

## On an Optical Model

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atmosphere. Therefore we can use the ratio of the functions  $\left(\frac{A+B}{A-B}\right)$  of the *observations only* at the two stations.

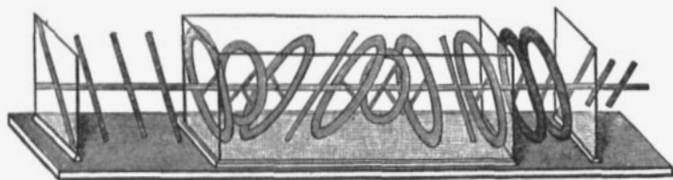
In practice the glass tube is sunk into a groove in a light piece of wood provided with two eyes, which serve either for suspension from a nail in a wall, or for attaching a strap or cord for slinging the instrument round the shoulders in climbing. The eye at the open end of the tube will screw in far enough to stop the opening temporarily if that should be desirable; but if care is taken to climb with the closed end downwards, there is small fear of the quicksilver becoming either lost or discontinuous.

The instrument, as made by Messrs. Watson Brothers, of 4 Pall Mall, weighs between 6 and 7 oz.

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IV. *On an Optical Model.* By Prof. A. W. RÜCKER, F.R.S.\*

THE model exhibited and described is to illustrate the character of the vibrations in a crystal cut parallel to the axis, when plane-polarized light is incident upon it. A rectangular glass box represents the crystal, and glass plates placed at



short distances from each end imitate crossed Nicols. A rod carrying coloured circular and elliptical rings and straight bars passes along the axis of the box. These rings are intended to indicate the character of the vibration at the different points at which they are placed. The length of the crystal is supposed to be such that plane-polarized red rays emerge plane-polarized in the initial plane after being successively plane, elliptical, circular, elliptical plane, elliptical circular, elliptical and plane-polarized within the crystal. All the light is quenched by the analyzing Nicol. Supposing another kind of light (say

\* Read June 23, 1868.

green) to be used, another rod with green ellipses &c. is placed in the box, and illustrates that such light may emerge elliptically polarized, one component only being stopped by the analyzer. This shows how plane-polarized white light, when passed through crystals placed between Nicols, may become coloured.

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V. *A Design for a Standard of Electrical Resistance.* By J. A. FLEMING, M.A., D.Sc., Professor of Electrical Technology in University College, London\*.

[Plate I.]

IN designing a standard of electrical resistance the two points to which attention is directed are the choice of the material in which the standard is embodied, and the form or disposition of the instrument.

Experience is yet far from complete as to the entire permanence of wires of alloys over prolonged periods of time when employed as standards of electrical resistance ; but having regard to the inconveniences which attend the use of mercury in standards intended to be conveyed about, evidence, as far as we have it, points to the tolerable permanence of the platinum-silver alloy (66 p.c. of silver + 32 p.c. of platinum) when drawn into wire, for use as the material substance of which the actual standard is made.

A definite length and gauge of standard wire has then to be so arranged that, whilst kept at a constant temperature, currents can be passed through it and the resistance between certain points ascertained.

The form which has hitherto been chiefly manufactured, and which is in most general use, is the form of standard which was designed by the Committee of the British Association on the original introduction of the B.A. unit, and shown in plate 4 of the 'Reprint of Reports on Electrical Standards,' by Prof. Fleeming Jenkin. In this form of standard the actual coil is wound on a bobbin consisting of a tube of thin brass having ebonite cheeks. Attached to these cheeks are the two long bent copper rods which serve as the electrodes,

\* Read November 10, 1888.