

These data are obviously only a very rough approximation,¹ but even so they suggest a variation in the fluorine content of different samples.

When T. Deans² discovered the new mineral isokite, CaMgPO_4F , he felt it desirable to exclude the possibility that the new material might really be cryphiolite. By the courtesy of Prof. A. Scherillo of Naples, he was able to borrow one of Scacchi's original crystals; a powder photograph showed at once that isokite was something quite different, and the further examination of cryphiolite Mr. Deans left to us.

The crystal agrees in dimensions and habit with the figures and descriptions of Scacchi and of Zambonini, but the faces are too rough to give reflections, and the edges are irregular, and rounded in places. The only measurements possible confirm Scacchi's interzonal angles $[AB]:[Bm]$ and $[AB]:[Am]$. X-ray photographs show conclusively that the crystal is a pseudomorph, an unoriented mixture of apatite, sellaite, and a little wagnerite, in agreement with Scacchi's approximate chemical data. Both Zambonini's and Scacchi's³ goniometric data agree well with the view that the original mineral of the pseudomorph was wagnerite.

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¹ The P_2O_5 percentage is obviously too high; the phosphate precipitates were probably contaminated with silica.

² *Min. Mag.*, 1955, vol. 30, p. 681.

³ Accepting Zambonini's orientation, Scacchi's and our measurements compare with the calculated angles for wagnerite as follows: $[AB]:[Bm]$ 121° A.S., 122° M.H.H., $123^\circ 35'$ calc.; $[AB]:[Am]$ 117° A.S., 117° M.H.H., $117^\circ 31'$ calc.; $[Am]:[Bm]$ $94^\circ 30'$ A.S., $94^\circ 18'$ calc.

A method of impregnating friable rocks for the cutting of thin sections.

DURING work on the alteration of granite, it was necessary to impregnate severely kaolinized specimens to enable thin sections to be prepared. Canada balsam and Kollolith would not withstand grinding and permitted the disintegration of the section if the slide were heated during covering.

Advice was therefore sought from Bakelite Ltd. who recommended the use of a resin (SR 17431), an accelerator (Q 17448), a catalyst (Q 17447), and, to reduce the viscosity, a modifying agent (Z 17453). The suggested proportions were, in order of mixing, resin 100 g., modi-

fer 10–15 g., catalyst 1 g., and accelerator 2 g. The mixture would gel in about 2 hours at 25° C. and could then be hardened in about 2 hours at 80° C. or 1 hour at 100° C.

In practice, the method was to weigh out the resin in a tin on a rough balance, add the modifier, and mix them thoroughly. The specific gravities of the catalyst and accelerator being close to 1, these were measured by pipette and mixed into the resin in the proper order. The liquid was then poured over the specimens, which had been trimmed to about

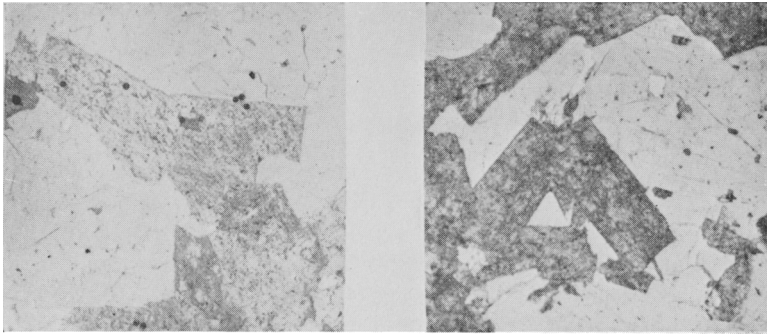


FIG. 1.

FIG. 2.

Fig. 1 (*left*). Rectangular albite crystals in a fresh granite.

Fig. 2 (*right*). A related altered granite, sectioned after impregnation; the pseudo-morphs of kaolinite and mica after albite have retained their shape perfectly.

$1\frac{3}{4}$ in. \times $1\frac{1}{2}$ in. \times $1\frac{3}{4}$ in. and placed in waxed-paper jelly cases of the appropriate size, each specimen being almost immersed.

Gelling was too rapid to permit thorough impregnation of relatively hard rocks and here the amounts of catalyst and accelerator were reduced. In an extreme example, one-tenth of the recommended quantities of these ingredients was used; gelling in this case took 10 days, but the specimens were completely impregnated. In all cases, once the resin had gelled, it was hardened for about 6 hours at 50° C., a temperature lower than that suggested by the makers but used to minimize the formation of contraction cracks. After hardening, the impregnated specimens could be sliced in the usual way.

It is convenient to impregnate a fair number of specimens at the same time; this reduces waste and facilitates the use of easily measured quantities. In general, the amounts given above suffice for six or eight specimens, depending on their porosity.

The refractive index of the resin varies according to the proportions of the various constituents, but is about 1.55.

Outstanding among the features revealed by this technique is the preservation by pseudomorphs of the original texture in an apparently textureless aggregate of clay and quartz. Fig. 1 shows a fairly fresh rock in which the mica has been stained to facilitate modal analysis.¹ Rectangular section, similarly stained, of a rock derived by alteration from that in fig. 1; the albite has been replaced entirely by microcrystalline aggregates of kaolinite and secondary mica but its shape is perfectly preserved, as is the general texture of the rock.

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¹ P. S. Keeling, *Trans. Brit. Ceram. Soc.*, vol. 53, p. 67.

Atacamite from Cumberland and Cornwall.

UNTIL a year or two ago, the only British specimen of atacamite, the orthorhombic basic copper chloride, was one in the British Museum collection, purchased in 1860 and labelled from Roughtongill in Cumberland; all the other British specimens, formerly supposed to be atacamite from the St. Just district in Cornwall, had been found to be the rhombohedral phase paratacamite.¹

In 1951 we collected, among some material from a small copper vein near Potts Gill on the northern fringe of the Caldbeck Fells in Cumberland, several specimens which proved to be atacamite and with which the British Museum specimen is absolutely identical in every way, so that we feel sure it must originally have come from the same locality. We have found no trace of the mineral at the Roughtongill mines, and from our recent investigations in the northern Lake District it has become very evident that the locality 'Roughtongill' was, in the past, used in an extremely loose and general way for almost anywhere in this district north of Skiddaw, and Potts Gill is, in fact, not very far from Roughtongill.

We have since found further specimens of atacamite at this locality near Potts Gill and, in addition, at Hay Gill, also in the Caldbeck Fells, but in no way resembling the Potts Gill material; one of us has also

¹ F. A. Bannister, M. H. Hey, and G. F. Claringbull, *Min. Mag.*, 1950, vol. 29, p. 280.