

VII.—*Note on certain Black Quartz Crystals from Boscaswell Downs, Cornwall.*

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IN the autumn of 1871 I found in a large cavity or “vugh” in the schorlaceous granite of Boscaswell Downs, in the parish of St. Just, Cornwall, a number of black and opaque hexagonal prisms, having ragged terminations, which I at first took to be pseudomorphs of black tourmaline (*schorl*), after quartz. They were set aside for further examination and forgotten until the beginning of the present year, when I undertook their examination.

I found that, although they were very compact, the sp. gr. was only 2·747, which at once negated the idea of schorl, the sp. gr. of which ranges from 3·0 to 3·3. I then cut a number of sections for microscopic examination, and these at once shewed that the prisms were composed of clear and colourless quartz, containing an immense number of tourmaline crystals, mostly very thin and arranged in feathery groups as in Plate III, figs. 1 to 4. A few of these included crystals are comparatively large,  $\frac{1}{100}$ th,  $\frac{1}{50}$ th, or even  $\frac{1}{12}$ th of an inch thick, and three or four times as long, but the great majority are from  $\frac{1}{3000}$ th to  $\frac{1}{10000}$ th of an inch thick. The larger crystals are yellow, brownish, or greenish; translucent, or even transparent; the smaller ones with low powers appear to be black and opaque, but with the  $\frac{1}{5}$ th are seen to be transparent and nearly colorless. We have, therefore, the somewhat curious result of a colorless transparent quartz appearing black and opaque from the presence of numerous nearly colorless microscopic crystals.

All the included tourmaline crystals exhibit distinct hemimorphism. The larger ones are often branched at one end, as in fig. 3, and some of the smaller ones are branched as in fig. 4, but whether simple or arranged in compound groups, the form of the individual crystals appears to be somewhat as represented in the diagrams, fig. 5.

I have cut sections in various directions but see no difference whatever in the grouping or arrangement of the feathery bunches, which seem also to be entirely independent even of the "lines of growth" of the quartz, which are distinctly indicated by concentric linear groups of minute cavities as shewn in figs. 1 and 2. The only instances in which I have observed any relation between the form of the quartz crystal and the grouping of the minute crystals of tourmaline are illustrated in fig. 2 where many little feathery groups are seen to have their origin at the exterior of the crystal. This is quite different from what is seen in connexion with the inner "lines of growth," and would go to prove that these latter do not indicate former exterior surfaces of the prisms.

In one or two cases I have found, included in the quartz crystals, besides the well-formed crystals of tourmaline, fragments of a white amorphous substance which is not less hard than the quartz itself, and which may be amorphous silica.

On the whole I cannot help thinking that this mutual association of well-characterized quartz and tourmaline indicates that the materials assumed the crystalline form at the same time; and from the inclusion of particles of amorphous substance, I should suppose that the crystallization had been tolerably rapid.