

V.—*On Cotterite, a new variety of Quartz.*

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RATHER more than twelve months ago Sir D. Jephson Norreys, Bart., of Mallow Castle, county Cork, directed my attention to a beautiful mineral which had been obtained by a friend and neighbour of his, Miss Cotter, of Rockforest. Through his kindness I was enabled to see the circumstances under which the mineral occurred; and also to obtain from Rockforest some fine specimens thereof.

The mineral itself is specially characterised by the peculiarity of its *lustre*, which it possesses in a high degree, producing an aspect of a very unique character. Concerning the *kind* of lustre, this is somewhat difficult to define. It is, however, intermediate between metallic and pearly. It exhibits features which have some analogy to the glaze of Belleek pottery; and occasionally has almost the brilliant lustre of polished silver. The *intensity* of the lustre is essentially splendid, the mineral having a bright specular aspect.

The *form* of the mineral is dependent on the circumstances under which it occurs. It is seen covering the terminal pyramidal faces of crystals of quartz, in the form of thin laminæ, which show, when examined by a low magnifying power, irregular cracked surfaces. In many instances, the face of the laminæ have on them thin films of limonite, which occasionally becomes sufficiently thick to hide the surfaces of the faces.

The position of the laminæ is, in all instances which I have seen, perfectly parallel to the terminal faces of the quartz crystals, on which they exclusively occur.

The *hardness* of the mineral is about that of quartz. It can, however, be removed from the quartz faces which it covers; fragments of the laminæ being detached by the action of quartz.

Microscopic examination indicates well the laminated nature of the portions so detached, especially when the fragments are examined by reflected light; and it is to this laminated structure that the mineral owes its beautiful pearly aspect. This, however, does not account for the metallic appearance which it often presents.

On submitting specimens of quartz coated by the mineral to the action of oxalic acid, a large amount of iron is dissolved, and the state of the

mineral becomes somewhat changed as regards the character of its reflecting surfaces; it loses its specular aspect, but its pearly features become more intense. After the action of oxalic acid, the stronger acids, as sulphuric and hydrochloric, produce no further change upon the surface of the mineral. Its specular character is due to thin films of limonite which lie between the thin laminæ.

On detaching, by means of rock crystal, portions of the laminæ, from which all the iron had been removed by the action of acids, a sufficient quantity was obtained for analysis, which was kindly undertaken for me by Mr. C. O'Keeffe, public analyst for the City of Cork, and assistant to Dr. M. Simpson, professor of Chemistry in this College.

The result of Mr. O'Keeffe's analysis shows that the mineral is entirely composed of silica, and that it is therefore quartz in a peculiar condition.

Immediately beneath the laminæ, the quartz pyramidal planes are, in some spots, well seen exhibiting the typical vitreous lustre; and in some cases this lustre is very apparent, the films of laminated quartz not having covered the whole of the surfaces of the pyramids.

When the mineral first came into my possession I was disposed to regard it as a thin deposit of siderite on the terminal faces of the quartz crystals, on account of the lustre and from the large quantity of iron obtained by the action of acids. The hardness of the substance, and still more, its analysis have now settled this point, and Cotterite must be regarded as laminated quartz, having films of limonite between the laminæ.

A specimen of the mineral, which Miss Cotter sent to the British Museum sometime ago was, I believe, regarded by Mr. Maskelyne as quartz, and was called by him pearly quartz. I am not aware of any other instances of quartz having such a lustre in connection with the planes of the terminal pyramids, such planes being always hitherto looked upon as the types of vitreous lustre.

The condition under which Cotterite was originally found is a matter of considerable interest. There are in the carboniferous limestone quarry at Rockforest, the place where the mineral was found, veins of rock crystal and brownish-coloured calcite. One of these veins of quartz, which is nearly horizontal, occurs on the top of the limestone, having at its base calcite. This quartz vein is, for the most part, covered by sand and gravel, the crystals occupying a vertical position; but under such a condition, viz. a capping of sand and gravel, no traces of Cotterite occur in the quartz crystals. But over an area of about 7 square yards, beneath the sand and gravel, a thin layer of fine reddish clay is seen, lying immediately upon the pyramidal faces of the quartz, and on removing this clay the Cotterite is at once recognised by its brilliancy, coating the quartz pyramids.

This peculiar circumstance under which Cotterite occurs, leads to the inference that it is a subsequent deposit of laminated quartz on crystals which had been sometime previously formed. Also that this laminated quartz was most probably derived from soluble silica contained in the clay, which is certainly the source of the limonite.

I regret to learn, through Sir D. Jephson Norreys, Bart., from Miss Cotter, the discoverer of the mineral, that it is now no longer to be obtained, the thin film of red clay having disappeared. When the peculiar condition under which it occurred is considered, I fear there is very little chance of this beautiful mineral being again found.