V.—*Note on Christophite from St. Agnes.*

By J. H. Collins, F.G.S.

About a year since I received from our associate Mr. Alfred Davies, of St. Agnes, a dark-brown mineral which was supposed to consist largely of sulphide of tin. As it differed greatly in appearance from the so-called tin pyrites, I at once felt interested in the supposed new mineral, and commenced an analysis which I have lately been able to complete.

It is generally granular in appearance, dark-brown, translucent very slightly on thin edges, infusible B.B., soluble more or less completely in aqua regia, &c.—in fact its properties differ but little from those of an ordinary dark variety of blende, except that with careful manipulation it yields a bead of tin when treated with reducing agents on charcoal. Most specimens are massive, dark-brown and granular as stated above, but certain small cavities are usually studded with black lustrous crystals, generally minute, but occasionally about 1-3rd of an inch across. The best of these crystals which I have seen exhibits planes of the hemihedral cube and of the positive and negative tetrahedrons.

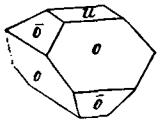
The mean of several analyses of the granular mineral is as follows:—

Zinc	32·0 per cent.
Iron	22·4 ,,
Tin	1·2 ,,
Sulphur	29·5 ,,
Alumina	7·2 ,,
Silica	6·8 ,,
Copper	trace.
Lime	trace.
	99·1

No alumina or silica can be detected in the crystals by blowpipe tests, but I have not been able to obtain enough of them for a complete analysis. Still there can be no doubt that they are extraneous bodies, and form no part of the mineral as such. Eliminating these constituents we have the following as the probable composition of the mineral:—

Zinc	37·6	Zn S.	56·1
Iron	26·2	Fe S.	41·1
Tin	1·4 =	Sn S.	1·9
Sulphur	34·7	S.	·8
	99·9		99·9

The tin I think does really form part of the mineral, and probably exists in the state of sulphide, as it is readily soluble in aqua regia, which solvent scarcely attacks native peroxide of tin in the slightest degree. The mineral is therefore very near that variety of blende named *Christophite** by *Breithaupt* from its occurrence at St. Christophe Mine near Johanngeorgenstadt—differing from it only in the larger proportions of sulphide of iron (which is to the sulphide of zinc nearly as 6:5 in molecules) and of tin.



My friend Dr. C. O. Trechmann, of Hartlepool, to whom I shewed the crystals referred to above and figured here, thus describes them :—"The Blende is a very interesting though by no means an unusual development. The crystals are simple (*i.e.* untwinned) and show the usual combination of the two tetrahedrons with the cube; the large development of the 2nd tetrahedron is rather uncommon, and causes the whole crystal to approximate to a holohedral habit. That it is not holohedral is shown by the superficial character of the tetrahedral faces, those belonging to the first, probably the + tetrahedron, are large, bright (polished) and striated parallel to the edges formed by the cubical and 2nd tetrahedral faces, whilst the 2nd, probably the − tetrahedron is small, dull, and uniformly rough. The cube is striated parallel to the 1st tetrahedron.

A slight fracture has exposed the dodecahedral cleavage on the large crystal.

These crystals from St. Agnes are very similar to the beautiful crystals of the same combination from the Binnenthal (dolomite) in Switzerland; though in the latter the striations of the cubical faces generally run in the opposite directions."

* Dana, System of Mineralogy, 1875, p. 49, anal. 14.