men gave an average hardness value of 2520 K_{100}, with a range of 2410–2600 K_{100}. These figures are comparable with those obtained by Thibault and Nyquist (2), 2760 K_{100} for molded boron carbide and 2550 K_{100} for gray silicon carbide, in their study of Knoop hardness.

Thirty indentations, made in four of the red pseudohexagonal crystals, gave an average hardness value of 2433 K_{100}, with a range of 2354–2527 K_{100}. Abrasion tests on the polished surfaces of silicon carbide and molded boron carbide, using crushed crystals of yellow aluminum boride, showed that the silicon carbide was scratched and pitted by the crystals, while the boron carbide was unaffected. A similar test using crushed red crystals showed no abrasion on either the silicon carbide or the boron carbide.

From the foregoing tests it appears that the hardness of yellow aluminum boride crystals is ≈ 2700 K_{100} and that they are harder than silicon carbide and very nearly as hard as boron carbide. The hardness value for the red pseudo-hexagonal crystals is ≈ 2400 K_{100}.

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DEVICE FOR PRECISELY CONTROLLING AN IRIS DIAPHRAGM*

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The photoelectric measurement of the reflectivity of ore-minerals, ably discussed by Bowie (1957), is facilitated if precise control of the light is achieved by means of an iris diaphragm. The device described below was designed for use on an ore-microscope, but could be used in any optical system where fine adjustment of the iris is desired.

The instrument is shown assembled on a microscope tube (Fig. 1*a*) and in "exploded" view (Fig. 1*b*).

The conventional control of an iris diaphragm is usually by means of a lever (K) acting more or less concentrically with the iris. The present device is mounted beside the lever and is coupled to it. An additional lever (A) moves coaxially on the microscope tube, resting on a flange. Mounted on the lever (A) is a flat knurled disk (D) in which is cut a spiral groove.

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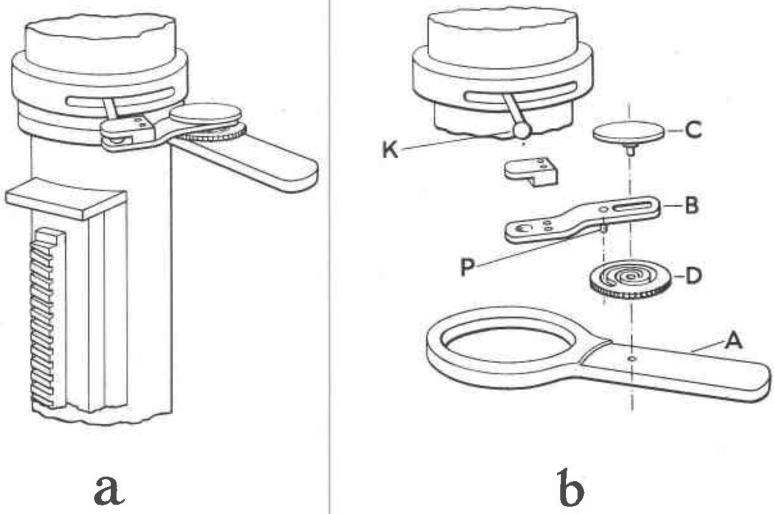

FIG. 1. Iris diaphragm device. (a) assembled. (b) "exploded" view.

A bracket (B) is attached to the lever (A) and disk (D) by means of a flat cover and screw (C). Pin (P) engages the spiral groove in the disk. The other end of the bracket is attached loosely by means of a clamp to the original lever of the iris.

Operation.—The lever (A) is used for coarse adjustment of the iris. For fine adjustment lever (A) is slightly depressed with the thumb in order to hold it by friction against the bearing surfaces above and below. The disk (D) is then turned with the forefinger so that bracket (B), engaging in the groove, moves slightly sideways in a direction along its length, thus finely adjusting the iris knob (K).

For use with an ore-microscope the device is not calibrated numerically but if calibration were wanted it could be done by arranging the lever (A) to have "click" stops at a number of equally-spaced definite positions, and engraving the edge of the knurled disk for movement between these positions.

REFERENCE

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