TABLE I.

VALUES OF THE COEFFICIENT OF DISCHARGE.

Head in feet	Orifice 1 in. diameter		Orifice 2 in. diameter	
	By Experiment	By Formula $Cd = .5930 + \frac{.019}{\sqrt{H}}$	By Experiment	By Formula $Cd = .5920 + \frac{.011}{\sqrt{H}}$
1	..	.6120	.6031	.6030
2	..	.6064	.5999	.5998
3	..	.6040	.5985	.5983
4	..	.6025	.5978	.5975
5	.6016	.6015	.5970	.5969
7	.5999	.6002	.5962	.5962
9	.5993	.5993	.5957	.5957
11	.5987	.5987	5949	.5953
13	.5985	.5983	.5948	.5951
15	.5981	.5979	.5948	.5949
17	.5976	.5976	.5948	.5947
19	.5975	.5974	.5947	.5946

Of the experimental values, judging by the agreement of the two observations, the best are: for the one-inch orifice, those at heads of 17 and 19 feet, and for the two-inch orifice, those at 1, 3, and 7 feet.

The values of the coefficients for the two-inch orifice at heads of 15 feet and above are a little uncertain, both on account of the disturbance caused by the large quantity of water (2000 gallons in 12 minutes) flowing into the tank, and of the difficulty of leading this quantity into the flume without losing any by leakage or splashing.

Inspection of the figures and curves will show that the coefficient increases as the head decreases, and also as the size of the orifice decreases; and again that the values tend to approach a constant value as the head is increased.

That the coefficient varies in the manner just stated is, of course, well known, but as far as the author is aware no general expression has yet been published giving Cd as a function of the head and the area of the orifice. The variation in Cd is so small as to be of little practical importance, and this also makes it necessary to obtain very accurate experimental values before an empirical equation can be deduced. Again it appears at present to be impossible to obtain a theoretical law which would give some indication of the correct form of an empirical equation.