Zoology Part LXXVII: Report on the SIPHONOPHORÆ. By Professor Ernst Haeckel. Bound in Volume 28,1888.

nucleus" (**9**, p. 6, pl. viii. figs. 14, 15). This good description of Huxley was not improved by later authors, who regarded the hypocystic villi as tubes or utriculi. Fewkes (in 1882) describes them as "finger-like pouches, which are sometimes bifurcated at their extremities and open at their distal ends, so that their cavities seem to freely communicate with that of the float" (**44**, p. 269, pl. vi. fig. 2). The most accurate description was afterwards given by Chun, who regards their physiological function as mechanical; they may serve as elastic cushions or bolsters, which protect the delicate pneumadenia covered by them, and prevent its sudden compression, when the stem is rapidly contracted (**47**, p. 404; **48**, p. 529). My own observations on the structure and development of these interesting villi, made in Lanzerote (1867), and continued in Ceylon (1881), are in complete accordance with those of Chun. The hypocystic villi are always arranged in eight radial bunches which arise from the outside of the air-funnel; each villus, or each finger-like branch of the dichotomously-branched villi, consists of a single giant-cell, or a few (two to four, rarely more) giant-cells, which reach a diameter of one to two millimetres, and belong, therefore, to the largest cells of animal tissues; the nucleus of these vesicular and vacuolated exoderm-cells is ovate or cup-shaped, and has a diameter of 0·1 to 0·2 mm. The surface of the villi is covered with a vibratile epithelium, composed of small entoderm-cells with long cilia (Pl. XXIV. fig. 6). In the youngest Rhizophysidæ there are only eight single club-shaped giant-cells, which arise from the pylorus infundibuli; they correspond to the base of the eight radial apophyses of the air-funnel, which pass into the radial septa dividing the cavity of the pneumatophore into eight radial pouches in many Physonectæ (*e.g.*, Discolabidæ, compare above, p. 187). Afterwards arises a second corona of eight radial giant-cells from the distal base of the hypocystic funnel, and a third corona between the former and the latter (**48**, p. 530). By dichotomous ramification of these twenty-four giant-cells and further development of lateral branches arises the large elastic cushion, composed of numerous finger-like villi, which envelops in the adult Rhizophysidæ the greater part of the pericystic cavity and hangs down into the apical part of the stem-canal (Pl. XXIII. figs. 3, 4; Pl. XXIV. figs. 4, 5).

Siphons.—The feeding polypites are in the Rhizophysidæ usually of considerable size, sometimes very large, 4 to 8 centimetres long, or more, in the expanded state. The four segments of the siphon which are usually distinct in the majority of Siphonophoræ are rarely evident in this family; in the majority they are not distinct or not recognisable at all, so that the whole siphon is a simple cylindrical or spindle-shaped tube (Pl. XXIII. fig. 5; Pl. XXIV. figs. 1–4). Sometimes, however, especially in the peculiar *Linophysa*, the four segments are distinctly marked:—(1) A small pedicle to which the tentacle is attached; (2) a large ovate basigaster, the exoderm of which is full of cnidocysts; (3) a wide stomach with coloured hepatic glands; and (4) a very contractile tubular proboscis, with the tubular mouth-opening (**40**, p. 9, Taf. i. fig. 4). The thick wall of

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