increases. Then, denoting the vertical lines N_1O_1, N_2O_2, ... $N_{n-1}O_{n-1}$ by p_1, p_2, ... p_{n-1}, we readily obtain

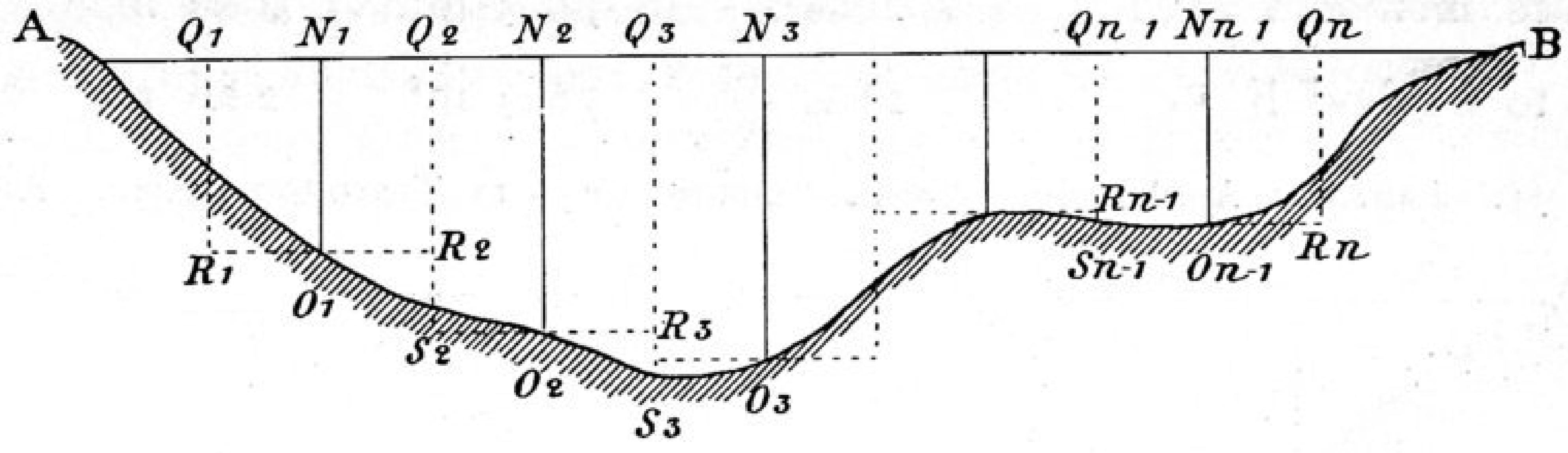


Fig. 35.

$$Q = v_1 p_1 \frac{h_1 + h_2}{2} + v_2 p_2 \frac{h_2 + h_3}{2} + \ldots . + v_{n-1} p_{n-1} \frac{h_{n-1} + h_n}{2} \quad . \; . \; . \; . \; . \; (6)$$

and

$$A = p_1 \frac{h_1 + h_2}{2} + p_2 \frac{h_2 + h_3}{2} + \ldots . + p_{n-1} \frac{h_{n-1} + h_n}{2} \quad . \; . \; . \; . \; . \; . \; (7)$$

From (6) and (7), by means of equations (2) and (4), we are able to obtain the values of d_m and V_m. If the n divisions are all equal, i. e.

$$h_1 = h_2 = \ldots . = h_n = h \qquad \text{and} \qquad b = nh,$$

the formulæ (6), (7), (2), and (4) become simplified thus

$$Q = h(v_1 p_1 + v_2 p_2 + \ldots . + v_{n-1} p_{n-1}) = h \Sigma vp \quad . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; (8)$$

$$A = h(p_1 + p_2 + \ldots . + p_{n-1}) = h \Sigma p \quad . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; . \; (9)$$

$$V_m = \frac{\Sigma vp}{\Sigma p} \quad . \; (10)$$

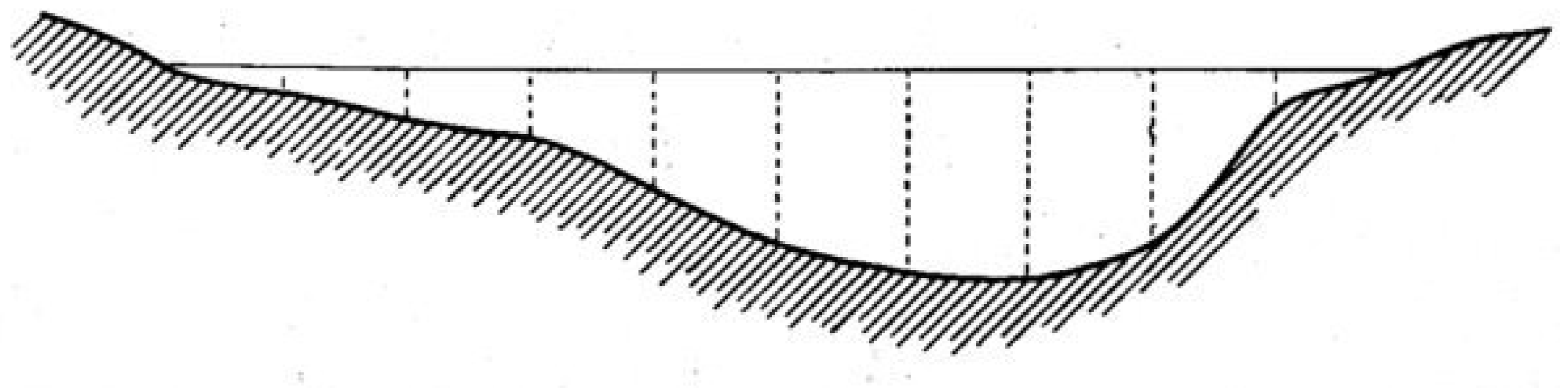
$$d_m = \frac{\Sigma p}{n} \quad . \; (11)$$

Formula (5) may be employed as a check upon this. Throughout the whole series of measurements the length of b has been divided into equal distances.

III.

In order to show the use of the simplified method worked out in II, we will now calculate the volume of the river, according to both methods, using the data afforded by four actual measurements. The constant k of the velocity instrument is 0.00930; multiplying by this coefficient, we reduce the values given here below for v/k, which indicate the number of revolutions in 30 seconds, to metres per second.

Fig. 36. Left. 10 April 1900. $b = 30.0$ metres. $n = 10$ Kum-tschapghan. Right.



p . .	0.68	1.18	1.67	2.96	4.30	4.93	5.09	4.33	0.87	metres
v/k . .	21.5	31.5	33.7	39.0	45.0	38.4	43.2	26.4	0	$\frac{1}{k} \frac{\text{metre}}{\text{second}}$