ephyra grows in size it gradually takes on the form and structure of the young medusa. The adradial regions grow (fig. 11, F) so as to change the star-like contour into one more evenly circular, the tentacles grow out, and the various parts become complicated and take on the structure of the adult medusa.

The course of development sketched out above is that which is typical of the higher forms of Scyphomedusae, and is by no means to be regarded as the most primitive type of development. The complicated alternation of generations seen in such a form as *Aurelia* does not occur in the more primitive genera. Thus in *Pelagia* the scyphistoma-stage is free-swimming and changes directly into the ephyra, which in its turn grows into the adult form. On the other hand, such a form as *Lucernaria* or *Haliclystus* may be regarded simply as a scyphistoma which has become adult and mature. The comparison of the metagenetic type of development, such as that of *Aurelia,* with the more primitive, genera of Scypho- medusae, indicates clearly that the scyphistoma and ephyra are recapitulative larval stages which are represented by the adult forms of primitive genera, making such allowances as are necessary when comparing adult and larval forms. The metagenesis has arisen through the scyphistoma-larva acquiring the power of larval proliferation by budding. A similar origin for metagenesis has been discussed

under the Hydromedusae *(q.v.).* The above comparison further

indicates that the scyphistoma should not be regarded as a polyp but rather as a medusoid organism. The only certain criterion of a medusa-individual is the presence of definite sense-organs, but in cases where the organism is much reduced, this criterion may fail us, as it does in the genus *Lucernaria.* Nevertheless a comparison between *Lucernaria* and its close ally *Haliclystus* shows clearly that the absence of sense-organs in the former is the result of secondary reduction, so that a true medusa may lose its most characteristic feature. Hence the absence of sense-organs in the scyphistoma does not necessarily disprove its medusoid character, while its anatomical structure resembles that of a simple scyphomedusa, such as *Lucernaria,* rather than

that of a polyp.

*Affinities of the Scyphomedusae.—*By some authorities the Scyphomedusae have been removed from the Hydrozoa and united with the Anthozoa in a common group termed Scyphozoa. The diagnostic features of the class Scyphozoa thus constituted are supposed to be (1) an ectodermal oesophagus or stomodaeum, (2) a gastric cavity subdivided by mesenteries, (3) gonads formed in the endoderm. It appears, however, that the first of these characters is non-existent, and that the so-called mesenteries are simply the concrescence-areas found in all medusae. There remains only the third feature, the endodermal gonads, as an argument for uniting the Scyphomedusae with the Anthozoa, against which must be set all the peculiarities of medusan organization in which the Scyphomedusae resemble the Hydromedusae. The fact that the Scyphomedusae have a number of well-marked peculiarities of form and structure is not incompatible with placing them in the Hydrozoa as a distinct sub-class, contrasting sharply in many ways with the Hydromedusae.

Classification of the Scyphomedusae

Order I. Cubomedusae or Charybdaeida.—Medusae more or less cubical in form, with four perradial rhopalia alternating with

four interradial tentacles or groups of tentacles; oral arms short; stomach a wide cavity bearing four interradial groups of phacellae and giving off four broad perradial pouches completely separated from each other by four interradial septa (*i.e.* ring-canal absent); gonads divided each into two by the septa, hence eight in number; subgenital pits small or absent.

This order stands very much apart from the other orders of the Scyphomedusae. It has been proposed by Maas to divide the entire subclass Acraspeda into A, Charybdaeida and B, Acraspeda typica. The Charybdaeida comprise three families:—

1. *Charybdaeidae.*—With four interradial tentacles. *Charybdaea marsupialis* (fig. 4) is a familiar Mediterranean medusa ; the wonderful development of the sense-organs in this genus has already been described (figs. 7-9). The species of *Charybdaea* are stated to be quick and active in their movements and to be voracious feeders.

2. *Chirodropidae.—*With four interradial groups of tentacles. *Chirodropus.*

3. *Tripedaliidae.—*With four interradial groups of tentacles, three in each group. *Tripedalia.*

Order II. Stauromedusae or Lucernarida.—Medusae of deep pyramidal form, often sessile, attached by a stalk developed from the centre of the exumbral surface; rhopalia absent or repre- sented by colletocystophores. Four families:—

1. *Lucernaridae.—*Sessile, stalked, with capitate tentacles arranged in groups on eight projecting marginal lobes. Eight gonads. *Lucernaria,* without, and *Haliclystus* (fig. 1) with colletocystophores, are two well-known genera.

2. *Τesseridae.—*Free, with eight or more tentacles, without tentaculocysts. *Tessera,* &c.

3. *Depastridae.—*Sessile, stalked, with eight shallow marginal lobes bearing one or more rows of tentacles; without tentaculocysts; with four gonads. *Depastrum* is a British genus.

4. *Stenoscyphidae.—*Sessile, with the margin undivided; with eight colletocystophores and eight adradial groups of capitate tentacles. *Stenoscyphus inabai,* from Japan.

Order III. Coronata.—Free medusae with rhopalia of the normal type; the exumbrella is divided by a circular, so-called *coronal groove,* into two parts, a central portion, which is conical, thimble-shaped, or domed in form, and a peripheral portion, the *pedal zone,* which bears the marginal lobes, tentacles and rhopalia; the pedal zone is subdivided into areas termed *pedalia,* from each of which arises a tentacle or rhopalium in the interspace between two adjacent lobes of the margin. The order contains the following families :—

1. *Periphyllidae.—*With sixteen marginal lobes, four rhopalia and twelve tentacles; the rhopalia are interradial. *Periphylla* (fig. 13), a widely distributed deep-sea genus.

2. *Paraphyllinidae —* With six­teen marginal lobes, four rhopalia and twelve tentacles; the rhopalia are perradial in position, corresponding to the angles of the stomach. *Paraphyllina* recent ;

*Paraphyllites* fossil [see Maas (8 and 12)J.

3. *Atorellidae.—*With twelve marginal lobes, six rhopalia and six tentacles. *Atorella.*

4. *Pericolpidae.—* With eight marginal lobes, four rhopalia and four tentacles. *Pericolpa.*

5. *Collaspidae (Atollidae).*—With sixteen or thirty-two rhopalia, marginal lobes and tentacles often very numerous. *Atolla* (fig. 14) is a well-known deep-sea genus.

6. *Ephyropsidae.—*With sixteen

marginal lobes, eight rhopalia and eight tentacles. *Nausithoë,* a small medusa of world-wide distribution is the type of the subfamily *Nausithoidae*; the subfamily *Linergidae* includes the genera *Linerges,* &c., medusae confined to tropical seas. By Maas and others the *Nausithoidae* and *Linergidae* are ranked as independent families.

Order IV. Discophora.—Medusae with umbrella flattened or disk-like, without coronal groove; lips always prolonged into long oral arms. The most prolific and dominant group of the Scyphomedusae, containing two suborders; the Semaeostomae, in which the oral arms remain separate, and the Rhizostomeae, in