

as *Helix* with its shell is an animal of the same order as a *Limax* with a rudimentary shell, or a *Tebennophorus* without any shell. Similar differences occur among the Hydroids proper in the genera *Coryne*, *Tubularia*, *Campanularia*, and *Sertularia*. In *Porpita*, we observe the same relations between the primary enlarged Hydra with its tentacles and the secondary fertile Hydræ, as in *Veleva*. The polymorphism in these two genera extends only to a marked difference between the primary Hydra and the secondary Hydræ, analogous to the difference there is between the sterile and fertile Hydræ in *Campanularia*. (Compare *Fig. 15*, p. 46.) Both *Veleva* and *Porpita* acquire their full size before *Medusæ* buds appear upon their fertile Hydræ.

In *Physalia*, the community is also formed upon an enlarged primary Hydra. The young of this genus has been described and figured by Huxley in two different stages of growth (*Oceanic Hydrozoa*, Pl. X. *Figs. 1* and *2*). In the earliest stage it is a simple Hydra with a single tentacle (*Fig. 1*); and while that primary

Fig. 49.



PHYSALIA AERETHUSA, Til.

*a* Blunt end of the air sac, supporting the whole community, at which the youngest *Medusæ* buds may be found. — *b* Open end of the air sac, the mouth of the primary Hydra. — *c* Crest of the air sac. — *m* Bunches of single individuals; and among them the youngest *Medusæ* buds. — *n* Contracted tentacle. — *t* Tentacles of the largest kind extended.

Hydra is enlarging and assuming its permanent characteristics, other secondary Hydræ, somewhat different from the first, bud forth from it, and form with it a Hydrarium (*Fig. 2*), gradually enlarging by the addition of others. But there is this difference between such a *Physalia* Hydrarium and a *Veleva* Hydrarium, that in the former the successive secondary Hydræ differ among themselves greatly,—some acquiring a considerable size and having a large tentacle, while others remain small and have a small tentacle, and the proboscis of some having an open mouth, while in others it remains closed. But, as I shall show hereafter, similar differences are also observed among the Hydroids proper: so that the peculiarities noticed in the different Hydræ amount only to a more extensive polymorphism in this genus than in *Veleva* and *Porpita*, akin to what we have already seen in *Hydractinia*. As I myself have seen a great many small *Physaliæ* in the Gulf of Mexico, I may add that these communities acquire a considerable size before any other but Hydra buds are developed from their pendent bunches. But when about one fourth the size (*Fig. 49*) of the largest I have ever seen, the *Medusæ* buds begin to make their appearance and increase in number, until they form distinct *Medusaria* combined with Hydraria; and the whole community is then a most complicated Hydro-Medusarium. The androphores and gynophores of such a community