logical function, since these Siphonophoræ, which have no nectocalyces, descend into the depths of the ocean by expelling the gas, and ascend again by secreting gas and filling the float. We call this important new portion of the pneumatosac, which lines the inside of the air-flask (excepting its apical portion), tapetum endocystale ("Secundaeres exoderm," Chun, **48**, pp. 514, 530).

*Hypocystic Villi.*—The second peculiarity which distinguishes the air-sac of the Rhizophysidæ, Salacidæ, and Epibulidæ, is the production of peculiar hypocystic villi (Pl. XXII. figs. 6–8, *pv*; Pl. XXIV. figs. 1–6, *pv*; Pl. XXV. figs. 1–3, *pv*). These remarkable apophyses of the air-funnel were first described in the Mediterranean *Rhizophysa filiformis* by Gegenbaur (**7**, p. 44, Taf. xviii. fig. 6, *e*) and by Huxley (**9**, p. 6, pl. viii. figs. 14, 15); they occur not only in all Rhizophysidæ, but also in *Salacia* and *Epibulia*. From the hypocystic air-funnel, beyond the pylorus, arise eight radial bunches of clustered villi, which fill up the basal portion of the pericystic cavity, often more than half of it. The single villi, or the finger-shaped branches of the clustered bunches, are composed of a single or a few gigantic exoderm-cells (1 to 2 mm. in diameter) and of a ciliated epithelium of small entoderm-cells. Their function is probably mechanical, as an elastic cushion to protect the delicate pneumadenia and prevents its sudden compression. (Compare below the description of the float in the Rhizophysidæ, and also Chun, **47**, p. 404; **48**, p. 529.)

*Siphons.*—The feeding polypites or siphons in all Cystonectæ are relatively large, often of an extraordinary size. The four different segments of the siphon, which we could distinguish in most Physonectæ and Calyconectæ (pedunculus, basigaster, stomachus, proboscis), are also recognisable in many Cystonectæ, as in *Cystalia* (Pl. XXII. fig. 5) and *Salacia* (Pl. XXV. fig. 5). They are not distinguished, or at least not sharply separated, in most Rhizophysidæ, where usually each siphon is a simple cylindrical or fusiform tube, distally contractile and protractile, with strong muscular wall (Pl. XXIII. figs. 1, 2, 5; Pl. XXIV. figs. 1–3, *s*). Probably in all Cystonectæ the stomach, or the digestive middle part of the siphon, bears inside numerous hepatic villi, sometimes arranged in longitudinal series; but rarely there occur continuous hepatic striæ, as in *Linophysa*. The glandular villi are often coloured brown or black by pigment-granules, especially in the Physalidæ (Pl. XXVI. fig. 6, *sv*). The stomach in these and in other Cystonectæ is rather distinctly separated from the proboscis, or the distal part of the siphon, without villi, with thickened muscular wall. Its distal mouth-opening may be expanded in the form of a large suctorial disc, usually of circular, more rarely of polygonal or quadrangular form. The basigaster or the basal cavity (Pl. XXVI. fig. 6, *sb*) is usually not separated from the stomach by a pyloric valve, and its exoderm is not strongly thickened; it passes over into the peduncle without a sharp boundary, and often this latter part is scarcely distinguishable. But sometimes the peduncle of the siphon is rather long and thin (*bp*). The monogastric Cystalidæ (Pl. XXII. figs. 1–5) possess only a single large siphon. All other Cystonectæ