This *sail*, or the vertical crest of the Velellidæ, is the most characteristic part of their trunk, and its gradual development is the primary cause of their peculiar amphithect form. The sail is originally nothing other than a small fold of the exumbrella, or the soft upper lamella of the disc. We may assume that the elevation of such a fold in any ancestral Porpitidæ was very useful as an aid to the locomotion of the pelagic animal floating on the level of the sea by its horizontal disc. Natural selection, therefore, will have increased the height of that crest, driven by the wind, and the immediate effect must have been the transformation of the circular disc into an elliptical one, the sail occupying the major axis of the ellipse (*Rataria*). Afterwards the soft and contractile sail becomes supported by the development of an inner chitinous crest, arising from the pneumatophore (*Velella*), and finally the whole outline of the disc, and the arrangement of its marginal parts, assumes the form of a parallelogram, and the sail is placed in its diagonal axis (*Armenista*). A continuous series of intermediate transitional forms conducts us from the elliptical *Rataria* (with sagittal sail), through different forms of *Velella*, to the most specialised parallelogram-shaped *Armenista* (with diagonal veil). The special form of the sail in the two latter genera depends upon that of the supporting firm crest of the pneumatophore; in *Rataria*, however, where the skeleton-crest is wanting, its form differs greatly according to its varying state of contraction.

Exumbrella.—That part of the trunk which includes the pneumatocyst, and corresponds to the invaginated exumbrella, is composed in the Velellidæ, as in the other Disconectæ, of two parallel membranes connected by branched septa. The outer membrane, or the permanent exumbrella (the uninvaginated part), is the pneumatocodon; its exodermal epithelium is armed with many cnidoblasts, and beyond it is placed a strong muscular plate, composed of longitudinal or radial fibres. The inner membrane, or the invaginated part of the exumbrella, is the pneumatosaccus; its thinner exodermal epithelium envelops like a complete sac the whole surface of the pneumatocyst, and this is nothing more than the hardened chitinous cuticula secreted by the former. A great number of septa connect both membranes, and between them occur the canals of the exumbrella, more radially in the horizontal surface of the disc, more longitudinally and parallel in the vertical surface of the sail (on both sides of it). These pallial canals open in the periphery of the horizontal disc into the marginal canal, and along the free margin of the sail into a crescentic canal, running along the whole margin.

Pneumatocyst.—The chitinous polythalamous float filled with air, which we call pneumatocyst (usually called the "inner shell"), always assumes the form of its surrounding matrix, the pneumatosaccus. It is, therefore, in the Velellidæ elliptical or quadrangular, and very different from that of the Porpitidæ and Discalidæ, where it is always circular and regularly octoradial. Since, however, the former have arisen originally from the latter, their pneumatocyst also must be regarded as an amphithect or bilateral modification of that circular float of the latter. Indeed, in all Velellidæ there are traces, more or