

Type genus, *Villebrunaster* Spencer, 1951. Type species, *Villebrunaster thorali* Spencer, 1951, from the lower Ordovician of France.

The characters of *Villebrunaster* were incorrectly given by Spencer (1951, p. 92-94, Fig. 1). In his figure of *V. thorali* (Spencer, 1951, p. 92) no marginal or adambulacral virgalia are shown, and the long lateral wings of the ambulacrals are omitted from the distal part of the arm. The figure is said to be based on the holotype, which is shown, with a paratype, in Plate 2, fig. 29, of the paper cited. Comparison of Fig. 29 (a photograph of the block containing the types) with the actual types shows that Spencer apparently had only an incomplete positive mould, from which the marginal region and the distal parts of the arms had been omitted. Spencer did, however, illustrate the shelf-like character of the reduced cupule in the middle part of the arm (Spencer, *loc. cit.*, Figure 4), though without illustrating the relationship to the adjoining structures. He indicated his belief that *Villebrunaster*, like all other Palaeozoic asterozoans, had closed external cupules, and that accordingly there were no internal ampullae. With this conclusion I do not agree. As will be seen from Fig. 1 of this paper, the base of the tube-foot in Villebrunasteridae lay in direct proximity to a perforation bounded by the adjacent ambulacral wings, and by the adjacent adambulacral virgalium, and the arrangement of the skeletal structures is directly comparable to that found in *Platasterias*, where an internal ampulla is developed through the perforation. There can be little doubt that a similar development had occurred in Villebrunasteridae. Thus, as early as the lower Ordovician, a stock of asterozoans had differentiated having many of the characters of modern asteroids.

The family Chinianasteridae, as now restricted by the exclusion of *Villebrunaster*, differ from Villebrunasteridae in several important respects, not recorded by Spencer. On receiving from me a preliminary account of *Platasterias*, Professor Ubaghs examined the types of *Chinianaster*, and wrote to inform me that he could observe some of the characters of *Platasterias* in that genus also. These included: the presence of lateral flanges on the virgalia; the presence of a double series of flattened quadrangular cover-plates, carried on the flanges; the presence of free terminal radioles; and pointed tube-feet. On receiving the material of *Chinianaster* I was able to confirm these observations, and then asked Professor Ubaghs to announce them; he, however, generously has preferred to allow me to do this. It is clear that the inferred structure of the fossils, derived from study of *Platasterias*, has been confirmed. Other important differences between Chinianasteridae and Villebrunasteridae include the undifferentiated virgalia of the former, and the fact that the cupule in Chinianasteridae lies on the adoral surface of the capitulum, which develops no wing. As will shortly be recorded elsewhere, the jaw-structure of Chinianasteridae, Villebrunasteridae and Platasteriidae is fundamentally the same.

The Platasteriidae resemble Villebrunasteridae in having differentiated virgalia, and cupules which communicate with the body-cavity between the wings of the ambulacrals. They differ in having coverplates, in having the virgalia stabilised as 4 elements in each metapinnule, the second virgalium being occluded as a superambulacral ossicle, in having longer ambulacral wings, which rest along the upper surface of the elongate adambulacral virgalia, and having a fulcrum-mechanism at the outer end of the adambulacral, permitting erection of a temporary furrow of asteroid type.

In addition to *Villebrunaster*, a second genus of Villebrunasteridae may be distinguished as follows:—