where x is the height of weir, qi and q are the discharge intensities over the weir and in river upstream. In case of a weir with undersluices, discharge through normal bays is calculated to find q1 over the weir. If height of the weir x is greater than the value obtained from eq. (2) it will cause afflux. Both the undersluice and normal bays will dicharge as broad-crested weir with free overfall nad depth of flow at the downstream edge of openings equal to their respective "two thirds", the afflux will be given by the following equation :

$$L1\,(H - U^2/2g)^{3/2} + L2\,(H + x + U^2/2g)^{3/2} = 1.8370/9 \qquad (4)$$

where Q is river discharge, L1 and L2 are widths of weir and undersluices openings respectively, x is height of weir, H is height of afflux level above weir crest and u is velocity of approach.

Velocity being super-critical at glacis and sub-critical in the stream lower down, the standing wave forms at some point on the glacis or below it. Unwin's formula can be applied to find position of standing wave on horizontal bed but the author had to modify the relation for using it to determine the position of standing wave on the glacis. The depth of flow Ho just upstream of standing wave can be determined from following equation :

$$Ho^3 - Ho\,\{\,(H1 - a) + 2q^2/gH\,\} + 2q^2/g = O \qquad (5)$$

where H1 is the depth downstream of standing wave,q is the discharge intensity and 'a' is the height form floor (where H1 is measured) to point on glacis where Ho is measured. Taking a few values of 'a' a graph for Ho can be developed. The standing wave forms where this graph intersects the water surface curve. It was found in the course of these experiments that water surface plotted by using Manning's formula is very close to the observed one. sometimes instead of a standing wave of alone there appears in water surface a smooth wave of height $(u^2$ $v^2)/2g$ followed by a standing wave. The author obseved this phenomenon in his experiments but it is difficult to define conditions necessary to produce it.