



XXXVI. A new arrangement for the micrometer of the automatic spectroscope

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XXXVI. *A new Arrangement for the Micrometer of the Automatic Spectroscope.* By WALTER BAILY*.

IN some spectroscopes the micrometer-wires are seen by means of a pencil of light reflected from the surface of the last prism; but this arrangement is not applicable to the automatic spectroscope, because the last surface of its last prism is perpendicular to the axis of the eye-telescope. An equivalent arrangement may, however, be made by using one of the forms of prism whose sections are given in the figures, as the last prism of an automatic spectroscope. The light to be analyzed having passed through the rest of the train of prisms, enters the last prism, which is immovable, through the side AB , and emerges through CD , the light which is brought to a focus in the centre of the field emerging perpendicularly to CD . Let the light from the cross-wires be made parallel by a lens, and let PQ be the direction of the light from the centre of the cross. In fig. 1 PQ is perpendicular to the axis of the eye-telescope, in fig. 2 PQ is inclined at an angle of 120° , and in fig. 3 at an angle of 60° to this direction. $PQRS$ gives the course of the light from the centre of the micrometer-cross; and RS is perpendicular to the side CD ; and therefore the centre of the cross will be distinctly seen in the centre of the field at the same time as the spectrum. The form of prism to be used depends upon the position in which it is desired to place the micrometer. The diameter of the pencil of light from the micrometer is taken in the figures as one third of that through the prisms; and the latter is taken as the unit of length in the following dimensions for each prism.

Fig. 1.

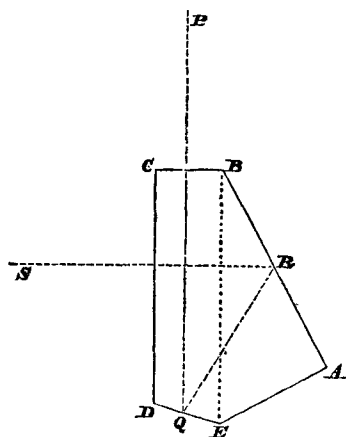
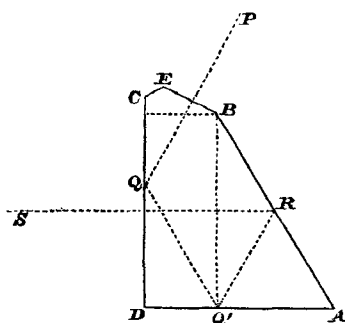


Fig. 2.



* Communicated by the Author.

Fig. 1. Angles :— $B=120^\circ$; $C=90^\circ$; $D=105^\circ$. $BE=\frac{4}{3}$, and is parallel to CD ; $BC=\frac{1}{3}$; $BA=\frac{2}{\sqrt{3}}=1.15$; AE is unpolished.

The angle between BA and $DE=45^\circ$.

Fig. 2. Angles :— $A=60^\circ$; $B=150^\circ$; $D=90^\circ$. $BE=\frac{1}{3}$; the perpendicular from B on $CD=\frac{1}{3}$; the perpendicular from B on $AD=1$; DC is not less than 1; CE is unpolished.

The angle between BE and $DC=60^\circ$.

Fig. 3.

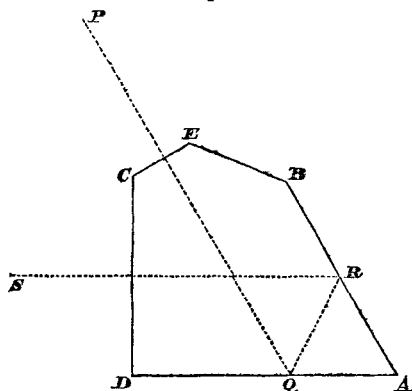


Fig. 3. Angles :— $A=60^\circ$; $C=120^\circ$; $D=90^\circ$. $CE=\frac{1}{3}$; $CD=1$; $DA=\frac{7}{3\sqrt{3}}=1.35$; $AB=\frac{2}{\sqrt{3}}=1.15$; BE is unpolished.

The angle between AB and $CE=90^\circ$.

In the scale to which the figures are drawn the unit is one inch. If desirable the sides DE in fig. 1, and DA in figs. 2 and 3, may be silvered, as they are only used for reflection.

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XXXVII. "*In the Beginning*."—I. *Mass and Position*. By PLINY EARLE CHASE, *Professor of Mathematics in Haverford College*.*

IN tracing the influence of undulations, propagated with the velocity of light, upon cosmical aggregation and dissociation, I have shown that the ratio of the limiting velocity of incipient dissociation to the limiting velocity of incipient aggrega-

* Communicated by the Author.