2	22,243	23	13.2	52,104	38	23.4	109,041
9	6.6	25,198	24	13.4	58,414	39	25.4	93,876
10	6.7	24,168	25	13.8	56,357	40	25.4	94,213
11	7.3	26,638	26	14.2	65,439	41	27.0	103,255
12	7.7	29,210	27	15.0	56,864	42	27.3	118,407
13	8.2	31,620	28	16.5	67,276	43	28.5	126,313
14	8.5	32,174	29	17.2	72,907			
15	9.2	36,722	30	17.7	70,793			

A rating table has been made based on these measurements, but it will not be applied to the gage heights for 1896 and 1897 until it can be verified by future discharge measurements.

Daily gage height, in feet, of Coosa River at Wetumpka, Alabama, for 1896.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	4.4	3.4	3.7	4.8	1.6	1.0	1.2	0.8	—0.1	0.4	1.2
2	3.6	4.0	3.4	4.4	4.9	1.5	.9	1.2	.6	—.2	.2	1.6
3	3.7	3.8	3.4	4.9	5.3	1.8	.8	1.2	.5	—.3	.4	2.9
4	3.6	3.6	3.2	6.1	4.1	2.2	.8	1.0	.5	2.4	.6	3.5
5	3.4	4.6	3.1	7.5	5.0	2.0	.9	1.2	.4	2.1	1.0	4.1
6	2.9	7.3	3.0	7.0	3.6	1.8	1.0	1.4	.3	2.0	1.2	3.3
7	1.5	9.8	5.0	6.5	3.6	2.2	1.3	1.4	.2	1.4	.5	2.6
8	2.8	12.2	4.9	5.8	3.3	2.0	1.6	1.3	.0	.8	.5	2.1
9	2.8	15.2	4.2	4.6	3.0	2.5	1.7	1.2	.0	.5	.4	2.0
10	2.5	15.1	4.0	4.1	2.5	3.5	4.3	1.0	.0	.2	2.2	2.0
11	2.2	14.0	4.4	3.7	2.4	3.4	5.2	.8	.0	.1	1.7	1.8
12	2.2	12.2	6.1	3.5	2.1	3.0	6.2	.8	.0	.1	1.9	1.6
13	2.4	11.7	6.9	3.3	2.0	2.5	5.9	.6	—.1	.0	4.9	1.4
14	2.6	9.9	6.7	3.3	1.8	2.0	4.4	.6	—.1	.0	2.6	1.4
15	2.2	8.7	5.2	3.1	2.9	1.6	3.8	.6	—.1	.0	2.6	1.6
16	2.6	7.4	5.8	3.0	2.3	1.6	3.0	.5	—.2	.0	2.6	1.7
17	4.0	7.2	5.0	2.9	1.8	1.6	3.7	.6	—.2	.1	3.9	1.5
18	4.0	6.9	4.8	2.7	1.5	1.5	3.6	.7	—.2	.0	4.5	1.3
19	3.8	6.7	6.4	2.4	1.5	1.5	3.0	.6	—.2	.0	3.6	1.2
20	4.0	5.6	7.3	2.4	1.5	1.8	2.7	.5	—.2	.0	3.0	1.4
21	3.9	5.0	7.8	2.4	1.5	1.5	3.4	.5	—.3	.0	2.0	1.4
22	7.6	4.5	7.5	2.3	1.5	2.0	3.1	.4	—.3	.0	1.8	1.4
23	11.6	4.2	7.2	2.2	1.5	2.0	3.4	.4	1.9	.1	1.2	1.3
24	9.7	3.4	7.0	2.0	1.5	1.8	2.7	.4	1.4	.3	1.1	1.2
25	9.4	3.4	6.3	2.1	1.4	1.5	2.1	.8	.5	.2	1.0	1.1
26	9.3	3.4	5.6	2.2	1.4	1.4	1.9	.6	.2	.1	.9	1.1
27	9.1	3.4	5.0	2.2	1.4	1.4	1.8	.5	.0	.0	.8	1.0
28	8.7	3.4	4.7	2.6	1.4	1.1	1.8	.4	.0	.0	.8	.9
29	7.6	.....	4.4	3.0	3.6	1.0	1.8	.4	—.1	.2	1.0	.9
30	6.2	.....	4.0	4.3	2.6	1.0	1.6	.4	—.1	.1	1.0	.9
31	5.2	.....	3.9	.....	1.8	.....	1.4	.6	.....	.3	.....	.8

Daily gage height, in feet, of Coosa River at Wetumpka, Alabama, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.8	2.4	6.0	5.8	4.2	1.7	0.8	1.6	1.0	0.2	0.3	0.2
2	.8	2.4	5.5	6.8	3.6	1.7	.9	1.5	.7	.2	.3	.3
3	.8	4.5	5.5	7.0	3.6	1.6	1.1	1.4	.7	.2	.4	.4
4	.9	6.9	5.2	6.8	3.6	1.6	1.8	1.4	.9	.2	.4	.8
5	.9	7.2	4.7	7.0	3.5	1.6	1.5	1.4	.8	.2	.4	1.9
6	.9	7.9	7.9	9.3	3.4	1.7	1.5	1.4	.8	.2	.4	2.0
7	.9	8.5	13.8	10.0	3.4	1.7	1.7	1.4	.8	.3	.1	2.3
8	.9	9.1	16.7	10.3	3.0	1.6	2.0	1.4	.8	.3	.1	2.5
9	1.1	7.9	18.1	11.5	2.8	1.6	2.1	1.6	.7	.3	.4	2.7
10	1.0	6.8	16.3	12.7	2.8	1.6	2.4	1.8	.7	.4	.5	2.6
11	1.0	6.3	15.7	12.3	2.6	1.5	2.2	1.9	.7	.4	.3	2.6
12	.9	9.3	14.9	10.8	2.5	1.5	2.0	2.0	.5	.4	.2	2.7
13	.9	9.0	17.8	9.0	2.5	1.4	1.8	2.0	.5	.4	.1	3.1
14	.9	9.6	21.4	7.9	2.8	1.4	1.8	2.2	.4	.4	.0	3.5
15	.9	7.3	21.9	6.7	3.0	1.2	1.8	1.8	.3	1.0	.0	3.8
16	.9	6.9	21.9	7.0	6.6	1.2	1.8	1.8	.3	1.0	.2	3.6
17	1.7	6.2	20.7	6.3	6.9	1.0	1.7	2.0	.3	1.2	.2	3.0
18	4.9	5.9	19.1	5.8	6.9	1.4	1.8	2.3	.3	1.0	.2	2.6
19	5.4	5.3	18.7	5.4	6.8	1.2	2.0	2.6	.2	.6	.3	2.5
20	5.4	5.3	17.4	5.0	6.0	1.7	2.4	2.9	.2	.4	.3	2.3
21	8.1	5.0	19.3	4.6	5.3	1.8	4.0	3.0	.2	.4	.2	2.0
22	7.3	4.7	18.4	4.5	4.6	2.0	4.8	3.6	.2	.2	.2	2.0
23	7.3	6.2	20.7	4.0	2.0	1.8	6.0	3.0	.2	.0	.3	2.4
24	7.2	7.3	19.4	4.0	2.0	1.6	7.1	2.4	.1	.0	.3	2.9
25	6.2	8.6	18.7	4.0	1.8	1.4	5.6	1.8	.1	.0	.3	4.1
26	5.6	8.6	17.5	3.8	1.8	1.2	4.6	1.4	.1	.2	.3	4.9
27	4.1	8.2	15.3	3.6	1.8	1.0	3.7	1.4	.0	.2	.3	4.6
28	3.5	7.9	10.7	3.4	1.7	1.0	2.9	1.4	.0	.4	.2	4.1
29	3.0	.....	7.0	3.4	1.7	.8	2.2	1.3	—.1	.4	.2	4.0
30	2.7	.....	6.5	3.7	1.7	.8	1.8	1.3	—.1	.3	.2	3.7
31	2.5	.....	5.5	.....	1.7	.....	1.6	1.1	.....	.3	.....	3.4

MILSTEAD STATION ON TALLAPOOSA RIVER.

This station is located on the bridge of the Tallassee and Montgomery Railroad, about one-quarter of a mile from Milstead, Alabama. The bridge is of iron, two spans of about 155 feet each, with short wood trestles at each end. The banks are high and overflow only at very high stages. The initial point for measurement is the end of iron bridge, left bank downstream side. The rod of wire gage is fastened to outside of guard rail on downstream side of bridge. Its zero is 45 feet from initial point and is 5 feet from center of pulley. The bench mark is top of second crossbeam from left bank pier, downstream end, and is 60.00 feet above datum. Center of pulley is 60.60 feet above datum. The observer is Seth Johnson.

The following discharge measurements were made during 1897 by Max Hall:

May 3, gage height, 6.20 feet; discharge, 7,333 second-feet.
July 15, gage height, 1.95 feet; discharge, 1,692 second-feet.
August 7, gage height, 2.42 feet; discharge, 2,292 second-feet.
September 4, gage height, 1.60 feet; discharge, 1,271 second-feet.
November 23, gage height, 1.20 feet; discharge, 677 second-feet.
December 16, gage height, 3.58 feet; discharge, 4,210 second-feet.

Daily gage height, in feet, of Tallapoosa River at Milstead, Alabama, from August to December, 1897.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.70	0.80	0.90	1.50	17	1.90	1.10	0.80	1.20	2.80
2	.....	1.80	.80	1.00	1.50	18	2.20	1.00	.90	1.20	2.40
3	.....	1.60	.80	1.10	1.50	19	2.80	1.10	.90	1.20	2.10
4	.....	1.60	.70	1.10	1.60	20	9.70	1.10	.90	1.10	2.00
5	.....	1.60	.70	1.10	1.80	21	7.40	1.10	.80	1.20	1.90
6	.....	1.40	.70	1.10	2.00	22	8.50	1.00	.80	1.10	2.00
7	2.45	1.40	.70	1.10	2.10	23	5.30	1.00	.90	1.10	2.40
8	1.90	1.30	.60	1.10	2.00	24	3.40	1.00	.90	1.20	2.40
9	1.70	1.20	.70	1.20	1.90	25	2.90	1.00	.80	1.20	2.40
10	1.50	1.20	.70	1.20	1.90	26	2.80	1.00	.90	1.20	2.80
11	1.50	1.10	.70	1.30	1.90	27	2.30	1.00	.90	1.20	2.60
12	2.70	1.10	.70	1.30	2.00	28	2.00	.90	.90	1.60	2.50
13	2.20	1.10	.70	1.30	1.90	29	1.80	.90	.90	1.50	2.30
14	2.00	1.10	.80	1.30	5.50	30	1.70	.80	.90	1.50	2.20
15	1.80	1.40	.80	1.20	4.70	31	1.70	.....	.90	.....	2.40
16	1.60	1.20	.80	1.20	3.60						

TUSCALOOSA STATION ON BLACK WARRIOR RIVER.

This station, as described in the Eighteenth Annual Report, Part IV, page 103, is located about three-fourths of a mile from the business center of Tuscaloosa, Alabama, and is reached by passing down Bridge street to the river, thence down the east bank 1,800 feet to the gage, which consists of an inclined timber, 2 by 6 inches, supported on posts and graduated by means of notches placed 1 foot vertically apart. The observer is W. S. Wyman, jr., Tuscaloosa, Alabama. The bench marks are fixed, one on a willow 10 feet west of gage, 97.84 feet above Mobile datum, the other on a small hackberry 30 feet south of the upper end of the gage and 139.36 feet above Mobile datum. Zero of gage is 87.30 feet above same datum. The current here is rather sluggish, being almost imperceptible at low stages. Both banks are of earth and subject to overflow. The bed of the stream is composed of sand and gravel. The following discharge measurement was made by B. M. Hall in 1897:

January 12, gage height, 1.70 feet; discharge, 829 second-feet.

Daily gage height, in feet, of Black Warrior River at Tuscaloosa, Alabama, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.34	3.90	11.14	13.90	9.51	1.83	—0.15	1.36	0.60	—1.65	—1.39	—1.28
2	.47	6.00	9.57	15.28	9.95	1.75	— .18	1.08	.96	—1.71	—1.30	—1.12
3	.40	11.50	8.58	22.20	9.22	1.70	— .20	.87	1.02	—1.72	—1.29	— .48
4	.90	12.60	8.72	21.11	7.66	2.01	— .18	.62	.92	—1.75	—1.31	+1.29
5	1.24	11.70	10.14	22.00	6.23	1.98	— .05	.50	.76	—1.79	—1.33	13.10
6	1.11	12.37	16.33	26.95	5.36	2.65	1.63	.40	.62	—1.86	—1.28	14.24
7	1.40	16.24	51.42	25.32	4.67	3.44	3.40	.25	.51	—1.79	—1.27	10.72
8	2.60	18.70	54.77	22.10	4.20	2.87	3.90	.24	.47	—1.85	—1.27	7.39
9	2.66	21.04	51.59	21.30	3.87	2.25	3.71	1.10	.42	—1.88	—1.17	5.12
10	2.30	19.80	44.69	29.27	3.50	1.85	3.05	2.10	.36	—1.90	—1.13	3.72
11	2.03	17.90	40.54	29.57	3.20	1.60	2.53	3.26	.29	—1.90	—1.10	3.05
12	1.76	23.12	42.53	25.48	3.64	1.39	2.42	3.22	.23	—1.88	—1.14	2.70
13	1.52	25.90	48.70	21.60	11.40	1.24	2.16	2.73	.14	—1.89	—1.17	2.56
14	1.33	23.84	50.96	18.10	20.36	1.11	1.86	2.27	.11	—1.92	—1.25	3.05
15	1.23	20.30	48.57	16.32	20.46	.95	1.46	1.63	.10	—1.92	—1.25	3.54
16	8.23	16.96	45.20	18.43	16.59	.85	1.16	1.28	.06	—1.92	—1.27	4.12
17	9.70	14.04	47.21	18.33	12.68	.75	.97	1.00	.01	—1.90	—1.33	4.10
18	13.10	11.72	46.72	15.92	9.77	.63	1.50	.73	— .05	—1.90	—1.35	3.78
19	19.35	9.97	42.90	13.66	7.73	1.30	3.50	.52	— .36	—1.90	—1.36	3.50
20	18.70	8.77	42.57	11.86	6.35	1.45	12.50	1.53	— .75	—1.88	—1.36	3.82
21	17.43	8.08	44.54	10.45	5.37	1.11	14.50	1.78	— .95	—1.88	—1.36	6.70
22	18.64	8.32	41.50	9.24	4.66	.80	11.30	1.58	—1.07	—1.77	—1.37	19.58
23	16.52	11.00	37.70	8.15	4.13	.55	8.42	1.33	—1.17	—1.64	—1.42	31.00
24	13.30	20.20	35.66	7.37	3.70	.33	6.64	1.08	—1.26	—1.58	—1.44	29.96
25	10.60	21.24	32.40	6.80	3.45	.23	4.77	1.27	—1.24	—1.63	—1.40	24.08
26	8.60	18.97	28.86	6.37	3.13	.16	3.46	.97	—1.36	—1.63	—1.36	18.97
27	7.20	16.18	25.60	5.90	2.90	.12	2.72	.80	—1.41	—1.61	—1.36	15.67
28	6.00	13.31	23.15	5.49	2.60	.03	2.92	.61	—1.44	—1.64	—1.28	13.10
29	5.10	.....	20.33	5.10	2.28	.00	2.15	.54	—1.50	—1.61	—1.22	11.00
30	4.42	.....	17.52	5.90	2.09	— .08	1.80	.46	—1.55	—1.63	—1.24	9.38
31	3.80	.....	14.98	.....	2.00	.....	1.62	.31	.....	—1.63	.....	8.00

ALDERSON STATION ON GREENBRIER RIVER.

This station is described in the Eighteenth Annual Report, Part IV, page 111. It is located one-half mile above the mouth of Muddy Creek, on the county bridge at Alderson, West Virginia. The wire gage is in the third panel of the second span, lower side. The distance from the end of the weight to the marker is 28.37 feet. The distance from the zero of the gage to the top of the lower end of the third floor beam, second span, from the left bank, is 22.47 feet. Bench marks: Upper end of coping of the first pier from left bank 21.75 feet above the zero of the gage; upper end of the bridge seat of the left bank abutment 21.61 feet above the zero of the gage; stone foundation of the water tank of the Chesapeake and Ohio Railway 23.48 feet above the zero of the gage. The observer is W. J. Hancock, clerk in the store of George Graves. The following measurements of discharge were made by Prof. D. C. Humphreys and F. H. Anschutz in 1897:

March 30, gage height, 2.75 feet; discharge, 1,639 second-feet.
May 3, gage height, 4.88 feet; discharge, 6,181 second-feet.
May 4, gage height, 4.29 feet; discharge, 4,963 second-feet.
May 4, gage height, 4.38 feet; discharge, 5,450 second feet.
May 6, gage height, 3.56 feet; discharge, 3,158 second-feet.
May 13, gage height, 12.30 feet; discharge, 32,563 second-feet.
May 14, gage height, 12.33 feet; discharge, 33,034 second-feet.
May 14, gage height, 9.53 feet; discharge, 20,722 second-feet.
May 31, gage height, 2.26 feet; discharge, 681 second feet.
October 12, gage height, 1.42 feet; discharge, 71 second-feet.

Daily gage height, in feet, of Greenbrier River at Alderson, West Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.00	2.22	3.05	2.77	2.18	2.55	2.03	2.35	1.62	1.43	1.40	2.00
2	1.95	2.21	2.90	2.75	3.44	2.65	3.40	2.25	1.58	1.38	1.52	1.90
3	1.98	2.20	2.80	2.67	4.80	2.45	4.30	2.45	1.58	1.40	1.48	1.85
4	2.00	2.05	2.75	2.63	4.44	2.35	3.40	2.45	1.55	1.40	1.58	1.85
5	2.10	2.02	3.13	2.78	3.90	2.50	2.87	2.34	1.50	1.45	1.55	2.30
6	2.85	4.04	3.15	4.83	3.60	2.47	3.40	2.30	1.50	1.44	1.60	3.26
7	2.80	6.62	3.42	4.18	3.52	2.40	3.35	2.18	1.53	1.41	1.60	3.17
8	2.45	5.20	3.80	3.65	3.25	2.28	3.25	2.15	1.50	1.40	1.66	2.68
9	2.35	4.20	3.50	3.50	3.03	2.26	2.93	2.05	1.48	1.40	1.62	2.43
10	2.35	3.55	3.60	4.78	2.92	2.30	2.75	2.00	1.50	1.38	1.60	2.25
11	2.35	3.43	4.85	4.50	2.83	2.23	2.45	2.00	1.49	1.36	1.60	2.05
12	2.20	4.08	4.52	4.00	3.16	2.17	2.70	1.97	1.48	1.40	1.60	2.05
13	2.05	5.40	4.65	3.50	8.26	2.20	2.60	1.91	1.44	1.41	1.90	1.98
14	2.00	5.07	4.40	3.20	12.20	2.23	2.38	1.85	1.44	1.42	1.63	1.95
15	1.95	5.00	6.10	3.05	6.01	2.20	2.28	1.83	1.43	1.43	1.75	1.97
16	2.20	5.10	5.12	3.00	4.75	2.98	2.17	1.83	1.42	1.43	1.72	2.37
17	2.20	5.10	4.10	2.95	4.05	2.65	2.08	1.80	1.40	1.43	1.74	3.07
18	2.20	4.45	3.80	2.95	3.55	2.55	2.00	1.78	1.40	1.37	1.68	2.77
19	2.60	4.48	6.00	2.82	3.25	2.45	2.10	1.75	1.38	1.52	1.65	2.60
20	2.65	4.38	6.75	2.75	3.05	2.90	2.15	1.72	1.38	1.50	1.67	2.55
21	2.55	4.35	6.15	2.68	2.90	2.95	2.34	1.70	1.40	1.52	1.65	2.68
22	2.55	10.08	4.15	2.58	2.80	2.80	4.85	1.67	1.40	1.53	1.67	4.30
23	2.60	16.93	3.95	2.50	2.68	2.65	4.65	1.67	1.37	1.50	1.67	3.83
24	2.60	9.23	3.55	2.45	2.58	2.50	4.00	1.80	1.37	1.50	1.60	3.20
25	2.45	5.80	3.45	2.35	2.50	2.45	4.05	1.73	1.38	1.50	1.60	2.85
26	2.50	4.55	3.25	2.35	2.50	2.48	3.28	1.77	1.40	1.54	1.57	2.50
27	2.42	3.80	3.07	2.35	2.42	2.20	3.46	1.68	1.35	1.52	1.55	2.35
28	2.35	3.35	2.95	2.28	2.33	2.13	3.40	1.68	1.40	1.52	1.55	2.43
29	2.25	.....	2.88	2.25	2.28	2.05	2.65	1.70	1.40	1.52	1.78	2.25
30	2.20	.....	2.82	2.20	2.23	2.00	2.57	1.66	1.40	1.48	2.07	2.15
31	2.20	.....	2.80	.....	2.25	.....	2.48	1.64	.....	1.45	.....	2.15

FAYETTE STATION ON NEW RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 113, is located just below the mouth of Wolf Creek on a highway bridge of one span, at Fayette, West Virginia. The wire gage is located on the guard rail, on the upper side of the bridge about the middle of the span, and the graduation is to feet and tenths. Bench marks: The top of the bottom plate of the lower plate girder, at the end of the first panel from the left bank, lower side, is 55.13 feet above the zero of the gage; top of lower end of coping on the main pier, right bank, lower side, 52.13 feet above the zero of the gage; bridge seat, on the right bank, lower side, 54.58 feet above the zero of the gage; west corner of abutment stone, by Chesapeake and Ohio Railway station, 58.62 feet above the zero of the gage. The observer is M. W. Brellahan, agent Chesapeake and Ohio Railway. The following discharge measurements were made by Prof. D. C. Humphreys and F. H. Anschutz in 1897:

March 31, gage height, 5.50 feet; discharge, 9,587 second-feet.
May 5, gage height, 8.50 feet; discharge, 15,931 second-feet.
May 15, gage height, 13.98 feet; discharge, 35,195 second-feet.
May 31, gage height, 3.70 feet; discharge, 5,145 second-feet.
October 12, gage height, —0.18 foot; discharge, 1,136 second-feet.
November 5, gage height, 1.72 feet; discharge, 2,616 second-feet.

Daily gage height, in feet, of New River at Fayette, West Virginia, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.80	1.90	7.20	6.00	4.30	3.25	2.25	4.07	1.20	0.10	1.40	0.40
2	2.30	2.05	6.65	5.50	4.30	3.60	3.15	3.25	1.10	.05	1.55	.45
3	3.00	2.20	6.35	5.05	7.80	3.65	3.55	2.85	1.05	.05	1.80	1.15
4	3.30	3.05	6.05	5.90	9.52	3.50	4.52	2.40	.95	.01	1.90	1.25
5	3.60	4.30	6.15	6.95	9.25	3.33	4.50	2.50	.90	.00	1.75	1.25
6	3.20	6.50	6.50	7.10	7.48	3.30	4.10	2.90	.65	.00	2.00	1.05
7	3.50	16.72	7.25	9.80	6.50	4.70	3.73	2.80	.50	.05	2.40	1.10
8	4.00	14.10	7.40	11.10	6.20	5.00	4.75	2.75	.45	.10	1.50	3.75
9	3.50	8.60	7.70	7.80	5.25	5.95	3.80	4.60	.40	.10	1.30	3.00
10	3.35	6.03	12.05	8.10	5.15	6.55	3.50	4.05	.35	.05	1.25	2.95
11	3.00	6.40	16.00	9.75	4.75	6.22	3.45	3.00	.35	.00	1.20	1.85
12	2.90	9.20	11.70	8.50	5.95	5.25	3.85	2.50	.20	.00	1.00	1.20
13	2.35	13.70	14.00	8.00	6.12	5.00	3.50	2.25	.00	.00	.80	1.15
14	2.05	14.70	15.20	7.15	20.58	4.60	3.05	2.10	.95	5.56	.70	1.30
15	2.30	14.00	17.40	6.45	16.10	3.55	2.40	2.00	.80	2.95	.70	1.80
16	2.10	13.25	16.80	6.10	11.00	3.40	1.90	1.60	.75	1.85	.70	1.70
17	2.45	10.10	15.70	6.30	8.20	3.80	2.00	1.30	.90	1.05	.60	1.75
18	2.75	9.90	13.00	6.05	7.50	3.50	2.25	1.25	.90	.90	.55	3.50
19	3.00	9.00	14.10	5.80	6.55	3.10	2.25	1.35	.90	.70	.45	3.40
20	3.45	9.25	12.30	5.45	5.70	4.40	2.45	1.40	.50	.60	.40	3.20
21	4.00	20.10	11.40	5.15	5.35	4.85	2.90	1.80	.50	.45	.40	3.00
22	4.50	26.12	10.30	4.85	5.00	5.25	5.50	1.90	.50	.50	.35	3.40
23	4.70	27.55	9.60	4.50	4.65	5.38	8.10	1.85	.00	4.05	.20	5.25
24	4.00	23.18	9.20	4.20	4.10	3.95	11.48	1.75	.50	2.35	.10	3.85
25	3.80	18.30	8.70	4.10	4.00	3.40	10.00	1.75	.50	1.50	.15	3.10
26	2.90	11.55	8.25	4.00	3.85	3.25	9.50	1.85	.65	1.10	.25	3.10
27	2.30	8.15	7.00	3.85	3.30	3.08	8.20	1.80	.75	1.05	.00	2.40
28	1.95	7.80	6.70	3.70	3.30	2.57	7.85	1.90	.80	.95	.05	2.40
29	1.60	.....	6.65	3.60	3.90	2.38	6.70	1.90	.60	.90	.20	1.90
30	1.35	.....	6.40	3.50	3.78	2.35	5.30	1.60	.30	.80	.20	2.10
31	1.60	.....	6.25	.....	3.70	.....	4.25	1.35	.....	1.10	.....	2.00

ASHEVILLE STATION ON FRENCH BROAD RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 116, is located at the Bingham school iron highway bridge, 3 miles west of Asheville, North Carolina, and is reached by electric-car line. It is also 3 miles below the mouth of Swannanoa River. The gage is a wire one. The zero of the rod is opposite the east edge of the fifth upright, first span from east, upper side. The outside edge of the pulley is 3 feet from the end of the rod, and the length of the wire cable from the end of the weight to the index marker is 26.03 feet. When the gage height is 3.22 feet the water surface is 17.18 feet below top of the lower end of the second floor beam, first span from the east.

The initial point for soundings is on the right bank, at the end of the first span of the bridge. Both banks may overflow in very high water. The current is swift and the channel is rough and rocky, and reasonably permanent. The observer is J. M. Taylor, a carpenter of Asheville, North Carolina. The following discharge measurements were made by E. W. Myers and others during 1897:

August 18, gage height, 2.86 feet; discharge, 882 second-feet.
October 14, gage height, 2.84 feet; discharge, 808 second-feet.
October 27, gage height, 2.50 feet; discharge, 734 second-feet.

Daily gage height, in feet, of French Broad River at Asheville, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.80	3.60	3.90	4.25	7.10	3.30	3.30	2.75	2.65	2.30	2.90	2.85
2	2.75	3.80	3.80	4.20	7.00	3.25	3.15	2.80	2.63	2.30	3.85	2.85
3	2.70	4.60	3.80	4.15	3.90	3.90	3.05	2.85	2.60	2.30	3.83	2.90
4	2.90	4.90	3.80	5.30	5.70	3.95	3.10	2.95	2.60	2.27	3.77	3.00
5	3.25	4.90	3.70	7.60	4.50	3.85	3.15	2.95	2.60	2.27	2.95	3.00
6	3.25	7.90	7.00	7.30	4.30	3.40	3.25	3.10	2.55	2.25	2.85	2.90
7	2.95	7.40	7.25	6.90	4.00	3.30	3.35	4.00	2.55	2.25	2.65	2.83
8	2.93	6.40	5.50	6.50	3.90	4.50	3.37	4.00	2.53	2.23	2.55	2.77
9	2.93	4.85	5.00	5.40	3.85	3.80	3.37	3.05	2.45	2.23	2.53	2.65
10	2.87	4.55	5.10	5.35	3.80	3.65	3.25	3.03	2.40	2.23	2.50	2.63
11	2.85	4.60	5.20	4.60	3.60	3.40	3.60	3.00	2.37	3.35	2.47	2.60
12	2.85	4.70	6.20	4.55	3.45	3.30	3.40	2.80	2.37	3.30	2.46	2.60
13	2.87	4.60	6.43	4.40	4.00	3.20	3.20	2.73	2.35	3.20	2.45	2.55
14	2.90	4.55	7.00	4.60	4.15	3.15	3.25	2.70	2.35	2.83	2.45	2.45
15	2.85	4.35	5.90	4.60	4.00	3.05	3.30	2.70	2.40	2.75	2.45	2.45
16	2.83	4.15	6.40	4.50	3.70	3.30	3.30	2.80	2.40	2.65	2.45	3.15
17	2.95	3.95	5.90	4.35	3.65	3.40	3.40	2.85	2.35	2.63	2.43	3.15
18	3.35	3.90	5.30	4.15	3.65	3.55	3.35	2.87	2.33	2.45	2.43	3.10
19	3.15	3.85	5.45	4.10	3.55	3.60	3.35	2.85	2.37	3.25	2.40	2.95
20	3.50	3.75	5.85	4.05	3.53	3.35	3.25	2.92	2.35	3.23	2.37	3.00
21	4.45	4.15	5.50	4.00	3.50	3.35	3.40	2.90	2.33	2.85	2.27	3.15
22	4.40	3.90	4.90	3.90	3.50	3.25	3.55	2.90	2.40	2.75	2.35	3.20
23	3.65	6.85	4.75	3.85	3.50	3.40	3.40	2.85	2.50	2.67	2.33	3.25
24	3.55	6.05	4.65	3.85	3.50	3.55	3.35	2.83	2.45	2.65	2.35	3.20
25	3.45	4.86	4.55	3.75	3.45	3.40	3.30	2.70	2.43	2.63	2.40	3.05
26	3.35	4.35	4.45	3.70	3.35	3.35	3.15	2.70	2.43	2.50	2.60	3.25
27	3.35	4.20	4.45	3.70	3.37	3.30	3.20	2.70	2.40	2.50	2.90	3.40
28	3.45	4.15	4.35	3.67	3.27	3.50	3.10	2.65	2.37	2.47	2.85	3.65
29	3.43	.....	4.10	3.65	3.25	3.65	3.05	2.50	2.35	2.45	2.83	3.57
30	3.33	.....	4.00	5.40	3.35	3.45	3.00	2.55	2.33	2.45	2.90	3.50
31	3.45	.....	4.10	.....	3.35	.....	2.75	2.57	.....	2.45	.....	3.40

BRYSON STATION ON TUCKASEEGEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 116, was located on the Southern Railway bridge about 3 miles above Bryson, North Carolina, and just below Governor Island post-office, and was abandoned March 25 because the section was poor. A new station was established November, 1897, in the town of Bryson, at the highway bridge. The bottom is muddy, the water is deep, and the current is very sluggish. The gage is bolted to the north pier and lower side, and can be read from the bridge. The initial point for soundings is the south end, upstream hand-rail. The channel is obstructed by the remains of two old piers. The observer is H. H. Welch. The following discharge measurement was made in 1897 by A. P. Davis:

October 28, gage height, 1.00 foot; discharge, 168 second-feet.

Daily gage height, in feet, of Tuckaseegee River at Bryson, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Nov.	Dec.	Day.	Jan.	Feb.	Mar.	Nov.	Dec.
1	2.25	3.10	3.75	.....	1.25	17	2.90	3.60	5.70	1.00	1.30
2	2.20	3.80	3.60	.....	1.10	18	3.30	3.50	5.80	1.00	1.30
3	2.30	3.10	4.40	.....	1.35	19	2.90	3.50	6.90	1.00	1.60
4	2.50	3.00	3.65	.....	1.60	20	3.30	3.70	5.70	1.00	1.70
5	2.80	3.30	3.60	.....	2.30	21	3.30	4.30	5.60	1.00	3.40
6	2.40	5.52	7.50	.....	1.60	22	3.30	4.55	5.40	1.00	2.60
7	2.40	4.70	5.60	1.05	1.30	23	3.25	4.90	5.10	1.00	2.05
8	2.40	4.10	4.90	1.00	1.25	24	3.00	8.85	5.00	1.00	1.70
9	2.40	4.00	5.00	1.15	1.20	25	2.90	5.30	4.80	1.00	1.60
10	2.30	3.80	7.10	1.10	1.15	26	2.85	4.70	.....	1.00	1.70
11	2.30	4.00	5.30	1.00	1.15	27	2.80	4.30	.....	1.40	1.65
12	2.40	5.40	9.15	1.00	1.15	28	2.20	3.90	.....	1.20	1.50
13	2.30	5.00	6.80	1.00	1.30	29	2.20	.....	.....	1.30	1.45
14	3.00	4.15	7.70	1.00	2.00	30	2.60	.....	.....	1.30	1.40
15	2.80	3.90	6.20	1.00	1.70	31	2.90	.....	.....	.....	1.50
16	2.60	3.80	6.90	1.00	1.40						

JUDSON STATION ON LITTLE TENNESSEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 117, is located on the Southern Railway bridge about one-fourth of a mile from Judson, North Carolina, and below the mouth of Sawyer Branch. The zero of the gage rod is 25 feet west of the east end of the second span from the east. The outer rim of the pulley wheel is 2 feet from the zero of the gage rod, and the distance from the end of the weight to the marker on the wire rope is 26.25 feet. The gage reads zero when the weight touches the bottom of the stream. The bottom is rocky and very rough on the west side of the stream, and sandy on the east side, and the current is very swift. The river is straight for several hundred yards above and below the station. The section is not a very good one, as there are two bad pier obstructions. The observer is R. C. Sawyer, Judson, North Carolina. The following discharge measurements were made by E. W. Myers and A. P. Davis in 1897:

August 21, gage height, 3.21 feet; discharge, 771 second-feet.
October 13, gage height, 2.75 feet; discharge, 701 second-feet.
October 28, gage height, 2.44 feet; discharge, 448 second-feet.

Daily gage height, in feet, of Little Tennessee River at Judson, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.40	5.50	4.20	6.23	4.20	3.82	3.30	3.48	2.83	2.52	2.38	2.58
2	3.56	6.40	3.56	7.50	3.56	3.78	3.50	3.46	2.85	2.53	3.30	2.56
3	3.53	5.54	3.56	7.91	3.54	2.91	3.42	3.39	2.89	2.60	2.86	2.55
4	3.54	4.80	3.53	7.90	3.52	4.20	3.50	3.43	2.86	2.54	2.70	3.00
5	3.51	4.59	3.56	6.55	3.53	4.80	3.60	3.45	2.84	2.55	2.58	4.58
6	3.52	5.30	4.50	6.53	3.58	3.90	3.70	3.40	2.84	2.57	2.79	4.39
7	3.65	4.56	4.35	5.80	3.57	3.59	3.63	3.46	2.85	2.50	2.80	4.00
8	3.65	4.59	4.59	5.70	3.57	3.58	3.67	3.48	2.73	2.56	2.72	3.80
9	3.64	4.50	6.40	5.30	3.22	3.55	3.75	3.47	2.71	2.53	2.73	3.00
10	3.63	4.47	7.29	4.23	3.23	3.56	3.72	3.44	2.73	4.54	2.78	2.90
11	3.69	5.20	7.38	4.50	3.27	3.59	3.70	3.38	2.77	4.58	2.70	2.89
12	3.65	5.28	9.20	4.60	3.27	3.57	3.48	3.35	2.89	2.56	2.76	2.86
13	3.66	5.26	7.32	5.70	4.76	3.58	3.49	3.36	2.89	2.49	2.79	2.80
14	3.65	5.30	7.23	5.23	5.21	3.53	3.42	3.32	2.83	2.50	2.61	3.51
15	3.64	4.59	7.15	4.59	5.13	3.59	3.45	3.35	2.88	2.53	2.63	3.00
16	3.62	4.56	6.35	5.40	4.12	3.61	3.51	4.00	2.86	2.53	2.68	3.00
17	3.65	3.70	5.53	4.54	4.90	3.62	4.33	3.86	2.90	2.54	2.73	2.89
18	3.64	3.80	6.95	3.53	4.70	3.60	4.56	3.86	2.90	2.60	2.70	2.90
19	3.69	3.53	7.65	3.52	4.30	3.60	4.91	3.78	2.80	2.22	2.69	2.96
20	4.80	3.52	8.90	3.15	3.57	3.48	5.20	3.52	2.38	3.48	2.67	3.40
21	4.80	4.30	8.00	3.22	3.56	3.50	4.36	3.32	2.40	3.37	2.68	3.58
22	4.82	5.60	8.50	3.21	3.56	3.42	4.20	3.22	2.37	2.86	2.60	4.56
23	4.62	8.60	7.53	3.18	3.41	3.44	4.21	3.23	2.33	2.70	2.65	4.59
24	4.60	6.75	7.85	3.18	3.90	3.47	3.78	3.35	2.39	2.72	2.67	3.48
25	3.90	4.75	6.25	3.32	3.70	3.41	3.72	3.29	2.50	2.60	2.70	3.36
26	3.84	4.63	5.55	3.39	3.90	3.48	3.70	3.90	2.60	2.63	2.82	3.38
27	3.84	4.53	5.53	3.30	3.80	3.46	3.73	3.00	2.52	2.35	3.10	3.30
28	3.83	4.29	5.60	3.41	3.51	3.45	3.71	3.33	2.50	2.39	2.89	3.00
29	3.68	.....	5.56	3.90	3.60	3.43	3.75	2.78	2.53	2.39	2.80	2.97
30	3.69	.....	5.70	3.99	3.90	3.40	3.71	2.79	2.57	2.33	2.86	2.78
31	3.65	.....	6.21	.....	3.80	.....	3.69	2.77	.....	2.34	.....	2.90

MURPHY STATION ON HIWASSEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 117, is located on the highway bridge crossing the river at Murphy, North Carolina, one-half mile above Valley River. The zero of the gage rod is 8 feet north of the center of the second full-length compression member from the north end and on the downstream side of bridge. The outer rim of the pulley wheel is 2 feet from the zero of the gage rod, and the distance from the end of the weight to the marker on the wire is 29.10 feet. The reading of the gage is zero when the weight touches the bottom of the river. The section here is a fairly good one, though somewhat obstructed by the remains of two old piers directly under the present bridge. The course of the stream is straight for several hundred yards above and below the bridge and the current fairly rapid. The bottom is hard and rocky and is not subject to any decided change by high water. The banks are high and not subject to overflow except in very high water. The observer here is M. L. Brittain. The following measurements were made by E. W. Myers and A. P. Davis in 1897:

August 20, gage height, 5.33 feet; discharge, 528 second-feet.
October 14, gage height, 4.76 feet; discharge, 267 second-feet.
October 29, gage height, 4.71 feet; discharge, 253 second-feet.

Daily gage height, in feet, of Hiwassee River at Murphy, North Carolina, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.90	4.80	4.60	5.40	4.80	4.16	3.90	4.20	.....	.....	5.00	5.02
2	3.90	5.50	4.50	5.50	4.70	4.15	3.90	4.32	.....	.....	5.40	5.00
3	3.90	4.90	4.55	5.38	4.65	4.12	3.90	4.20	.....	.....	5.10	5.10
4	3.90	4.62	4.70	6.26	4.60	4.10	3.90	4.10	.....	.....	5.02	5.45
5	4.12	4.60	4.60	8.20	4.55	4.30	4.15	4.35	.....	.....	5.00	6.10
6	4.02	5.15	9.20	6.12	4.52	4.12	4.00	4.20	.....	.....	5.00	5.50
7	4.00	5.40	6.50	5.75	4.50	4.10	4.02	4.20	.....	.....	4.95	5.30
8	4.00	5.12	5.65	5.50	4.50	4.10	4.10	.....	.....	.....	5.00	5.20
9	3.92	5.10	5.40	6.10	4.50	4.22	4.10	.....	.....	.....	4.98	5.12
10	3.92	4.85	5.62	5.35	4.45	4.10	4.25	.....	.....	.....	5.00	5.10
11	4.00	4.85	5.50	5.30	4.52	4.02	4.15	.....	.....	.....	5.00	5.10
12	3.90	4.82	9.90	5.15	4.40	4.05	4.00	.....	.....	.....	4.95	5.00
13	3.92	4.82	6.85	5.05	5.00	4.05	3.98	.....	.....	.....	4.95	5.02
14	4.40	4.12	6.70	5.05	4.80	4.00	3.90	.....	.....	.....	5.00	6.20
15	4.60	4.70	6.12	5.50	4.60	4.00	3.85	.....	.....	.....	5.00	5.55
16	4.15	4.60	7.65	5.05	4.50	4.10	3.90	.....	.....	.....	5.00	5.30
17	4.55	.....	6.30	5.00	4.50	4.03	4.50	.....	.....	.....	4.95	5.28
18	4.40	.....	6.00	4.90	4.42	4.10	4.05	.....	.....	.....	4.95	5.20
19	4.40	.....	7.05	4.80	4.40	4.20	5.72	.....	.....	.....	4.95	5.40
20	5.10	.....	6.80	4.80	4.32	4.15	5.00	.....	.....	5.00	4.95	6.00
21	4.70	4.80	6.10	4.70	4.36	4.05	4.50	.....	.....	4.75	4.95	7.35
22	4.52	4.50	5.80	4.70	4.35	4.00	4.85	.....	.....	4.75	4.95	6.85
23	4.40	7.92	5.55	4.70	4.30	4.00	4.34	.....	.....	4.70	4.90	6.15
24	4.40	5.50	5.40	4.70	4.26	4.00	4.20	.....	.....	4.70	4.90	5.80
25	4.40	5.10	5.30	4.65	4.25	4.00	10.85	.....	.....	4.70	5.00	5.50
26	4.20	4.97	5.15	4.70	4.22	4.00	6.20	.....	.....	4.65	4.98	5.85
27	4.30	4.70	5.10	4.63	4.20	3.90	5.20	.....	.....	4.66	5.00	5.60
28	4.10	4.64	5.00	4.60	4.20	3.90	4.72	.....	.....	4.70	5.05	5.50
29	4.15	.....	4.90	4.60	4.20	4.30	4.52	.....	.....	4.72	5.00	5.40
30	4.15	.....	5.00	4.68	4.20	4.00	4.40	.....	.....	4.90	5.10	5.40
31	4.15	.....	4.90	.....	4.20	.....	4.25	.....	.....	4.87	.....	5.30

CHATTANOOGA STATION ON TENNESSEE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 119, is located on the Tennessee River at the city of Chattanooga, Tennessee. The gage is on an incline of railroad iron for about 20 feet in its lower portion. Above this it is a vertical rod bolted to the vertical rock bluff forming the river bank. The zero of the gage is 630.64 feet above sea level. It is located at the foot of Lookout street, just below Chattanooga Island. Measurements are made from the Hamilton County steel highway bridge at the foot of Walnut street, a short distance below the gage. The observer is L. M. Prindell. The following discharge measurements were made by Max Hall and others during 1897:

May 8, gage height, 7.07 feet; discharge, 44,187 second-feet.
May 28, gage height, 4.52 feet; discharge, 25,892 second-feet.
June 29, gage height, 5.76 feet; discharge, 32,943 second-feet.
July 13, gage height, 4.59 feet; discharge, 26,884 second-feet.
September 7, gage height, 1.67 feet; discharge, 10,313 second-feet.
October 6, gage height, 0.48 foot; discharge, 5,969 second-feet.
November 16, gage height, 0.83 foot; discharge, 5,552 second-feet.
December 23, gage height, 10.30 feet; discharge, 67,000 second-feet.

Daily gage height, in feet, of Tennessee River at Chattanooga, Tennessee, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	3.0	12.5	8.7	5.9	4.3	5.0	4.4	2.1	0.8	0.8	1.0
2	2.5	7.0	9.6	12.2	6.3	4.2	4.6	3.9	2.2	.8	.9	1.2
3	2.8	10.1	8.6	15.0	7.4	4.1	3.8	3.8	1.9	.7	1.0	1.3
4	2.6	10.5	9.0	16.0	9.6	4.1	3.4	3.6	1.8	.6	1.2	2.0
5	2.6	9.4	9.5	26.0	9.6	4.1	3.4	3.3	1.8	.5	1.2	3.3
6	2.7	8.3	12.1	30.4	8.5	4.1	4.0	3.5	1.7	.5	1.3	3.8
7	2.9	8.8	19.2	29.7	7.7	4.4	3.8	4.4	1.7	.5	1.4	3.9
8	3.0	10.7	25.1	25.4	7.2	4.4	3.8	4.2	1.6	.4	1.2	3.5
9	2.8	14.1	24.2	20.0	6.6	4.0	4.4	4.2	1.6	.4	1.2	2.9
10	2.8	15.5	21.3	16.0	6.2	5.2	4.0	5.6	1.4	.4	1.2	2.6
11	2.7	13.2	22.3	14.0	6.0	5.0	4.1	5.2	1.3	.5	1.1	2.4
12	2.6	10.8	28.4	26.0	6.2	5.7	4.5	4.6	1.2	.6	1.0	2.1
13	2.4	9.9	34.9	11.4	7.8	5.0	4.6	4.1	1.2	.9	1.0	1.8
14	2.6	10.0	37.9	10.3	18.4	4.3	4.2	3.5	1.1	1.4	.9	1.8
15	4.1	10.5	37.9	9.7	22.4	3.9	3.8	3.1	1.0	1.1	.8	2.5
16	6.5	10.7	37.0	9.8	20.3	3.6	3.6	2.8	1.0	1.2	.8	2.7
17	6.6	9.8	36.0	10.2	16.5	3.7	4.5	2.8	.9	1.2	.8	2.5
18	6.3	8.6	33.8	9.9	11.9	3.6	6.3	3.0	.9	1.2	.8	2.5
19	6.4	7.6	29.6	9.3	9.1	3.3	6.1	3.4	.8	1.1	.8	2.6
20	6.8	7.0	29.6	8.8	7.7	3.3	5.6	3.0	.8	1.4	.7	3.4
21	7.0	7.0	32.4	8.1	6.9	4.1	6.7	3.0	.9	2.0	.7	4.5
22	7.2	8.3	33.3	7.5	6.4	5.0	6.1	3.4	.9	1.9	.7	7.1
23	7.3	13.2	30.9	7.0	5.9	4.8	5.8	3.1	.8	1.6	.7	10.2
24	7.0	25.2	25.0	6.7	5.6	5.3	6.0	3.8	.9	1.4	.7	9.3
25	6.6	31.6	18.1	6.4	5.3	5.5	8.4	3.4	.8	1.6	.7	7.7
26	5.9	34.8	14.2	6.2	5.1	6.2	9.7	2.9	.8	1.4	.7	6.4
27	5.3	33.8	12.2	6.0	4.8	5.4	13.3	2.8	.7	1.2	.7	5.6
28	4.8	23.6	10.8	6.1	4.6	5.5	8.7	2.8	.7	1.0	.7	5.0
29	4.4	.....	9.8	6.2	4.4	6.2	6.7	2.5	.7	.9	.7	4.5
30	3.7	.....	9.1	5.8	4.2	5.2	5.6	2.2	.8	.8	.9	4.0
31	3.0	.....	8.6	.....	4.2	.....	5.0	2.1	.....	.8	.....	3.8

TOWNSEND STATION ON MISSOURI RIVER.

This station, mentioned in the Eighteenth Annual Report, Part IV, page 123, and described more fully in Bulletin No. 131, page 22, is located on a wagon bridge about a mile north of the railroad station at Townsend, Montana, and immediately below the railroad bridge. The heights given are the means of two daily readings expressed in feet above the St. Louis directrix, which is 412.73 feet above mean gulf level. This gage is maintained by Capt. J. C. Sanford, Corps of Engineers, U. S. A., Sioux City, Iowa, and copies of the record are sent weekly to the office of the Missouri River Commission. The secretary of that commission, Capt. Hiram M. Chittenden, has kindly furnished this office with the record for the year 1897. In the following table, taken from this record, the figures 3,300 have been omitted. It is, therefore, necessary to add 3,300 to obtain elevation above the St. Louis directrix. The following discharge measurements have been made by Roe Emery during 1897:

May 10, gage height, 92.10 feet; discharge, 14,247 second-feet.
May 19, gage height, 92.50 feet; discharge, 19,466 second-feet.
June 12, gage height, 91.00 feet; discharge, 12,352 second-feet.
June 23, gage height, 90.28 feet; discharge, 8,189 second-feet.
July 12, gage height, 89.50 feet; discharge, 5,917 second-feet.
July 27, gage height, 88.85 feet; discharge, 3,797 second-feet.
August 12, gage height, 88.50 feet; discharge, 2,901 second-feet.
September 17, gage height, 88.40 feet; discharge, 2,695 second-feet.

Daily gage height, in feet, of Missouri River at Townsend, Montana, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	88.8	92.1	91.5	89.1	90.6	92.5	90.1	88.7	88.2	88.6	88.8	a93.3
2	88.8	92.2	91.4	89.0	90.7	92.7	90.2	88.7	88.2	88.6	88.8	93.3
3	88.8	92.4	91.3	89.0	90.9	92.6	90.2	88.7	88.3	88.6	88.8	93.3
4	88.8	92.5	91.2	89.0	91.2	92.3	90.2	88.7	88.4	88.6	88.7	93.3
5	88.8	92.6	91.1	89.1	91.4	91.9	90.2	88.6	88.4	88.6	88.7	93.3
6	88.6	92.7	91.1	89.1	91.6	91.6	90.2	88.5	88.4	88.6	88.7	93.3
7	88.6	92.8	91.1	89.1	91.7	91.4	90.1	88.5	88.4	88.6	88.7	93.3
8	88.5	92.8	91.1	89.1	91.9	91.3	90.0	88.5	88.4	88.6	88.7	93.1
9	88.5	92.6	91.1	89.2	92.1	91.3	89.8	88.4	88.4	88.6	88.7	92.9
10	88.5	92.6	91.0	89.1	91.9	91.2	89.7	88.4	88.4	88.6	88.7	92.6
11	88.5	92.5	90.0	89.1	91.4	91.1	89.6	88.4	88.4	88.6	88.7	92.3
12	88.5	92.4	90.8	89.2	91.1	91.0	89.4	88.4	88.4	88.6	88.7	92.1
13	88.5	92.4	90.7	89.4	91.1	90.9	89.4	88.4	88.4	88.6	88.7	92.1
14	91.4	92.4	90.7	89.5	91.1	90.8	89.3	88.4	88.4	88.6	88.7	92.2
15	91.4	92.4	90.7	89.8	91.5	90.8	89.2	88.4	88.4	88.6	88.7	92.2
16	91.4	92.3	90.8	90.1	91.8	90.9	89.1	88.4	88.4	88.6	88.7	92.3
17	91.4	92.1	91.1	90.4	92.1	90.9	89.1	88.4	88.4	88.6	88.7	92.3
18	91.4	92.0	91.4	90.6	92.4	90.8	86.1	88.4	88.4	88.7	88.7	92.3
19	91.4	92.0	91.4	90.9	92.4	90.7	89.1	88.4	88.5	88.7	88.7	92.3
20	91.4	91.9	91.4	91.0	92.6	90.5	89.1	88.4	88.4	88.7	88.7	92.3
21	91.4	92.0	91.4	90.8	92.9	90.4	89.1	88.4	88.4	88.8	88.7	92.3
22	91.5	91.9	91.5	90.5	93.0	90.3	89.1	88.4	88.4	88.8	88.7	92.3
23	a92.4	91.8	a91.6	90.2	93.0	90.2	89.0	88.4	88.4	88.8	88.8	92.3
24	92.4	91.7	91.8	90.1	92.8	90.1	89.0	88.4	88.4	88.8	88.8	92.3
25	92.4	91.7	92.4	90.0	92.7	90.1	89.0	88.3	88.4	88.8	88.8	92.3
26	92.4	91.7	93.2	90.2	92.7	90.1	88.9	88.2	88.5	88.8	88.8	92.3
27	92.3	91.7	91.7	90.4	92.5	90.1	88.8	88.2	88.5	88.8	88.8	92.3
28	92.3	91.7	89.9	90.6	92.4	90.1	88.7	88.2	88.5	88.8	88.8	82.3
29	92.2	.....	89.5	90.6	92.3	90.1	88.7	88.2	88.5	88.8	88.8	92.3
30	92.1	.....	89.3	90.6	92.2	90.1	88.7	88.2	88.5	88.8	88.8	92.3
31	92.1	.....	89.2	.....	92.3	.....	88.7	88.2	.....	88.8	.....	92.1

a Ice readings Jan. 23 to Mar. 23, inclusive, and Dec. 1 to Dec. 31, inclusive.

SALESVILLE STATION ON WEST GALLATIN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 123, is about 16 miles southwest of Bozeman, Montana, at the highway bridge crossing the stream about 5 miles south of Salesville. The old gage rod erected in July, 1895, is spiked to a tree. In September, 1896, a wire gage was placed on the bridge, the pulley being fastened to the end of the rod opposite the 0.15 foot mark. The distance of the end of the weight to the index marker is 15.50 feet. The two gages were made to read the same. The bed of the stream is rocky and the current is swift.

The bench mark for the wire gage is the head of the southwest bolt in the rim of the southeast cylindrical pier. Its elevation is 13.70 feet above datum. The observer is Ira T. Williams, Salesville, Montana. Discharge measurements were made during 1897, by Roe Emery, as follows:

May 9, gage height, 4.70 feet; discharge, 1,835 second-feet.
May 22, gage height, 6.70 feet; discharge, 5,538 second-feet.
June 5, gage height, 5.40 feet; discharge, 3,221 second-feet.
June 30, gage height, 4.55 feet; discharge, 1,858 second-feet.
July 19, gage height, 3.90 feet; discharge, 1,187 second-feet.
August 10, gage height, 3.50 feet; discharge, 869 second-feet.
September 10, gage height, 3.20 feet; discharge, 533 second-feet.
October 30, gage height, 3.20 feet; discharge, 491 second-feet.

Daily gage height, in feet, of West Gallatin River at Salesville, Montana, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Dec.
1	.....	4.15	6.70	4.50	3.60	3.20	3.20	.....
2	2.90	4.35	6.40	4.50	3.60	3.20	3.25	.....
3	2.90	4.65	5.90	4.65	3.50	3.20	3.30	.....
4	2.90	4.95	5.70	4.40	3.50	3.30	3.20	.....
5	2.90	5.15	5.60	4.50	3.50	3.20	3.20	.....
6	2.90	5.25	5.35	4.40	3.50	3.20	3.20	3.00
7	2.90	5.85	5.30	4.30	3.50	3.20	3.20	.....
8	2.90	5.75	5.20	4.40	3.50	3.20	3.20	.....
9	2.90	5.45	5.35	4.20	3.50	3.20	3.20	.....
10	2.95	4.85	5.70	4.15	3.50	3.20	3.20	.....
11	3.00	4.65	5.30	4.10	3.40	3.20	3.20	3.00
12	3.00	4.65	5.20	4.00	3.40	3.20	3.30	.....
13	2.90	5.15	5.20	4.00	3.40	3.20	3.30	.....
14	2.90	5.40	5.30	3.95	3.40	3.20	3.30	.....
15	3.05	5.75	5.30	3.90	3.30	3.20	3.20	2.90
16	3.10	6.15	5.25	3.90	3.20	3.20	3.20	.....
17	3.20	6.30	5.20	3.90	3.20	3.20	3.20	.....
18	3.35	6.30	5.00	3.90	3.20	3.20	3.20	.....
19	3.50	6.30	5.00	3.90	3.20	3.20	3.20	3.00
20	3.55	6.35	4.90	3.85	3.20	3.20	3.20	.....
21	3.40	6.85	4.70	3.80	3.20	3.20	3.20	.....
22	3.40	6.70	4.70	3.80	3.20	3.20	3.20	.....
23	3.45	6.20	4.70	3.85	3.20	3.20	3.20	.....
24	3.45	6.30	4.65	3.80	3.20	3.20	3.20	.....
25	3.40	6.80	4.55	3.80	3.20	3.20	3.20	.....
26	3.50	6.70	4.50	3.85	3.20	3.20	3.20	3.30
27	3.60	6.00	4.85	3.70	3.20	3.20	3.20	.....
28	3.95	6.00	4.50	3.65	3.20	3.20	3.20	.....
29	4.00	6.15	4.50	3.65	3.20	3.20	3.20	.....
30	3.95	6.30	4.45	3.60	3.20	3.20	3.20	.....
31	.....	6.80	.....	3.60	3.20	.....	3.20	.....

BOZEMAN STATION ON MIDDLE CREEK.

This station, described in the Eighteenth Annual Report, Part IV, page 127, is located in Middle Creek Canyon, 9 miles from Bozeman, Montana, and one-eighth of a mile above the old sawmill dam on the road from Bozeman. The gage is about half a mile upstream from the small footbridge which has been placed across the stream for convenience in making discharge measurements. It consists of a vertical post, 4 inches square, secured to a tree stump and protected by the latter from the full force of the current. The bench mark consists of a spike driven horizontally into a stump 5 feet high, about 80 feet east of the gage rod. The middle of this spike is at an elevation of 7.03 feet of the gage. Another bench mark consists of an 8-inch bridge spike driven horizontally into a charred stump about 25 feet northeast of the gage. The top of the spike is at an elevation of 3.58 feet. A third bench mark consists of a large rock 93 feet east of the gage, marked "B. M." in black paint. It is 4.84 feet above datum. Gage heights were not taken in 1897, owing to the impossibility of securing an observer at moderate expense. The following measurements were made during 1897 by Roe Emery:

May 3, gage height, 1.20 feet; discharge, 174 second-feet.
May 21, gage height, 1.20 feet; discharge, 340 second-feet.
June 4, gage height, 0.80 foot; discharge, 233 second-feet,
June 21, gage height, 0.70 foot; discharge, 184 second-feet.
July 6, gage height, 0.65 foot; discharge, 133 second-feet.
July 19, gage height, 0.50 foot; discharge, 108 second-feet.
August 1, gage height, 0.40 foot; discharge, 54 second-feet.
August 10, gage height, 0.30 foot; discharge, 44 second-feet.
September 20, gage height, 0.25 foot; discharge, 42 second-feet.

LOGAN STATION ON GALLATIN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 128, is located at Logan, Montana, near the mouth of Gallatin River. The wire gage is placed in the east span of the railroad bridge and fastened to the guard rail on the upper side. The distance from the outside edge of the pulley to the end of the rod is 1 foot; from the end of the weight to the index marker 18.40 feet. Bench mark 1 is the top of the northeast corner of the iron plate at foot of diagonal end member of truss, east end, upper side, and is 13.70 feet above datum. Bench mark 2 consists of the head of a bridge spike driven vertically into the top of the pile stump, to which the lower end of the old inclined gage is fastened, and is 0.38 foot below the 2-foot mark on the gage. Discharge measurements are made from the cable across the river 300 feet above the railroad bridge. The section is a good one, the channel being straight for some distance above and below the cable. The bed is gravelly. The observer is James Martin. The following measurements were made by Roe Emery in 1897:

April 24, gage height, 1.50 feet; discharge, 930 second-feet.
May 4, gage height, 2.30 feet; discharge, 2,708 second-feet.
June 7, gage height, 3.30 feet; discharge, 3,811 second-feet.
July 3, gage height, 1.90 feet; discharge, 1,339 second-feet.
July 16, gage height, 0.70 foot; discharge, 555 second-feet.
July 31, gage height, 0.70 foot; discharge, 459 second-feet.
September 15, gage height, 0.90 foot; discharge, 526 second-feet.
October 6, gage height, 0.90 foot; discharge, 601 second-feet.

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

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	(a)	.....	1.05	1.95	4.60	1.72	0.70	0.70	0.90	1.10	1.35
2	0.95	(a)	.....	1.20	2.00	4.20	1.80	.70	.70	1.15	1.10	1.40
3	.....	(a)	0.80	1.05	2.20	3.70	1.90	.70	.78	1.10	1.10	1.30
4	.....	(a)	.....	1.15	2.32	3.50	1.82	.70	.82	1.00	1.00	1.30
5	.....	(a)	.....	1.50	2.65	3.20	1.70	.70	.80	.90	1.00	1.20
6	1.25	(a)	.90	1.20	3.00	3.10	1.70	.70	.80	.90	1.00	1.10
7	.....	(a)	.....	1.10	3.20	3.10	1.65	.70	.80	.90	1.00	1.10
8	.....	(a)	.....	1.30	3.05	3.15	1.50	.70	.80	.90	1.00	1.10
9	1.20	(a)	.....	1.30	2.70	3.20	1.40	.70	.80	.90	1.00	1.00
10	.....	(a)	1.25	1.30	2.50	3.30	1.30	.70	.80	.90	1.00	1.00
11	.....	(a)	.....	1.30	2.25	3.00	1.20	.70	.80	1.00	1.10	1.00
12	.....	(a)	.....	1.50	2.35	3.00	1.10	.70	.80	1.00	1.10	1.00
13	1.30	(a)	.70	1.30	2.62	3.00	1.00	.70	.80	1.00	1.10	1.00
14	.....	(a)	.....	1.70	2.75	3.10	.90	.70	.80	1.00	1.10	1.00
15	.....	(a)	.....	1.90	3.15	3.00	.80	.70	.80	1.00	1.10	1.10
16	1.50	(a)	.....	1.90	3.45	2.90	.75	.70	.90	1.00	1.10	1.10
17	.....	(a)	.90	1.90	3.75	2.80	.70	.70	.90	1.00	1.10	1.00
18	.....	(a)	.....	1.90	3.85	2.70	.80	.70	.90	1.00	1.20	1.00
19	.....	(a)	.....	1.90	3.88	2.50	1.00	.70	.90	1.00	1.20	(a)
20	1.40	(a)	.95	1.70	4.10	2.40	.85	.70	.90	1.00	1.20	(a)
21	(a)	(a)	.....	1.60	4.28	2.30	.80	.70	.90	1.00	1.20	(a)
22	(a)	(a)	.....	1.50	4.10	2.20	.80	.70	.90	1.05	1.30	(a)
23	(a)	(a)	.....	1.50	3.95	2.20	.80	.70	.90	1.10	1.30	(a)
24	(a)	(a)	1.00	1.50	3.90	2.20	.80	.65	.90	1.10	1.20	(a)
25	(a)	(a)	.....	1.40	4.30	2.10	.78	.65	.90	1.10	1.20	(a)
26	(a)	(a)	.....	1.50	4.70	2.00	.70	.70	.90	1.10	1.10	(a)
27	(a)	0.95	1.80	1.60	3.95	2.00	.70	.70	.90	1.10	1.10	(a)
28	(a)	.....	.....	1.90	3.80	2.00	.70	.70	.90	1.10	1.10	(a)
29	(a)	.....	.....	1.95	3.85	2.00	.65	.70	.80	1.10	1.10	(a)
30	(a)	.....	.....	1.98	3.90	2.00	.60	.70	.80	1.10	1.20	(a)
31	(a)	.....	.....	.....	3.85	.....	.65	.70	.....	1.10	.....	1.03

a Frozen.

REDBLUFF STATION ON MADISON RIVER.

This station is located at the ranch of the observer, Mrs. S. A. Black, 4 miles below the Redbluff iron county bridge over the Madison, and about 1½ miles below the mouth of Cherry Creek. It is also about 3 miles below the location of the old Redbluff station, described in Bulletin No. 131, on page 18. It was established May 2, 1897, at which time the one at Threeforks was discontinued. The vertical gage is fastened to a post set firmly into the bed of the river, and braced with crosspieces from the bank. Discharge measurements are made from the iron bridge above. Cherry Creek is measured at the same time as it enters between the gage and the bridge. The initial point for soundings is at the left abutment of the bridge. The banks are high and do not overflow. The bed of the stream is rocky and the current is quite swift. The following are the discharge measurements made during 1897 by Roe Emery:

Not including Cherry Creek:

April 27, gage height, 1.70 feet; discharge, 1,806 second-feet.

May 7, gage height, 2.45 feet; discharge, 2,803 second-feet.

Including Cherry Creek:

May 26, gage height, 3.70 feet; discharge, 8,467 second-feet.

June 19, gage height, 2.22 feet; discharge, 4,191 second-feet.

July 1, gage height, 1.90 feet; discharge, 2,794 second-feet.

July 14, gage height, 1.65 feet; discharge, 2,241 second-feet.

July 29, gage height, 1.50 feet; discharge, 2,115 second-feet.

September 14, gage height, 1.40 feet; discharge, 1,656 second-feet.

October 4, gage height, 1.50 feet; discharge, 1,940 second-feet.

November 2, gage height, 1.40 feet; discharge, 1,545 second-feet.

Daily gage height, in feet, of Madison River at Redbluff, Montana, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1....	.....	3.75	1.92	1.60	1.40	1.40	17.....	2.75	2.50	1.88	1.40	1.40	1.30
2....	2.08	3.65	1.92	1.60	1.40	1.40	18.....	(a)	2.30	1.85	1.40	1.40	1.30
3....	2.08	3.55	2.00	1.60	1.40	1.40	19.....	(a)	2.25	1.80	1.40	1.40	1.35
4....	2.15	3.35	2.00	1.60	1.40	1.40	20.....	(a)	2.25	1.85	1.40	1.40	1.40
5....	2.22	3.20	2.00	1.60	1.40	1.40	21.....	(a)	2.10	1.80	1.40	1.40	1.40
6....	2.35	2.50	1.90	1.50	1.40	1.40	22.....	(a)	2.05	1.70	1.40	1.40	1.40
7....	2.45	2.40	2.00	1.50	1.40	1.40	23.....	(a)	2.10	1.82	1.40	1.40	1.40
8....	2.50	2.50	2.00	1.45	1.40	1.40	24.....	(a)	2.00	1.85	1.40	1.40	1.50
9....	2.35	2.60	1.95	1.40	1.40	1.40	25.....	(a)	2.00	1.70	1.40	1.40	1.50
10....	2.28	2.55	1.90	1.40	1.40	1.40	26.....	(a)	2.00	1.70	1.40	1.35	1.50
11....	2.15	2.40	1.90	1.40	1.40	1.40	27.....	3.75	1.94	1.75	1.40	1.35	1.50
12....	2.10	2.30	1.90	1.40	1.40	1.40	28.....	3.60	1.93	1.70	1.40	1.40	1.50
13....	2.15	2.30	1.80	1.40	1.40	1.40	29.....	3.40	1.90	1.70	1.40	1.40	1.50
14....	2.35	2.40	1.80	1.40	1.40	1.40	30.....	3.45	1.90	1.70	1.40	1.40	1.50
15....	2.45	2.45	1.82	1.40	1.40	1.40	31.....	3.55	.....	1.60	1.40	.....	.....
16....	2.65	2.50	1.80	1.40	1.40	1.40							

a Over gage.

THREEFORKS STATION ON MADISON RIVER.

A description of this station was given in the Eighteenth Annual Report, Part IV, page 131. The gage is at the bridge of the Northern Pacific Railroad company, one-half mile from the town of Threeforks. The greater part of the discharge of the river flows under this bridge, but there are a number of small side channels, branching off at points above, through which considerable water flows, especially in time of flood. For this reason the station was discontinued on the 1st of May and one established at the Redbluff iron bridge, 30 miles above. A measurement was made June 8, 1897, which gave a discharge of 4,316 second-feet, at the same time the sloughs were discharging 1,568 second-feet additional. The gage is inclined, the zero being 14.11 feet below the top of the rail on the east end of the bridge.

Daily gage height, in feet, of Madison River at Threeforks, Montana, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May.
1	.....	2.30	0.90	1.00	1.50	17	1.00	0.90	0.60	0.50	.....
2	.....	2.30	.90	1.00	.....	18	1.50	.90	.60	.50	.....
3	.....	2.30	.80	1.00	.....	19	1.40	.90	.60	.70	.....
4	.....	1.90	.80	2.00	.....	20	1.30	.99	.70	.70	.....
5	.....	2.00	.70	2.00	.....	21	1.20	.90	.70	.60	.....
6	.....	1.70	.70	1.05	.....	22	1.00	.90	.50	.60	.....
7	.....	1.30	.60	1.03	.....	23	.90	.90	.50	.70	.....
8	.....	1.30	.60	.50	.....	24	.90	.90	.40	.70	.....
9	.....	1.30	.60	.40	.....	25	1.00	.90	.40	.80	.....
10	2.00	1.20	.60	.40	.....	26	.80	.90	.30	.80	.....
11	1.51	1.20	.60	.50	.....	27	.80	.90	.20	.90	.....
12	2.25	1.00	.50	.55	.....	28	.80	.90	.80	1.00	.....
13	1.00	1.00	.50	.40	.....	29	.80	.....	.80	1.30	.....
14	2.00	.90	.60	.40	.....	30	.80	.....	.90	1.40	.....
15	1.00	.90	.60	.40	.....	31	1.30	.....	.90	.....	.....
16	1.00	.85	.60	.50	.....						

SAPPINGTON STATION ON JEFFERSON RIVER.

This station is described in the Eighteenth Annual Report, Part IV, page 134. The wire gage is fastened to the guard rail, on the upper side, in the east span of the Northern Pacific Railroad bridge, one-fourth of a mile north of Sappington station, Montana. The outside edge of the pulley is 0.2 foot from the end of the rod. The distance from the end of the weight to the index marker is 16 feet. Bench mark 1 consists of a 6-inch wire nail driven horizontally in the east side of the blocking which forms the south abutment of the railroad bridge, and is 6.9 feet on the gage. Bench mark 2 is a 6-inch wire nail driven horizontally into a telegraph pole about 30 feet south and east of the south abutment of the bridge, and is at an elevation of 7 feet on the gage. Bench mark 3 is the head of the northwest bolt fastening the switch standard to the cross-tie, 30 feet east of the bridge. Its elevation is 15.67 feet. On November 3, 1897, the rod was lowered 0.8 foot, by placing its end that distance nearer the pulley, thus making the pulley distance 0.2 foot, subsequent readings being adjusted to the old position. The

section is good, being straight for some distance above and below the cable. The bed of the river is gravelly. The observer is Clem Piper, storekeeper, address, Sand Creek, Montana. The following discharge measurements were made during 1897 by Roe Emery:

April 26, gage height, 2.60 feet; discharge, 3,571 second-feet.
May 6, gage height, 3.85 feet; discharge, 8,293 second-feet.
July 2, gage height, 2.10 feet; discharge, 3,321 second-feet.
July 15, gage height, 1.30 feet; discharge, 2,077 second-feet.
July 30, gage height, 0.80 foot; discharge, 1,116 second-feet.
September 14, gage height, 0.40 foot; discharge, 811 second-feet.
October 5, gage height, 0.50 foot; discharge, 920 second-feet.
Gage heights at Sappington; discharge measured at bridge at Three Forks:
May 27, gage height, 4.20 feet; discharge, 9,704 second-feet.
June 8, gage height, 2.65 feet; discharge, 4,638 second-feet.

Daily gage height, in feet, of Jefferson River at Sappington, Montana, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.00	2.95	3.65	2.10	0.70	—0.10	0.30	.....	.....
2	.....	3.10	3.75	2.00	.70	— .10	.30	.....	.....
3	.....	3.35	3.60	2.20	.60	— .10	.45	.....	.....
4	.....	3.50	3.40	2.35	.60	— .10	.50	.....	.....
5	.....	3.75	3.25	2.40	.60	+ .10	.50	.....	.....
6	.....	4.00	3.05	2.30	.60	.20	.50	.60	1.60
7	.95	4.45	2.85	2.20	.50	.20	.50	.....	.....
8	.....	4.30	2.65	2.10	.50	.25	.50	.....	.....
9	.....	4.35	2.60	2.00	.50	.30	.50	.....	.....
10	1.00	3.95	2.60	2.00	.50	.30	.50	.....	.....
11	.....	3.60	2.45	1.85	.50	.20	.50	.....	.....
12	.....	3.35	2.25	1.65	.40	.30	.50	.....	1.90
13	.....	3.30	2.00	1.55	.40	.30	.50	.....	.....
14	1.00	3.45	1.90	1.40	.30	.40	.50	.60	.....
15	.....	3.55	1.85	1.25	.30	.40	.55	.....	.....
16	.....	3.80	1.90	1.20	.30	.40	.60	.....	.....
17	.....	3.95	2.10	1.05	.25	.40	.60	.....	.....
18	.....	4.30	2.25	1.10	.20	.40	.60	.....	.....
19	.....	4.50	2.30	1.20	.20	.40	.60	.....	1.80
20	3.90	4.50	2.25	1.20	.20	.40	.60	.....	.....
21	.....	4.50	2.15	1.15	.20	.40	.60	1.90	.....
22	.....	4.45	1.95	1.10	.....	.35	.65	.....	.....
33	.....	4.40	1.80	1.10	.....	.30	.70	.....	.....
24	.....	4.15	1.80	1.10	.....	.30	.80	.....	.....
25	.....	4.00	1.95	1.10	.....	.30	.80	.....	.....
26	2.60	4.05	2.00	1.05	.....	.30	.80	.....	(a)
27	3.00	4.20	1.95	1.00	.....	.30	.80	.....	.....
28	3.35	4.10	2.05	.95	— .10	.30	.80	1.90	.....
29	3.10	3.85	2.25	.85	— .10	.30	.70	.....	.....
30	3.05	3.65	2.20	.80	— .10	.30	.70	.....	.....
31	.....	3.40	.....	.70	— .10	.....	.....	.....	.....

a Frozen.

River frozen Jan. 1 to Apr. 1.

GREAT FALLS STATION ON SUN RIVER.

This station is located on Sun River, 10 miles above its mouth, at Great Falls, Montana. It is at the dam of the Priest Rapids Water Power and Irrigation system. The vertical rod with its zero corresponding to the crest of the dam is fastened to the north abutment. The observer is Mr. I. S. Corson, Great Falls, Montana. A discharge measurement made July 4, 1897, at the highway bridge 5 miles above the dam gave a discharge of 2,108 second-feet. On August 28 a measurement was made at the wagon bridge in the outskirts of West Great Falls about one-half mile above the junction of Sun and Missouri rivers. The gage height was 0.30 foot and the discharge 362 second-feet.

Daily gage height, in feet, of Sun River near Great Falls, Montana, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Day.	July.	Aug.	Sept.	Oct.
1	.....	0.64	0.32	0.50	17	1.06	0.71	0.49	0.51
2	.....	.61	.32	.52	18	1.02	.72	.46	.50
3	.....	.62	.37	.50	19	.99	.62	.46	.50
4	.....	.64	.39	.49	20	.94	.60	.46	.51
5	.....	.66	.40	.50	21	.90	.58	.48	.54
6	.....	.65	.40	.49	22	.90	.52	.46	.54
7	.....	.66	.40	.49	23	.88	.50	.48	.52
8	.....	.67	.39	.49	24	.86	.48	.48	.51
9	.....	.68	.40	.50	25	.86	.44	.46	.52
10	.....	.68	.40	.50	26	.84	.39	.46	.53
11	1.07	.67	.42	.52	27	.82	.36	.46	.53
12	1.09	.66	.44	.52	28	.78	.32	.46	.53
13	1.06	.68	.43	.52	29	.73	.30	.46	.54
14	1.06	.68	.46	.50	30	.68	.30	.48	.53
15	1.04	.69	.48	.50	31	.64	.32	.....	.....
16	1.02	.69	.50	.52					

CHINOOK STATION ON MILK RIVER.

This station is located at the wagon bridge over Milk River, 1 mile south of Chinook, Montana. It was established May 25, 1897. The gage rod consists of a vertical timber, marked in feet and tenths, nailed to the south abutment of the bridge. The bench mark is the top of the inside tie rod directly over the gage and is at an elevation of 18.0 feet. The measurements at this point do not give the total discharge of the river, as quite a large canal, that of the Fort Belknap Irrigation Company, is taken out about 10 miles above the station. The observer is Fred E. Neill, rancher. Discharge measurements during 1897 were made by Roe Emery as follows:

May 25, gage height, 1.40 feet; discharge, 110 second-feet.
July 3, gage height, 2.30 feet; discharge, 460 second-feet.
November 10, gage height, 0.72 foot; discharge, 34 second-feet.

Daily gage height, in feet, of Milk River at Chinook, Montana, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	1.15	2.80	0.50	0.10	0.40	17	.....	8.95	1.90	0.30	0.40	0.50
2	.....	1.10	2.60	.50	.10	.40	18	.....	.....	1.80	.30	.60	.30
3	.....	1.30	2.20	.40	.10	.40	19	.....	8.00	1.60	.30	.60	.40
4	.....	1.30	2.00	.50	.10	.30	20	.....	7.00	1.40	.30	.70	.40
5	.....	1.20	2.30	.60	.10	.20	21	.....	6.40	1.00	.20	.70	.40
6	.....	1.10	2.40	.70	.10	.10	22	.....	5.30	.90	.20	.60	.30
7	.....	1.00	2.50	.60	.10	.40	23	.....	5.00	1.00	.20	.50	.30
8	.....	.90	2.60	.60	.10	.50	24	.....	4.00	1.10	.10	.40	.....
9	.....	.90	3.30	.50	.10	.60	25	1.40	3.40	1.00	.10	.30	.....
10	.....	.80	3.10	.40	.10	.40	26	1.60	3.00	.90	.10	.20	.....
11	.....	.80	3.00	.40	.10	.50	27	1.50	3.10	.80	.05	.20	.....
12	.....	1.00	2.80	.30	.10	.40	28	1.50	3.40	.70	.10	.30	.....
13	.....	.90	2.60	.20	.10	.40	29	1.50	3.00	.80	.10	.20	.....
14	.....	.80	2.20	.40	.10	.40	30	1.40	3.20	.60	.10	.20	.....
15	.....	.80	2.00	.30	.10	.60	31	1.20	.....	.60	.10	.....	.....
16	.....	1.40	1.80	.30	.20	.40							

LIVINGSTON STATION ON YELLOWSTONE RIVER.

This station is located at the highway bridge over the Yellowstone River, 5 miles south of Livingston, Montana, at the mouth of the canyon. It was established May 2, 1897, a vertical rod fastened to the face of the pier being first used. A wire gage was afterwards established. Length of cable 18.30 feet; pulley distance, 0.58 foot. The bench mark is the head of the 2-inch nut on the center pin at the foot of the end diagonal of the truss, east pier, upper side, and is 13.44 feet above datum. The left bank is high, and will not overflow. The right bank is low, and during floods a part of the water escapes through a slough on that side, and has to be measured separately. The observer is Thos. S. Carter, rancher. The following discharge measurements were made by Roe Emery during 1897:

April 30, gage height, 1.40 feet; discharge, 3,270 second-feet.
May 17, gage height, 4.50 feet; discharge, 14,127 second-feet.
June 15, gage height, 5.15 feet; discharge, 16,282 second-feet.
June 23, gage height, 4.50 feet; discharge, 13,209 second-feet.
July 8, gage height, 3.85 feet; discharge, 6,611 second-feet.
July 24, gage height, 3.00 feet; discharge, 5,971 second-feet.
August 4, gage height, 2.65 feet; discharge, 4,657 second-feet.
September 23, gage height, 1.40 feet; discharge, 2,121 second-feet.
November 8, gage height, 0.90 foot; discharge, 1,394 second-feet.

Daily gage height, in feet, of Yellowstone River at Livingston, Montana, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	6.70	3.98	2.80	1.88	1.30	1.10	.....
2	1.95	5.88	4.20	2.78	1.85	1.32	1.10	1.00
3	2.25	5.48	4.32	2.68	1.80	1.35	1.10	.....
4	2.60	5.10	4.20	2.68	1.80	1.30	1.05	.....
5	3.05	4.90	4.00	2.70	1.80	1.30	1.05	.....
6	3.40	4.75	3.92	2.68	1.75	1.30	1.10	.....
7	3.75	4.60	3.85	2.70	1.75	1.30	.....	.....
8	3.52	4.90	3.82	2.65	1.75	1.25	.....	.....
9	3.00	5.32	3.72	2.65	1.70	1.25	.....	.....
10	2.68	5.12	3.62	2.65	1.68	1.25	.....	.....
11	2.58	4.94	3.50	2.65	1.60	1.25	.....	.....
12	2.72	5.02	3.50	2.60	1.60	1.30	1.20	.....
13	3.02	5.30	3.40	2.55	1.60	1.40	.....	.....
14	3.70	5.32	3.45	2.48	1.58	1.45	.....	.90
15	4.22	5.18	3.43	2.40	1.60	1.40	.....	.....
16	4.48	5.12	3.35	2.38	1.58	1.30	.....	.....
17	4.55	4.90	3.33	2.33	1.55	1.30	.....	.....
18	4.80	4.70	3.30	2.30	1.50	1.30	.....	.40
19	4.95	4.50	3.18	2.28	1.50	1.30	1.10	.....
20	5.75	4.45	3.15	2.20	1.45	1.25	.....	.....
21	6.10	4.45	3.10	2.20	1.45	1.25	.....	.....
22	6.05	4.45	3.08	2.15	1.40	1.25	.....	.....
23	5.85	4.45	3.03	2.13	1.40	1.25	.....	.....
24	5.78	4.38	3.05	2.10	1.40	1.28	.....	.70
25	6.10	4.30	3.10	2.08	1.38	1.25	.....	.....
26	6.10	4.30	3.05	2.05	1.35	1.25	1.00	.....
27	5.60	4.30	3.05	2.00	1.35	1.18	.....	.....
28	5.55	4.28	2.98	2.00	1.35	1.12	.....	.....
29	5.65	4.02	2.88	1.95	1.32	1.12	.....	.....
30	6.02	3.98	2.85	1.95	1.30	1.15	.....	.....
31	5.95	.....	2.85	1.90	.....	1.15	.....	.85

MISCELLANEOUS DISCHARGE MEASUREMENTS IN MONTANA.

During 1897 a number of discharge measurements shown below were made on streams in the immediate vicinity of Bozeman, Montana, by Roe Emery and others, at points where no gage rods were established:

Bozeman Creek.—May 12, discharge, 91 second-feet; May 29, discharge, 60 second-feet; June 22, discharge, 21 second-feet; July 10, discharge, 21 second-feet; July 23, discharge, 30 second-feet; August 9, discharge, 21 second-feet; September 7, discharge, 21 second-feet; September 27, discharge, 12 second-feet.

Rocky Creek.—May 12, discharge, 143 second-feet; May 29, discharge, 74 second-feet; June 22, discharge, 38 second-feet; July 10, discharge, 23 second-feet; July 25, discharge, 24 second-feet; August 9, discharge, 15 second-feet; September 11, discharge, 12 second-feet.

Shields River.—These measurements were made at the bridge near the mouth of the river, 5 miles east of Livingston: May 17, discharge, 1,708 second-feet; June 15, discharge, 883 second-feet; June 23, discharge, 722 second-feet; July 8, discharge, 798 second-feet; July 24, discharge, 315 second-feet; August 5, discharge, 117 second-feet; September 22, discharge, 59 second-feet.

MEETEETSE STATION ON GREY BULL RIVER.

This station is located at the highway bridge in the town of Meeteetse, Wyoming. The rod is fastened to the first pier from the south bank of the river. The bed of the river is of sandstone and but few places can be found on the stream where the water is not a torrent during May and June. The channel is straight. The rod was established by J. E. Hill in May, 1897. A. C. Thomas is the observer.

The following discharge measurements were made by Elwood Mead and C. T. Johnston during 1897:

June 11, gage height, 4.70 feet; discharge, 1,435 second-feet.
August 23, gage height, 2.60 feet; discharge, 147 second-feet.
August 26, gage height, 2.65 feet; discharge, 158 second-feet.

Daily gage height, in feet, of Grey Bull River at Meeteetse, Wyoming, for 1897.

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1	.....	3.50	3.30	2.30	17	3.80	3.35	2.90	2.50
2	.....	4.95	3.30	2.30	18	3.50	3.35	2.90	2.50
3	.....	3.80	3.40	2.30	19	3.30	3.05	2.90	2.50
4	.....	3.70	3.30	2.20	20	3.40	3.15	2.80	2.50
5	.....	3.70	3.60	2.10	21	4.10	3.10	2.80	2.40
6	.....	3.60	3.30	2.10	22	4.30	3.05	2.70	2.40
7	.....	3.60	3.20	2.00	23	4.50	3.10	2.70	2.30
8	.....	3.50	3.40	2.00	24	4.10	3.10	2.90	2.20
9	.....	3.50	3.30	2.00	25	4.30	3.25	2.80	2.10
10	.....	3.40	3.50	1.90	26	4.30	3.25	2.70	2.10
11	.....	3.30	3.20	1.90	27	4.10	3.20	2.60	2.20
12	.....	3.50	3.20	2.30	28	4.00	2.95	2.50	2.20
13	.....	3.50	3.30	2.40	29	3.10	3.15	2.40	2.30
14	4.70	3.40	3.10	2.50	30	3.50	3.10	2.40	2.30
15	4.80	3.50	3.00	2.50	31	.....	3.50	2.30	.....
16	4.60	3.55	3.00	2.50					

LOVELL STATION ON SHOSHONE RIVER.

This station is located at Lovell, Wyoming, and was established May 23, 1897. The observer is Henry Cockrell. The rod is securely fastened to the landing pier of the Lovell ferry on the south side of the river. The channel is straight for some distance above and below the rod and a cross section there has a uniform depth. The bed of the river is stable.

The following discharge measurements were made by Elwood Mead and C. T. Johnston in 1897:

May 24, gage height, 2.70 feet; discharge, 8,736 second-feet.
June 2, gage height, 2.40 feet; discharge, 7,310 second-feet.
September 15, gage height, —0.70 foot; discharge, 363 second-feet.

Daily gage height, in feet, of Shoshone River at Lovell, Wyoming, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	3.00	1.50	0.30	—0.70	—0.70	17	.....	2.00	1.20	—0.30	—0.70	.....
2	.....	2.40	1.90	.10	— .70	— .70	18	.....	1.40	.90	— .40	— .70	.....
3	.....	1.80	1.90	.10	— .70	— .70	19	.....	1.00	.60	— .40	— .70	.....
4	.....	1.40	1.50	.10	— .70	— .70	20	.....	1.20	.40	— .40	— .70	.....
5	.....	1.20	1.00	.10	— .70	— .70	21	.....	1.80	.20	— .50	— .70	.....
6	.....	1.10	.80	.00	— .70	— .70	22	.....	1.70	.30	— .60	— .70	.....
7	.....	1.00	.80	.00	— .70	— .70	23	2.70	2.00	.50	— .50	— .70	.....
8	.....	1.70	1.30	—.10	— .70	— .70	24	2.85	1.80	.40	— .50	— .70	.....
9	.....	2.70	1.00	—.10	— .70	— .70	25	2.70	1.70	.30	— .60	— .70	.....
10	.....	2.10	.90	—.10	— .70	— .70	26	2.70	1.90	.20	— .60	— .70	.....
11	.....	2.00	1.10	.00	— .70	— .70	27	2.10	1.90	.30	— .60	— .70	.....
12	.....	2.30	.90	—.10	— .70	— .70	28	2.10	1.50	.20	— .60	— .70	.....
13	.....	2.50	1.10	—.20	— .70	— .70	29	2.50	1.30	.10	— .60	— .70	.....
14	.....	2.60	1.30	—.20	— .70	— .60	30	.....	1.40	.20	— .60	— .70	.....
15	.....	2.70	1.20	—.30	— .70	— .50	31	.....	.....	.40	— .60	.....	.....
16	.....	2.80	1.00	—.30	— .70	— .70							

SHERIDAN STATIONS ON BIG AND LITTLE GOOSE CREEKS.

These stations are described in the Eighteenth Annual Report, Part IV, pages 136 and 137. The gage on Little Goose Creek is located at Broadway bridge in the town of Sheridan, Wyoming, and about 1,000 feet above the mouth of the creek. The gage rod is firmly fastened to the piles of the bridge. The channel is shifting, being composed of clay and gravel.

The station on Big Goose Creek is located in the northern part of Sheridan, at the Fifth avenue bridge crossing. The rod is securely fastened to the bridge piles and protected from injury by driftwood or ice. The channel is shifting, composed of clay and gravel. The station is below the mouth of Little Goose Creek. The observer for both stations is Felix O'Connor. No measurements of discharge were made of either creek in 1897.

Daily gage height, in feet, of Big Goose Creek at Sheridan, Wyoming, for 1897.

Day.	May.	June.	July.	Aug.	Day.	May.	June.	July.	Aug.
1	.....	3.60	2.50	1.35	17	.....	3.10	1.65	.....
2	.....	3.90	2.45	1.35	18	.....	2.85	1.65	.....
3	.....	3.25	2.40	.....	19	.....	2.65	1.65	.....
4	.....	3.25	2.35	.....	20	.....	2.35	1.65	.....
5	.....	3.10	2.25	.....	21	4.65	2.35	1.65	.....
6	.....	2.90	2.25	.....	22	5.00	2.35	1.65	.....
7	.....	3.05	2.15	.....	23	4.10	2.40	1.60	.....
8	.....	3.15	2.15	.....	24	3.70	2.40	1.60	.....
9	.....	3.40	2.15	.....	25	4.65	2.40	1.60	.....
10	.....	3.40	2.20	.....	26	4.05	2.40	1.60	.....
11	.....	3.15	2.15	.....	27	3.55	2.35	1.60	.....
12	.....	3.15	2.15	.....	28	3.35	2.35	1.50	.....
13	.....	3.30	2.15	.....	29	3.25	2.35	1.50	.....
14	.....	3.15	1.65	.....	30	4.50	2.40	1.40	.....
15	.....	3.05	1.65	.....	31	3.50	.....	1.40	.....
16	.....	3.05	1.65	.....					

Daily gage height, in feet, of Little Goose Creek at Sheridan, Wyoming, for 1897.

Day.	May.	June.	July.	Aug.	Day.	May.	June.	July.	Aug.
1	.....	2.10	1.20	1.00	17	.....	1.60	1.00	.....
2	.....	2.25	1.15	1.00	18	.....	1.25	1.00	.....
3	.....	2.00	1.00	.....	19	.....	1.00	1.00	.....
4	.....	1.95	1.00	.....	20	.....	1.10	1.00	.....
5	.....	2.10	1.00	.....	21	3.05	1.35	1.00	.....
6	.....	1.70	1.00	.....	22	3.00	1.10	1.00	.....
7	.....	2.05	1.00	.....	23	2.55	1.10	1.00	.....
8	.....	2.10	1.00	.....	24	2.40	1.00	1.00	.....
9	.....	2.35	1.00	.....	25	2.35	1.00	1.00	.....
10	.....	2.15	1.00	.....	26	2.40	1.00	1.05	.....
11	.....	2.05	1.00	.....	27	2.40	1.00	1.00	.....
12	.....	2.00	1.00	.....	28	2.50	1.00	1.00	.....
13	.....	2.00	1.00	.....	29	2.60	1.20	1.00	.....
14	.....	1.60	1.00	.....	30	2.00	1.00	1.00	.....
15	.....	1.35	1.00	.....	31	2.00	.....	1.00	.....
16	.....	1.35	1.00	.....					

BUFFALO STATION ON CLEAR CREEK.

This station, described in the Eighteenth Annual Report, Part IV, page 138, is located about 4 miles west of Buffalo, Wyoming, the county seat of Johnson County, on what was formerly the Fort McKinney Military Reservation. The observer is Fred Bond. Measurements were begun in 1889, in which year a substantial measuring flume was placed in the channel of the stream. This flume is 24 feet long, 30 feet wide, with sides 7 feet high, and with wings at the sides and a pitched apron at the upper end 12 feet long. The floor is set level in all directions, the upstream edge being even with the grade of the creek channel, and the lower 3 or 4 inches above. It cost $300, and although subjected to rough usage through the practice of floating cord wood and timber down the stream, it is still uninjured, and permits of more accurate measurements than can be obtained at any other gaging station in the State. The following discharge measurements were made by Fred Bond during 1897:

January 3, gage height, 0.35 foot; discharge, 20 second-feet.
February 7, gage height, 0.30 foot; discharge, 17 second-feet.
March 10, gage height, 0.40 foot; discharge, 25 second-feet.

Daily gage height, in feet, of Clear Creek, at Buffalo, Wyoming, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	2.22	1.30	0.65	0.50	.....	.....	.....
2	.....	1.22	1.80	1.15	.60	.50	.....	.....	.....
3	.....	1.22	1.54	1.05	.65	.50	.....	.....	.....
4	.....	1.33	1.42	.95	.65	.50	.....	.....	.....
5	.....	1.45	1.40	1.00	.65	.....	.....	.....	.....
6	.....	1.56	1.47	1.05	.65	.....	.....	0.40	0.45
7	.....	1.93	1.28	1.05	.70	.....	0.45	.....	.....
8	.....	1.79	1.38	1.00	.70	.....	.....	.....	.....
9	.....	1.51	1.57	1.00	.70	.....	.....	.....	.....
10	.....	1.33	1.49	.90	.75	.....	.....	.....	.....
11	.....	1.22	1.39	.90	.80	.....	.....	.....	.....
12	.....	1.17	1.36	.90	.75	.....	.....	.45	.40
13	.....	1.20	1.28	.90	.70	.....	.....	.....	.....
14	.....	1.25	1.29	.90	.70	.....	.....	.....	.....
15	.....	1.44	1.30	.90	.70	.....	.....	.....	.....
16	.....	1.57	1.30	.90	.70	.....	.....	.....	.....
17	1.35	1.60	1.30	.85	.65	.....	.45	.....	.....
18	.....	1.69	1.30	.85	.65	.....	.....	.....	.....
19	.....	1.86	1.30	.90	.65	.....	.....	.45	.....
20	.....	1.35	1.30	.90	.65	.....	.....	.60	.....
21	.....	2.16	1.30	.95	.60	.....	.....	.60	.....
22	.....	1.89	1.15	.90	.60	.....	.....	.60	.....
23	.....	1.68	1.20	.95	.60	.....	.....	.50	.....
24	.....	1.71	1.40	.95	.60	.....	.50	.....	.....
25	.....	1.93	1.35	.90	.55	.....	.....	.....	.40
26	.....	1.97	1.30	.85	.55	.....	.....	.....	.....
27	1.15	1.70	1.25	.75	.55	.....	.....	.....	.....
28	.....	1.54	1.20	.75	.55	.....	.....	.....	.....
29	.....	1.56	1.25	.70	.55	.....	.....	.....	.....
30	.....	1.56	1.30	.65	.55	.....	.....	.40	.....
31	.....	1.62	.....	.65	.55	.....	.40	.....	.40

CRAWFORD STATION ON WHITE RIVER.

This station is about 6 miles southwesterly from Crawford, Nebraska, near the line of the Fremont, Elkhorn and Missouri Valley Railroad. It was established on June 26, 1897, by O. V. P. Stout. The gage is placed against a stop gate in the canal of the Crawford Water Power and Irrigation Company, about one-eighth of a mile below the head. All the water of White River is diverted into this canal, and only an insignificant amount escapes between the head of the canal and the gage. The gage was placed by the canal company and is a vertical rod graduated to tenths of a foot. The observer is George Barclay, ditch rider for the canal company. Discharge measurements were made by O. V. P. Stout and A. B. McCoskey in 1897, as follows:

June 26, gage height. 0.42 foot; discharge, 14.4 second-feet.
July 21, gage height, 0.62 foot; discharge, 14.2 second-feet.
August 14, gage height, 0.60 foot; discharge, 12.1 second-feet.
September 6, gage height, 0.40 foot; discharge, 8.9 second-feet.
September 20, gage height, 0.62 foot; discharge, 10.4 second-feet.
September 21, gage height, 0.64 foot; discharge, 11 second-feet.
October 18, gage height, 0.89 foot; discharge, 15 second-feet.
November 5, gage height, 0.92 foot; discharge, 16 second-feet.

Daily gage height, in feet, of White River at Crawford, Nebraska, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Day.	July.	Aug.	Sept.	Oct.
1	.....	0.40	0.40	0.71	17	0.30	0.60	0.70	0.90
2	.....	.40	.40	.70	18	.55	.60	.62	.89
3	.....	.60	.40	.70	19	.80	.60	.68	.87
4	.....	.70	.40	.75	20	.70	.50	.60	.89
5	.....	.70	.40	.73	21	.60	.50	.63	.90
6	.....	.70	.43	.76	22	.55	.55	.68	.90
7	.....	.60	.40	.77	23	.55	.50	.65	.88
8	.....	.60	.43	.76	24	.50	.50	.68	.88
9	.....	.70	.50	.68	25	.65	.50	.69	.82
10	.....	.70	.63	.73	26	.55	.40	.70	.82
11	.....	.70	.65	.75	27	.55	.45	.69	.82
12	.....	.60	.70	.82	28	.65	.40	.69	.91
13	0.40	.55	.65	.86	29	.50	.40	.69	.91
14	.30	.60	.63	.82	30	.50	.45	.70	.91
15	.40	.60	.63	.84	31	.45	.45	.....	.....
16	.35	.60	.60	.84					

FORT NIOBRARA STATION ON NIOBRARA RIVER.

This station was established July 22, 1897, by O. V. P. Stout. It is about three-quarters of a mile southwesterly from Fort Niobrara and about 3 miles east of Valentine, Nebraska. The gage is an oak rod 2 by 4 inches, graduated to tenths of a foot, and fastened in a vertical position by lag screws to a plumb post in the trestle bent which serves as the west pier of the bridge. The zero of the gage is 9.08 feet below the top of the short cap, at the shoe of the north truss at the west end of the bridge; it is also 8.09 feet below the top of the north end of the long pile cap, below the cap above noted; and also 9.17 feet lower than the top of the west side of the iron cap of the north cylinder of the center pier of the bridge. The observer is Giacomo Bevilaqua, private, Company F, Twelfth United States Infantry. Discharge measurements were made by O. V. P. Stout and Adna Dobson in 1897, as follows:

June 24, gage height, 0.59 foot; discharge, 925 second-feet.
July 22, gage height, 0.48 foot; discharge, 883 second-feet.
August 15, gage height, 0.38 foot; discharge, 703 second-feet.
September 5, gage height, 0.46 foot; discharge, 730 second-feet.
October 16, gage height, 0.21 foot; discharge, 845 second-feet.

Daily gage height, in feet, of Niobrara River at Fort Niobrara, Nebraska, for 1897.

Day.	July.	Aug.	Sept.	Oct.	Day.	July.	Aug.	Sept.	Oct.
1	.....	0.33	0.41	0.42	17	.....	0.39	0.41	0.17
2	.....	.30	.38	.40	18	.....	.32	.37	.20
3	.....	.45	.36	.40	19	.....	.31	.39	.15
4	.....	.41	.41	.40	20	.....	.31	.36	.14
5	.....	.50	.46	.40	21	.....	.39	.38	.12
6	.....	.50	.41	.38	22	0.51	.39	.45	.19
7	.....	.46	.39	.35	23	.46	.38	.45	.22
8	.....	.47	.34	.30	24	.50	.34	.46	.23
9	.....	.40	.45	.31	25	.44	.31	.48	.28
10	.....	.50	.47	.32	26	.41	.32	.....	.37
11	.....	.34	.45	.32	27	.44	.32	.....	.29
12	.....	.40	.45	.26	28	.44	.32	.....	.22
13	.....	.36	.49	.27	29	.44	.31	.45	.15
14	.....	.37	.50	.23	30	.40	.32	.44	.12
15	.....	.36	.42	.21	31	.40	.39	.....	.....
16	.....	.29	.45	.20					

WOODS LANDING STATION ON LARAMIE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 145, is located at Woods Landing, Wyoming, 26 miles from Laramie, Wyoming, and reached by stage. The measurements of discharge are made from a wagon bridge which spans the river at a point about 400 feet below the location of the gage rod. The bottom of the stream is composed of large granite bowlders. This character of bottom, while it renders the shape and slope of channel practically unchangeable, at the same time adds an element of uncertainty to the gaging results, especially at low-water stages. The permanent gage rod is fixed to a perpendicular post set firmly in the bed of the stream and braced at the top to adjacent trees. It stands about 4 feet from the river bank in a position which protects it from drift. The bench mark is a nail head in a notch on a cottonwood tree, 1 foot in diameter, 6 feet from the rod, and is level with the 7-foot mark on the rod. The observer is S. S. Wood. The following discharge measurements were made by C. T. Johnston in 1897:

April 10, gage height, 0.70 foot; discharge, 69 second-feet.
May 12, gage height, 2.30 feet; discharge, 1,110 second-feet.
May 25, gage height, 4.10 feet; discharge, 3,538 second-feet.
June 1, gage height, 3.60 feet; discharge, 2,509 second-feet.
June 2, gage height, 3.75 feet; discharge, 2,651 second-feet.
June 14, gage height, 2.65 feet; discharge, 1,432 second-feet.
June 26, gage height, 2.00 feet; discharge, 707 second-feet.
June 27, gage height, 2.00 feet; discharge, 706 second-feet.

Daily gage height, in feet, of Laramie River at Woods Landing, Wyoming, for 1897.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1....	0.50	1.65	3.70	1.70	0.95	0.70	17.....	.85	3.05	2.95	1.30	0.80	0.60
2....	.50	1.75	3.70	1.70	.90	.70	18.....	1.00	3.15	2.75	1.50	.80	.60
3....	.45	1.85	3.65	1.60	.95	.70	19.....	1.10	3.30	2.55	1.50	.80	.60
4....	.50	2.05	3.55	1.50	1.15	.70	20.....	1.20	3.55	2.45	1.40	.80	.60
5....	.45	2.30	3.20	1.40	1.00	.70	21.....	1.25	3.70	2.35	1.30	.80	.60
6....	.60	2.65	2.85	1.35	1.00	.70	22.....	1.10	3.80	2.25	1.25	.70	.60
7....	.60	2.85	2.65	1.30	.90	.70	23.....	1.05	3.90	2.20	1.20	.70	.60
8....	.60	2.95	2.65	1.30	.90	.70	24.....	1.05	3.85	2.10	1.10	.70	.60
9....	.60	2.90	2.90	1.40	1.00	.70	25.....	1.00	4.05	2.00	1.00	.70	.60
10....	.60	2.85	3.20	1.50	1.00	.70	26.....	1.20	3.95	2.00	1.00	.70	.60
11....	.70	2.45	3.15	1.60	.90	.70	27.....	1.35	3.90	2.00	1.10	.70	.60
12....	.70	2.25	3.25	1.50	.90	.70	28.....	1.40	3.80	2.00	1.10	.70	.60
13....	.75	2.40	3.15	1.45	.80	.70	29.....	1.45	3.75	1.85	1.00	.70	.60
14....	.85	2.55	3.05	1.40	.80	.70	30.....	1.50	3.65	1.80	1.00	.70	.60
15....	.90	2.65	3.15	1.30	.80	.70	31.....	.....	3.75	.....	1.00	.70	.....
16....	.90	2.90	3.05	1.30	.80	.70							

UVA STATION ON LARAMIE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 148, is on the line of the Cheyenne Northern Railway, about 1 mile from the town of Uva, Wyoming. The observer is the railway section man, J. A. Carley. The rod is fixed to the side of one of the cluster of piles in mid-channel which supports the railroad bridge. As the section here is not a suitable place to make the discharge measurements, they are made at the wagon bridge which crosses the stream with one clear span about 1,000 feet below the railroad bridge. Here the river has a sufficient straight stretch above and below the bridge to insure a uniform current. The bed of the river is sandy and liable to change during high water. The bench mark is a spike head on south side of pile at east end of railroad bridge. It is 11.95 feet above zero of gage. The following discharge measurements were made by C. T. Johnston in 1897:

April 12, gage height, 1.85 feet; discharge, 205 second-feet.
May 4, gage height, 3.00 feet; discharge, 830 second-feet.
May 14, gage height, 3.10 feet; discharge, 748 second-feet.
May 15, gage height, 3.00 feet; discharge, 742 second-feet.
May 21, gage height, 3.70 feet; discharge, 1,160 second-feet.
May 29, gage height, 5.15 feet; discharge, 2,432 second-feet.
June 8, gage height, 4.05 feet; discharge, 1,365 second-feet.
June 19, gage height, 3.35 feet; discharge, 817 second-feet.
June 22, gage height, 2.45 feet; discharge, 500 second-feet.
July 10, gage height, 1.05 feet; discharge, 44 second-feet.

Daily gage height, in feet, of Laramie River at Uva, Wyoming, for 1897.

Day.	Jan.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	2.60	3.00	4.90	1.50	0.80	0.80	0.60
2	1.50	2.60	3.20	5.00	1.40	.70	.80	.60
3	.....	3.70	3.10	5.20	1.40	1.00	.80	.....
4	.....	3.60	3.00	5.00	1.30	2.00	.70	.....
5	.....	3.60	3.00	4.10	1.20	2.40	.70	.....
6	.....	2.40	3.20	4.80	1.00	1.60	.70	.....
7	1.50	1.80	3.20	4.80	1.00	1.50	.65	.....
8	.....	1.70	3.10	4.40	.90	1.40	.65	.....
9	.....	1.60	2.90	3.80	.90	1.40	.65	.....
10	.....	1.60	3.20	3.40	.90	1.40	.65	.....
11	.....	1.50	3.30	3.30	1.00	2.60	.65	.....
12	.....	1.70	3.50	3.70	1.00	2.40	.65	.....
13	.....	1.80	3.30	4.10	1.00	2.00	.60	.....
14	.....	1.80	3.20	3.80	1.00	1.60	.60	.....
15	1.30	1.80	3.00	3.80	.90	1.40	.55	.....
16	.....	2.00	2.90	3.70	.90	1.20	.55	.....
17	.....	2.00	3.00	3.60	.90	1.10	.55	.....
18	.....	4.30	2.90	3.30	.90	1.10	.60	.....
19	.....	4.00	3.10	2.80	.90	1.00	.60	.....
20	.....	4.10	3.20	2.80	.90	1.00	.65	.....
21	.....	4.40	3.60	2.80	.90	1.00	.65	.....
22	.....	4.00	4.10	2.60	.90	1.00	.65	.....
23	.....	3.90	4.70	2.30	.90	1.00	.60	.....
24	.....	3.70	4.90	2.00	.90	1.00	.60	.....
25	.....	3.40	5.10	1.90	.80	1.00	.60	.....
26	.....	3.10	5.20	1.50	.80	.90	.60	.....
27	.....	3.00	5.30	1.70	.80	.90	.60	.....
28	.....	3.00	5.30	1.60	.80	.90	.60	.....
29	.....	2.90	5.20	1.60	.80	.90	.57	.....
30	.....	3.00	4.10	1.50	.80	.80	.57	.....
31	.....	.....	4.80	.....	.90	.80	.....	.....

ORIN JUNCTION STATION ON NORTH PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 150, is located at the bridge of the Cheyenne Northern Railway, near Orin Junction, Wyoming. The rod is fixed upon the mid-channel pier of the railway bridge, and is connected with the following permanent bench mark: Spike on top of cap on the set of piles nearest the water at east end of bridge is 11.52 feet above datum. The bed of the stream is composed of heavy gravel and sand, the cross section being quite uniform. The channel is straight for some distance above and below the station. The section boss, P. J. Burns, is employed as observer. The stream at this station is divided into two permanent main channels by the bridge pier, and at high water there is a third channel to the west of the second pier across which the bridge rests on piles, and at a certain stage of water a long cobble bar running down to the bridge divides this third channel into two, thus making at times four channels altogether. The following discharge measurements were made in 1897 by C. T. Johnston:

April 13, gage height, 2.57 feet; discharge, 1,710 second-feet.
May 3, gage height, 5.50 feet; discharge 8,751 second-feet.
May 13, gage height, 5.40 feet; discharge, 10,434 second-feet.
May 20, gage height, 5.90 feet; discharge, 13,471 second-feet.
May 28, gage height, 6.60 feet; discharge, 16,320 second-feet.
June 7, gage height, 5.55 feet; discharge, 11,622 second-feet.
June 18, gage height, 5.25 feet; discharge, 10,100 second-feet.
June 21, gage height, 4.90 feet; discharge, 8,424 second-feet.

Daily gage height, in feet, of North Platte River at Orin Junction, Wyoming, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	.....	.....	2.88	5.68	6.45	3.38	.....	0.72
2	1.90	.....	.....	2.78	.....	6.18	3.35	1.40	.70
3	.....	.....	.....	2.68	5.52	6.40	3.22	1.32	.70
4	.....	.....	.....	.....	5.60	7.00	.....	1.78	.70
5	.....	.....	.....	2.62	5.68	6.90	3.30	1.75	.....
6	.....	2.05	2.30	2.52	5.78	.....	3.32	1.78	.70
7	.....	.....	.....	2.42	5.98	5.45	3.32	2.62	.70
8	1.60	.....	.....	2.32	6.12	5.15	3.15	.....	.70
9	.....	.....	.....	2.25	.....	4.95	2.90	2.08	.62
10	.....	.....	.....	2.20	6.20	4.75	2.65	2.08	.60
11	.....	.....	.....	.....	6.10	4.65	.....	2.00	.60
12	.....	.....	.....	2.42	5.90	5.10	2.42	1.88	.....
13	.....	2.05	2.40	2.55	5.55	.....	2.32	1.78	.82
14	.....	.....	.....	2.68	5.32	5.50	2.30	2.15	.78
15	1.50	.....	.....	2.78	5.15	5.35	2.20	.....	.68
16	.....	.....	.....	3.12	.....	5.35	2.28	1.78	.58
17	.....	.....	.....	3.32	5.32	5.25	2.18	1.52	.50
18	.....	.....	.....	.....	5.60	5.25	.....	1.45	.50
19	.....	.....	.....	4.48	5.85	5.00	2.42	1.35	.65
20	.....	2.20	2.70	4.65	5.98	.....	2.32	1.30	.62
21	.....	.....	.....	5.25	6.08	4.30	2.15	1.22	.62
22	.....	.....	.....	5.90	6.25	4.15	2.02	.....	.60
23	1.75	.....	.....	5.85	.....	3.98	2.00	1.12	.60
24	.....	.....	.....	5.50	6.60	3.88	2.00	1.02	.60
25	.....	.....	.....	.....	6.85	3.80	.....	.92	.60
26	.....	.....	.....	4.48	7.00	3.80	1.92	.82	.....
27	.....	2.15	1.65	4.68	7.18	.....	1.82	.80	.65
28	1.75	.....	.....	4.90	7.20	3.73	1.72	.88	.65
29	.....	.....	.....	5.35	7.05	3.60	2.62	.....	.65
30	.....	.....	.....	5.58	.....	3.48	2.52	.80	.52
31	.....	.....	3.15	.....	6.78	.....	1.42	.78	.....

GERING STATION ON NORTH PLATTE RIVER.

This station is located about 1 mile north of Gering, Nebraska, and was established May 29, 1897, by A. B. McCoskey, assistant State engineer. The gage is on the west side of the bridge within a few feet of the south edge of the main channel of the river, and is a vertical rod graduated to tenths of a foot, and fastened to the bridge pile. The zero of the gage is 6.61 feet below a nail head on top of the west end of the first cap at the south end of the bridge. The observer is C. D. Snyder, who is manager of the mill near the gage. Discharge measurements were made in 1897 by O. V. P. Stout and A. B. McCoskey as follows:

May 29, gage height 3.28 feet; discharge, 23,364 second-feet.
September 11, gage height 0.90 foot; discharge, 500 second-feet.
November 2, gage height 1.02 feet; discharge, 661 second-feet.

Daily gage height, in feet, of North Platte River at Gering, Nebraska, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	3.00	1.80	1.20	1.10	0.80	17	.....	.....	1.30	1.40	0.90	0.95
2	.....	3.00	1.80	1.10	1.10	.80	18	.....	.....	1.40	1.30	.90	.95
3	.....	3.12	1.80	1.10	1.10	.80	19	.....	.....	1.50	1.20	.90	.95
4	.....	3.30	1.70	1.20	1.00	.80	20	.....	.....	1.30	1.20	.90	.95
5	.....	3.35	1.70	1.10	1.00	.80	21	.....	.....	1.30	1.10	.90	.95
6	.....	.....	1.60	1.10	1.00	.80	22	.....	.....	1.30	1.10	.85	.95
7	.....	.....	1.50	1.10	1.00	.80	23	.....	.....	1.30	1.00	.85	.95
8	.....	.....	1.50	1.30	.90	.80	24	.....	.....	1.30	1.00	.85	1.00
9	.....	.....	1.60	1.30	.90	.80	25	.....	.....	1.30	1.00	.85	1.00
10	.....	.....	1.70	1.50	.90	.85	26	.....	.....	1.30	.90	.85	1.00
11	.....	.....	1.50	1.30	.90	.85	27	.....	.....	1.30	.90	.85	.95
12	.....	.....	1.40	1.30	.90	.85	28	.....	.....	1.30	.90	.85	.95
13	.....	.....	1.40	1.30	.90	.90	29	.....	.....	1.30	.90	.80	.95
14	.....	.....	1.30	1.40	.90	.90	30	3.50	.....	1.20	.90	.80	.95
15	.....	.....	1.30	1.40	.90	.90	31	3.30	.....	1.20	.90	.....	.....
16	.....	.....	1.30	1.40	.90	.90							

CAMP CLARKE STATION ON NORTH PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 153, is located on the right bank of the river, about 40 feet above the bridge at Camp Clarke, Nebraska. The observer is Robert H. Willis, county surveyor of Cheyenne County, Nebraska, who lives about 1 mile from the gage. The gage consists of an oak piece, 2 by 4 inches, 10 feet long. It is fastened to cross-ties, which are bedded in the bank of the river. The face of the rod is inclined at an angle of 30 degrees to the horizontal, so that 2 feet along the rod are equal to 1 foot in the vertical, and the rod is graduated accordingly. The channel at the station is fairly straight, above and below. The bed, as elsewhere along this river, is of loose, coarse sand. Two bench marks were established. The first consists of a spike which is driven horizontally in the northeast side of the downstream pile of the bent at the north end of the first truss span on the south end of the bridge. This spike is 7.55 feet above the zero of the gage. The second bench mark is a point on the southeast corner of the window sill at the front of the store. This point is 9.74 feet above the zero of the gage. A measurement of discharge was made at this station by O. V. P. Stout on September 12, 1897. Gage height 2.11 feet; discharge, 551 second feet.

Daily gage height, in feet, of North Platte River at Camp Clarke, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.91	2.89	2.80	2.85	4.20	4.55	3.35	2.30	2.20	2.03
2	2.90	2.89	2.76	2.82	4.26	4.50	3.30	2.35	2.19	2.02
3	2.90	2.89	2.72	2.81	4.20	4.51	3.15	2.50	2.19	2.05
4	2.85	2.89	2.74	2.78	4.25	4.68	3.10	2.52	2.20	2.04
5	2.85	2.89	2.78	2.74	4.26	4.90	3.03	2.45	2.18	2.05
6	2.80	2.89	2.78	2.68	4.25	5.00	2.99	2.50	2.14	2.06
7	2.80	2.89	2.85	2.75	4.32	4.78	2.91	2.54	2.13	2.06
8	2.80	2.89	2.79	2.84	4.25	4.50	2.91	.....	2.12	2.08
9	2.80	2.89	2.55	2.80	4.35	4.27	3.05	2.61	2.12	2.08
10	2.80	2.89	2.46	2.65	4.30	4.10	3.05	2.79	2.10	2.06
11	2.80	2.89	2.30	2.75	4.50	3.95	2.97	2.79	2.10	2.12
12	2.84	2.89	2.20	2.80	4.46	3.87	2.90	2.65	2.10	2.10
13	2.84	2.89	2.12	2.60	4.40	4.00	2.90	2.68	2.13	2.10
14	2.84	2.83	.....	2.75	4.35	4.03	2.80	2.67	2.12	2.10
15	2.85	2.80	2.57	2.75	4.17	4.10	2.75	2.60	2.15	2.11
16	2.87	2.75	2.59	2.77	4.07	4.03	2.65	2.54	2.15	2.11
17	2.87	2.65	2.57	2.75	3.94	4.05	2.57	2.50	2.16	2.11
18	2.89	2.75	2.52	2.79	4.05	4.10	2.92	2.49	2.14	2.12
19	2.89	2.86	2.45	2.90	4.07	4.08	2.92	2.43	2.17	2.11
20	2.89	2.90	2.40	3.30	4.25	4.08	2.68	2.35	2.15	2.15
21	2.89	2.85	2.40	3.60	4.33	3.89	2.60	2.29	2.13	2.20
22	2.89	2.85	2.42	3.68	4.26	3.89	2.62	.....	2.10	2.21
23	2.89	2.85	2.45	3.95	4.37	3.65	2.60	2.30	2.09	2.19
24	2.89	2.85	2.43	4.28	4.56	3.62	2.65	2.24	2.10	2.18
25	2.89	2.85	2.45	4.28	7.72	3.47	2.58	2.25	2.09	2.19
26	2.89	2.85	2.42	3.95	4.78	3.50	2.52	2.22	2.10	2.21
27	2.89	2.85	2.43	3.88	4.77	3.49	2.57	2.20	2.11	2.22
28	2.89	2.80	2.41	3.80	4.72	3.51	2.52	2.22	2.10	2.20
29	2.80	.....	2.42	3.88	4.74	3.57	2.56	2.22	2.11	2.21
30	2.89	.....	2.45	4.00	4.70	3.40	2.45	2.18	2.06	2.21
31	2.89	.....	2.80	.....	4.67	.....	2.40	2.20	.....	2.21

NORTH PLATTE STATION ON NORTH PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 156, is located at the wagon bridge 1 mile north of the town of North Platte, Nebraska. The water, except in times of flood, does not pass under all the spans of the long bridge, but usually the greater part flows under two or three of these, speading out in shallow pools or streamlets under others. The initial point for soundings is on the right bank. The channel is nearly straight for about 500 feet, both above and below the station. The gage is at the railroad bridge 2 miles below the wagon bridge. The zero is 12.00 feet below the top and immediately under the east rail of the track. The observer is Fred Hanlon. The following measurements of discharge were made by C. P. Ross, in 1897:

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.ft.*		*Feet.*	*Sec.ft.*		*Feet.*	*Sec.ft.*
Apr. 5....	2.70	4,038	June 19 ...	3.35	11,393	Sept. 4 ...	1.65	679
Apr. 12...	2.80	2,961	June 29 ...	3.05	6,518	Sept. 18 ..	1.70	744
Apr. 26...	3.45	10,328	July 10....	2.25	4,112	Oct. 6....	1.50	486
May 17 ...	3.50	13,486	July 24....	2.05	2,940	Oct. 18...	1.90	1,343
May 29 ...	4.05	20,796	Aug. 7	2.40	3,118	Nov. 11 ..	1.90	1,511
June 10 ..	3.95	17,172	Aug. 21 ...	2.15	2,306			

Daily gage height, in feet, of North Platte River at North Platte, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.90	2.80	2.50	2.30	3.20	4.10	2.95	1.85	1.75	1.60	2.00	2.30
2.....	2.85	2.80	2.60	2.55	3.20	4.05	2.80	1.85	1.75	1.50	1.90	2.20
3.....	3.00	2.80	2.75	2.75	3.25	4.05	2.75	1.85	1.70	1.50	1.80	2.30
4.....	2.95	2.90	2.85	2.75	3.50	3.90	2.65	1.90	1.65	1.50	1.70	2.30
5.....	3.00	2.85	2.90	2.85	3.50	3.90	2.55	1.95	1.60	1.50	1.70	2.30
6.....	3.05	2.85	3.00	2.70	3.45	3.90	2.50	2.45	1.65	1.50	1.80	2.30
7.....	3.10	2.85	3.05	2.75	3.50	4.10	2.40	2.40	1.55	1.50	1.90	2.30
8.....	3.15	2.85	3.10	2.85	3.50	4.25	2.35	2.50	1.45	1.50	1.90	2.30
9.....	3.20	2.95	3.15	2.75	3.65	4.15	2.45	2.40	1.45	1.50	2.00	2.40
10.....	3.15	3.05	3.25	2.65	3.60	3.90	2.25	2.45	1.50	1.65	2.00	2.45
11.....	3.15	3.15	3.35	2.65	3.60	3.85	2.10	2.50	1.65	1.55	1.90	2.50
12.....	3.15	3.15	2.45	2.80	8.65	3.85	2.15	2.35	1.70	1.65	1.90	2.55
13.....	3.25	3.20	2.50	2.65	3.65	3.55	2.35	2.20	1.60	1.70	1.90	2.70
14.....	3.25	3.25	2.40	2.55	3.60	3.40	2.10	2.30	1.65	1.65	1.90	2.70
15.....	3.15	3.25	2.30	2.45	3.65	3.25	2.05	2.45	1.60	1.70	1.90	2.80
16.....	3.20	3.35	2.25	2.25	3.45	3.35	2.15	2.35	1.65	1.80	1.90	2.80
17.....	3.20	3.35	2.40	2.25	3.55	3.35	2.15	2.35	1.65	1.85	2.00	2.90
18.....	3.20	3.35	2.55	2.30	3.45	3.45	2.20	2.35	1.65	1.90	2.00	2.90
19.....	3.20	3.35	2.25	2.30	3.45	3.35	2.15	2.30	1.60	1.90	2.00	2.90
20.....	3.20	3.35	2.20	2.35	3.55	3.35	2.35	2.20	1.60	1.80	2.00	2.90
21.....	3.15	3.35	2.45	2.55	3.50	3.35	2.15	2.15	1.60	1.80	2.00	2.90
22.....	3.05	3.25	2.40	2.65	3.55	3.35	2.25	2.15	1.60	1.70	1.95	2.90
23.....	2.90	3.15	2.40	2.85	3.55	3.35	2.40	1.95	1.55	1.70	2.00	2.80
24.....	2.80	3.05	2.30	3.05	3.60	3.25	2.05	1.90	1.50	1.70	2.00	2.80
25.....	2.80	2.25	2.05	3.25	3.70	3.25	2.00	1.85	1.55	1.70	1.80	2.70
26.....	2.90	2.30	2.05	3.45	3.85	3.10	1.95	1.85	1.55	1.85	1.95	2.70
27.....	2.90	2.30	2.20	3.55	4.00	3.05	1.95	1.80	1.50	1.90	2.15	2.70
28.....	2.90	2.30	2.10	3.35	4.05	3.10	1.95	1.80	1.50	2.20	2.30	2.60
29.....	2.90	.....	2.05	3.25	4.05	3.05	1.95	1.75	1.50	2.25	2.30	2.70
30.....	2.90	.....	2.15	3.20	4.10	3.05	1.90	1.70	1.50	2.20	2.30	2.80
31.....	2.90	.....	2.20	.....	4.05	.....	1.85	1.70	.....	2.05	.....	2.80

DEANSBURY STATION ON SOUTH PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 159, is located about 1,000 feet southwest of Deansbury, Colorado. The discharge measurements are made from a footbridge crossing the stream. The gage rod is vertical. An automatic register is also used. Both banks are high and not liable to overflow.

Station No. 2 is located about 300 feet above station No. 1, and is used during the summer months, being a more desirable point for high-water measurements than station No. 1. The gage consists of a 2 by 4 inch inclined timber. The railroad embankment forms the right bank, while the left is low and subject to overflow at high water. The bed of the stream is rocky and not liable to change. The following measurements of discharge were made by L. R. Hope in 1897:

At Station No. 1:

January 8, gage height, 2.75 feet; discharge, 79 second-feet.
January 16, gage height, 2.68 feet; discharge, 85 second-feet.
January 22, gage height, 2.56 feet; discharge, 68 second-feet.
January 31, gage height, 2.33 feet; discharge, 55 second-feet.
February 17, gage height, 2.58 feet; discharge, 71 second-feet.
March 1, gage height, 2.75 feet; discharge, 90 second feet.
March 11, gage height, 2.82 feet; discharge, 103 second-feet.
March 20, gage height, 2.75 feet; discharge, 92 second-feet.
March 27, gage height, 3.40 feet; discharge, 165 second-feet.
April 8, gage height, 4.17 feet; discharge, 260 second-feet.

At Station No. 2:

April 17, gage height, 2.02 feet; discharge, 342 second-feet.
April 22, gage height, 2.62 feet; discharge, 510 second-feet.
May 3, gage height, 3.05 feet; discharge, 643 second-feet.
May 9, gage height, 3.50 feet; discharge, 831 second-feet.
May 23, gage height, 4.15 feet; discharge 1,006 second-feet.
June 10, gage height, 3.85 feet; discharge, 985 second-feet.
July 1, gage height, 3.15 feet; discharge, 678 second-feet.

Daily gage height, in feet, of South Platte River at Deansbury, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1....	2.74	2.38	2.63	3.83	2.92	5.25	17.....	2.70	2.56	2.95	2.16	3.82	4.13
2....	2.76	2.39	2.68	3.80	2.97	4.89	18.....	2.70	2.50	2.99	2.42	3.94	3.97
3....	2.70	2.42	2.67	3.95	3.05	4.66	19.....	2.69	2.55	2.96	2.64	3.92	3.79
4....	2.80	2.41	2.69	4.11	2.97	4.40	20.....	2.67	2.54	2.81	2.81	4.04	3.55
5....	2.80	2.40	2.71	4.23	3.00	4.20	21.....	2.63	2.50	2.90	2.80	4.16	3.60
6....	2.80	2.39	2.74	4.22	3.06	4.26	22.....	2.55	2.72	2.78	2.55	3.95	3.56
7....	2.80	2.41	2.80	4.03	3.26	4.19	23.....	2.55	2.63	2.47	2.45	4.07	3.50
8....	2.80	2.75	2.78	1.65	3.30	3.98	24.....	2.53	2.57	2.65	2.38	4.32	3.38
9 ...	2.62	2.53	2.70	1.66	3.42	3.89	25.....	2.91	2.56	2.91	2.38	4.48	3.32
10....	2.62	2.52	2.58	1.64	3.45	3.85	26.....	3.06	2.55	3.20	2.49	4.43	3.39
11....	2.63	2.63	2.69	1.75	3.61	4.18	27.....	2.41	2.60	3.43	2.77	4.77	3.60
12....	2.63	2.60	2.73	1.77	3.94	4.20	28.....	2.32	2.57	3.64	2.92	4.53	3.58
13....	2.65	2.97	2.70	1.68	3.98	4.23	29.....	2.39	.....	3.84	2.95	4.69	3.55
14....	2.63	3.62	2.62	1.75	3.95	4.23	30.....	2.34	.....	3.99	2.94	4.98	3.50
15....	2.63	2.55	2.82	1.83	3.95	4.37	31.....	2.33	.....	3.72	.....	5.19	.....
16....	2.66	2.50	2.91	1.87	4.08	4.38							

Register move to station No. 2, April 8.

DENVER STATION ON SOUTH PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 162, is located at the Fifteenth street bridge, Denver, Colorado, immediately below the mouth of Cherry Creek. The inclined gage consists of two 6 by 2 inch planks spiked together and fastened to posts driven into the river bank. Also, a short vertical rod is spiked to a pile near left abutment of the bridge. The bench mark is 107 feet southwesterly from the gage, and is a cross mark on top of the east abutment of the Fifteenth street bridge, on the north corner. It is marked B. M., and is 15.15 feet above the zero of the gage rod. The river is confined between slag embankments, and the bed is sandy and shifting. The observer is J. H. Hodgson. The following discharge measurements were made by F. Cogswell in 1897:

January 15, gage height, 4.70 feet; discharge, 98 second-feet.
April 15, gage height, 5.35 feet; discharge, 385 second-feet.
May 1, gage height, 5.70 feet; discharge, 595 second-feet.
May 25, gage height, 5.85 feet; discharge, 778 second-feet.
June 4, gage height, 6.45 feet; discharge, 1,311 second-feet.
June 15, gage height, 6.75 feet; discharge, 1,406 second-feet.
July 13, gage height, 5.60 feet; discharge, 687 second-feet.
August 5, gage height, 7.45 feet; discharge, 1,849 second-feet.
August 20, gage height, 5.55 feet; discharge, 473 second-feet.
September 6, gage height, 4.95 feet; discharge, 116 second-feet.
October 11, gage height, 5.70 feet; discharge, 413 second-feet.

Daily gage height, in feet, of South Platte River at Denver, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.55	4.65	4.60	5.40	5.70	6.65	5.35	4.90	5.20	5.20	6.10	5.45
2	4.60	4.70	4.55	5.45	5.65	6.85	5.05	4.85	5.10	5.30	6.05	5.40
3	4.55	4.70	4.60	5.55	5.65	6.65	5.35	6.10	5.00	5.25	6.00	5.25
4	4.50	4.60	4.65	5.50	5.55	6.45	5.15	7.65	4.85	5.35	6.05	5.10
5	4.55	4.70	4.75	5.60	5.50	6.40	5.30	8.25	4.80	5.35	5.90	5.15
6	4.60	4.65	4.80	5.60	5.40	6.45	5.20	7.40	5.10	5.50	5.95	5.25
7	4.75	4.50	4.75	5.70	5.45	6.40	5.10	7.20	5.05	5.40	5.85	5.35
8	4.80	4.55	4.70	5.55	5.45	6.35	5.05	6.00	5.05	5.45	5.70	5.55
9	4.80	4.45	4.80	5.40	5.40	6.30	5.55	5.80	5.20	5.50	5.65	5.45
10	4.75	4.40	4.85	5.30	5.35	6.35	5.95	5.80	5.05	5.55	5.80	5.35
11	4.75	4.35	4.80	5.25	5.55	6.75	5.80	5.70	4.95	5.80	5.85	5.30
12	4.80	4.25	4.85	5.25	5.75	6.80	6.50	5.70	4.70	5.50	5.75	5.40
13	4.75	4.25	4.90	5.30	5.75	6.70	5.75	5.70	5.05	5.35	5.70	5.45
14	4.65	4.25	4.85	5.25	5.65	6.65	5.60	5.60	5.25	5.25	5.75	5.40
15	4.65	4.35	4.85	5.30	5.70	6.65	5.30	5.70	5.40	5.20	5.70	5.35
16	4.70	4.40	4.95	5.40	5.60	6.55	5.00	5.70	5.30	5.30	5.60	5.20
17	4.80	4.55	5.00	5.50	5.70	6.50	4.80	5.70	5.65	5.40	5.50	5.15
18	4.75	4.60	4.90	5.60	5.75	6.35	4.55	5.70	5.20	5.25	5.65	5.10
19	4.70	4.45	5.00	5.80	5.65	6.25	5.55	5.60	5.50	5.30	5.75	5.10
20	4.65	4.40	4.95	5.90	5.80	6.10	5.70	5.55	5.45	5.25	5.80	5.15
21	4.60	4.50	5.00	6.00	6.05	6.00	5.70	5.45	5.40	5.25	5.70	5.20
22	4.65	4.55	5.05	5.60	5.85	5.95	5.55	5.35	5.30	5.25	5.70	5.25
23	4.60	4.65	5.05	5.35	5.80	5.85	5.35	5.38	5.25	5.20	5.60	5.35
24	4.55	4.70	5.10	5.30	5.75	5.75	5.25	5.30	5.30	5.30	5.60	5.35
25	4.50	4.65	5.15	5.20	6.10	5.65	5.30	5.25	5.25	5.35	5.50	5.40
26	4.55	4.75	5.20	5.15	6.05	5.60	5.15	5.20	5.00	5.40	5.30	5.40
27	4.50	4.70	5.25	5.10	6.80	5.75	5.05	5.05	5.30	5.50	5.00	5.35
28	4.55	4.55	5.30	5.25	6.65	5.65	5.10	5.10	5.00	5.75	4.80	5.40
29	4.65	.....	5.35	5.50	6.55	5.65	5.15	5.35	4.85	5.90	4.95	5.55
30	4.70	.....	5.40	5.65	6.70	5.55	5.00	5.35	4.85	5.80	5.25	5.45
31	4.60	.....	5.35	.....	6.60	.....	4.90	5.20	.....	5.95	.....	5.40

ORCHARD STATION ON SOUTH PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 166, is located one-fourth mile southwest of Orchard, Colorado. The gage is inclined, consisting of two 2 by 4 inch planks, spiked together and fastened to posts driven into the river bank. It is marked to vertical 0.10 of a foot, the space between the marks being 0.127 of a foot. The bench mark consists of a 2 by 4 inch stick driven almost to the surface of the ground 8 feet back from the rod. The top of this is 8.30 feet above the zero of the gage rod. The initial point for soundings is on the right shore. The left bank is high and the right low and liable to overflow, the bed of the stream being sandy and shifting. Measurements are made by wading. The primary object of this station is to obtain the winter flow of the Platte at this point. The observer is Mrs. U. E. Foley. The following discharge measurements were made by F. Cogswell and others in 1897:

January 18, gage height, 4.14 feet; discharge, 377 second-feet.
May 28, gage height, 5.00 feet; discharge, 1,921 second-feet.
June 20, gage height, 4.60 feet; discharge, 1,926 second-feet.
June 27, gage height, 3.20 feet; discharge, 504 second-feet.
July 25, gage height, 3.60 feet; discharge, 524 second-feet.
September 13, gage height, 2.50 feet; discharge, 86 second-feet.
November 9, gage height, 4.40 feet; discharge, 1,299 second-feet.

Daily gage height, in feet, of South Platte River at Orchard, Colorado, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.75	4.50	3.80	4.20	3.75	5.80	3.20	3.00	2.75	2.50	4.45	3.90
2	3.80	4.50	3.80	4.30	3.65	6.20	3.10	3.00	2.60	2.50	4.50	5.00
3	3.80	4.50	3.80	4.30	3.40	6.50	3.00	3.00	2.50	2.50	4.50	5.05
4	3.80	4.50	3.80	4.30	3.40	6.30	2.90	3.00	2.50	2.50	4.50	4.70
5	3.85	4.55	3.80	4.30	3.40	6.20	2.35	4.40	2.50	2.50	4.50	4.70
6	3.90	4.55	3.80	4.30	3.35	5.95	2.35	5.30	2.50	2.50	4.50	4.70
7	3.95	4.50	3.80	4.30	3.30	5.40	2.35	5.30	2.50	2.50	4.50	4.75
8	4.25	4.45	3.75	4.35	3.20	4.75	2.30	5.30	2.50	2.50	4.50	4.80
9	4.35	4.40	3.75	4.35	3.00	4.50	2.30	5.40	2.45	2.50	4.40	5.00
10	4.30	4.30	3.75	4.35	3.00	4.50	2.30	5.20	2.45	2.50	4.30	4.90
11	4.35	4.20	3.70	4.40	2.90	5.50	4.00	5.10	2.40	2.50	4.30	4.70
12	4.35	4.10	3.70	4.40	2.80	6.30	3.70	4.50	2.50	2.55	4.20	4.20
13	4.30	4.00	3.70	4.35	2.80	6.50	3.25	4.30	2.50	2.80	4.30	3.90
14	4.30	6.00	4.60	4.30	2.75	6.80	2.50	4.15	2.60	2.80	4.30	4.20
15	4.30	7.00	3.80	4.25	2.70	6.70	2.50	4.00	2.60	2.85	4.20	4.00
16	4.30	6.00	3.70	4.20	2.60	6.40	2.40	4.00	2.60	2.85	4.15	3.60
17	4.30	4.00	3.70	4.20	2.55	6.20	2.35	3.80	2.60	2.90	4.10	3.60
18	4.15	3.90	3.70	4.20	2.50	5.95	2.35	3.70	2.60	3.00	4.10	3.55
19	4.25	3.90	3.70	4.15	2.50	4.75	2.70	3.65	2.60	3.10	4.10	3.70
20	4.35	3.90	3.70	4.15	2.70	4.60	2.95	3.40	2.60	3.20	4.00	3.90
21	4.45	3.85	3.70	4.15	3.20	4.50	3.60	3.35	2.50	3.30	4.00	4.10
22	4.50	3.85	3.70	4.10	4.50	4.40	3.60	3.30	2.45	3.30	4.05	4.10
23	4.55	3.80	3.75	4.10	4.70	4.30	3.90	3.20	2.50	3.35	4.10	4.10
24	4.50	3.80	3.75	4.05	5.00	4.10	3.60	3.00	2.50	3.40	4.00	4.20
25	4.30	3.75	3.80	4.00	5.10	3.95	3.60	2.90	2.50	3.40	4.00	4.30
26	4.25	3.75	3.80	4.00	5.20	3.80	3.60	2.85	2.50	3.45	4.00	4.30
27	4.20	3.75	3.80	3.95	5.30	3.50	3.60	2.85	2.50	3.65	4.00	4.35
28	4.20	3.75	3.80	3.95	5.80	3.30	3.50	2.75	2.50	3.85	4.00	4.40
29	4.35	.....	3.80	3.90	5.80	3.25	3.45	2.75	2.50	4.00	3.90	4.50
30	4.45	.....	3.80	3.85	5.98	3.25	3.30	2.75	2.50	4.20	3.80	4.55
31	4.50	.....	3.90	.....	5.85	.....	3.20	2.75	.....	4.40	.....	4.60

MORRISON STATION ON BEAR CREEK.

This station, described in the Eighteenth Annual Report, Part IV, page 167, is located in the upper part of the town of Morrison, Colorado. The gage rod is placed in the river about 150 feet above the railroad depot. It consists of two inclined planks, 2 by 4 inches by 8 feet long, spiked together and fastened to posts driven into the ground. It is divided into vertical tenths of a foot, the space between the marks being 0.127 of a foot. Three nails in a tree in right bank 190.5 feet below gage rod are 10.14 feet above zero of gage. Both banks are low and liable to overflow at high water. Measurements are made by wading, but the bridge above the gage can be used at high water. The observer is Henry Hines. The following measurements of discharge were made by R. S. Sumner and others in 1897:

May 20, gage height, 3.60 feet; discharge, 179 second-feet.
June 13, gage height, 3.70 feet; discharge, 209 second-feet.
June 26, gage height, 3.50 feet; discharge, 162 second-feet.
July 24, gage height, 3.45 feet; discharge, 131 second-feet.
September 11, gage height, 3.05 feet; discharge, 55 second-feet.
October 12, gage height, 3.00 feet; discharge, 52 second-feet.

Daily gage height, in feet, of Bear Creek at Morrison, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.85	3.35	3.20	3.20	3.05	3.00
2	.....	3.65	3.30	3.60	3.15	3.05	3.00
3	3.35	3.55	3.25	4.15	3.15	3.05	2.90
4	3.35	3.60	3.20	5.05	3.15	3.05	2.90
5	3.35	3.60	3.20	4.75	3.15	3.05	2.90
6	3.45	3.65	3.20	4.10	3.05	3.05	2.90
7	3.40	3.55	3.15	4.15	3.05	3.05	2.85
8	3.35	3.55	3.35	3.90	3.05	3.05	2.85
9	3.30	3.55	3.95	3.80	3.05	3.15	2.90
10	3.35	3.55	3.80	3.75	3.05	3.05	3.00
11	3.25	3.80	3.45	3.65	3.05	3.05	3.00
12	3.25	3.85	3.40	3.65	3.05	3.00	3.00
13	3.35	3.75	3.30	3.50	3.05	3.00	3.00
14	3.45	4.00	3.25	3.45	3.15	3.00	3.00
15	3.45	3.70	3.25	3.55	3.35	3.00	3.00
16	3.55	3.65	3.25	3.55	3.25	3.00	3.00
17	3.35	3.55	3.25	3.55	3.15	3.00	2.90
18	3.45	3.55	3.30	3.45	3.15	3.00	2.90
19	3.45	3.55	3.50	3.45	3.15	3.00	2.90
20	3.55	3.55	3.45	3.45	3.15	3.00	2.90
21	3.55	3.50	3.35	3.35	3.15	3.00	2.90
22	3.45	3.45	3.35	3.35	3.10	3.00	2.90
23	3.45	3.45	3.45	3.30	3.05	3.00	2.85
24	3.65	3.45	3.45	3.25	3.05	3.00	2.45
25	3.75	3.40	3.35	3.25	3.05	3.00	2.50
26	3.55	3.45	3.35	3.25	3.05	3.00	2.50
27	3.80	3.50	3.25	3.25	3.05	3.00	2.50
28	3.65	3.45	3.25	3.25	3.05	3.15	2.55
29	3.75	3.45	3.20	3.25	3.00	3.15	2.70
30	3.80	3.40	3.20	3.25	3.05	3.10	2.70
31	3.80	.....	3.20	3.25	.....	3.10	.....

MARSHALL STATION ON SOUTH BOULDER CREEK.

This station, described in the Eighteenth Annual Report, Part IV, page 169, is located about 3 miles west of Marshall, Colorado. The gage consists of an inclined 2 by 6 inch timber, with a 1 by 6 inch scale nailed to it, and is fastened to a tree and to stakes driven into the ground. It is marked to vertical 0.10 of a foot, the distance between the marks being 0.22 of a foot. The bench mark is a stone, 15 feet northwest of the gage, marked with black paint. Its elevation is 6.99 feet above zero of rod. Measurements are usually made by wading near the gage, but a footbridge 20 feet above can be used in high water. The Community Ditch and the South Boulder and Coal Creek Ditch both take out water above the gage, and this amount must be added to the discharge at the station to obtain total run-off of the drainage basin of the creek. The observer is C. E. Barber. The following measurements of discharge were made by F. Cogswell and others in 1897:

May 22, gage height, 2.45 feet; discharge, 348 second-feet.
June 19, gage height, 2.60 feet; discharge, 363 second-feet.
June 25, gage height, 2.50 feet; discharge, 370 second-feet.
July 27, gage height, 1.65 feet; discharge, 122 second-feet.
August 13, gage height, 1.55 feet; discharge, 116 second-feet.
October 14, gage height, 0.82 foot; discharge, 14 second-feet.

Daily gage height, in feet, of South Boulder Creek at Marshall, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	3.25	2.40	1.65	1.25	1.15	1.20
2	1.60	3.10	2.40	1.65	1.25	1.15	1.00
3	1.70	2.75	2.40	1.75	1.20	1.10	1.00
4	1.65	2.55	2.25	2.25	1.15	1.05	1.10
5	1.90	2.55	2.10	2.25	1.10	1.10	.90
6	1.95	2.35	2.20	2.20	1.00	1.20	.90
7	1.85	2.30	2.10	2.25	.90	1.25	.85
8	2.00	2.30	2.10	1.85	1.10	1.25	.85
9	2.00	2.30	2.80	1.80	1.10	1.30	.95
10	1.90	2.50	2.60	1.65	1.15	1.10	.90
11	1.85	3.40	2.35	1.65	1.10	1.10	1.00
12	1.75	3.10	2.25	1.60	1.15	.95	1.15
13	1.75	3.10	2.15	1.60	1.15	.90	1.15
14	1.90	2.90	2.15	1.65	1.20	.85	1.20
15	2.05	2.85	2.10	1.60	1.20	.85	1.15
16	2.10	2.95	2.00	1.55	1.25	1.25	1.15
17	2.15	2.85	2.00	1.55	1.30	1.05	1.15
18	2.20	2.50	2.05	1.55	1.20	1.00	1.05
19	2.30	2.60	2.05	1.45	1.10	1.00	1.05
20	2.50	2.60	1.85	1.35	1.15	.90	1.05
21	2.50	2.60	1.85	1.35	1.15	.95	1.05
22	2.55	2.60	1.75	1.35	1.10	.95	1.15
23	2.65	2.60	1.80	1.35	1.05	.90	1.05
24	2.95	2.45	1.75	1.40	1.05	.90	1.10
25	3.00	2.55	1.75	1.40	1.00	1.05	1.05
26	2.85	2.80	1.70	1.30	1.00	1.25	1.00
27	3.25	2.65	1.70	1.35	1.00	1.00	1.10
28	3.05	2.45	1.65	1.40	1.05	1.20	.95
29	3.15	2.35	1.60	1.40	1.10	1.25	.95
30	3.15	2.30	1.60	1.35	1.05	1.10	.85
31	3.05	.....	1.65	1.30	.....	1.15	.....

BOULDER STATION ON BOULDER CREEK.

This station, described in the Eighteenth Annual Report, Part IV, page 171, is located about 1½ miles above the town of Boulder, Colorado. The gage rod consists of an inclined 2 by 6 inch timber, with a 1 by 6 inch scale fastened to it, and spiked to stakes driven into the ground. It is marked to vertical 0.10 of a foot, the space between the marks being 0.207 of a foot. The bench mark is a large stone, 20 feet north of the gage. Its elevation is 9.95 feet above the zero of the rod. The observer is Mrs. Carrie Osgood. Both banks are high and rocky, and not liable to overflow. The bed of the creek is quite rocky. Measurements are usually made by wading, but during high water can be made from a bridge 40 feet above the gage. On June 14, 1897, this bridge was carried out by a flood. The following measurements of discharge were made by F. Cogswell and others in 1897:

May 21, gage height, 2.15 feet; discharge, 377 second-feet.
July 26, gage height, 1.75 feet; discharge, 298 second-feet.
August 12, gage height, 1.55 feet; discharge, 224 second-feet.
October 13, gage height, 0.55 foot; discharge, 48 second-feet.

Daily gage height, in feet, of Boulder Creek at Boulder, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.35	2.68	2.12	1.62	1.00	0.62	0.40
2	1.40	2.50	2.15	1.75	.95	.65	.43
3	1.42	2.28	2.20	2.00	.95	.60	.55
4	1.45	2.12	2.48	2.20	.90	.60	.53
5	1.50	2.02	1.90	2.15	.85	.55	.50
6	1.50	2.00	1.85	1.92	.80	.58	.45
7	1.55	1.90	1.85	1.78	.80	.70	.48
8	1.65	1.90	2.20	1.80	.75	.95	.52
9	1.60	2.10	2.85	1.70	.75	.78	.55
10	1.60	3.62	2.55	1.68	.78	.72	.50
11	1.55	3.05	2.38	1.58	.88	.70	.45
12	1.45	2.72	2.15	1.58	1.05	.65	.40
13	1.50	2.75	2.08	1.52	1.08	.58	.45
14	1.58	2.70	2.08	1.45	1.28	.55	.50
15	1.80	2.80	2.00	1.40	1.18	.60	.38
16	1.85	2.75	1.98	1.40	1.12	.68	.25
17	1.85	2.58	1.90	1.38	1.08	.70	.38
18	1.90	2.35	1.92	1.35	1.00	.63	.48
19	2.12	2.32	2.00	1.35	.92	.58	.55
20	2.20	2.40	1.90	1.32	.90	.55	.52
21	2.18	2.45	1.80	1.30	.85	.60	.55
22	2.18	2.50	1.65	1.25	.82	.55	.50
23	2.30	2.48	1.70	1.22	.70	.53	.52
24	2.42	2.42	1.82	1.18	.68	.48	.55
25	2.50	2.42	1.88	1.12	.65	.50	.45
26	2.48	2.50	1.75	1.08	.65	.42	.30
27	2.62	2.40	1.70	1.05	.60	.38	.28
28	2.45	2.35	1.62	1.37	.60	.42	.45
29	2.45	2.28	1.60	1.12	.60	.50	.75
30	2.42	2.25	1.55	1.02	.65	.45	.97
31	2.48	.....	1.60	1.05	.....	.43	.....

LYONS STATION ON ST. VRAIN CREEK.

This station, described in the Eighteenth Annual Report, Part IV, page 172, is located one-half mile southeast of Lyons, Colorado, below the intersection of the north and south forks of St. Vrain Creek. The Supply ditch takes water out on the left side of the stream, above the gage. To obtain the total run-off of the drainage basin of the creek at this station, the amount of water in the ditch will have to be added to the discharge of the creek. The gage is an inclined 2 by 4 inch timber, marked to vertical 0.10 of a foot, the space between the marks being 0.134 of a foot, and is fastened to posts driven into the ground. Both banks are low and liable to overflow, and the bed of the stream is composed of gravel. Measurements are usually made by wading, but at high water can be made from a wagon bridge 400 feet below the gage. The observer is Miss Bessie Sites. The following measurements of discharge were made by F. Cogswell and others in 1897:

May 25, gage height, 4.15 feet; discharge, 659 second-feet.
June 17, gage height, 4.40 feet; discharge, 713 second-feet.
June 28, gage height, 3.70 feet; discharge, 551 second-feet.
July 20, gage height, 3.10 feet; discharge, 379 second-feet.
September 15, gage height, 2.10 feet; discharge, 115 second-feet.
November 10, gage height, 1.75 feet; discharge, 54 second-feet.

Daily gage height, in feet, of St. Vrain Creek at Lyons, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	4.95	3.65	2.85	2.15	1.85	1.65
2	3.08	4.55	3.55	2.85	2.15	1.85	1.65
3	3.05	4.05	3.75	3.00	2.05	1.85	1.60
4	2.95	3.60	3.35	3.10	2.05	1.85	1.60
5	3.00	3.50	3.25	3.75	2.05	1.75	1.60
6	3.05	3.45	3.35	3.10	2.05	1.75	1.55
7	3.05	3.35	3.45	2.95	2.05	1.75	1.55
8	3.20	3.55	3.50	2.85	2.00	1.75	1.55
9	3.15	4.15	4.95	2.75	2.00	1.75	1.60
10	3.15	4.35	4.55	2.75	2.05	1.75	1.60
11	3.10	5.45	3.80	2.70	2.05	1.75	1.60
12	3.00	5.25	3.50	2.75	1.95	1.75	1.55
13	3.05	5.10	3.50	2.65	2.25	1.65	1.55
14	3.10	5.00	3.45	2.65	2.30	1.65	1.55
15	3.25	5.10	3.70	2.55	2.25	1.65	1.55
16	3.35	5.10	3.35	2.55	2.35	1.65	1.55
17	3.35	4.35	3.40	2.55	2.25	1.80	1.65
18	4.65	4.00	3.35	2.55	2.25	1.70	1.65
19	3.70	3.80	3.55	2.55	2.15	1.65	1.65
20	3.60	4.00	3.45	2.65	2.05	1.65	1.65
21	3.70	4.20	3.25	2.55	2.05	1.65	1.65
22	3.55	4.10	3.20	2.55	2.05	1.65	1.65
23	3.90	4.25	2.85	2.55	2.05	1.65	1.65
24	4.10	4.00	3.20	2.65	1.95	1.65	1.65
25	4.30	4.00	3.05	2.55	1.95	1.55	1.65
26	4.25	4.30	2.95	2.35	1.95	1.55	1.75
27	4.80	3.85	2.95	2.35	1.95	1.55	1.75
28	4.45	3.85	2.75	2.35	1.85	1.65	1.65
29	4.25	3.75	2.85	2.35	1.85	1.65	1.55
30	4.40	3.65	2.75	2.25	1.85	1.65	1.55
31	4.40	.....	2.85	2.15	.....	1.65	.....

ARKINS STATION ON BIG THOMPSON RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 174, is located about 9 miles west of Loveland, Colorado, and about 600 feet below the Home Supply Dam. The gage is vertical, unpainted, but notched for each foot and 0.10 of a foot, and is fastened to the timbers of a bridge. The bench mark is a notch in a tree about 50 feet below the gage, on the left-hand side of the stream. Its elevation is 4.92 feet above the zero of the rod. The right bank is high, but the left is low, and liable to overflow at high water. The bed of the stream is of gravel, with some bowlders. Measurements are usually made from the upper side of the wagon bridge. The head gates of the Home Supply Ditch and Handy Ditch are located above the dam. The observer is E. Chasteen. The following measurements of discharge were made by R. S. Sumner and others in 1897:

May 26, gage height, 2.45 feet; discharge, 804 second-feet.
June 18, gage height, 1.60 feet; discharge, 400 second-feet.
June 29, gage height, 1.50 feet; discharge, 409 second-feet.
July 21, gage height, 1.20 feet; discharge, 214 second-feet.
September 16, gage height, 0.60 foot; discharge, 61 second-feet.
November 11, gage height, 0,65 foot; discharge, 79 second-feet.

Daily gage height, in feet, of Big Thompson River at Arkins, Colorado, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0.60	2.40	1.30	1.20	0.40	0.40	0.10
2	.85	1.85	1.30	1.15	.40	.40	.10
3	.65	1.55	1.30	1.15	.40	.30	.20
4	1.00	1.35	1.15	1.30	.45	.30	.50
5	.95	1.25	.95	1.55	.30	.30	.45
6	1.25	.45	.95	1.25	.30	.25	.50
7	1.40	.40	1.10	1.15	.30	.15	.50
8	1.45	1.30	1.30	1.10	.30	.20	.45
9	1.45	1.75	1.70	1.10	.35	.35	.50
10	1.40	1.90	1.65	1.10	.40	.30	.35
11	1.40	2.55	1.40	1.05	.40	.30	.60
12	1.35	2.40	1.30	1.00	.55	.20	.00
13	1.35	2.35	1.20	.90	.65	.10	.00
14	1 50	2.10	1.40	1.00	.70	.10	.00
15	1.70	2.25	1.65	.85	.65	.08	.00
16	1.75	2.20	1.45	.70	.55	.03	.00
17	1.60	1.75	1.35	.80	.60	.08	.00
18	1.70	1.50	1.45	.65	.45	.10	.00
19	1.75	1.70	1.50	.60	.35	.00	.15
20	1.95	1.55	1.40	.70	.30	.00	.30
21	2.05	1.75	1.10	.60	.20	.00	.30
22	1.85	1.65	1.15	.60	.15	.00	.25
23	2.10	1.65	1.15	.60	.35	.00	.25
24	2.05	1.55	1.40	.55	.30	.00	.35
25	2.15	1.65	1.25	.45	.30	.00	.25
26	2.05	1.80	1.15	.40	.25	.00	.25
27	2.10	1.70	1.15	.50	.20	.00	.45
28	1.85	1.40	1.00	.50	.20	.00	.45
29	1.90	1.40	1.00	.55	.20	.25	.45
30	1.90	1.35	1.00	.60	.35	.50	.45
31	2.15	.....	1.10	.55	.....	.20	.....

ST. PAUL STATION ON NORTH LOUP RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 176, is located on the left bank, at the lower side of the wagon bridge, 4 miles north of St. Paul, Nebraska. The gage consists of a piece of oak, 2 by 3 inches, 16 feet long, with the face inclined 30 degrees to the horizontal. This rests upon cross-ties well bedded and covered, the bottom of the rod being thrust into the bed of the river. The zero of this rod is 15.01 feet below the top of the lower horizontal projecting part of the footplate at the north end of the west truss of the north span of the bridge. Bench mark 2 is the standard iron pipe with brass cap of the United States Geological Survey. It is set with the top 5 inches above the ground and 169 feet north of the gage rod. Its elevation is 6.54 feet above zero of gage. The observer is James Stout, jr. The bed of the river is sandy and is liable to change during floods. The following measurements of discharge were made by Adna Dobson and O. V. P. Stout in 1897:

April 20, gage height, 2.89 feet; discharge, 1,281 second-feet.
May 11, gage height, 2.85 feet; discharge, 1,080 second-feet.
May 28, gage height, 2.76 feet; discharge, 1,061 second-feet.
June 19, gage height, 2.94 feet; discharge, 933 second-feet.
July 17, gage height, 2.66 feet; discharge, 615 second-feet.
July 28, gage height, 2.85 feet; discharge, 708 second-feet.
August 18, gage height, 2.82 feet; discharge, 659 second-feet.
October 10, gage height, 2.92 feet; discharge, 819 second-feet.
October 31, gage height, 3.17 feet; discharge, 1,525 second-feet.

Daily gage height, in feet, of North Loup River at St. Paul, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	.....	.....	2.86	2.95	2.65	3.80	2.78	2.75	2.91
2	3.85	3.70	3.70	3.04	2.93	2.70	3.48	2.75	2.75	2.90
3	.....	.....	.....	3.82	2.90	2.76	4.02	2.75	2.85	2.92
4	.....	3.72	3.78	3.90	2.94	2.84	3.12	2.75	2.79	2.85
5	3.80	.....	.....	2.80	2.92	2.82	3.13	2.81	2.80	2.85
6	.....	3.72	3.79	2.78	2.93	2.81	2.97	2.76	2.83	2.88
7	.....	.....	.....	2.70	2.95	2.79	2.95	3.12	2.84	2.88
8	4.00	3.75	.....	2.63	2.90	2.83	2.97	2.98	2.85	2.87
9	.....	.....	3.80	2.68	2.92	2.80	2.74	2.95	2.73	2.91
10	4.40	3.85	3.86	2.64	2.87	2.78	2.81	2.96	3.35	2.91
11	.....	.....	4.08	3.11	2.87	2.78	2.83	2.87	3.00	2.90
12	.....	3.88	4.22	3.12	2.85	2.77	2.81	2.84	2.97	2.88
13	4.70	.....	a2.84	3.10	2.82	2.78	2.87	2.82	2.95	2.93
14	.....	3.90	2.82	3.07	2.88	2.90	2.83	2.85	2.92	2.95
15	4.50	.....	2.80	3.05	2.85	2.95	2.75	2.82	2.89	2.97
16	.....	3.92	2.83	2.96	2.85	2.95	2.67	2.82	2.89	3.04
17	.....	.....	.....	2.95	2.81	2.90	2.80	2.90	2.85	3.32
18	4.20	3.93	2.80	2.95	2.79	3.00	2.76	2.91	2.84	3.25
19	.....	.....	.....	3.04	2.76	2.94	2.89	2.85	2.84	3.01
20	.....	3.95	2.86	2.88	2.77	2.90	2.79	2.82	2.86	3.12
21	.....	.....	.....	2.93	2.76	3.70	2.77	2.83	2.86	3.05
22	.....	4.00	2.85	2.98	2.75	3.50	2.75	2.80	2.83	3.02
23	.....	.....	2.85	3.02	2.77	3.30	2.78	2.85	2.85	3.02
24	.....	3.62	.....	2.87	2.76	3.10	2.80	2.79	2.85	3.00
25	.....	.....	2.90	2.85	2.75	2.98	2.83	2.77	2.84	3.08
26	3.78	3.62	.....	2.77	2.75	2.71	2.80	2.75	2.87	3.05
27	.....	.....	3.12	2.79	2.75	.....	2.94	2.73	2.82	3.03
28	3.82	3.62	.....	2.83	2.70	3.89	2.81	2.75	2.83	3.00
29	.....	.....	.....	2.89	2.68	3.30	2.79	2.80	2.82	3.02
30	3.80	.....	.....	2.90	2.68	4.64	2.75	2.77	2.85	3.01
31	.....	.....	.....	.....	2.67	.....	2.74	2.73	.....	.....

a Ice going out.

ST. PAUL STATION ON MIDDLE LOUP RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 179, is located on the right bank of the stream, at the lower side of the wagon and railroad bridge, 1 mile south of St. Paul, Nebraska. The gage consists of an oak stick, 2 by 3 inches, 16 feet long, inclined 30 degrees to the horizon. This is securely fastened to cross-ties bedded in the soil. The zero of the rod is 9.62 feet below the bottom of the downstream end of the cap of the first river bent at the south end of the bridge. Bench mark 2 is the regulation 4-foot iron post of the United States Geological Survey, and is placed with its top 3 inches above the ground, 50 feet southeast of the gage, and 100 feet at right angles from line of downstream rail of bridge. Its elevation is 7.35 feet above the zero of the gage. The observer is A. C. Snyder, a farmer, who lives one-third mile distant. The following measurements of discharge were made by Adna Dobson and O. V. P. Stout in 1897:

April 21, gage height, 1.74 feet; discharge, 1,792 second-feet.
May 11, gage height, 1.77 feet; discharge, 1,441 second-feet.
May 27, gage height, 1.84 feet; discharge, 1,256 second-feet.
June 18, gage height, 1.87 feet; discharge, 979 second-feet.
July 16, gage height, 1.58 feet; discharge, 816 second-feet.
July 27, gage height, 1.56 feet; discharge, 666 second-feet.
August 18, gage height, 1.65 feet; discharge, 661 second-feet.
October 9, gage height, 1.70 feet; discharge, 814 second-feet.
October 30, gage height, 1.68 feet; discharge, 1,671 second-feet.

Daily gage height, in feet, of Middle Loup River at St. Paul, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	1.50	2.40	.....	1.78	1.43	1.66	2.64	1.42	1.67	1.60
2	1.20	.....	2.26	1.95	1.50	1.69	2.60	1.48	1.60	1.58
3	.....	.....	3.59	2.40	1.54	1.94	2.17	1.50	1.55	1.65
4	.....	2.35	3.20	2.35	1.60	1.86	1.85	1.49	1.48	1.72
5	.....	.....	.....	1.80	1.65	1.86	1.75	1.67	1.50	1.76
6	2.00	.....	.....	1.95	1.68	1.67	1.68	1.75	1.62	1.68
7	2.20	.....	3.61	1.89	1.65	1.76	1.65	1.71	1.44	1.65
8	2.45	2.31	.....	1.78	1.70	1.75	1.58	1.95	1.38	1.67
9	2.57	.....	.....	1.63	1.78	1.74	1.55	1.92	1.43	1.64
10	.....	.....	3.00	1.66	1.75	1.79	1.69	2.25	1.74	1.78
11	2.89	.....	2.26	1.80	1.77	1.90	1.70	1.78	1.70	1.82
12	.....	2.33	1.45	2.25	1.72	1.85	1.78	1.85	1.73	1.80
13	2.88	.....	.....	2.03	1.78	1.77	1.72	1.77	1.76	1.68
14	2.87	.....	.....	2.25	1.76	1.80	1.55	1.75	1.71	1.80
15	2.70	.....	1.50	2.05	1.63	1.86	1.50	1.73	1.74	1.72
16	.....	2.30	.....	1.90	1.65	1.84	1.47	1.68	1.72	1.83
17	.....	.....	2.10	1.90	1.67	1.89	1.53	1.64	1.65	1.90
18	.....	2.38	2.10	1.65	1.77	1.87	1.60	1.60	1.63	1.90
19	2.47	.....	1.85	1.60	1.73	1.83	1.61	1.66	1.68	1.86
20	.....	2.74	1.86	1.63	1.68	1.68	1.72	1.63	1.65	1.80
21	.....	.....	.....	1.75	1.86	1.70	1.67	1.65	1.67	1.73
22	.....	.....	1.91	1.70	1.68	1.75	1.64	1.64	1.69	1.75
23	.....	.....	1.90	1.58	1.80	1.77	1.71	1.67	1.70	1.78
24	.....	2.15	.....	1.77	1.73	1.68	1.68	1.65	1.68	1.76
25	.....	.....	1.70	1.86	1.77	1.70	1.68	1.51	1.65	1.73
26	2.40	2.00	1.70	1.78	1.73	1.87	1.70	1.48	1.71	2.20
27	.....	.....	.....	1.80	1.83	1.92	1.58	1.50	1.64	2.55
28	.....	.....	.....	1.75	1.78	1.79	1.55	1.56	1.68	1.98
29	.....	.....	.....	1.88	1.75	1.77	1.67	1.64	1.50	1.80
30	.....	.....	.....	1.60	1.67	3.11	1.65	1.72	1.56	1.50
31	.....	.....	1.69	.....	1.68	.....	1.58	1.75	.....	1.77

COLUMBUS STATION ON LOUP RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 182, is located near the iron bridge of the Union Pacific Railway, just west of Columbus, Nebraska. The observer is M. Savage, bridge watchman. The gage is 50 yards from the bridge, and is of oak, 3 by 6 inches, 12 feet long, fastened by lag screws to a pile, which forms part of the training works above the bridge. The rod is vertical. The 12-foot mark on the rod is 7 feet below a point 2 feet east of the third panel point of the north truss of the east span, counting the end of the span as the first panel point. Bench mark 2 is the regulation 4-foot iron post of the United States Geological Survey, placed 72 feet east of gage rod. Its elevation is 13.27 feet above zero of gage. The following discharge measurements were made by Adna Dobson and O. V. P. Stout in 1897:

March 19, gage height, 5.22 feet; discharge, 6,307 second-feet.
March 23, gage height, 4.85 feet; discharge, 3,869 second-feet.
April 27, gage height, 4.53 feet; discharge, 2,972 second-feet.
April 27, gage height, 4.53 feet; discharge, 3,103 second-feet.
May 25, gage height, 4.77 feet; discharge, 2,572 second-feet.
May 25, gage height, 4.77 feet; discharge, 2,410 second-feet.
June 17, gage height, 4.72 feet; discharge, 2,818 second-feet.
July 16, gage height, 4.01 feet; discharge, 2,513 second-feet.
July 29, gage height, 3.87 feet; discharge, 1,660 second-feet.
August 17, gage height, 4.27 feet; discharge, 1,783 second-feet.
August 29, gage height, 4.21 feet; discharge, 1,436 second-feet.
October 7, gage height, 4.19 feet; discharge, 1,926 second-feet.
October 30, gage height, 4.70 feet; discharge, 4,580 second-feet.
November 21, gage height, 4.40 feet; discharge, 3,006 second-feet.

Daily gage height, in feet, of Loup River at Columbus, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	5.24	.....	.....	.....	4.46	4.52	7.71	3.89	4.24	4.16
2	.....	.....	7.53	.....	4.44	4.44	5.32	3.85	4.20	4.16
3	.....	.....	.....	5.83	4.52	4.41	4.69	3.81	4.15	4.17
4	.....	.....	.....	.....	4.54	4.80	4.60	3.79	4.15	4.16
5	4.96	.....	7.59	.....	4.56	4.64	4.48	4.02	4.13	4.16
6	.....	.....	.....	.....	4.57	4.78	4.22	4.42	4.09	4.16
7	.....	.....	.....	.....	4.57	4.70	4.02	4.31	4.12	4.17
8	5.18	.....	.....	4.88	4.60	4.68	3.84	4.39	4.03	4.18
9	.....	.....	7.68	4.77	4.62	4.68	3.78	4.71	4.07	4.16
10	.....	.....	.....	4.70	4.69	4.68	3.86	4.70	4.22	4.18
11	.....	.....	.....	4.56	4.63	4.63	3.92	4.81	4.31	4.29
12	7.18	.....	8.45	4.44	4.66	4.70	4.02	4.61	4.36	4.43
13	.....	.....	.....	4.84	4.63	4.77	3.96	4.54	4.36	4.46
14	.....	.....	.....	4.93	4.63	4.75	3.91	4.48	4.34	4.44
15	7.04	.....	.....	4.74	4.66	4.76	4.20	4.40	4.34	4.44
16	.....	.....	5.73	4.70	4.67	4.74	4.08	4.33	4.30	4.50
17	.....	.....	.....	4.77	4.66	4.72	3.92	4.28	4.37	4.58
18	.....	.....	.....	4.91	4.65	4.69	3.84	4.19	4.28	5.00
19	.....	.....	5.43	4.53	4.66	4.82	3.78	4.17	4.25	5.02
20	.....	6.45	.....	4.63	4.62	4.74	3.95	4.15	4.23	4.86
21	.....	.....	.....	4.61	4.64	4.54	4.00	4.15	4.20	4.82
22	.....	.....	.....	4.62	4.77	4.43	3.96	4.15	4.20	4.76
23	.....	6.45	4.85	4.86	4.78	4.35	3.95	4.15	4.21	4.72
24	.....	.....	.....	4.82	4.82	4.34	3.96	4.16	4.24	4.80
25	.....	.....	.....	4.72	4.77	4.34	3.95	4.15	4.26	4.68
26	.....	7.68	4.59	4.66	4.66	4.44	3.98	4.20	4.26	4.64
27	.....	.....	.....	4.54	4.60	4.70	3.93	4.15	4.22	4.81
28	.....	.....	.....	4.41	4.68	4.95	3.85	4.10	4.20	6.26
29	.....	.....	.....	4.40	4.62	4.79	3.85	4.20	4.18	4.80
30	.....	.....	4.76	4.54	4.55	5.00	3.86	4.23	4.16	4.75
31	.....	.....	.....	.....	4.47	.....	3.93	4.28	.....	.....

COLUMBUS STATION ON PLATTE RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 188, is located on the left bank of the main channel of the river, about 75 feet above the bridge which crosses the channel on the sixth principal meridian near Columbus, Nebraska. The observer is George E. Barnum, a farmer, whose house is about one-half mile from the gage. The gage consists of an inclined oak piece, 3 by 4 inches in section, and 12 feet long. It is fastened to cross-ties, which are bedded, and to stakes which are driven in the bank of the river. The channel is straight both above and below the gage. A round stump on the west side of the road and 80 feet north of the north end of the north truss of the bridge and a square stump directly opposite on the east side of the road were selected as bench marks. The top of the first is 7.38 feet above the zero of the gage, and the top of the second is 7.66 feet above the zero of the gage. Bench mark 3 is the standard 4-foot iron post of the United States Geological Survey and is located 44.5 feet east of gage, 60 feet north of north end of north bridge truss, and 10 feet west of cottonwood tree 6 inches in diameter. Its elevation is 7.06 feet above gage datum. The following discharge measurements were made by Adna Dobson and O. V. P. Stout in 1897:

March 20, gage height, 2.90 feet; discharge, 4,963 second-feet.
April 29, gage height, 3.93 feet; discharge, 8,608 second-feet.
May 5, gage height, 3.79 feet; discharge, 7,322 second-feet.
May 26, gage height, 4.31 feet; discharge, 10,694 second-feet.
June 17, gage height, 4.37 feet; discharge, 12,685 second-feet.
July 11, gage height, 3.05 feet; discharge, 4,001 second-feet.
July 28, gage height, 2.43 feet; discharge, 994 second-feet.
August 17, gage height, 3.18 feet; discharge, 3,343 second-feet.
August 29, gage height, 2.50 feet; discharge, 1,649 second-feet.
October 7, discharge, 2 second-feet.
November 20, gage height, 2.88 feet; discharge, 2,645 second-feet.

Daily gage height, in feet, of Platte River at Columbus, Nebraska, for 1897.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	4.90	3.90	(a)	(a)	(a)	17	4.30	4.42	2.70	2.70	(a)	(a)
2	.....	4.88	3.90	(a)	(a)	(a)	18	4.40	4.05	(a)	2.80	(a)	(a)
3	.....	4.88	3.82	(a)	(a)	(a)	19	4.40	3.90	(a)	2.80	(a)	(a)
4	3.70	5.15	3.65	(a)	(a)	(a)	20	4.28	3.95	(a)	2.90	(a)	(a)
5	3.75	4.95	3.35	(a)	(a)	(a)	21	4.20	4.20	(a)	2.90	(a)	(a)
6	3.82	4.80	3.18	(a)	(a)	(a)	22	4.20	4.32	(a)	2.90	(a)	(a)
7	3.95	4.80	3.10	(a)	(a)	(a)	23	4.10	4.22	(a)	2.80	(a)	(a)
8	4.10	4.85	3.10	(a)	(a)	(a)	24	4.00	4.18	(a)	2.70	(a)	(a)
9	4.05	4.90	3.10	(a)	(a)	(a)	25	4.15	4.25	(a)	2.60	(a)	(a)
10	4.20	4.95	3.00	(a)	(a)	(a)	26	4.30	4.30	(a)	2.60	(a)	(a)
11	4.15	5.00	2.85	(a)	(a)	(a)	27	4.28	4.30	(a)	2.60	(a)	2.20
12	4.20	5.30	2.70	(a)	(a)	(a)	28	4.48	4.25	(a)	2.60	(a)	2.20
13	4.20	5.20	2.70	(a)	(a)	(a)	29	4.52	4.15	(a)	2.20	(a)	2.25
14	4.20	4.82	2.70	(a)	(a)	(a)	30	4.75	3.95	(a)	2.20	(a)	2.25
15	4.30	4.68	2.70	(a)	(a)	(a)	31	4.90	(a)	(a)	2.20	(a)	(a)
16	4.30	4.58	2.70	(a)	(a)	(a)							

a No water at gage.

NOTE.—August 17 rod found to be loose, and heights subject to change.

NORFOLK STATION ON ELKHORN RIVER.

This station, described in the Eighteenth Annual Report, Part IV, page 190, is about 2 miles south of Norfolk, Nebraska, near the line of Thirteenth street extended. The gage is on the left bank of the river. It consists of an inclined oak piece, 2 by 4 inches, 12 feet long, resting on beveled blocks which rest in turn on horizontally bedded cross-ties. All are firmly fastened together by lag screws. The zero of the gage s 8.21 feet below a small spike driven horizontally into a tree near the root, about 20 feet back, and downstream from the gage. Also, the zero of the gage is 3.96 feet below the head of a lag screw which is placed vertically in the horizontal trunk of a large living willow tree which overhangs the stream about 15 feet below the gage. Bench mark 3 is a standard 4-foot iron pipe of the United States Geological Survey, located 35 feet west and 7 feet north of top of gage, and 15.5 feet west of ash tree on which is bench mark 1. Its elevation is 10.70 feet above zero of gage. The observer is Burr Taft, a farmer, whose home is about 300 yards from the gage. The river bed at the station is composed of sand and mud. The following measurements of discharge were made by O. V. P. Stout and Adna Dobson, in 1897:

March 24, gage height, 2.72 feet; discharge, 1,323 second-feet.
May 6, gage height, 2.02 feet; discharge, 647 second-feet.
May 24, gage height, 1.38 feet; discharge, 387 second-feet.
June 21, gage height, 1.03 feet; discharge, 270 second-feet.
July 9, gage height, 0.90 foot; discharge, 212 second-feet.
July 30, gage height, 0.78 foot; discharge 200 second-feet.
August 16, gage height, 0.89 foot; discharge 220 second-feet.
September 2, gage height, 0.68 foot; discharge, 163 second-feet.
October 15, gage height, 0.79 foot; discharge, 168 second-feet.

North Fork:

March 24, discharge, 701 second-feet.
May 6, discharge, 166 second-feet.
May 24, discharge, 77 second-feet.
July 30, discharge, 70 second-feet.

Daily gage height, in feet, of Elkhorn River at Norfolk, Nebraska, for 1897.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	.....	.....	.....	2.41	1.22	1.21	0.70	0.64	0.63
2	2.90	.....	.....	.....	2.30	1.33	1.21	.75	.67	.62
3	.....	.....	.....	4.06	2.22	1.34	1.12	.80	.63	.60
4	.....	.....	.....	5.95	2.15	1.29	1.08	.81	.61	.61
5	.....	.....	.....	.....	2.05	1.26	1.02	.81	.62	.61
6	.....	2.86	3.01	5.66	2.01	1.26	.96	1.00	.58	.64
7	.....	.....	.....	6.43	1.93	1.24	.95	.91	.57	.64
8	.....	.....	.....	6.93	1.93	1.20	.89	1.06	.56	.70
9	2.52	.....	.....	6.62	2.12	1.16	.88	1.06	.50	.67
10	.....	.....	.....	6.27	1.95	1.16	1.21	1.03	.65	.71
11	.....	.....	.....	5.50	1.86	1.15	1.36	.97	.65	.72
12	.....	.....	.....	5.26	1.80	1.12	1.10	.96	.64	.71
13	.....	2.99	.....	4.90	1.78	1.11	1.02	.90	.64	.85
14	.....	.....	.....	4.52	1.74	1.11	1.00	.96	.64	.85
15	.....	.....	.....	4.28	1.73	1.12	.96	.95	.64	.77
16	2.66	.....	.....	4.08	1.66	1.09	.91	.90	.73	.84
17	.....	.....	.....	3.99	1.65	1.16	.89	.81	.79	.94
18	.....	.....	.....	3.98	1.65	1.15	.86	.86	.78	9.71
19	.....	.....	.....	3.89	1.57	.....	.82	.86	.77	1.02
20	.....	4.24	3.42	3.93	1.52	1.11	1.01	.81	.70	1.00
21	.....	.....	.....	3.87	1.48	1.03	1.02	.76	.77	.98
22	.....	.....	.....	3.72	1.47	1.03	.....	.76	.70	.96
23	2.04	.....	.....	3.56	1.47	1.04	.91	.76	.70	.94
24	.....	.....	.....	3.42	1.38	1.03	.90	.74	.76	.91
25	.....	.....	.....	3.26	1.35	1.00	.86	.75	.70	.94
26	.....	.....	.....	3.10	1.34	1.01	.86	.72	.69	.96
27	.....	3.22	2.24	2.94	.....	1.00	.82	.70	.68	.99
28	.....	.....	.....	2.82	1.31	1.01	.81	.71	.64	1.06
29	.....	.....	.....	2.65	1.26	1.07	.76	.67	.66	1.07
30	2.72	.....	.....	2.51	1.24	1.18	.76	.70	.63	1.09
31	.....	.....	.....	.....	1.22	.....	.76	.64	.....	1.12

WESTERN RIVER STATIONS.

The descriptions of the remaining river stations, mainly within the Rocky Mountain Region, and tables of river height, are printed in Water-supply and Irrigation Paper No. 16, since the publications of this series are limited by the act of June 11, 1896, to 100 pages in length. The results of computations of discharge and facts of general interest are prepared for publication in the Nineteenth Annual Report of this survey, these being accompanied by diagrams, maps, and other illustrations, in form similar to the report of progress of stream measurements for the calendar year 1896, printed in the Eighteenth Annual Report, Part IV.

[For index, see Part II of this report—Water-Supply Paper No. 16.]