

OFFSETS FROM TANGENT ON A 1° CURVE.

BY T. S. RUSSELL.

The following table will be found useful to railway engineers. There are cases, of frequent occurrence in railway work both on location and construction, when it is necessary to lay out a curve, or a part of a curve, without a transit. In such cases this table can be used, either for finding the actual offsets from the tangent for different points on the curve, or for finding the lengths of ordinates from chords of different lengths.

To illustrate the use of this table draw a diagram representing any length of a railway curve—say 600 feet. Draw the chord for this 600 feet of curve and draw a tangent to the curve at its middle point; this tangent will of course be parallel to the chord. Now number the 100 foot points, or stations on the curve in regular order, calling one end of the chord sta. 0, the end of the first 100 feet sta. 1, the end of the second 100 feet sta. 2, and so on. The tangent will touch the curve at sta. 3 and the chord will end at sta. 6. Then it will be readily seen that the middle ordinate of the curve at sta. 3 is equal to the offset from tangent for 300 feet of a curve with the same radius; the ordinate at sta. 2 is the offset from tangent for 300 feet *minus* the offset from tangent for 100 feet; also the ordinate at sta. 1 is the offset from tangent for 300 feet *minus* the offset from tangent for 200 feet. Similarly ordinates may be calculated for any intermediate points on this curve.

These offsets here given are calculated for all distances on the curve from 0 to 500 feet, and are for a 1° curve or a curve of 5,730 feet radius. To find the offset from tangent for any distance on any curve of different radius, take the tabular offset here given for the given distance and multiply it by the degree of the curve, expressed in degrees and decimals of a degree. Thus in the table the offset from tangent for 145 feet is 1.835 feet, therefore for a 2° curve the offset for 145 feet will be 3.67 feet; for a $2^\circ 30'$ curve the offset for 145 feet will be 4.637 feet, and so on.

The Engineering Society is indebted to H. Bannister, A. M. Can. Soc. C. E., for this useful table: