

spines alternating with four smaller (interradial), indicating radii of first and second order. The section of *Perissacantha* is much smaller, and commonly represented only by triradial forms, with three spines at equal distances (120°)—*Triactis*, *Tripocyclia*, *Tripodictya*, *Spongotropus*, &c. (Pl. 33, fig. 6; Pl. 37, fig. 5; Pl. 42, figs. 7-9).

Radial Arms on the margin of the disk appear in similar variety of number, form, and disposition as the radial spines; but the number is here commonly limited to from two to four, rarely five to six. The arms are absent in the families Cenodiscida and Phacodiscida; in the four other families they return under similar forms. These arms are direct prolongations of the disk, and exhibit the same structure, so that they may be regarded both as centrifugal productions of certain radii, and also inversely as peripheral parts of a disk, the interjacent radii of which are reduced. The regular disposition and shape of the arms, an important character for the distinction of genera and species, is repeated in a quite analogous manner in the four above mentioned families, so that we can distinguish the following groups—A. Amphibrachida, with two radial arms, opposite on the poles of one equatorial axis (the first cross axis)—*Diplactura*, *Amphibrachium*, *Spongobrachium* (Pl. 38, figs. 3-5; Pl. 44, figs. 6-11); B. Triobrachida, with three radial arms; the most important group (with all Pylodiscida); either all three arms are equal and disposed at equal distances (*Trigonactura*, *Dictyastrum*, *Rhopalodictyum*, Pl. 38, figs. 6-9; Pl. 43, figs. 5, 13, 16; Pl. 48, figs. 12-19), or a single odd arm differs in size and position, and is often larger than both the opposite paired arms (*Rhopalastrum*, *Euchitonia*, Pl. 43, figs. 6, 10, 15, &c.); C. Tetrabrachida, with four radial arms, opposite in pairs in two crossed axes, commonly perpendicular one to another, *Stauractura*, *Stauralastrum*, *Spongaster*, &c. (Pls. 46, 47).

The arms are commonly simple, undivided, but sometimes also forked or branched (Pl. 43, figs. 15, 16; Pl. 47). Their basal parts are either free, separately inserted into the margin of the circular central disk, or they are connected by a "patagium," a peculiar connecticulum, like a web-membrane, which is composed of a chambered, commonly more or less spongy framework, different in texture from the lattice-work of the arms (Pl. 38, figs. 8, 9; Pl. 43, figs. 9-16; Pl. 46). Sometimes the patagium overgrows the whole shell. A peculiar modification of it appears in *Stephanastrum* (Pl. 44, fig. 1), where only the distal parts of the arms are connected by the ring-shaped patagium, whilst the basal parts are free; therefore open gates rest between them, like those of the Pylodiscida (Pl. 48, figs. 12-20).

The Central Capsule of the Discoidea is constantly discoidal, more or less lenticular; in some cases more biconvex, with vaulted faces and thin margin; in others more medal-shaped, with flat faces and thick margin. In the Cenodiscida alone the capsule lies freely inside the simple phacoid shell, and is separated from it by the jelly-veil. In the other five families the capsule encloses the central parts of the skeleton, and is enveloped by the superficial parts of it, whilst its membrane is perforated by radial beams connect-