(Botryopylida and Botryocyrtida) are to be regarded as primitive; the Botryocellida and Botryocampida have arisen by the closure of this mouth with a basal lattice-plate.

190. *Genealogical Tree of the Cyrtoidea.*—The multiform and extensive group Cyrtoidea presents the greatest difficulties to be found in the phylogeny of the NASSELLARIA, because their morphological relations are most complicated, and because similar forms very often appear to be of quite different origin. The great majority of the Cyrtoidea show more or less clearly a combination of the three structural elements; sagittal ring, basal tripod, and latticed cephalis (p. 891). There are also, however, numerous Cyrtoidea, whose skeleton no longer shows any trace of the sagittal ring. Many of these show as the basis of the skeleton a strong basal tripod with an apical spine, around which the cephalis has obviously been secondarily developed, *e.g.*, the remarkable Euscenida (p. 1146, Pls. **53, 97**) and the interesting Callimitrida (p. 1217, Pls. **63, 64**). These may have been derived immediately from the Plectoidea without any relation to the Stephoidea. There are also numerous true Monocyrtida, whose shell consists of a simple latticed cephalis without a trace of the sagittal ring or basal tripod (Cyrtocalpida, Pl. **51**, figs. 9–13; Pl. **98**, fig. 13); these may have been developed directly from the skeletonless Nassellida by the formation of a simple ovoid *Gromia*-like shell, and may have no relation either to the Stephoidea or Plectoidea. On these grounds, as well as from the complicated relationships of the many smaller groups of Cyrtoidea, it is probable that the whole order has been developed polyphyletically from different divisions of the Plectellaria.

191. *Systematic Arrangement of the Cyrtoidea.*—Although for the reasons just given no systematic arrangement of the Cyrtoidea can at present, or for a long time in the future, be regarded as other than artificial, yet some general principles of classification for this extensive group can be laid down, which may serve as starting points for some future natural disposition. This is especially true of the relations which in an artificial system (p. 1129) were primarily utilised for the distinction of twelve families and twenty-four subfamilies; the number of segments in the shell, the number of radial apophyses (and parameres), and the constitution of the basal aperture of the shell.

As regards the *number of segments*, separated by transverse constrictions, of which the shell is composed, it is dependent upon the secondary addition of new joints at the basal pole of the main axis. Hence all many-jointed Cyrtoidea are to be derived from single-jointed ones, and the four sections thus distinguished (Monocyrtida, Dicyrtida, Tricyrtida, Stichocyrtida) form a phylogenetic series. Very often, however, the primary cephalis disappears owing to retrograde metamorphosis; and in such cases the single joint of the apparent Monocyrtida is formed of the thorax (*e.g.*,