SHORT COMMUNICATIONS

A note on the composition of staurolite from the Caenlochan schists.

THE Caenlochan schists occur along the north-west side of the Duchray Hill gneiss. They form a belt of country about 1 mile wide extending north-east from the Glen Shee diorite towards the Tolmount situated in the north-west corner of Forfarshire. These schists were named and described by Barrow (1912*a*, p. 22), who correlated them with the Ben Lawers schists of Perthshire. The dominant constituent of the Caenlochan schists is a finely banded, soft, micaceous rock; the lighter bands are specially rich in granulitic quartz and oligoclase while the darker are mainly composed of mica with biotite in excess of muscovite, garnets, iron ores, and secondary chlorite. Intimately associated with these pelitic and psammopelitic schists are some thin bands of quartzite and some impure limestone. The schists occur within the garnet zone (Barrow, 1912*b*), but as the older granites of the Duchray Hill gneiss are approached there is a marked increase in grain size coupled with the appearance of kyanite and staurolite. Particularly good exposures of coarsely crystalline kyanite–staurolite gneiss occur on the Crags of Cannes at the head of Glen Isla. Staurolite is very abundant and forms crystals up to 3 cm. in length. It is very resistant to weathering, and crystals, weathering out of the gneiss, have accumulated in small hollows on the glaciated rock surface to form patches of staurolite gravel. In thin section this staurolite gneiss is seen to be composed of quartz, oligoclase, biotite, garnet, kyanite, and staurolite, with a little muscovite. Garnet and biotite occur as felts, interleaving quartz–felspar strings, lenticles, and augen. Porphyroblasts of staurolite and kyanite are more or less regularly distributed throughout the rock. Most of the staurolites are riddled with inclusions of quartz. Although the coarse grain size of these rocks can probably be attributed to the adjacent older granites, it is uncertain whether there has been any addition of material for though the gneiss is rich in oligoclase, the normal fine-grained pelitic and psammopelitic schists also contain appreciable amounts of oligoclase.

An analysis of the staurolite from these schists gave: SiO_2 28·33, TiO_2 0·86, Al_2O_3 52·85, Fe_2O_3 3·41, FeO 10·92, MnO 0·04, MgO 2·13, CaO 0·22, H_2O+ 1·91, H_2O- nil, sum 100·67 %. Refractive indices

(Na light) α 1·741, β 1·746, γ 1·755 (all $\pm$0·003). Ferrous iron was determined by fusion of the mineral in sodium metafluoroborate, following the procedure given by Groves (1951); water by a modified Penfield method, the mineral sample being heated in a silica tube for half an hour by an oxy-coal gas burner, the temperature reached being about 1300° C. The number of metal atoms have been calculated on the basis of 48(O,OH) to the unit cell: Si 7·807, Al 17·163, Fe‴ 0·706, Ti 0·178, Mg 0·874, Fe″ 2·515, Mn 0·015, Ca 0·064, OH 3·510; Al+Fe‴ 17·869; Fe″+Ti &c., 3·646. If Ti and Ca are grouped with Fe″, Mg, and Mn, the resultant formula agrees best with that proposed by Juurinen (1956), namely $Fe_4Al_{18}Si_8O_{44}(OH)_4$.

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Serpierite from the Lake District.

SERPIERITE, a basic sulphate of copper, zinc, and calcium, was first described in 1881 from the Camareza section of the Laurium mines in Greece; in 1927 Sir Arthur Russell[1] described a second occurrence at Ross Island, Killarney, Co. Kerry, in Ireland, this being the first and hitherto only known locality in the British Isles. One other locality, in Kazakhstan, in the U.S.S.R., has since been recorded, but it is a rare mineral.

We have recently found and confirmed the occurrence of serpierite at two localities in the northern part of the Lake District. First, at Driggith Mine, Caldbeck, where in some massive, intergrown chalcopyrite and blende, derived from the 30-fathom level, serpierite occurs in narrow veinlets or coating surfaces of joints; it forms aggregates of tiny, pale-blue, lath-like crystals, with a pearly lustre, and at first sight could be confused with aurichalcite. Its identity was confirmed by powder-photographs which exactly match that of authenticated serpierite from Laurium. On some of the specimens from Driggith mine the serpierite is intimately associated with another pale-blue, pearly mineral, in minute hexagonal plates, which gives an entirely different but well-defined powder-pattern, but has so far remained unidentified.