

both the lens and the naked aperture. The magnified object may thus be compared with a scale of any large dimensions at such a distance as may best suit the convenience of the observer.

The author, however, recommends a small scale attached to the instrument, as better adapted for steady comparison with the object to be measured.

The instrument has externally the appearance of a telescope, consisting of three tubes, with the little lens at its smaller extremity; and in the place of the object-glass is fixed the scale of equal parts, which consists of pieces of wire placed side by side, and so proportioned in their lengths at regular intervals, as to be easily counted.

A wire of known dimensions, as for instance, $\frac{1}{50}$ th of an inch, being then placed in a suitable position before the lens, the tube is drawn out till this wire apparently occupies fifty divisions upon the scale, and consequently each division at that distance corresponds to $\frac{1}{50 \times 200}$ of an inch in the focus. Again, at half that distance the same wire covers only twenty-five divisions, each of which now corresponds with $\frac{1}{25 \times 200}$ th of an inch seen in the focus of the eye-glass.

These numbers are marked accordingly on the outside of the tube, and the intermediate fractions $\frac{1}{100}$ th, $\frac{1}{150}$ th, &c. are found by dividing the exterior scale into equal intervals. Hence in the measurement of any wire, the number of divisions which it occupies on the interior scale are to be noted as numerator, and the number marked on the tube externally as denominator of a fraction, expressing its dimensions in proportional parts of an inch. Since the correctness of the instrument depends on the precision with which the first wire is known as basis of the exterior indications, the wire is made of fine gold, and its dimensions determined by the weight of a given length.

Observation of the Winter Solstice of 1812, with the Mural Circle at Greenwich. By John Pond, Esq. Astronomer Royal, F.R.S. Read February 25, 1813. [*Phil. Trans.* 1813, p. 123.]

The weather was so extremely unfavourable, that it was not possible to obtain more than eight observations of the sun, from which the obliquity of the ecliptic at the late solstice could be deduced; from these it is inferred to have been $23^{\circ} 27' 47'' \cdot 35$, that from the summer solstice having been $23^{\circ} 27' 51'' \cdot 3$. This small discordance, it is observed, might be easily made to disappear by a slight modification of Bradley's refractions; but the Astronomer Royal has not yet had an opportunity of making a sufficient number of observations on circumpolar stars with the new circle, to warrant making any corrections in his table of refractions, and he leaves the subject of the discordance of the solstices for discussion in a separate paper.