THE PETROGRAPHY OF DARTMOOR AND ITS BORDERS.

PART III.

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IN the nine years which have elapsed since Part II. of this series was read at Sidmouth, the writer has found no opportunity for continuing the work systematically. None the less, individual observations of interest have been made, and, although the scheme of work may be interrupted thereby, it is possibly better to sacrifice rigid continuity than to leave "finds" of geological significance unrecorded.

In accordance with this want of principle the present contribution, after a brief reference to Felsite "A," will be wholly illogically devoted to the record of a discovery of the mineral *Pinite* in Dartmoor granite.

A TYPICAL DARTMOOR FELSITE (FELSITE "A") (*continued*).

The gap between the last two recorded localities for this felsite must now be subdivided by the interpolation of another *in situ* exposure, on the east bank of the Avon, CXIII, S.E., 10a., *lon.* 3° 51′ 30″, *lat.* 50° 27′ 44½″. This point is half a mile, or thereabouts, up-stream from Brent Moor House, and about 100 feet from the river. It is the greater part of a mile inside the junction of the granite and the sedimentaries, but from the presence of altered slate at the same spot it is evidently associated with an inlier of slate. The felsite is somewhat rougher in texture than typical specimens of this material, but otherwise requires no discrimination from it.

In passing, it may be well to remark that inliers of slate

are much more frequent on Dartmoor than is generally known : they are found as far in toward the heart of the granite as Brown Heath over Erme Pound, and Tor Royal Newtake, near Princetown ; later the writer hopes to record these in detail.

ON THE OCCURRENCE OF PINITE IN DARTMOOR GRANITE.

The works of the China Clay Corporation, Ltd., although extending from Cantrell on the south to Redlake on the north, have brought little of novelty to our knowledge.

The pipe-trench to the west of the light railway, between the 2½ and 2¾ mile-posts, has, however, yielded a granite in which *pinite* is quite a common mineral.

Thus one hand specimen shows on a face 3 inches by 4 inches at least fourteen crystals of *pinite*, and there are probably many smaller crystals not clearly identifiable on the same face. The type specimen has been labelled Devon, CXIX, S.E. 24, *lon.* 3° 53′ 28″, *lat.* 50° 25′ 34½″.

The *pinite* is pseudomorphous after *iolite*. The largest crystal found as yet is a twelve-sided prism of at least 15½ mm. in length, and having a greatest diameter of 12 mm. and a least of 10 mm. There is a perfect cleavage parallel to the base of the prism, and there are cleavages parallel to the alternate sides, giving a six-sided form.

More usual dimensions for the crystals are 9½ mm. long by 5 mm. diameter ; 6 mm. long by 2¾ mm. diameter ; and others in which the length cannot be ascertained, but of which the diameters average about 4 mm. There are also smaller crystals. Six-sided prisms are the more usual, but all agree with the largest specimen as to the direction of their cleavages.

Every cleavage parallel to the base is marked by the development of mica, and accordingly the cross sections of the crystals, which occur in any hand specimen of the granite, mostly present the appearance of well-developed hexagonal plates of dark mica. In a micro-section of a large crystal, taken somewhat obliquely to the longitudinal axis, there are 38 cross sections of such plates of mica in a length of 14 mm. The average distance apart, and thus the average thickness of the platy structure of the crystal, would probably be 0·33 mm. in a direction parallel to the

long axis of the prism. This structure is discontinuous, and does not always extend across the whole width of the prisms.

The general colour of the mineral in the micro-section is olive-green. There are inclusions of quartz, of dark mica, with crystal direction other than that described above, and of tourmaline. All tourmaline, wholly surrounded by *pinite*, is bright blue; one mass, which lies partly without the *pinite*, is olive-brown where outside that crystal, and blue as to that portion within.

The granite in which the *pinite* occurs is of medium grain; the other porphyritic constituents are felspar (chiefly, but not exclusively, orthoclase), quartz, and dark mica, with a little tourmaline. The interstitial matter, or groundmass, varies both in texture and quantity; on the whole it is fine-grained, and where finest it forms a larger proportion of the whole rock. The colour of the felspar divides the rock into two classes; in some specimens the felspars are all white, in others they are flesh-coloured; the larger felspars stronger in colour in their outer parts, the smaller rather bright in colour throughout.

The quartz is thickly strewn with fluid enclosures, most of which have a bubble, and many a cubic crystal inclusion also.

The rock is fresh and hard, but some specimens have an occasional bright ochreous patch of fairly firm texture, which has possibly been derived from the partial kaolinization of a felspar (?).

There is no reason to believe that the rock with flesh-coloured felspars is other than identical in origin with that having uncoloured felspar. Local colouration of felspars near joints and veins is a common secondary character on Dartmoor.

The discovery of *pinite* is interesting as a further link between the granites of Dartmoor and Cornwall. With sufficient patience and care it is possible to match practically all varieties of Cornish granite on Dartmoor.

Since this paper was read the writer has found *pinite* in granite from the China Clay Corporation's quarry on the southern slope of Western Beacon (Devon, CXXV, N.E. 8, *lon.* 3° 53′ 45½″, *lat.* 50° 23′ 53½″). The mineral is present in considerable quantity. In addition, there are also crystals of pale grey iolite, the alteration of which is confined to