

spines also not differing from one another (*Acanthostaurus*, &c.). But in the majority of this family there are three different kinds: four larger equatorial spines, eight tropical spines of middle size, and eight smaller polar spines (*Belonostaurus*, &c.); the latter become sometimes rudimentary, so that only twelve spines are developed (four larger equatorial and eight smaller tropical spines). In this case the development of the flat discoidal body is much stronger in the equatorial plane than in all other planes. These discoidal or lenticular Quadrilonchida exhibit a relation to the spherical Astrolonchida similar to that which the Discoidia exhibit to the Sphaeroidea among the Sphaerellaria.

A further morphological differentiation takes place in the remarkable genera *Lonchostaurus* and *Zygostaurus*. In the former (Pl. 131, figs. 4–6) the four larger equatorial spines becomes differentiated in pairs, so that the opposite equal spines of one pair, *c1*, *c3* (in the longitudinal or hydrotomical axis), are larger, and often also of another form, than the opposite equal spines of the other pair, *c2*, *c4* (in the transverse or geotomical axis). The most peculiar form is the rather common *Zygostaurus* (Pl. 131, figs. 7, 8). Here the two opposite spines of one equatorial axis (of the longitudinal axis) become very different, so that the anterior or frontal spine (*c1*) is very unequal to the posterior or caudal spine (*c3*), whereas the two opposite spines, of the other equatorial axis (of the transverse axis) remain equal (*c2*, *c4*). Therefore the fundamental forms become here “amphithect,” as in the Ctenophora.

The numerous Quadrilonchida may be disposed in two different subfamilies: in the Acanthostaurida all twenty radial spines are simple, without apophyses; in the Lithopterida all twenty spines (or only one part of them) bear two opposite apophyses (or lateral transverse processes). The former correspond to the Zygacanthida, the latter to the Phractacanthida among the Astrolonchida. The two opposite apophyses are simple in *Quadrilonche* (Pl. 133, fig. 1). In *Xiphoptera* they are provided on their distal side with lateral branches which are parallel to the spine itself. In *Lithoptera* the spines bear two to four parallel pairs of transverse apophyses, and these are crossed by perpendicular branches, parallel to the spine itself, so that there arise fenestrated wings or latticed plates, comparable to the sails of a wind-mill. The lattice-work of these plates lies in the same meridian plane with the radial spine itself, and is therefore not comparable to the fenestrated apophyses of *Doracantha*, of *Phatnacantha*, and of the Dorataspida; in these the lattice-plates lie in tangential planes, perpendicular to the radial spine.

The apophyses of the Lithopterida may be developed either on all twenty spines equally, or only on twelve spines (four equatorial and eight tropical, whilst the eight polar spines are simple, Pl. 131, fig. 10), or only on the four equatorial spines (whilst the sixteen others are simple, Pl. 131, fig. 9).

*The Central Capsule* of the Quadrilonchida is rarely spherical, commonly more or