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CAMBRIAN AND ORDOVICIAN FOSSILS FROM THE MACQUARIE HARBOUR AREA

by M. J. Clarke

LOCALITY E3417/N7735

Lithology

The exposure comprises a few feet of olive-brown, fine to coarse grained, micaceous, laminated siltstone with a very varied, abundant and well-preserved trilobite fauna with rare inarticulate brachiopods and fragmentary dendroid graptolites.

Fauna

The trilobites occur mostly as isolated cranidia, pygidia and librigenae, but a few more or less complete specimens are also represented. They include abundant agnostids, predominantly the important *Leiopyge laevigata* (Dalman), but also *Peronopsis*, *Pseudophalacroma dubium* (Whitehouse) and *?Hypagnostus*; abundant nepeids and ceratopygids (*Proceratopyge* spp.); several spinose pygidia which compare very closely with the dorypygid *Kootenia*; an emmrichellid, possibly *Lorenzella*; a probable new genus of papyriaspid nearest to *Tosotychia sors* Opik, but with a much flatter frontal rim and without the axial bifurcation of the first glabellar furrows; and rare dolichometopids which appear to combine the characters of *Amphoton* (*Amphoton*) and *Amphoton* (*Fouchouia*), (compare with Opik, 1961, pp. 139-140). Inarticulate brachiopods are rare and include a single specimen of *Acrothele* and two possible acrotretids. Dendroid graptolites also occur but are too fragmentary and poorly preserved for precise identification.

Correlation and Age

The occurrence of *Leiopyge laevigata* (Dalman) and *Pseudophalacroma dubium* (Whitehouse) demonstrates an uppermost Middle Cambrian age, the zone of *Leiopyge laevigata* (Westergaard, 1946; Opik, 1957, 1961, 1963). The abundance of nepeids reinforces this conclusion as *Nepea narinosa* Whitehouse is known only from the uppermost Middle Cambrian. *Nepea*, like all monotypic genera, is unsatisfactory. The present forms are certainly specifically different and probably generically different from the type material. The true *Nepea* has a very pronounced median boss developed on the pre-glabellar field. The Tasmanian forms are consistently smaller, and although the pre-glabellar field is markedly inflated and convex, there is never a differentiated median boss. The consistently smaller size of the Tasmanian material might suggest an earlier growth stage of the true *Nepea* prior to the development of the median boss. This is considered to be improbable since over forty specimens are unlikely to have all died prior to maturity. Similarly, stunting or dwarfing would not preclude the development of ephebic characters. *Proceratopyge* is usually characteristic of the Upper Cambrian, at least in Australia (Whitehouse, 1939; Opik, 1963), but also occurs in the uppermost Middle Cambrian (Harrington *et al.*, 1959). *Kootenia* ranges throughout the Cambrian, but both *Amphoton* and *Lorenzella* are confined to the Middle Cambrian. A precise position within the *Leiopyge laevigata* Zone is less evident. None of the subzonal indices, *Ptychagnostus cassis* Opik, *Agraulos* [*Proampyx*] *agra* (Opik), and *Holteria arepo* Opik have been recognised but they are rare elsewhere in Australia (Opik, 1961). In Queensland, *Tosotychia sors* Opik is confined to *laevigata* I and II, and *Amphoton* to *laevigata* II; but *Peronopsis* apparently does not range above *laevigata* I. The evidence is therefore conflicting but *laevigata* III can be reasonably ruled out. The most probable correlation is with the Smithton *laevigata* II horizon (Banks, 1962), although the possibility of a *laevigata* I age cannot be dismissed.

LOCALITY E3449/N7688

Lithology

Grey-green, brown weathering, fine grained, micaceous siltstone. A cleavage or closely spaced jointing is developed at a high angle to the bedding. The fossils occur in thin, separated bands and are distorted by the cleavage.

Fauna

Brachiopods are common and include several specimens of *Paurorthis* sp. nov. (as internal and external moulds of both pedicle and brachial valves), and *Tritoechia*(?) *careyi* Brown. A single, more or less complete specimen comprising crown and stem of a probable new genus of cystoid also occurs. This form is broadly similar to *Echinoencrinites* with respect to plate arrangement and sculpture, but the individual plates are much more elongate.

Correlation and Age

Tritoechia(?) *careyi* Brown has been recorded from a number of localities in Tasmania (Banks, 1962). In each case the beds have been dated as Middle Canadian (Lower Ordovician) equivalent in age to a high Bendigonian (Be 4) horizon or low in the Chewtonian of the Victorian graptolite succession (Harris and Thomas, 1938; Kobayashi, 1940a; Brown, 1948). *Paurorthis*, a Lower and Middle Ordovician genus (Williams *et al.*, 1965) in association with *Tritoechia* and other fossils has been recorded from siltstones and sandstones overlying the Cabbage Tree Conglomerate near Beaconsfield and correlated with the Caroline Creek Sandstone (Green, 1959). These beds are dated as Middle to Upper Canadian by Banks (1962). *Echinoencrinites* is an Ordovician genus.

LOCALITY E3448/N7709

Lithology

Coarse grained, pale green-yellow, white weathering, siliceous, cavernous sandstone with occasional, well rounded vein quartz pebbles up to 10 mm in diameter. Fossils are very abundant along certain bedding planes but are very poorly preserved.

Fauna

Gastropods are the commonest faunal component. A number of separate types are present but none are sufficiently well preserved for precise determination. A number of straight orthocone nautiloids are present. The conch is slowly expanding, apparently ovoid in cross section (although this may be due to crushing), and with septa spaced at intervals of 3 mm. Trilobites are represented by a single cranidium and several pygidia. The cranidium and pygidia do not appear to belong to the same genus. The cranidium is fragmentary but shows an inflated, anteriorly sloping and narrowing glabella with three glabellar furrows. The two anterior furrows are marginal and weak, but the posterior furrow is strong giving rise to well marked occipital lobes. In front of the glabella there is a wide, gently concave frontal brim. The

exact nature of the facial sutures cannot be determined but they are probably opisthoparian. This form may possibly be a dokimocephalid. The pygidia are of asaphid type and offer comparison with *Basiliella*.

Correlation and Age

The age of this fauna is tenuous. Asaphids and dokimocephalids cannot occur together (unless the dokimocephalids are derived, but this is most unlikely). The trilobite determinations must therefore be treated with caution. The presence of orthocone nautiloids indicates that the fauna is not older than the Upper Cambrian. Dokimocephalids would support this conclusion. If on the other hand, the pygidia are correctly determined the fauna is of Lower Ordovician age.

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