upstream and downstream glacis slope of 1 : 5 and 1 : 15 and crest width of one foot was made to fit the full width of the flume. One side of the flume was finished with cement plaster to make a sharp edge which could be used for recording water levels with the help of a scale graduated to decimals. On the downstream end of the flume a provision was made to facilitate the regulation of water level for changing the depth of flow downstream of the weir. The channel below the wellfall in a length of 120 feet was properly shaped and closed at the end to serve as a measuring tank. The gate of the head regulator was suddenly opened and the depth of water at downstream edge of weir observed at regular intervals. The time taken to fill the tank for various depths was noted to compute the discharge. The analysis showed that the discharge could be represented by the relation;

$$q = y^{2/3} \cdot g^{1/2}$$

where g is the discharge per foot run and y is the depth at downstream edge of the crest. The observed discharges and those calculated from the equation were in close agreement. For a fixed discharge passing over the weir the downstream water level was raised gradually by means of karries at the lower end of the flume to form a standing wave which shifted up the glacis and then to crest as the downstream water was further raised till undulations replaced the standing wave, and the corresponding upstream and downstream water levels were observed to be the same. The observations revealed that a weir caused no afflux when flow attained a certain depth. A smooth depression in water surface replaced undulations with further raising of downstream water level.

These experiments mainly aimed at studying the effect of variation in water levels downstream of the weir, on water levels at the crest and upstream of the weir. The tail water levels were maintained so as to cover the range of flow conditions characterized by the following.

(i) free overfall
(ii) formation of standing wave
(iii) undulations appearing in place of standing wave
(iv) undulation replaced by a depression in water surface at the crest.

It was invariably observed in all the experiments that if standing wave was below the downstream edge of te crest, depth of flow at this edge