

VIII.—*Further notes on the Oxides of Iron, enclosed in Quartz,
at Mwyndy, Glamorganshire.*

BY WM. VIVIAN.

SINCE my communication on this subject published in the first number of the *Mineralogical Magazine*, I have made further observations, and have found other specimens greatly varying, but all embodying the same general principle of solid quartz enclosing the oxides of iron.

The quartz is perfectly solid, breaking with its usual conchoidal fracture, and though richly colored with the oxides of iron disseminated through it in beautiful forms, is itself transparent, so that the forms and colors of the iron are well seen. The colors are various shades of red, yellow, amber, grey, &c., and these colors are distributed in well-defined forms, and not in mere tints as in the case of amethyst, &c.

The forms of the iron are greatly diversified, as indicated in Pl. III. Sometimes as mere lines, nearly straight but hollow, and including little vesicles as in figs. 6 and 8; this form is mostly in massive quartz, but when the quartz occurs in angular crystals then the iron oxides are denser and convoluted or doubled back upon themselves, sometimes producing a finely granular appearance as in fig. 10. A third form, fig. 9, is of an olive color, and composed of thicker lines, branching out, not unlike some kinds of coral; a fourth, fig. 7, has a centre, or core, of grey crystallized iron oxide, and presents a tangled mass of arborescent form, through which it is hard to detect any trunk or root to the mass. The olive color of this form seems to be derived from the grey oxide, seen through, and in combination with its thin translucent yellow coating.

Wherever seen, either in extended linear forms, in arborescent clusters, or in denser masses encircled with quartz, a coating of colored oxide always appears between the grey iron and the quartz.

It should be noted that contact with the quartz seems to have changed the character of the grey oxide. In some places the coating is sufficiently thick to show a crystallized structure; seen in a cross section there is a series of crystals arranged on a radiate system,

similar to that of limonite, and swelling out into the surrounding quartz with botryoidal roundings, but generally it exists as a simple coating over the core on all sides.

This change seems to have been secondary to the linear formation of the grey oxide, and was apparently caused by the partial or entire decomposition of the first ore, for the crystalline form is different, the grey ore being a congeries of scalene or foliated crystals. In some of the lines where hollow tubes are seen, the grey iron seems to have entirely disappeared in forming the yellow coating.

If I may express an opinion on these peculiar primary formations of iron in quartz, I may say that the deposition of the different substances took place at the same time, and that they assumed their forms under the action of the crystallizing forces acting on the iron oxide and quartz simultaneously, that is, while the oxide was suspended in the quartz and pushing out into dendritic lines, it was controlled and modified by the quartz assuming its own angular structure.

The diagrams given illustrate the forms referred to in the paper, though they fail to convey a perfect idea of the extreme delicacy, beauty, and variety of form and colour seen in this microscopic structure.