

centre from top to bottom. This rule, however, does not apply to the face of rod, which must always be slanted over either to the right or left, so that the "vertical" hair in diaphragm will intersect the centre of rod-face throughout its length. The reason for this is, that when the telescope is tilted up or down, by being moved around the gradient limb to the pair numbers selected, the diaphragm (in common with the telescope) leans over to one side or the other, so that the cross-hairs are only truly vertical and horizontal respectively when the index is at zero on the gradient limb, and the instrument levelled up.

A valuable property of the telemeter not generally known is, that distance can always be measured by using any pair, whether the instrument has been levelled up at zero or not. For example, assume a 16-foot rod to be 1,000 feet from the instrument and a level reading of 8 feet is obtained as foresight. The instrument man cannot get the distance (by tilting either up or down) at the corresponding pair number of 100, for in the first case he strikes 2 feet above the top, and in the alternative case 2 feet below the foot of rod. However, after booking his level reading, he can depress or raise the line of sight by using the leveling screws, and then, having the whole rod to work upon, can obtain the distance by moving index to the pair number. Gradient pairs which do not include a level (or zero) reading can also be calculated from by this method, but the result will only be approximate, and such readings should only be used for "intermediate" sights.

The telemeter gives very satisfactory results in the strongest winds, and will stand a good deal of travelling in rigs extremes of temperature, etc., without getting out of adjustment. It is not designed for particularly accurate work in cities, etc., but for preliminary and even final location, contour work and exploration, it is a very decided success.

A specimen of telemeter field-notes, taken in the ordinary course of the surveys, is appended.