The Recent Sea-star *Platasterias* and the Fossil Somasteroidea

When discussing Fell's theories on the phylogeny of sea-stars[1–3], Philip[4] omitted any comparison of living forms with somasteroids. This comparison, however, deserves a short comment.

Spencer's sub-class of Asterozoa, the Somasteroidea[5], has always puzzled me, and I wonder whether the skeletal elements in *Villebrunaster* interpreted as ambulacralia may not be the adambulacralia, while the ambulacralia are hidden from view. I consider Spencer's virgalia to be ventrolateral ossicles. Figs. 1*a* and *b* show the resemblance between the reconstruction of a somasteroid and the ventrolateral skeleton of a recent *Porania*. (An aboral skeleton of radiate ossicles as found in some somasteroids is also present in *Porania*.) Spencer[5] compared this recent sea-star with his *Villebrunaster*, but only on account of its mucus-ciliary method of feeding which he assumed had also applied to the fossil. I would add that the resemblance stated is not taken to imply any close taxonomic relationship.

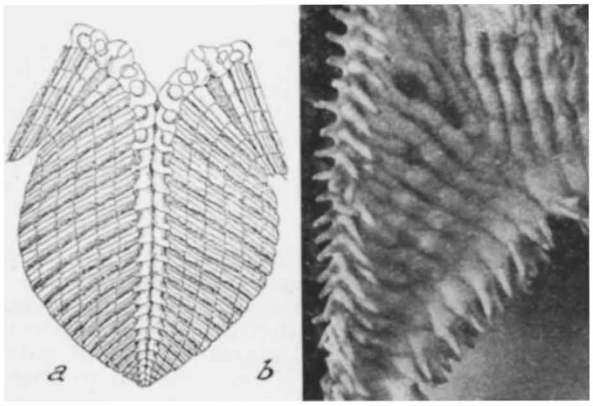

Fig. 1. *a*, *Villebrunaster* (after Spencer (ref. 5)); *b*, ventrolateral area of *Porania pulvillus* (O.F.M.)

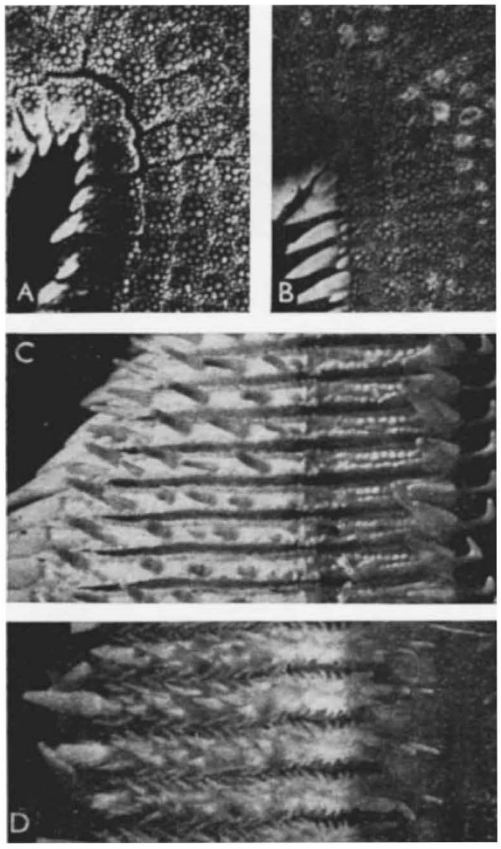

Fig. 2. Dorsal paxillae and ventrolateral skeleton of *Platasterias latiradiata* (*A*, *C*) and *Luidia* (*Petalaster*) *marginata* (*B*, *D*)

Fell[1–3] claims that *Platasterias latiradiata* Gray, 1871, is a living somasteroid. I consider this rare West-Mexican sea-star to be a somewhat aberrant *Luidia* of the sub-genus *Petalaster* (or of a sub-genus of its own). Fig. 2 illustrates the agreement in external characters between *Platasterias* and the East-Pacific *Luidia* (*Petalaster*) *marginata* Koehler. I assume the petaloid arms in *Platasterias* (brought about by a transverse elongation of the adambulacralia and inferomarginalia) to be a secondary adjustment to a life on a shifting sandy bottom (and perhaps a primarily ciliary method of feeding).

Fell[3] has put forward many interesting views on the phylogeny of sea-stars. I agree that the Luidiidae may be a very ancient group, but I fail to see how the Somasteroidea can indicate any closer affinity between asteroids and crinoids, even though *Villebrunaster* and *Chiniaster* may not be of so true an asteroid organization as I suspect.

F. Jensenius Madsen

Zoological Museum,
Copenhagen, Denmark.

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MICROBIOLOGY

Persistence of Fluoroacetate and Fluoroacetamide in Soil

Laboratory tests have shown that sodium fluoroacetate[1,2] and fluoroacetamide[3,4] can act as systemic insecticides, and the latter compound has been tested or used in the field for pest control (mainly against aphids) in several countries[5–7]. In Britain, however, following the Smarden incident, the use of these compounds as rodenticides has been severely restricted and their use as insecticides prohibited[8].

One question that arose in an acute form from the Smarden incident was the rate of decomposition of fluoroacetamide in the soil. It also arises when the materials reach the soil from rodenticides and insecticides. According to Horiuchi[9], bacteria in the soil break down fluoroacetamide; recently the organism responsible has been isolated[10].

This communication reports results of fuller tests, of the type already described[4], to determine the persistence in the soil of both sodium fluoroacetate and fluoroacetamide. The method used was to treat moist Kettering loam and local garden soil with 10 p.p.m. and 50 p.p.m. of the compounds, which were thoroughly incorporated. The soil samples were in 1 lb. screw-top jars and, in the case of the garden soil, half the batch was steam-sterilized after the chemicals had been added at 120 lb. pressure for 2 h. This enabled a comparison to be made between the rate of breakdown in unsterilized and sterilized soil. The jars were stored at 20° C and at intervals broad beans infested with *Aphis fabae* L. were planted in the soil samples and the fate of the aphid population on each plant was followed for 5 days. Similarly infested control plants in untreated soil were also kept.

The results obtained are shown in Table 1. It can be seen that 10 p.p.m. was not detectable in the Kettering loam by this means even immediately after addition. In garden soil toxicity could be detected and lasted for 2 weeks with sodium fluoroacetate or 3 weeks with fluoroacetamide. At 50 p.p.m. a lower level of toxicity was detected by this method in the ninth week but not in the eleventh week or later. In the sterilized garden soil, at