The readings *A* and *B* on rod **F** at point 17 easily give us the distance between station 50 and point 17, which is equal to 100 (*B*—*A*) +0·4=590·5; also the uncorrected elevation of the zero which is found to be equal to:

$$11{\cdot}05061 - \frac{(6{\cdot}912 + 6{\cdot}906)}{2} = 4.14161$$

where as already shown, 6·912 and 6·906 represent the rod readings in the erect and inverted positions of the telescope and the direct and reversed positions of the level, viz.: when the line of sight is very nearly horizontal in each case.

As detailed in column 8—the mean length of the back sights whence collimation 11·0505 was deduced is equal to 939·60 feet—and the corresponding correction required to determine the effects of curvature and refraction is 0·01855 while the correction needed in the case of the foresight of 590 feet is only 0·00731, the diffirence to be applied to the 0 being thus 0·01124, which when deducted from the uncorrected elevation 4·14161 gives: 4·13037 for the correct elevation of the zero of rod **F**. Finally, in order to arrive at the elevation of the water surface, we have further to subtract from 4·13037 the height of the 0 above the water. This height is equal to 0·25 foot, the height of the index or 0 of the pointer scale, (which is at the same level as the zero of the rod) above the underside of the ball support—plus the reading 0·114 foot afforded by the index of the said scale, when the point touches the water—or in all 0·364 foot. A small table of corrections required for curvature and refraction at every 100 feet, up to say 1200 feet or more, printed in each field book, will prove very convenient in this connection, for use in the office or on the ground.

Now, if we had decided to follow for the fore and back sights the still more accurate, although somewhat longer method of determining the elevations above referred to, which consists in measuring with the aid of the micrometer screw and vertical scale the distance *i* between the apparent intersection of the horizontal wire, (or line engraved on the field glass of the eye piece) with the rod scale and the next lowest whole hundredth foot division, instead of estimating the said interval with the eye—we would have to take four micrometer readings, in addition to the rod readings, as shown in the case of the back sight from station 49 to point 8, and compute the thousandths, and ten and hundred-thousandths to be added to the feet, tenths and hundredths entered in column 2, page 47 of tacheometer book. The first micrometer reading (28 0) entered in column 2, page 47, shows the position of the micrometer drum, with the telescope in the erect and the double faced level in the direct position with bubble in centre of glass tube. The second reading (31·0) indicates the position of the micrometer head for a pointing made with the telescope and level in the same relative positions on the whole hundredth of a foot next below the horizontal sight first taken. third reading (17·2) shows the position of the micrometer head for a pointing made to the same whole hundredth division with the telescope inverted, and the level reversed and the fourth reading (22·0) shows the position of the micrometer head with the telescope inverted and the level reversed.

The micrometer reading corresponding to the mean horizontal pointing is, in the case under consideration, equal to: $\frac{28{\cdot}0 + 22{\cdot}0}{2} = 25$,