0.65, which did not change during 48 hr. Exact measurement on the strongest of these sources yielded $a_2 = 0.3533 \pm 0.0066$ and $a_4 = 0.0258 \pm 0.0081$ (t of five degrees of freedom; on the variance-ratio test a_4 is significant on the 2 per cent level). Allowing for the influence of scattering, the experimental value of a_2 is c. 18 per cent lower than the theoretical one.

A detailed report of these experiments will be communicated in due course to the *Proceedings of the Physical Society*.

E. BREITENBERGER

Cavendish Laboratory,
Cambridge.
March 11.

¹ Biedenharn, L. C., and Rose, M. E., *Rev. Mod. Phys.*, **25**, 729 (1953).

² Russinov, L. I., and Chuykin, E. I. *Doklady Akad. Nauk. U.S.S.R.*, **68**, 1029 (1949). Ward, A. H., and Walker, D., *Nature*, **163**, 168 (1949). Walter, M., Huber, O., and Zünti, W., *Helv. Phys. Acta*, **23**, 697 (1950).

³ *Phil. Mag.*, **44**, 987 (1953).

⁴ *Phil. Mag.* (in the press).

⁵ Cf. a standard text in statistics, for example, Weatherburn, C. E. "A First Course in Mathematical Statistics" (Cambridge, 1946).

⁶ Segrè, E., and Helmholtz, A. C., *Rev. Mod. Phys.*, **21**, 271 (1949).

⁷ Goldhaber, M., and Hill, R. D., *Rev. Mod. Phys.*, **24**, 179 (1952). deShalit, A., Huber, O., and Schneider, H., *Helv. Phys. Acta*, **25**, 279 (1952).

⁸ McGowan, F. K., *Phys. Rev.*, **77**, 138 (1950). Deutsch, M., and Wright, W. E., *ibid.*, 139.

Etch Trignons on Diamonds

IN the course of an investigation on the effects of high temperatures on diamonds, a new variation of surface etching was encountered which apparently has not been observed before. The etching agent was simply air, the temperature 1,400°C., the time of etching 2 min. Under these conditions etch trignons were formed on a (111) cleavage face, which was slightly polished. The occurrence of such etch trignons is known.

Similar to the triangular growth figures standing out from {111} faces of many natural diamond octahedrons, these etchings show a parallel orientation, and the negative growth trignons are orientated anti-parallel. The etch trignons have one more point in common with positive growth triangles, namely, that their sides are always concave when looking from the centre of the trignon towards the sides. Negative growth trignons always have straight sides.

Many of the etch trignons show what may be called bridges (Fig. 1). The sides of the trignons can be clearly seen; their directions are given by the crystallographic symbol $\langle 111 \rangle$. They are fairly wide and appear to be triangular annular plateaux. From the centre of the sides flat bridges have formed perpendicular to these sides. These bridges meet in the centre of the trignon and are of the form $\langle 211 \rangle$. In each of the three compartments formed by the bridges there is a tiny protruding four-sided irregular pyramid. If the edge of one of these tiny pyramids, which starts from a corner point of the large surrounding annular trignon, was a $[110]$ direction, as one might perhaps expect, then the two other edges arranged symmetrically with respect to the first one would also be of the type $\langle 110 \rangle$, but the fourth edge, running from the top of the tiny pyramid to the centre of the trignon, would be a $\langle 411 \rangle$ direction. However, the height of these pyramids is much smaller than expected, and this also applies to the height of the regular three-sided pyramids of these trignons, which do not show the bridge formation. Whereas the sides

Fig. 1. A photomicrograph showing two trignons one of which has three bridges meeting in the centre. $\times 2,235$

Fig. 2. Large negative etch trignons on a (111) face of a diamond octahedron. $\times 425$

of such a trignon are about 10 microns, the height of the pyramid is only 1 micron. If the edges of this three-sided pyramid were $\langle 110 \rangle$ directions, the height should have been about 8 microns.

It was also observed that these etch trignons, especially the well-developed ones without bridges, seem to be arranged along spirals.

The trignon sides and bridges are at a lower level than the surrounding etched crystal face. This means that, approaching the trignon from the outside, there is a fairly steep decline to the plateau-level, and from this level the pyramid is protruding. On some parts of the etched surface of the diamond many of these bridged trignons were found, and on other parts none at all.

Another type of etch trignon also occurred (Fig. 2). This is in the form of a depression in the surface, its sides being fairly straight, with the bottom of the depression flat except for irregular very tiny etched patches. These trignons are usually very much larger than those with cross-bridges. Whereas the flat-bottomed trignons may have lengths of side up to 75 microns with a depth of 9 microns, the other type is the order of about 10 microns or smaller.

It is hoped to study these etch trignons more carefully and to publish the results at a later date.

J. F. H. CUSTERS
H. R. SIMPSON

Diamond Research Laboratory,
P.O. Box 916,
Johannesburg. Nov. 24.