

based on characters derived immediately from the shell itself. For the purpose of classification, four characters, of more or less value, are especially available. These comprise:—(1) the character of the aperture; (2) the form of the septa; (3) the position and character of the siphuncle; and (4) the form and mode of growth of the shell.

The aperture may be: (a) open; (b) contracted. The septa: (a) simple; (b) angular or lobed. The position of the siphuncle: (a) central or sub-central; (b) internal or "ventral;" (c) external or "dorsal." The siphuncle itself: (a) simple; (b) complicated. The form of the shell: (a) straight or conical; (b) arched or "horned" in various ways; (c) discoidal, with or without contiguous volutions; and (d) spiral.

By means of these characters, all the trustworthy genera of the chambered cephalopods may be arranged, conveniently at least, if not naturally, in ten sections or families*: as shewn in the following tabular view:—

1. GOMPHOCERATIDÆ:—Aperture contracted. *Gomphoceras* (including Hall's *Orthoceras fusiforme*;) *Phragmoceras*; *Oncoceras*; *Lituites*.

2. HETEROSIPHONIDÆ:—Aperture unknown, perhaps contracted. Siphuncle more or less complicated, or otherwise marginal; with conical orthoceras-like shell. Septa simple or slightly wavy. (See remarks below.) *Endoceras*; *Cameroeras*?; *Gonioceras*; *Ormoceras*; *Ascoceras*.

3. NAUTILIDÆ: Aperture open. Septa simple. Siphuncle central or sub-central: *Orthoceras*; *Nautilus*; *Lituites*; *Hortolus*; *Aploceras* (including Hall's *Cyrtoceras Annulatum*?) *Nautiloceras*; *Trochoceras*.

4. TROCHOLITIDÆ:—Aperture open. Septa simple. Siphuncle internal or "ventral" *Trocholites*.

5. CYRTOCERATIDÆ:—Aperture open. Septa simple. Siphuncle external or "dorsal":—*Cyrtoceras*; *Gyroceras*; *Cryptoceras*.

6. CLYMENIDÆ:—Aperture open. Septa lobed. Siphuncle internal. *Clymenia*; *Sub-clymenia*.

* Many palæontologists will, no doubt, think an extended sub-division of this kind very unnecessary, and prefer to group these forms in two, or at the most, in three families; but, in adopting this plan, the characters of the respective families become ill-defined, and the appreciation of transition groups much weakened; whilst, at the same time, a necessity is occasioned for the creation of sub-families or tribes. A classification which does not shew upon its face a greater distinction between *Goniatites*, *Ceratites*, and *Ammonites*, than between the last named genus and *Hamites* or *Baculites* for example, assuredly has no claim to be considered a natural grouping. In the arrangement given in the text, the second family is merely a provisional one, rendered necessary by our still imperfect knowledge of its included forms.—E. J. C.