

their replacement upwards by undisturbed or slightly burrowed sediments is thought to point to an increasing rate of sedimentation inhibiting benthonic faunal activity. There is, therefore, no necessity to invoke a "destruction of carbonaceous banding" (Rickards, p. 445). Furthermore, if the origin of the carbonaceous and pyritic films is accepted as being due to the reduction and preservation of organic matter within the pelleted sediments, the lower percentage of free carbon recorded by Dr. Rickards (p. 445) in the homogeneous sediments may be accounted for by a "dilution" of any organic matter present by increased sedimentation. There need, therefore, be no "loss of carbon" (Rickards, p. 445) due to reworking of the sediment.

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P. G. LLEWELLYN.

HENRIETTE ROLAND HOLSTLAAN 53,
RIJSWIJK (Z.H.),
HOLLAND.
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VERTICILLOPORA AND *PHRAGMOPORELLA*, DESCRIBED AS
CALCAREOUS ALGAE, ARE CRINOID STEMS

The two genera *Verticillopora* and *Phragmoporella* were described by Rezak (1959) as members of a new Tribe of Palaeozoic Dasycladaceae. Recently, in the course of an investigation of Palaeozoic algae, specimens of *Verticillopora* have been borrowed from the United States National Museum through the good offices of Dr. G. A. Cooper. These have been studied in section and by serial grinding. Patchy development of beekite and dolomite obscured the micro-structure, but on a polished surface it was possible to observe interlocking zig-zag junctions between the segments which must be cross sections of radially disposed ribs and sockets. Such a structure could serve no purpose in algae; the radial grooves seen on the ends of segments of Tertiary genera such as *Neomeris* and *Larvaria* lie directly above similar grooves in the segment beneath and each is actually half of the external mould of a sterile secondary branch.

This, together with the undoubted pentamerous symmetry of these fossils, seen in Rezak's plate 3, figure 3, and plate 4, figure 5, strongly suggests that they are portions of crinoid stems. Two European groups of Silurian crinoids, the *Crotalocrinidae* and the *Polypeltidae*, display the most striking features of these American fossils—the large central cavity and the radially arranged perforations in the stem. The species *Crotalocrinus verrucosus* Schlotheim, 1826, was founded because of the wart like excrescences on the stem, which leave circular holes in the ossicles at their broken bases. The family *Polypeltidae* (Ubaghs, 1956) includes the genus *Trybliocrinus* with a radially arranged vessel system in its stem. The specimen of this genus shown on plate viii, figure 12 of Breimer's monograph (1962) is quite closely similar to that illustrated by Rezak on his plate 4, figure 3.

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ALAN WOOD.

DEPARTMENT OF GEOLOGY,
UNIVERSITY COLLEGE OF WALES,
ABERYSTWYTH, WALES.

26th April 1965.

REVIEWS

CONODONTS. By MAURITS LINDSTRÖM. 196 pp. 64 illustrations, 5 tables. Elsevier Press, Amsterdam, 1964. Price 58s.

Dr. Lindström has produced an excellent general introduction to *Conodonts*. The section on morphology and structure is comprehensive in scope, but emphasises how little is yet known about conodont microstructure. Even the details of structure that may be readily observed by optical microscopy are imperfectly understood, and there is still virtually no information available on the organic composition, or ultra-microscopic structure of conodonts or of the structure of the basal "filling".

The discussion of the stratigraphical sequence of conodont faunas is useful for broad aspects of correlation, but little emphasis is given to the zonal refinement which has been achieved in the Devonian and Lower Carboniferous by Ziegler and others in Germany, and Collinson and his fellow workers in North America, although there is a short section on palmatolepid development.

Dr. Lindström accepts the validity of the Upper Cretaceous conodonts described by Diebel from the Cameroons. These intriguing fossils "fit in" phylogenetically with what is known of earlier conodont evolutionary development, but the present apparent absence of conodonts in the interval separating the widespread Triassic faunas remains an anomaly.

The two chapters on the occurrence of conodonts and on natural assemblages are short, but well written, and the latter chapter serves as a basis for the reinterpretation of the nature of conodonts. In his review of conodont affinities Lindström follows most contemporary authors in rejecting a traditional vertebrate or annelid affinity, the first on the grounds that conodonts lack the histological structure associated with vertebrates, and the second because their method of growth conflicts with the typical pattern of discontinuous growth and moulting shown in annelid jaws. He accepts the interpretation that conodonts must have functioned as internal structures, basing his evidence chiefly on their mode of growth. He then uses the typical arrangement of conodonts in a natural assemblage (the Class A assemblage of Rhodes) to suggest that they functioned as supports for a ciliated tentacle apparatus used by a hypothetical plankton feeder. Although this interpretation is based very largely upon conodont form and arrangement in natural assemblages and the relation of conodont morphology to supposed water currents, the reconstruction (Fig. 46) rings uncannily true and it may be that at last a natural conodont assemblage has been realistically fitted into a still unknown animal.

Lindström regards his reconstruction as a lophophore-like structure, but rejects an association with the brachiopods or the bryozoans. He mentions the possibility of an association with the hemichordates, and of all the possible groups this seems to be the most promising, even though it is not pursued by