

BRACTS OR COVERING PIECES.

(*Hydrophyllia*, *Protecta*, *Deckblätter*, *Covering Scales*, *Phyllozoids*).

The polymorphic organs which are usually spoken of as "covering pieces" (*Deckstücke*) are entirely absent in the three orders *Disconectæ*, *Cystonectæ*, and *Auronectæ*; in the former originally, in the two latter probably as the result of degeneration. In the two remaining orders the bracts are essentially distinguished in this, that in the *Calyconectæ* they appear singly on each Medusome, in the *Physonectæ* on the other hand there are several. Only the primary larva of the latter (*Siphonula*) frequently forms a single "primary covering piece" (*Protobractea*), which is then to be compared with the single bract of the former (*Eudoxia*), and to the umbrella of the primary ancestral form (*Protomeda*).

The physiological importance of the bracts consists exclusively in their protective function; they are shields or umbrellar organs, under the shelter of which the other persons of the colony are protected. As regards their morphological import, the poly-person theory regards them as degenerate medusoid persons, which have lost manubrium and tentacles, while the gelatinous disc has been the more developed; the poly-organ theory, on the other hand, regards them as multiplied umbrellas. According to our medusome theory, a distinction must be drawn between primary and secondary bracts. The *protobracteæ* or *primary covering pieces*, which occur singly, on the larvæ of *Physonectæ* and on the *Eudoxiæ* of *Calyconectæ*, are to be interpreted as the umbrella of a primary medusoid person. The *metabracteæ* or *secondary covering pieces*, however, which usually cover the stem of the *Physonectæ* in large numbers, may have various phylogenetic origins. They may arise as—

- (1) Displaced umbrellas of secondary medusomes;
- (2) *Vicariæ* or multiplied reserve-bracts of the same;
- (3) Cleft portions of divided (*e.g.*, quadripartite) umbrellas.

The direct transition of nectophores into bracts is to be observed among the *Physonectæ* in the *Athoridæ* and *Anthophysidæ*. In *Athoria* and *Rhodophysa*, I find in the distal portion of each bract a small rudimentary nectosac or swimming cavity, sometimes with four cnidonodes or stinging knobs, which may be regarded as the rudiments of four reduced tentacles. The highest and most manifold development of bracts is found in the *Calyconectæ*, where the sterile medusome of each single cormidium bears a large hydrophyllium of a peculiar form, often characteristic of the genus. The phyllocyst, too, or the canal of the bract, here often exhibits several apophyses, which may be regarded as rudimentary radial canals of the umbrella; *e.g.*, *Aglaisma*, the free *Eudoxia* of *Calpe*, possesses four radial canals in its bract, two paired lateral and two odd sagittal (an ascending and a descending canal).