

2nd. What will be the depth when the discharge is reduced by the Chicago drainage channel to 161,500 - 12,500 = 149,000 cubic feet per second?

As above, with same notation—

$$h_1^{\frac{3}{2}} = \frac{D}{5350} = \frac{149000}{5350} = 27.85$$

Square both sides. Then

$$h_1^3 = 27.85^2; \text{ and } h_1 = 27.85^{\frac{2}{3}}$$

$$\log. 27.85 = 1.4448252 \times \frac{2}{3}$$

$$9.2943 = 0.9632168$$

the natural number to this log.

Height or head of water on the outlet or submerged dam at foot of Lake Huron when discharging 161,500 cubic feet per second.....	9.6978 feet.
Height or head of water on the outlet or submerged dam at foot of Lake Huron when discharging 149,000 cubic feet per second.....	9.2043 "
	0.4035 "
	12

Depression = 4.842 inches.

By the smooth curve of discharge of the Niagara River measurements, the discharge at mean level at Lake Erie, is 232,800 cubic feet per second. Assuming that 85 per cent is discharged by Lake Huron through the St. Clair river, is equal to 198,000 cubic feet per second.

Using the same formula and notation as above—

$$D = 8.025 c \times \frac{2}{3} b h_1^{\frac{3}{2}}$$

$$= 5.35 \times .5 \times 2000 h_1^{\frac{3}{2}} = 5350 h_1^{\frac{3}{2}}$$

$$\therefore h_1^{\frac{3}{2}} = \frac{D}{5350} = \frac{198,000}{5350} = 37$$

$$h_1^3 = 37^2; \text{ and } h_1 = 37^{\frac{2}{3}}$$

$$\log. 37 = 1.5682017 \times \frac{2}{3}$$

$$11.1 = 1.0454678.$$

At this stage, the Chicago drainage channel, as shown at p. 38 will discharge 15,066 cubic feet per second, diminishing to that extent the discharge of Lake Huron.

This is 198,000 - 15,000 = 183,000 cubic feet per second.

By the same process as above—

$$h_1^{\frac{3}{2}} = \frac{183,000}{5,350} = 34.2$$

$$h_1^3 = 34.2^2; \text{ and } h_1 = 34.2^{\frac{2}{3}}$$

$$\log. 34.2 = 1.5340261 \times \frac{2}{3}$$

$$10.563 = 1.0226841$$

the corresponding natural number.

Height or head of water on outlet at foot of Lake Huron, discharging, at mean stage, 198,000 cubic feet per second.....	11.1 feet.
Height or head of water on outlet at foot of Lake Huron, discharging 183,000 cubic feet per second, the efflux as reduced by the Chicago drainage channel.....	10.563 "
	0.537 "
	12

Depression of surface..... 6.444 inches.

When the Buffalo gauge registers + 1.8 feet, which is - 0.54 feet below the plane of reference of Lake Erie, the smooth curve of discharge of the Niagara River measurements indicates a discharge of 263,000 cubic feet per second. This elevation corresponds closely to an elevation of Lake Michigan of five feet above the monthly mean level of November, 1895.