NOTES AND NEWS

NOTE ON THE STRUCTURE OF CARBONADO OR BLACK DIAMOND

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A typical stone of the variety of diamond known as carbonado, or black diamond, from the Piranhas district in the State of Bahia, Brazil, was selected from a representative lot kindly loaned to the writers by the Pennsylvania Drilling Company for use in connection with this study. In order to examine the structure by reflected light, the specimen was sent to a diamond cutter who ground and polished a small surface on one side.

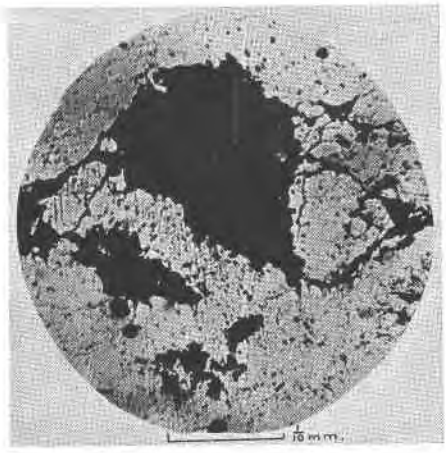

FIG. 1. Polished surface of carbonado.

Under the microscope, using reflected light, the porous structure characteristic of this variety of diamond is well brought out, as is shown in Fig. 1. The pores vary greatly in size, shape, and distribution. This no doubt accounts in large measure for the differences in specific gravity found between different stones as well as differences in behaviour when used in the bit of a diamond core drill.

In order to discover, if possible, further structural features, the polished surface was etched by flashing the oxidizing flame of a blow-pipe over it for approximately ten seconds. The surface then

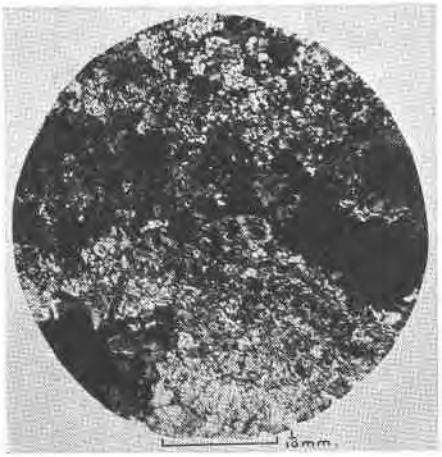

FIG. 2. Etched surface of carbonado.

took on the appearance shown in Fig. 2. Apparently the carbonado is made up of a large number of very small individual interlocking units, for the most part irregular in outline, resulting in a structure resembling somewhat that developed in some varieties of cryptocrystalline quartz. No doubt the toughness exhibited by the carbonado, which makes it so desirable for the bits of the diamond core drills, can be attributed to this characteristic.

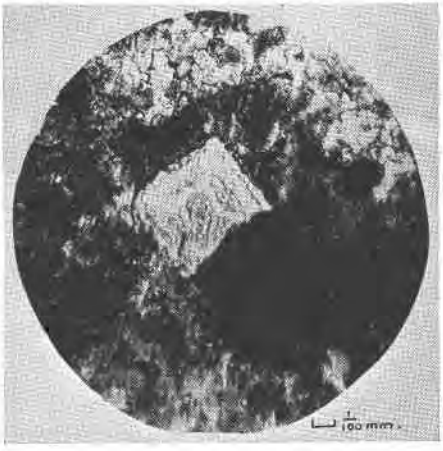

FIG. 3. Minute diamond crystal in cryptocrystalline matrix of carbonado.

Perhaps the most interesting feature brought out by the etching is the presence of actual minute octahedral crystals, ranging in diameter from .063 to .095 millimeters, amongst the individual units that go to make up the carbonado. One of these is shown in Fig. 3.

Walter Gerloch[1] has investigated the diffraction pattern of the carbonado obtained by the powder method of *X*-ray analysis and has compared this with those obtained from the ordinary diamond and graphite. The only difference observed between the pattern obtained from the carbonado and that from an ordinary diamond was an intense darkening of the background of the former. No indication of the presence of crystalline graphite was observed on the carbonado pattern. Gerloch concluded that carbonado consists of a very large number of small interlocking normal diamond grains with perhaps a little intermingled and finely distributed amorphous carbon. The effect produced upon a polished surface of the carbonado by etching with a blow-pipe apparently substantiates these conclusions. It further shows that some of the small individual units have actually assumed the octahedral form which is so characteristic of the diamond proper.

NOTE ON THE ALTERATION OF GALENA TO ANGLESITE, TO CERUSSITE

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Several specimens of galena, with their surfaces covered with alteration products which show clearly the sequence of its alteration, were found by Dr. W. A. Tarr in the southeast Missouri lead belt. These specimens came from the residual clays over the Bonneterre dolomite and show galena altered to anglesite, and the anglesite in turn altered to cerussite. Some veinlets and incrustations of dolomite are also present.

The galena shows all the characteristics commonly associated with that mineral. On a crystal, about one cubic inch in volume, one face shows a deposit of anglesite about 3 millimeters thick. The anglesite is dark gray in color and is soft and earthy. The

[1] Walter Gerloch, Über die Structur des "Schwarzen Diamants." *Zeitschrift für Anorganische und Allgemeine Chemie*, Band **137**, pp. 331–332. 1924.