

*A note on the occurrence of columbite in the Meldon aplite,
Devonshire.*

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DURING a departmental excursion to South Devon in April 1951, material was collected from the Meldon aplite quarry near Okehampton, to the north-west of the Dartmoor granite, which on examination has proved to contain the mineral columbite. The mineral is present only in very small amounts and as extremely minute crystals; nevertheless its presence is of considerable interest in that this appears to constitute the first authenticated record of the occurrence of a mineral of the columbite-tantalite series in Britain.

The following minerals have previously been recorded from the Meldon aplite quarry.^{1,2} They are partly found as accessory constituents in the main fine-grained aplite rock consisting of orthoclase, albite, and quartz, or more frequently and in larger amounts in the coarser portion of the aplite and particularly in veins of pegmatitic character.

Fluorite	Axinite	Montmorillonite
Quartz	Tourmaline	Petalite
Apatite	Cordierite	Orthoclase
Topaz	Prehnite	Albite
Garnet	Lepidolite	Heulandite

McLintock¹ has given a detailed account of the mineral assemblages and has described different types of pegmatite veins from the quarry. It would appear that the mineralization has developed in cracks and joints of the aplite, and it should be pointed out that the veins often show a zonal relationship with quartz and mica concentrated along the margins and feldspar in the central portion.

The material in which the columbite occurs was collected from the working quarry on the left-hand side of the entrance road, and consists of a rather distinctive narrow vein of pegmatitic character about 2 cm.

¹ W. F. P. McLintock, On the occurrence of petalite and pneumatolytic apatite in the Meldon aplite, Okehampton, Devonshire. *Min. Mag.*, 1923, vol. 20, pp. 140-150.

² Guide to Excursion A.4, Devon and Cornwall (Mineralogical), International Geological Congress, XVIII Session, Great Britain, 1948.

in width, which intersects the normal fine-grained aplite and has the appearance of filling a joint in the latter. The vein tends invariably to split along the centre.

This particular vein contains a considerable amount of a pink mineral, which first attracted attention. However, the mineral did not turn out to be petalite with montmorillonite, but another alteration product consisting mainly of quartz and a micaceous mineral. McLintock has previously described a similar pegmatite vein and found it to be free of petalite.

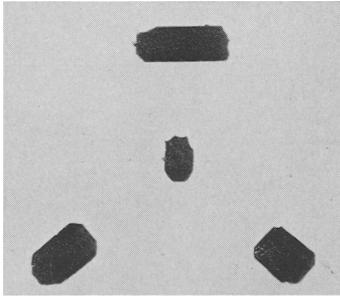


FIG. 1. Columbite crystals separated from aplite, Meldon, Devonshire. $\times 45$.

The mineral association in this case was as follows: quartz, albite, perthitic feldspar, lithia-mica, green and yellow tourmaline, blue apatite, topaz, fluorite, and tiny black crystals of columbite. A closer examination of the hand-specimen shows that columbite is not confined to this vein, but is also present in the adjacent fine-grained aplite. A mineral separation was carried out in order to obtain more material for investigation.

The columbite consists of small, often perfectly formed, black and dark-brown crystals up to 0.3 mm. in length. A few of the separated crystals showing the typical thin tabular orthorhombic habit are represented in fig. 1.

The identification was carried out in the first place by X-ray methods, and a powder photograph of columbite from the Meldon aplite is shown in fig. 2, together with powder photographs of columbite from Ivigtut, Greenland, and tantalite from Kigezi, Uganda, for comparison.

A spectrographic determination, made for the writer by Mr. Lars Lund of this department, showed the predominance of niobium and confirmed the identification of the mineral as columbite rather than tantalite.

Minerals of the columbite-tantalite series are frequently found in complex granite-pegmatites and more particularly in those rich in Li, P, and F. The present occurrence is of a similar mineralogical and chemical character, but genetically is probably more closely related to a pneumatolytic phase of crystallization.

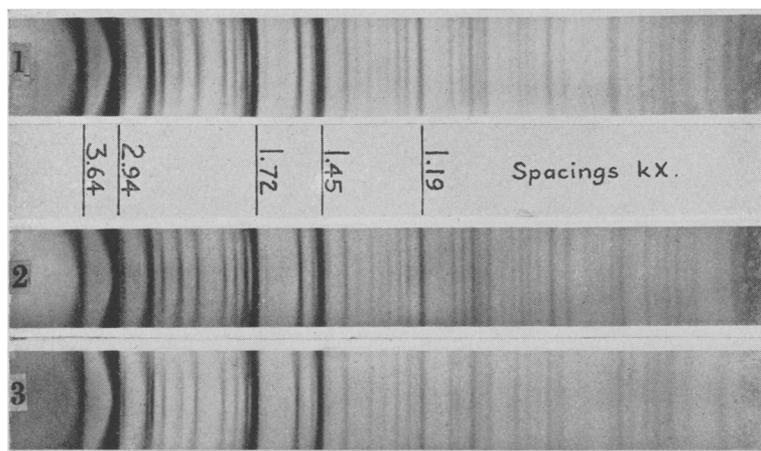


FIG. 2. X-ray photographs of:
(1) columbite, Meldon, Devonshire.
(2) columbite, Ivigtut, Greenland.
(3) tantalite, Kigezi, Uganda.

Cu- $K\alpha$ radiation, camera diameter, 9 cm.