

Both these Commissions of scientific and practical men of the highest standing have rendered the verdict: that this is the most perfect instrument for surveying purposes that human ingenuity can well devise, and hence bestowed the highest encomiums on its inventor for his great achievement.

Finally, the Commission of Inventions, instituted at the National School of "Ponts et Chaussées" in France, strongly reported in favour of the extended use of the "Tachéomètre Sanguet" by the members of this justly celebrated corps of engineers, and ordered the purchase of some instruments to be kept in their depot at the disposal of engineers who would require the same.

Let us return now to our special Tacheometer, No. 115. In this instrument :  
(a) The magnifying power has been increased from about 35 to say 50, which could be done without difficulty; the only slight drawback to the change being the little extra weight which had to be added to the instrument in lengthening the telescope from 10.83 to 15.83 inches and augmenting its diameter correspondingly, for, we had no supplementary lens to reckon with, intercepting a large portion of the light that passes through the objective, such as the lens used by Porro to render his telescope anallatic.

The increase in the power of the telescope was considered necessary in order to render the instrument more especially serviceable for precision levelling operations, and for the accurate measurement of greater distances than those falling within the every day practice of a surveyor or an engineer, in old settled countries like France, as already stated.

Now it would manifestly be of a little use to have at one's command a telescope of sufficient power to enable us to distinguish and bisect correctly a target stripe say 3,000 or 4,000 feet off, if we had not also the means of measuring very accurately the inclination of the optical axis when directed to the centre of this target, either in reference to the line of sight passing through the centre of another target fixed on a rod at a known distance from the former, or in reference to a truly horizontal line or one running in any given direction above or below the horizon. Hence :

(b) The ordinary slow motion or adjusting screw R on the end of which the guide rod, the clamp with knife edge and the eye end of the telescope are supported in common and by means of which they are adjusted in position, has been replaced by a micrometer screw with a pitch corresponding to 100 revolutions per inch, which is about the limit, as regards fineness of thread, where the number of revolutions indicated on a figured scale can still be comfortably read off with the naked eye.

Again, it is evident that the micrometer screw R together with the prismatic guide rod T and the knife edge should be placed as far as practicable from the axis of rotation of the telescope, otherwise some difficulty might be experienced to measure with precision, small spaces which could be easily distinguished looking through our telescope of increased optical power. It is also necessary that sufficient room be available between the transverse axis of the telescope and the longitudinal axis of the micrometer screw for the convenient installation of a spirit level with an air chamber at one end, and of a degree of sensitiveness commensurate with the small change of inclination produced by moving the micrometer head over one of its divisions.