XXI.—*Note on the Banded Structure of certain Minerals.*

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DURING the past year some remarkably fine specimens of lithomarge, exhibiting in fracture a series of brownish striæ arranged concentrically about nuclei of tin ore, have been found at Wheal Coates Mine, St. Agnes, Cornwall.

A banded structure of this kind is commonly met with in minerals, but in this instance it occurs in such a manner as to suggest the mode of its formation, not only in this particular example, but in the denser substances quartz (agate) wood-tin, wood-iron, malachite, some forms of copper pyrites, &c.

In their normal condition rocks are saturated with moisture, and it is not difficult to conceive that any material capable of being taken into solution may be diffused through the most compact of these. In the course of this diffusion, if the particles of the solid substance have a greater attraction for those of the dissolved material than the latter have for their solvent, the result will be a precipitation of the dissolved material, which will be deposited in a shape dependable upon the direction and intensity of the attraction, and the direction in which the fluid moves; a continued deposition taking place towards the entering surface, and a slower solution going on at the opposite surface as each successive band is formed, the result of the continued action being a structure of the kind referred to.

Where the action is prolonged, a complete displacement of the original solid substance may take place, or the deposited material may accumulate to form a compact band, ultimately assuming a crystalline structure.

The large vein at Wheal Coates has long been celebrated for its tin pseudomorphs; but specimens taken at random from the neighbourhood from almost any ore deposit, show a tendency to a structure that suggests the idea whether a large portion of the contents of the veins themselves may not have been gathered together by a process similar to that alluded to: the agent being water on its way to the more porous portions of the veins, through which it finds vent to supply the

numerous perennial springs characteristic of a mineral bearing district. The "comby" structure so often noticed would thus be simply accounted for.

Viewed in this way the rock masses would be acting as huge dialyzers, separating crystalloid and colloid bodies in the way described by Professor Graham, and gradually yielding up matter originally interspersed throughout their mass, as it becomes capable of solution and diffusion through a solid substance by a change from a colloid to a crystalline slate.

It is noteworthy that stannic and silicic acids, which are both colloid when freshly prepared artificially, slowly assume, under certain conditions, a crystalline form.

Amorphous quartz is universally regarded by miners as an unfavourable indication for mineral riches, while the crystalline, or semi-crystalline form is looked upon as eminently propitious. The rich tin-stone now being raised at East Pool Mine affords very interesting characteristic examples of the process of change from the amorphous to a crystalline shape, the fractures showing imperfect hexagonal prisms in various stages.