

ova, which increase in size from an organic connexion kept up with the living, circulating, nutrient fluids common to all the polype-mouths, and filling the stems and branches: the ova, on attaining maturity and a coat of ciliae, escape and swim to a convenient site, where they become fixed, lose their ciliae, and sprout into the form of the parent stem. The ovarian vesicles fall off when the ova are all gone. The first and all subsequent cells are formed by a cessation of growth in the convex, soft, growing tip of the branches, both the horny and inner membranous layers of which become inverted and cup-shaped by the shrinking of the pulp within; and when the cup is of the proper depth the two layers turn inwards to form the strong septum or bottom of the cup, in the centre of which the outer horny layer is deficient, leaving a perforation through which the inner membranous layer protrudes, gradually expanding into a stomach-like cavity, in and out of which the nutrient granules of the stem ebb and flow, and at the distal end of which a perforation or mouth and the circle of prehensile tentacles are ultimately developed. I have no hesitation in placing the *Graptolites* in this order, from the perfection in which the above characters are preserved in a great collection of them made last year by Professor Sedgwick in Scotland. I believe they should form a particular family, closely allied to the *Sertulariadae*, which have similar sessile polype-cells, in one or two rows according to the genus, intermediate between them and *Corymorpha*, which has the polypidom free, unattached, and living buried in the sand.

Fam. GRAPTOLITIDÆ (*M^cCoy*).

Stem simple or branched; thin, usually linear, horny, unrooted; polype-cells sessile, in one or two rows; each with an internal transverse diaphragm at base.

In the form of the thin horny polypidom and polype-cells the *Graptolitidæ* agree with the *Sertulariadae*, but differ in not being rooted. I have never found any trace of ovarian vesicles; others may find them, however, by examining great numbers of specimens, or by some fortunate accident; or the ova, as in the closely allied *Corymorpha* (which agrees with the *Graptolites* in having a free polypidom), may have been developed in naked sacks attached to the base of the tentacles of the polyps, and would not in that case leave any trace in the fossil state.

On the same grounds that the allied recent genera *Plumularia* and *Sertularia* are separated, I propose to restrict the term *Graptolites* to those which, like the original typical species, have the cell-denticles only on one side; and for those having them on both sides, I propose the generic name *Diplograpsus*. Professor Nilsson and Colonel Portlock have published nearly similar views, the latter with great clearness.

In connexion with the spirally inrolled species, I may call attention to a curious fact observed by my friend Mr Patterson of Belfast, that a broken stem of another Hydroid Zoophyte, the *Tubularia larynx*, when thrown into a jar of water kept "coiling itself up, uncoiling, stretching, twisting, knotting itself," giving him the notion "that the stem is not only flexible, but under certain circumstances is truly and entirely under the control of the zoophyte." (Johnston's *Brit. Zooph.* p. 51).

GRAPTOLITES CONVOLUTUS (*His. Sp.*)

Ref. and Syn.—*Prionotus convolutus*, Hisinger, Leth. Succ. t. 35. f. 7. = *Graptolites spiralis*, Geinitz, in Leonhard and Bronn's Jahrbuch für Mineral. for 1842. t. 10. fig. 24, 28, 29.

Sp. Ch.—Length unknown, occurs in short fragments, spirally convoluted in a few turns; cell-denticles on the outer side, radiating nearly at right angles to the capillary axis, slightly curved or straight, nearly one line long, very slender and apparently cleft to the bases; the space of axis between the denticles rather less than half their length.

The figure of Hisinger seems considerably too large and coarse in its details, but there can be little doubt as to the species; Geinitz's figures quoted are rather better, but the ones not quoted which he gives are doubtful.

Position and Locality.—Not uncommon in black earthy slate near Lockerby, Dumfriesshire.