

as part of our effort to understand the Quaternary history of the Ross Sea region. Similar perched deltas exist in nearby Salmon Valley. We suggest that the younger Salmon Valley deltas, which are at similar elevations to those in Taylor Valley, were deposited in small freshwater lakes dammed by ice-cored moraines deposited by the last Ross Sea glaciation. This interpretation is in contrast with the hypothesis of Miagkov and others (1976) that the Salmon Valley deltas, which contain many of the same freshwater diatom species found in the Taylor Valley deltas, formed in seawater or brackish water along the ice sheet edge during a general lowering of sea level related to tectonism.

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Ostracoda from the Pleistocene Taylor Formation, Ross Island, and the Recent of the Ross Sea and McMurdo Sound region, Antarctica

WILLIAM M. BRIGGS, JR.

*Divisions of Life and Physical Sciences
Scarborough College, University of Toronto
West Hill, Ontario, Canada M1C 1A4*

Current research on southern ocean ostracodes involves investigation of sediments of the Ross Sea and McMurdo Sound region and from the Taylor Formation, Ross Island. The Taylor Formation (Speden, 1962) has been studied at

three localities where it crops out on the western side of Ross Island, between Cape Barne and Cape Royds (figure 1). These localities are typical of the frozen, but unconsolidated, fossiliferous raised marine deposits that occur commonly in the McMurdo Sound region (Speden, 1962, figure 1).

One of three samples from locality 1 (figure 1) which contains ostracodes is from the middle shell layer (sample VNA-8), 30 meters above sea level; carbonate material from this layer gave a radiocarbon age of between 37,000 and 32,000 years (Hendy *et al.*, 1969). Another sample from the same locality gave a radiocarbon age of greater than 47,000 years (Denton *et al.*, 1970). The deposits at localities 2 and 3 occur at elevations of between 50 meters and 60 meters above sea level (Chapman, 1916; David and Priestly, 1914; Debenham, 1920; Speden, 1962). The ostracode assemblages from these localities suggest that the depth of deposition decreased from locality 1 to locality 3.

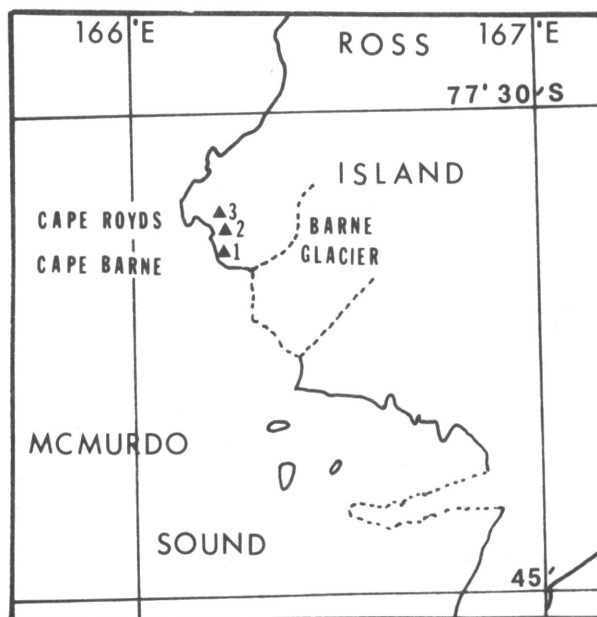


Figure 1. Taylor Formation localities, Ross Island: locality 1, near Deep Lake, Cape Barne, samples S6, SR26, VNA-8; locality 2, Cape Barne, samples WR11, VNA-13; locality 3, Backdoor Bay, sample VNA-11.

Chapman (1916) recorded eight ostracode species from the Taylor Formation of Ross Island, all from locality 2. Except for Chapman's work on the raised marine deposits on Ross Island and a deposit 6 meters above sea level farther to the north (75°S.), near the Dryglaski Ice Tongue, no other study has been made on Taylor Formation ostracodes.

Ross Sea and McMurdo Sound bottom samples have been examined for ostracodes; these include eight samples from the New Zealand Oceanographic Institute (Kennett, 1968, table 8) containing calcareous faunas (New Zealand Oceanographic Institute stations A533, A641, A455, A537, A449, A450, A463, and A537), from depths of 90-548 meters, and three samples (Glasby *et al.*, 1975, fig. 1) immediately north of the Ross Ice Shelf (77°S.) collected from the USCGC *Northwind*, from depths of 608-628 meters (New Zealand Oceanographic Institute stations G844, G855, and G856). The latter samples were devoid of calcareous faunas, presumably because of the shallow nature of the calcium carbonate solution boundary in the Ross Sea (Kennett, 1968).

Another sample studied was collected at a depth of 241 meters in McMurdo Sound (JC-8, 77°37'S., 166°17'E.).

A total of 44 genera and 72 species of ostracodes were found in the Taylor Formation and Recent sediments of the Ross Sea during this study. Because of the importance of this highly diverse ostracode fauna, and in view of the current interest generated by the Ross Ice Shelf Project (RISP) in the biota of the seabed beneath the Ross Ice Shelf, a list of the ostracode fauna is included in table 1; 37 of these species are illustrated in figure 2. The systematics of these taxa, including several new genera and species, and their abundances and distribution, will be discussed elsewhere.

This work has been aided by the following people: R.M. Kirk (Canterbury University) collected samples S6 and SR26 during the 1965-1966 field season; A.J. Wright (now at

Wollongong University) and V.E. Neall (now at Massey University) collected samples WR11 and VNA-8, 11, and 13 during Victoria University of Wellington Antarctic Expeditions (VUWAE-12, 1967-1968; VUWAE-14, 1969-1970, respectively); J. Eade, G. Glasby (USCGC *Northwind* samples), J. Kennett (now at the University of Rhode Island), and K. Lewis (New Zealand Oceanographic Institute) supplied Ross Sea samples; P. von Bitter and D. Collins (Department of Invertebrate Palaeontology, Royal Ontario Museum) and J. Westgate (University of Toronto) provided research facilities and funds for operation of the scanning electron microscope; and E. Lin (Department of Zoology, University of Toronto), and G. Gomolka (Department of Geology, University of Toronto) took the scanning electron micrographs on Cambridge Mark II instruments.

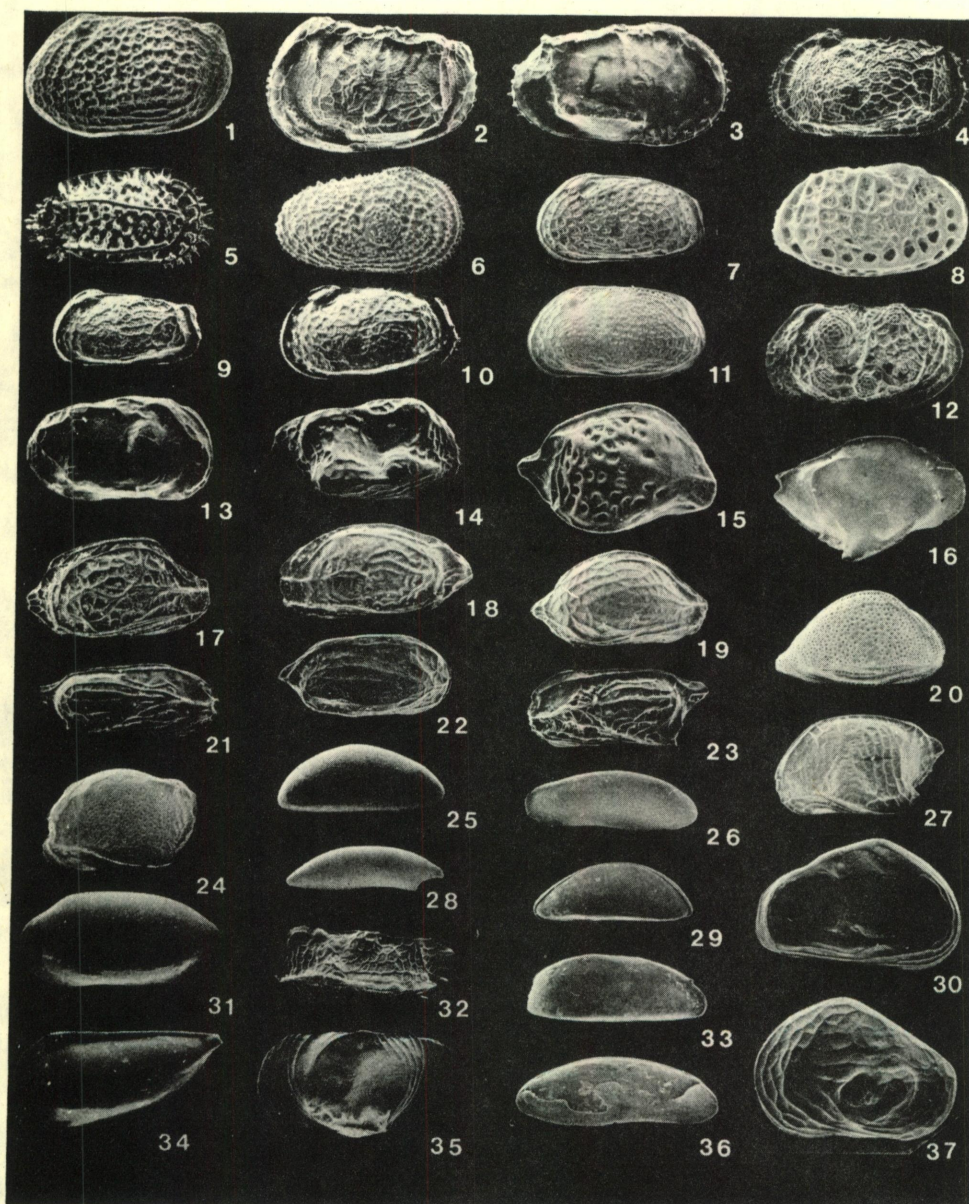


Figure 2. Scanning electron micrographs of 37 of the 72 ostracode species listed in table 1 (see table for identification).

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- Ostracode species.**
- Antarcticythere laevis* (Müller) = *Loxoconcha laevis* Müller, 1908. (fig. 2-31, LV¹, x422, loc. 13)
- "*Antarcticythere*" sp.
- Argilloecia obtusata* ? (Brady) = *Aglaia* (?) *obtusata* Brady, 1880.
- Australicythere polylyca* (Müller) = *Cythereis polylyca* Müller, 1908. (fig. 2-4, LV, x25, loc. 1)
- Aversovalva antarctica* (Müller) = *Eucytherura* (?) *antarctica* Müller, 1908. (fig. 2-27, LV, x63, sta. A455)
- Bairdoppilata* (B.?) *simplex* (Brady) = *Bairdia simplex* Brady, 1880.
- Baltralla* sp.
- Bradleya* sp. aff. *B. normani* (Brady) = *Cythere normani* Brady, 1866. (fig. 2-8, RV, x29, loc. 1)
- Bythoceratina dubia* (Müller) = *Loxoconcha* (?) *dubia* Müller, 1908.
- Bythoceratina* sp. (fig. 2-35, LV, x42, sta. A450)
- Bythocypris reniformis* Brady, 1880
- Bythocytheremorpho* ? sp. (fig. 2-32, LV, x43, sta. A455)
- Cativella bensoni* Neale, 1967. (fig. 2-5, RV, x25, loc. 1)
- Cluthia* ? sp. (fig. 2-13, RV, x50, loc. 1)
- Copypus elongatus* Benson, 1964
- Cythereis* sp. (fig. 2-26, LV, x43, loc. 2)
- Cytheropteron antarcticum* Chapman, 1916. (fig. 2-16, RV, x45, sta. JC-8)
- Cytheropteron gaussi* Müller, 1908. (fig. 2-24, LV, x40, sta. A455)
- Cytheropteron* sp. cf. *C. testudo* Sars, 1866. (fig. 2-20, RV, x59, sta. A455)
- Cytheropteron* sp. A.
- Cytheropteron* sp. B.
- Cytheropteron* sp. C.
- Cytheropteron* sp. D.
- "*Echinocythereis*" sp. (fig. 2-6, RV, x35, loc. 1)
- Eucytherura* ? sp. (fig. 2-14, RV, x84, sta. A455)

- "*Hemicythere*" *robusta* (Skogsberg) = *Cythereis* (*Procythereis*) *robusta* Skogsberg, 1928. (fig. 2-11, LV, x22, loc. 3)
- Hemicythere taeniata taeniata* (Skogsberg) = *Cythereis* (*C.*) *taeniata taeniata* Skogsberg, 1928. (fig. 2-7, LV, x31, loc. 3)
- Hemicytherura irregularis* (Müller) = *Cytheropteron irregularis* Müller, 1908. (fig. 2-17, RV, x55, loc. 1)
- Hemicytherura* sp. A. (fig. 2-18, LV, x47, loc. 2)
- Hemicytherura* sp. B. (fig. 2-19, RV, x53, sta. A455)
- Kangarina* sp. (fig. 2-15, RV, x64, sta. A455)
- Krithe* sp. cf. *K. tumida* Brady, 1880.
- Krithe* sp. cf. *Krithe* sp. Benson (1964).
- Loxocythere frigida* Neale, 1967.
- Loxoreticulatum fallax* (Müller) = *Cytheropteron fallax* Müller, 1908.
- Macrocypris* sp.
- Microcythere frigida* Müller, 1908. (fig. 2-33, RV, x80, loc. 1)
- Microcythere scaphoides* (Brady) = *Cytheropteron scaphoides* Brady, 1880. (fig. 2-29, carapace, left lateral view, x73, sta. A450)
- Paracypris* sp.
- Paracythereis similis* Müller, 1908. (fig. 2-36, LV, x59, sta. A450)
- Paracythereis* ? *vanhoffeni* Müller, 1908. (fig. 2-25, RV, x46, sta. A455)
- Paradoxostoma antarcticum* Müller, 1908.
- Paradoxostoma hypselum* Müller, 1908.
- Paradoxostoma* sp.
- "*Patagonacythere*" *devexa* (Müller) = *Cythereis devexa* Müller, 1908. (fig. 2-10, LV, x24, loc. 1)
- "*Patagonacythere*" *longiductus antarctica* Benson, 1964.
- "*Patagonacythere*" *megalodiscus* (Skogsberg) = *Cythereis* (*C.*) *megalodiscus* Skogsberg, 1928. (fig. 2-9, LV, x25, loc. 3)
- Pellucistoma* sp.
- Phlyctocythere* sp. A.
- Phlyctocythere* sp. B.
- Polycope brevis* Müller, 1908.
- Propontocypris* (*Ekpontocypris*) *mcmurdoensis* Maddocks, 1969.
- Pseudocythere caudata* Sars, 1866. (fig. 2-34, LV, x46, loc. 1)
- Pseudocythereis spinifera* (Skogsberg) = *Cythereis* (*Pseudocythereis*) *spinifera* Skogsberg, 1928. (fig. 2-1, LV, x31, sta. A450)
- "*Robertsonites*" *antarcticus* Neale, 1967. (fig. 2-2, LV, x37, sta. A455)
- "*Robertsonites*" sp. (fig. 2-3, RV, x37, sta. A455)
- "*Rotundacythere*" sp. A. (fig. 2-30, RV, x68, loc. 1)
- "*Rotundacythere*" sp. B. (fig. 2-37, LV, x68, loc. 1)
- "*Roundstonia*" sp. (fig. 2-12, LV, x37, loc. 1)
- Sclerochilus antarcticus* Müller, 1908.
- Sclerochilus meridionalis* Müller, 1908.
- Sclerochilus reniformis* Müller, 1908.
- Sclerochilus* sp.
- Semicytherura costellata* (Brady) = *Cytherura costellata* Brady, 1880. (fig. 2-21, RV, x55, loc. 1)
- Semicytherura notalis* (Müller) = *Cytherura notalis* Müller, 1908. (fig. 2-22, RV, x56, loc. 3)
- Semicytherura* sp. (fig. 2-23, LV, x52, sta. A455)
- Xestoleberis* sp. aff. *X. rigusa* Müller, 1908.
- Xestoleberis davidiana* Chapman, 1915.
- Xestoleberis kerguelensis* Müller, 1908.
- Xestoleberis rigusa* Müller, 1908.
- Xestoleberis setigera* Brady, 1880.
- Xiphichilis gracilis* (Chapman) = *Macrocypris gracilis* Chapman, 1915. (fig. 2-28, RV, x73, sta. A450)

¹LV, left valve; RV, right valve; all specimens single valves except Fig. 2-29, which is a carapace; all views exterior lateral except Fig. 2-36, which is interior lateral.

²All magnifications are for a figure width of 13 centimeters (5 inches).

³Localities 1, 2, 3 in Taylor Formation: loc. 1, 1.1 kilometers N. of Cape Barne; loc. 2, 2.1 kilometers N. of Cape Barne; loc. 3, 3 kilometers NE. of Cape Royds. Stations A450 and A455 are New Zealand Oceanographic Institute (N.Z.O.I.) Stations: A450, Ross Sea, 76°42'S.179°44'E., 395 meters depth; A455, Pennell Bank, 74°22'S.178°35'W., 330 meters depth. JC-8 is in McMurdo Sound, 77°37'S.166°17'E., 241 meters depth.