the temperature of irradiation on the value of β, and experimental data will be published in the near future.

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Etch Pits on Calcite Cleavage Faces

In a recent communication, Watts[1] describes a number of etch pits found in freshly cleaved calcite, and in particular notes that three, four- and five-sided pits are found, with the first two types having some curved sides. I have also observed similar shapes, and have examined these under a surface-finish interference microscope (C. Baker of Holborn, Ltd.) using a × 40 objective and a mercury vapour lamp with a green filter ($\lambda = 0{\cdot}564\mu$). This type of interferometer compares the surface under investigation with a reference surface in the objective, and shows a magnified image of the surface crossed by fringes. These fringes are straight for a perfectly plane surface, whereas irregularities cause the fringes to be shifted into a pattern that may be likened to a contour map, of vertical spacing $0{\cdot}273\mu$. The number and direction of the fringes in the field may be varied by tilting the specimen.

All the investigations were on calcite plates that had been freshly polished to a high optical standard parallel to a cleavage plane, or parallel to the optical axis. These plates were first examined by various interferometric and optical transmission methods, and only those plates selected for the investigation in which no internal optical irregularities of any kind could be detected.

The surfaces were etched with 10 per cent hydrochloric acid for 10–60 sec., and then washed in distilled water.

Fig. 1*a* shows a cluster of four-sided etch pits in a surface parallel to a cleavage plane. The typical concave nature of the walls is clearly shown by the form of the fringes. A similar etch pit is shown in Fig. 1*b*, but with a single isolated pit in one wall of approximately an eighth of a micron deep. Fig. 1*c* shows a line of overlapping five-sided pits. Several lines of fringe disturbances appear to originate from the vicinity of the pits. It is possible that the line of pits may be due to preferential etching along a dislocation line.

The remaining photographs are of etch pits obtained on surfaces of plates cut parallel to the optical axis of the crystal. In this case, the pits are boat-shaped, as shown in Fig. 1*d*. With longer etching, the ends become more rounded (Fig. 1*e*), but the pits never appear to become circular. If the microscope stage and the specimen are tilted, the fringes can be made to cross a pit, as in Fig. 1*f*, to show its typical rounded bottom.

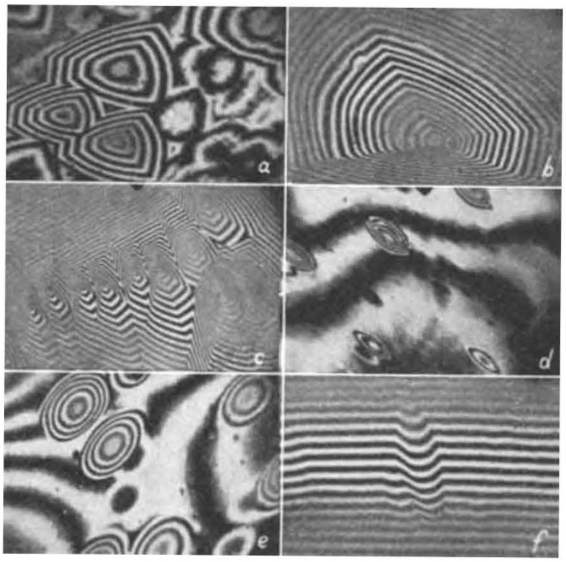

Fig. 1. (*a*) Four-sided etch pits, 20 sec. etching; (*b*) four-sided etch pits, 20 sec. etching, showing isolated hole in curved wall; (*c*) line of overlapping pits, 60 sec. etching; (*d*) boat-shaped etch pits, 10 sec. etching; (*e*) boat-shaped etch pits becoming rounded after 30-sec. etching; (*f*) rounded bottom of boat-shaped etch pit, 10-sec. etching. (× *c*. 40)

It is most noticeable, in these interferograms, how precipitous is the edge of a pit; there appears to be no rounding of the fringes at an edge.

I am indebted to the directors of C. Baker, Ltd., at whose works these photographs were obtained.

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Origin of Libyan Desert Silica-Glass

Since first reading of Libyan Desert glass[1], I have been intrigued concerning its origin. In the course of investigation of impurities in the glassy state, the role of trace germanium in fused silica was studied[2,3]. All fused silica produced artificially from natural quartz contains trace germanium impurity. Two different fused silicas investigated contained 0·9 p.p.m. of germanium[3]. It occurred to me that the trace germanium content of Libyan Desert glass might offer a clue to its origin, as no trace germanium would be expected to volatilize selectively (as germanium(II) oxide) during sudden melting and quenching of a high silica-content glass.

Table 1 gives the results of trace analyses of germanium, using a modified method of Schneider and Sandell[4], in Libyan Desert silica-glass, Libyan Desert sandstone, a Libyan Desert quartzite, two Libyan Desert sands, Aouelloul crater 'impactite' glass, two obsidians, the average for tektites from eleven different localities, including all known sources except Billiton (Darwin glass and americanites excluded), and the range for the non-magnetic portions of six meteoritic stones. It is seen that the Libyan Desert silica-glass contains very nearly the same germanium content as Libyan Desert sands. The average germanium content of the four materials from the Libyan Desert (other than glass) is 0·77 p.p.m. This agrees very closely with the value 0·80 for the Libyan Desert silica-glass and is not too different from the value for impact glass from the