

## B. EMBRYOLOGICAL NOTES.

We had at first intended to give a somewhat detailed account of a number of embryos which we have met with in the course of our work, but after consulting the literature<sup>1</sup> bearing upon this much vexed portion of our subject, we have decided that it is desirable to say as little as possible. There are already so many contradictory opinions with regard to the development of the sponges, and, according to Heider, it is so extremely unsafe to draw conclusions from specimens that have been preserved in spirit, that, for fear of adding to the already existing confusion, we naturally feel very diffident about recording our observations; we shall, therefore, make our remarks on this head very short.

Concerning the position in which the embryos develop in the sponge, the most interesting point seems to be that, as might be expected, they always develop in the position of greatest security. In large, massive sponges it is obvious that, so long as they do not lie very near to the surface, the position is a matter of no very great importance, and accordingly in *Esperella lapidiformis*, e.g., we find them scattered through the choanosome in groups, commencing a short distance below the surface of the sponge (Pl. XVI. fig. 2*a*, *e*). In small and delicate species, however, the position becomes a matter of considerable importance; thus in *Esperella biserialis*, where the sponge consists of a central spicular axis coated by only a thin layer of soft tissues, we find the embryos (Pl. XIV. fig. 3, *e*) taking refuge in the centre of the spicular axis. Again in *Esperella mammiformis*, a hemispherical sponge (Pl. XIV. figs. 5, 6) with flat base attached to stones, the embryos are found grouped close to the stone near the centre of the base. In *Chondrocladia crinita*, a "Crinorhiza" form (Pl. XX. fig. 4), the embryos again occur in the soft tissues near the centre of the sponge, and each appears to be surrounded by a dense mass of the characteristic isochelæ of the species.

The ova are, of course, developed from amœboid mesodermal cells, and it appears from our observations on *Esperella lapidiformis* (*vide* p. xxxi) that they may originate either in the choanosome or the ectosome (the latter being gelatinous), but that they develop only in the choanosome, whither we must imagine that those which originate in the ectosome migrate. The free-swimming larva escapes from the parent sponge through the exhalent canals, as is well shown in some of our preparations of *Esperella murrayi* (*vide* Pl. XLVIII. fig. 2, *e*).

The commonest type of embryo met with by us is that which occurs in *Esperella*

<sup>1</sup> Cf. Carter, Development of Marine Sponges, *Ann. and Mag. Nat. Hist.*, ser. 4, vol. xiv. p. 321, *et seq.*; Keller, Studien über Organization u. Entwicklung der Chalineen, *Zeitschr. f. wiss. Zool.*, Bd. xxxiii. p. 317; Marshall, Die Ontogenie von Reniera filigrana, *Zeitschr. f. wiss. Zool.*, Bd. xxxvii. p. 221; Schulze, Die Familie der Spongidae, *Zeitschr. f. wiss. Zool.*, Bd. xxxii. p. 593; Sollas, On the Development of Halisarca lobularis, *Quart. Journ. Micr. Sci.*, N.S., vol. xxiv. p. 603; Heider, Zur Metamorphose der Oscarella lobularis, *Arb. zool. Inst. Wien*, Bd. vi., Heft 2, p. 175; &c.