

complete. R. Hertwig supposes that the minor axis of this sagittal girdle is constantly at the same time the major axis of the lateral girdle, but this is not always the case. Very often the size of both these girdles is nearly the same, or one is not much larger than the other. In this case the principal axis of the body is the major axis of the second as well as of the third girdle.

The characteristic "gates" of the Pylonida, or the large wide openings in their cortical shell, remaining between the crossed latticed girdles, are in general roundish, sometimes nearly circular, commonly more elliptical, kidney-shaped or semilunar, their special form varying much according to the different form of the girdles. The narrowest part of each girdle, or its "isthmus," in the case of the halves of the transverse girdle is commonly at their origin from the medullary shell, in the case of the halves of the lateral girdle at the poles of the principal axis, and in the case of the halves of the sagittal girdle at the poles of the sagittal axis. The number of the gates is quite constant in the different genera. If only one girdle (the transverse) be developed, we find only two large gates, between the two wings on the poles of the principal axis (in *Monozonium*, *Amphipyle*, *Amphipyloonium*). In all other cases there are four gates (determining the original name "*Tetrapyle*"), as well if only two or if all three girdles be completed. If two girdles be complete (in *Dizonium*, *Tetrapyle*, *Tetrapylonium*) the four gates lie opposite in pairs on the sagittal faces (two anterior and two posterior gates), and are limited by the transverse and lateral girdles. If all three girdles be complete (in *Trizonium*, *Pylonium*, *Pylozonium*) the four gates lie opposite in pairs on the lateral faces (two dorsal and two ventral gates), and are limited by the sagittal and the transverse girdles. If we turn the shell through an angle of 90°, we have the same aspect as in the former group. A sagittal septum sometimes becomes developed, beginning with two polar beams, rising from the poles of the principal axis. If these polar beams become branched and connected with the middle part of the lateral girdle, we get a latticed vertical septum, which divides the four gates of *Tetrapyle* into eight gates, *Octopyle*.

The lattice-work of the Pylonida is commonly very variable and irregular, with roundish meshes of very unequal size, therefore without value in the determination of the species. Commonly the outside of the shell is thorny, and often distinguished by larger radial spines, symmetrically disposed. We can separate these into two groups; "dimensive" spines, lying in one of the three dimensive axes (principal, transverse, or sagittal), and "diagonal" spines, lying crossed in pairs in diagonal axes. Among these latter eight diagonal wing-spines, which arise from the lateral edges of the four gates, are particularly remarkable; they are not only characteristic of *Tetrapyle octacantha*, but also of a large number of other Pylonida, and form the starting-point for many specific forms.

The shell of the Pylonida is characterised by extraordinary variability and great