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GASTROPODS FROM THE CAPE MELVILLE FORMATION
(LOWER MIOCENE) OF KING GEORGE ISLAND,
WEST ANTARCTICA

(Plates 31—35)



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Thirty species of gastropods are described from glacio-marine sediments of the Cape Melville Formation (Lower Miocene) of the King George Island, West Antarctica. The genera represented include: *Gibbula*, *Cerithium*, *Turritella*, *Archimediella*, *Scalina*, *Natica*, *Margarites*, *Perisodonta*, *Aporrhais*, *Ficus*, *Liomesus*, *Beringius*, *Sipho*, *Neptunea*, *Nassarius*, *Buccinaria*, *Mitrella*, *Streptochetus*, *Sycostoma*, *Psephaea*, *Scaphella*, *Ancilla*, *Cancellaria*, *Austrotoma*, *Aforia*, and *Scaphander*. Two new species are erected: *Beringius gazdzickii* sp. n. and *Austrotoma antarctica* sp. n.

Key words: Gastropods, Lower Miocene, Antarctica.

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ŚLIMAKI Z OSADÓW FORMACJI CAPE MELVILLE (DOLNY MIOCEN) WYSPY KRÓLA JERZEGO,
ANTARKTYKA ZACHODNIA

Streszczenie. — Przedmiotem pracy są ślimaki pochodzące z lodowcowo-morskich utworów formacji Cape Melville (dolny miocen) odsłaniających się na półwyspie Melville'a, na Wyspie Króla Jerzego (Antarktyka Zachodnia). Opisano trzydzieści gatunków zaliczonych do dwudziestu sześciu rodzajów. Utworzono dwa nowe gatunki: *Beringius gazdzickii* sp. n. i *Austrotoma antarctica* sp. n. Około dziewięćdziesiąt procent opisanych ślimaków to gatunki znane głównie z miocenu Australii, Nowej Zelandii, obu Ameryk a także Europy.

INTRODUCTION

The investigated material of gastropods was collected by A. GAŹDZICKI and R. WRONA during the Fifth Polish Antarctic Expedition to the H. ARCTOWSKI Station in 1980—1981, led by K. BIRKENMAJER. The gastropods were found in glacio-marine sediments of the Cape

Melville Formation in the eastern part of the King George Island, the Cape Melville (fig. 1). The formation is represented by a sequence of shales with intercalations of siltstones, marls and sandstones, up to 200 m thick (BIRKENMAJER 1982, 1984, 1987 this volume, GAŹDZICKI and WRONA 1982, BIRKENMAJER *et al.* 1983). The sequence is cut by andesitic and basaltic dykes, dated by the K-Ar method at about 20 Ma, i. e. the Lower Miocene (BIRKENMAJER *et al.* 1985). Thus the Cape Melville Formation cannot be younger than the Lower Miocene. Taking into account the record of Lower Miocene brachiopods in the underlying Destruction Bay Formation, the Lower Miocene age is also suggested for the gastropod-bearing sediments of the Cape Melville Formation (BIERNAT *et al.* 1985, BIRKENMAJER *et al.* 1985, BIRKENMAJER 1987 this volume).

The investigated gastropod collection is housed in the Institute of Paleobiology of the Polish Academy of Sciences, Warsaw (abbreviated as ZPAL.).

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MATERIAL

The collection comprises sixty three specimens from six localities at the Melville Peninsula (fig. 1). The gastropods were found to be most common in the Crab Creek area (I), and the locality V. The specimens are rarely well-preserved. The majority is characterized by damaged apical or apertural parts. Moreover, some shells are flattened and a number of specimens is preserved as internal moulds. That is why twelve specimens are described using „open nomenclature”.

The stratigraphic value of the studied specimens is rather limited. However, almost all of the species described are known from the Miocene.

SYSTEMATIC DESCRIPTION

Superfamily **Trochacea** RAFINESQUE, 1815
Family **Trochidae** d'Orbigny, 1837 (RAFINESQUE, 1815)
Genus **Gibbula** RISSO, 1826
Gibbula sp.
(pl. 33 : 3a, b)

Material. — One somewhat deformed specimen.

Dimensions: shell 9 mm high and 14 mm wide (ZPAL Ga IV/67)

Description. — Shell small, with irregularly convex whorl. Apex slightly elevated above the last whorl; aperture of the last whorl quadrate in outline. Surface of the last whorl damaged. Umbilicus clearly marked, somewhat elongate.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. Some species of this genus are known from the Miocene of Europe.

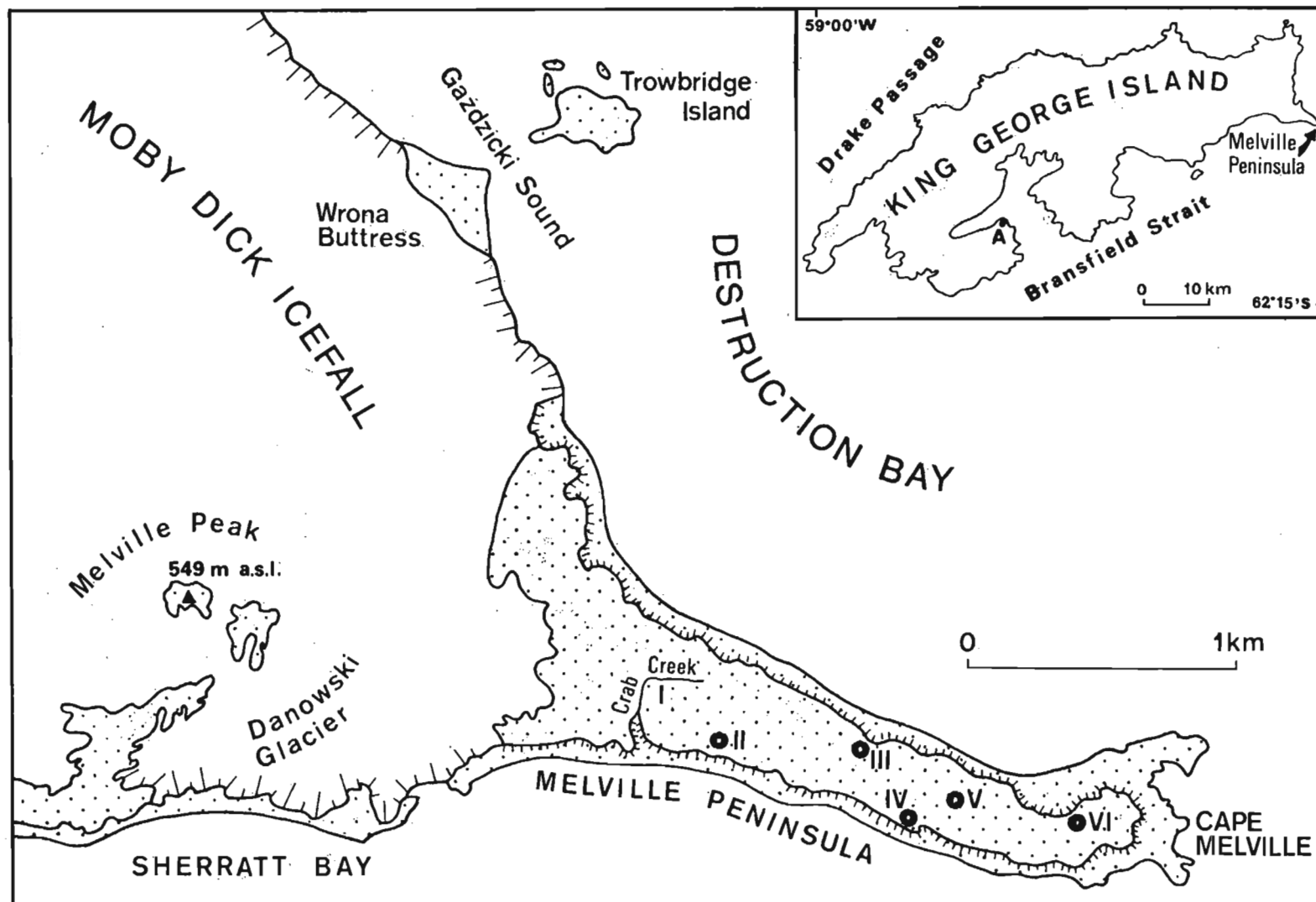


Fig. 1

Map showing position of gastropod-bearing localities (I–VI) on the Melville Peninsula. Insert shows location of Melville Peninsula in King George Island. A — ARCTOWSKI Station (Poland).

Superfamily *Cerithiacea* FLEMING, 1822Family *Cerithidae* FLEMING, 1822Genus *Cerithium* BRUGUIÈRE, 1789*Cerithium* sp.

(pl. 32 : 4a, b, 9)

Material. — Two damaged specimens.

Dimensions: shell 40 mm high, 14 mm wide (ZPAL Ga IV/60)

shell 20 mm high, 10 mm wide (ZPAL Ga IV/59)

Description. — Shell high, conical, with relatively convex whorls and clearly marked, deep sutures. The last whorl larger than the remaining ones, with elongate aperture. Surface of whorls damaged.

Occurrence. — King George Island, Melville Peninsula (localities I and III), Cape Melville Formation, Lower Miocene.

Family *Turritellidae* WOODWARD, 1851Genus *Turritella* LAMARCK, 1799*Turritella ocoyana* CONRAD, 1855

(pl. 32 : 1, 2, 10)

1970. *Turritella ocoyana* CONRAD; W. O. ADDICOTT: 49, pl. 2, 20—22, 26—28 (for full synonymy see ADDICOTT 1970).

Material. — Three incomplete specimens.

Dimensions: shell 45 mm high and 16 mm wide (ZPAL Ga IV/54)

shell 50 mm high and 19 mm wide (ZPAL Ga IV/55)

shell 38 mm high and 18 mm wide (ZPAL Ga IV/56)

Description. — Shell conical, slightly flattened. Whorls arranged stepwise and ornamented with numerous, densely spaced riblets passing parallel to suture. Riblets of the first and second order may be differentiated. Sutures slightly depressed.

Remarks. — The species is characterized by relatively high variability. The specimens from Antarctica appear most similar to those described from California by ADDICOTT (1970, pl. 2: 23, 24, 26 and 27).

Occurrence. — King George Island, Melville Peninsula (locality II), Cape Melville Formation, Lower Miocene. Known from the Miocene of the USA.

Turritella sp.

(pl. 32 : 6, 7, 8)

Material. — Three specimens.

Dimensions: shell 25 mm high and 10 mm wide (ZPAL Ga IV/40)

shell 23 mm high and 9 mm wide (ZPAL Ga IV/41)

shell 37 mm high and 10 mm wide (ZPAL Ga IV/43)

Description. — Shell elongate, conical. Whorls relatively high, convex, with obliterated ornamentation; sutures depressed, clearly marked; the last whorl with damaged aperture. Umbilicus obscure.

Remarks. — The specimens are most similar to those of *Turritella* (*Turritella*) *terebralis* LAMARCK. However, their preservation renders specific identification hazardous.

Occurrence. — King George Island, Melville Peninsula (localities I and V), Cape Melville Formation, Lower Miocene.

Genus *Archimediella* SACCO, 1895
Archimediella cf. *subangulata* (BROCCHI, 1814)
(pl. 35 : 1)

Material. — One incomplete specimen.

Dimensions: shell 14 mm high, 5 mm wide (ZPAL Ga IV/31)

Description. — Shell with convex and tightly coiled whorls. Ornamentation distinct, comprising bands densely spaced and oriented parallel to suture; bands of the first and second order may be identified. Sutures slightly depresses.

Remarks. — The specimen, although incomplete, is similar to *Archimediella subangulata* (BROCCHI). The specimen described from the Antarctica may be compared with that figured by RASMUSSEN (1968) in pl. 8, fig. 8. The Danish specimens (RASMUSSEN 1968) of this species are incomplete but it may be stated that varying in appearance.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Denmark, northern FRG, Spain, Italy, Hungary and Poland.

Superfamily *Scalacea* BRODERIP, 1829
Family *Epitoniidae* S. S. BERRY, 1910
Genus *Scalina* CONRAD, 1865
Scalina whitei (KEEN, 1943)
(pl. 33 : 5)

1943. *Ferminoscala whitei* KEEN; A. M. KEEN, 46, pl. 4 : 32, 33.

1970. *Scalina whitei* (KEEN); W. O. ADDICOTT, 57, pl. 3 : 20, 25—28.

Material. — One specimen.

Dimensions: shell 26 mm high, 13 mm wide (ZPAL Ga IV/39)

Description. — Shell small, with strongly convex, ornamented whorls. All the whorls ornamented with 5—6 riblets, well developed and oriented parallel to sutures, and striae cutting the riblets under right angle and giving rise to origin of reticulate structure. The last whorl with elongate aperture. Apertural lips damaged. Umbilicus obscure.

Remarks. — The specimen from Antarctica is almost identical with those assigned to *Scalina whitei* (KEEN) by ADDICOTT (1970) in ornamentation and dimensions.

Occurrence. — King George Island, Melville Peninsula (locality III), Cape Melville Formation, Lower Miocene. Known from the Middle Miocene of the USA.

Superfamily *Naticacea* FORBES, 1838
Family *Naticidae* FORBES, 1838
Genus *Natica* SCOPOLI, 1777
Natica (Natica) tigrina DEFRANCE, 1825
(pl. 34 : 4, 7a, b, 9a, b, 10a, b, 11a, b, 12a, b, 13)

1952. *Natica (Natica) tigrina* DEFRANCE; M. GLIBERT, 74, pl. 5 : 13 (for synonymy see M. GLIBERT 1952).

Material. — Six well-preserved specimens.

Dimensions: shell 40 mm long and 35 mm wide (ZPAL Ga IV/17)
shell 24 mm high and 22 mm wide (ZPAL Ga IV/18)
shell 32 mm high and 30 mm wide (ZPAL Ga IV/19)
shell 26 mm high and 20 mm wide (ZPAL Ga IV/22)
shell 27 mm high and 11 mm wide (ZPAL Ga IV/23)
shell 29 mm high and 25 mm wide (ZPAL Ga IV/29)

Description. — Shells with highly convex and tightly coiled whorls. Apical part somewhat damaged in some specimens. Suture distinct, slightly depressed. The last whorl very high, equal over three-fourth of shell height. Umbilicus clearly marked, deep. Aperture large, elongate. Both apertural lips damaged in all the specimens.

Remarks. — The specimens from Antarctica are almost identical with those from the Miocene of Belgium, assigned to *Natica (Natica) tigrina* DEFRANCE by GLIBERT (1952, fig. 3b and pl. 5 : 13) and insignificantly different from the holotype.

Occurrence. — King George Island, Melville Peninsula (localities I and III), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Belgium and Upper Miocene of France.

Natica sp.

(pl. 34 : 1, 6, 8)

Material. — Three damaged specimens.

Dimensions: shell 34 mm high and 35 mm wide (ZPAL Ga IV/21)

shell 18 mm high and 19 mm wide (ZPAL Ga IV/24)

shell 13 mm high and 14.5 mm wide (ZPAL Ga IV/32)

Description. — Shell wider than high. The last whorl very high, equal over three-fourth of shell height, similarly as apical part damaged in the specimens available. Aperture outline elongate. Umbilicus poorly visible.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene.

Genus *Margarites* GRAY, 1848

Margarites semiornata ZINSMEISTER, 1983

(pl. 34 : 2a, b, 3, 5)

1983. *Margarites semiornata* ZINSMEISTER; W. J. ZINSMEISTER, 1289, fig. 2A—D.

Material. — Three specimens.

Dimensions: shell 5.4 mm high and 7.5 mm wide (ZPAL Ga IV/45)

shell 7 mm high and 9 mm wide (ZPAL Ga IV/46)

shell 22 mm high and 11 mm wide (ZPAL Ga IV/47)

Description. — Shell small, sometimes wider than high, with convex whorls. Sutures poorly visible; apex flattened. Shell surface clearly depressed close to axial depression. Aperture ovate in outline.

Remarks. — The specimens from Antarctica are most similar to the paratype of *M. semiornata* ZINSMEISTER, figured under the symbol BD by ZINSMEISTER (1983). The former are somewhat flattened but their shape and character of whorls, apex and aperture fully correspond to those of the holotype of this species, described from the Paleocene of California.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I). Cape Melville Formation, Lower Miocene. The species is known from the Paleocene of the USA.

Superfamily *Strombacea* SWAINSON, 1840

Family *Struthiolariidae* MARWICK, 1924

Genus *Perissodonta* MARTENS, 1878

Perissodonta cf. *exilis* (PARTSCH, 1856)

(pl. 35 : 4a, b)

Material. — One specimen.

Dimensions: shell 23 mm high and 15 mm wide (ZPAL Ga IV/12)

Description. — Shell low, bulgy. The last of five traceable whorls very large, equal three-fourth of shell height. Sutures distinct. Ornamentation consisting of bands passing parallel to sutures, and fine striae cutting them at right angle, best traceable at the last whorl. Lower sides of all the whorls tuberculated. The last whorl ending with ovate, elongate aperture.

Remarks. — The specimen from Antarctica is very close to those of *Purpura exilis* PARTSCH, described by HÖRNES (1856) and FRIEDBERG (1911). Recently ZINSMEISTER and CAMACHO (1980) showed that this species should be allocated in the genus *Perissodonta* MARTENS because of the character of shell outline, ornamentation of whorls, and dimensions. Some authors (e. g., The Catalogue of Fossils, Tertiary, 1977) assigned the species to the genus *Thais* but this has to be questioned as species of that genus are characterized by massive, bulgy shape and heavy ribbing, and those of *Perissodonta* — by fine riblets and relatively small size. The specimen from Antarctica is tentatively assigned to *Perissodonta exilis* (PARTSCH), because of its poor preservation.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Poland and FRG.

Family **Aporrhaidae** ADAMS, 1858

Genus *Aporrhais* COSTA, 1778

?*Aporrhais* sp.

(pl. 33 : 2a, b)

Material. — One damaged specimen.

Dimensions: shell fragment 42 mm high and 37 mm wide (ZPAL Ga IV/50)

Description. — Shell with unproportionally developed outer apertural lip and convex, smooth whorls. The last whorl very high and ending with long, widened aperture. Outer lip damaged. Apical whorls missing. Sutures clearly depressed.

Remarks. — The specimen resembles those of the genus *Aporrhais* COSTA, 1778 in shape of shell and prominent outer apertural lip. However, its preservation is insufficient for assigning it to this genus without reservation.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene.

Superfamily **Doliacea**

Family **Ficidae (= Pyrulidae)**

Genus *Ficus* ROEDING, 1798

Ficus (Ficus) sp.

(pl. 35 : 9)

Material. — Two poorly preserved specimens.

Dimensions: shell 25 mm high and 13 mm wide (ZPAL Ga IV/48); fragment of shell 40 mm high and 29 mm wide (ZPAL Ga IV/49)

Description. — Shell bulgy, with damaged apical part. The last whorl very high, equal almost the whole height of shell. Aperture elongate, narrow.

Remarks. — The specimen described may be compared with those of the Miocene species *Ficus (Ficus) simplex* (BEYRICH), but its preservation renders more accurate identification hazardous. The other specimen is flattened.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene.

Superfamily **Buccinacea** RAFINESQUE, 1815

Family **Buccinidae** LATREILLE, 1825

Genus *Liomesus* STIMPSON, 1865

Liomesus cf. *fossulatus grippi* HINSCH, 1953

(pl. 35 : 5a, b, 8, 12)

Material. — Three specimens.

Dimensions: shell 25 mm high and 13 mm wide (ZPAL Ga IV/10)

shell 16 mm high and 11 mm wide (ZPAL Ga IV/37)

shell 20 mm high and 14 mm wide (ZPAL Ga IV/38)

Description. — Shell with strongly convex whorls and distinct, depressed sutures. Whorls ornamented with well visible riblets, passing parallel to sutures. The last whorl very large, equal almost three-fourth of whorl height and ending with aperture ellipsoidal in outline and with well marked siphonal channel. Umbilicus obscure.

Remarks. — The specimens from Antarctica are somewhat damaged, which precludes more accurate identification.

Occurrence. — King George Island, Melville Peninsula (locality III), Cape Melville Formation, Lower Miocene. The species *Liomesus fossulatus grippi* HINSCH is known from the Miocene of northern FRG, Belgium and the Netherlands.

Genus *Beringius* DALL, 1879

Beringius gazdzickii sp. nov.

(pl. 33 : 7a, b, 8)

Holotype: ZPAL Ga IV/15, pl. 33 : 8.

Type horizon: Cape Melville Formation, Lower Miocene.

Type locality: Melville Peninsula (locality III).

Derivation of the name: In honour of Dr. ANDRZEJ GAŹDZICKI.

Material. — One well-preserved and two fragmentary specimens.

Dimensions: shell 99 mm high, the greatest width — 45 mm (ZPAL Ga IV/15)

Diagnosis. — Shell large, with convex and relatively high whorls. The last whorl ending with distinct, elongate aperture. Siphonal channel short but well marked. Whorl sides finely ornamented.

Description. — Shell large, spindle-shaped, with high, uniformly convex whorls. Whorl sides ornamented with numerous fine striae passing parallel to sutures. Sutures distinct, depressed. The last whorl very high, ending with large, elongate aperture. Siphonal channel short. Umbilicus obscure.

Remarks. — *Beringius gazdzickii* sp. nov. is most similar to *B. crebricostatus* DALL (1879), differing in elongate large aperture, uniformly convex whorls, and larger size.

Occurrence. — King George Island, Melville Peninsula (locality III), Cape Melville Formation, Lower Miocene.

Genus *Sipho* BRUGUIÈRE, 1792

Sipho sp.

(pl. 33 : 6a, b)

Material. — Two poorly preserved specimens.

Dimensions: shell 45 mm high and 25 mm wide (ZPAL Ga IV/13)

shell 45 mm high and 22 mm wide (ZPAL Ga IV/14)

Description. — Shell incomplete (without apical whorls), with relatively high, convex whorls. Sutures distinct, depressed. Whorl sides display traces of riblets oriented parallel to sutures. The last whorl with elongate aperture. Umbilicus obscure.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. Species of this genus are known from the Eocene, Oligocene and Miocene.

Genus *Neptunea* BOLTEN, 1798

Neptunea despecta cobboldiae HARMER, 1919

(pl. 31 : 1, 2)

1914—19. *Neptunea despecta* (LINNÉ) var. *Cobboldiae* HARMER; F. W. HARMER, 164, pl. 18 : 8, 9.

Material. — Two specimens.

Dimensions: shell 35 mm high and 22 mm wide (ZPAL Ga IV/34)

shell 35 mm high and 20 mm wide (ZPAL Ga IV/35)

Description. — Shell conical, with whorls arranged step-wise. The last whorl equal over a half of shell height. The whole shell ornamented with distinct riblets parallel to sutures, as well as poorly visible second-order riblets. Sutures markedly depressed. Umbilicus missing.

Remarks. — The specimens from Antarctica do not differ from those from the Pliocene of England (Newbourman Crag), especially the form figured by HARMER (1919, pl. 18 : 9). The species, represented by some subspecies in Norway, Finland, Lofoten Is., Spitsbergen and Greenland, occurs up to present.

Occurrence. — King George Island, Melville Peninsula (locality III), Cape Melville Formation, Lower Miocene.

?*Neptunea* sp.

(pl. 31 : 3a, b)

Material. — Two fragmentary specimens.

Dimensions: specimens representing two whorls 35 mm high and 31 mm wide (ZPAL Ga IV/9)

shell fragment 99 mm long and 45 mm wide (ZPAL Ga IV/16)

Description. — A fragment of shell with convex whorls ornamented with riblets passing parallel to sutures. Sutures distinct, depressed. Whorl section triangular.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene.

Genus *Buccinaria* KITTIL, 1887

Buccinaria sp.

(pl. 32 : 3, 5)

Material. — Two damaged specimens.

Dimensions: shell 43 mm high and 20 mm wide (ZPAL Ga IV/29)

shell 32 mm high and 16 mm wide (ZPAL Ga IV/30)

Description. — Shell long, spindle-shaped, with convex whorls. Ornamentation of whorls obliterated. Sutures depressed, poorly visible. The last whorl high, with highly elongate aperture. Umbilicus obscure.

Remarks. — The specimens from Antarctica are most similar to those of *Buccinaria* (*Ooto-*

mella) *Ilochooenensis* MAC NEIL (1960), differing in larger size, outline of aperture, and higher whorls.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. The species of this genus are known from the Miocene of Europe and North America.

Family *Nassaridae* IREDALE, 1916

Genus *Nassarius* DUMERIL, 1806

Nassarius (*Zeuxis*) cf. *subbalteatus* MAC NEIL, 1960

(pl. 35 : 11)

Material. — One somewhat damaged specimen.

Dimensions: shell 28 mm high and 15 mm wide (ZPAL Ga IV/11)

Description. — Shell conical, bulgy, with strongly convex whorls and somewhat obliterated ornamentation. Sutures depressed, poorly visible. The last whorl ending with ovate aperture. Apertural lips damaged. Umbilicus obscure.

Remarks. — The specimen from Antarctica is somewhat larger than the holotype (shell of the holotype is 16.2 mm long) but resembles it in shape of shell, convexity of whorls and ornamentation, mainly differing in size.

Occurrence. — King George Island, Melville Peninsula (locality II), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Japan.

Family *Columbellidae* TROSCHER, 1852

Genus *Mitrella* RISSO, 1826

Mitrella sp.

(pl. 35 : 2)

Material. — One incomplete specimen.

Dimensions: shell (without apical part) 13 mm high and 8 mm wide (ZPAL Ga IV/42)

Description. — Shell small, spindle-shaped, with flat whorls. Sutures indistinct, depressed. The last whorl ending with narrow elongate aperture. Apertural lips damaged. Umbilicus obscure.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. Species of this genus are known from the Eocene of several parts of the world.

Superfamily *Fascioliaceae*

Family *Fascioliidae*

Genus *Streptochetus* COSSMANN, 1899

Streptochetus abruptus (BEYRICH, 1856)

(pl. 35 : 13a, b)

1856. *Fusus abruptus* BEYRICH; E. BEYRICH, 286.

1968. *Streptochetus abruptus* (BEYRICH); L. B. RASMUSSEN, 149, pl. 13 : 7, pl. 16 : 1, 2, 5, 6.

Material. — One specimen with damaged apical part.

Dimensions: shell (without apical part) 40 mm high and 21 mm wide (ZPAL Ga IV/33).

Description. — Shell elongate, conical, with whorls somewhat convex in middle part.

Sutures distinct. Whorls ornamented with numerous bands varying in width, best preserved in proximity of aperture. The last whorl ending with long aperture. Umbilicus obscure.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Denmark, northern FRG and the Netherlands.

Family **Galeodidae**

Genus *Sycostoma* COX, 1931

Sycostoma sp.

(pl. 31 : 7)

Material. — Two incomplete specimens.

Dimensions: shell 20 mm high and 12 mm wide (ZPAL Ga IV/44)

shell 40 mm high and 23 mm wide (ZPAL Ga IV/49)

Description. — Shell ovate, highly convex. The last whorl strongly inflated, equal almost four-fifths of shell length; the remaining whorls damaged. Aperture elongate, relatively large.

Occurrence. — King George Island, Melville Peninsula (localities I and III), Cape Melville Formation, Lower Miocene. Species of this genus are known from the Tertiary of FRG, USSR, France and Belgium.

Superfamily **Volutacea** RAFINESQUE, 1815

Family **Volutidae** FLEMING, 1822

Genus *Psephaea* CROSSE, 1871

Psephaea (*Miopleiona*) *weaveri* (TEGLAND, 1933)

(pl. 31 : 4—6)

1933. *Miopleiona weaveri* TEGLAND; M. N. TEGLAND, 127, pl. 11 : 1—5.

1970. *Psephaea* (*Miopleiona*) *weaveri* (TEGLAND); W. O. ADDICOTT, 104, pl. 13 : 15, 17, 19.

Material. — Three specimens.

Dimensions: shell (incomplete) 140 mm high and 55 mm wide (ZPAL Ga IV/3)

shell 130 mm high and 65 mm wide (ZPAL Ga IV/2)

shell 115 mm high and 50 mm wide (ZPAL Ga IV/1)

Description. — A fragment of very large shell, displaying three whorls. The last whorl equal almost a half of length of shell, ending with elongate aperture with siphonal channel. Outer lip damaged, inner lip markedly projected outwards. The last whorl smooth; the remaining ones ornamented with massive ribs normal to end passing from one suture to the other. Suture distinct, depressed. Umbilicus obscure.

Remarks. — The specimens from Antarctica are almost identical as those described from the Miocene of California by ADDICOTT (1970), differing in somewhat larger size only.

Occurrence. — King George Island, Melville Peninsula (localities I and IV), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of the USA (California).

Genus *Scaphella* SWAINSON, 1832

Scaphella bolli (KOCH, 1861)

(pl. 33 : 1a, b, 4a, b)

1872. *Voluta* (*Scapha*) *bolli* KOCH; A. KOENEN, 254.

1968. *Scaphella bolli* (KOCH) RASMUSSEN; L. B. RASMUSSEN, 163, pl. 10 : 10, pl. 13 : 9, pl. 16 : 3, 4 (for full synonymy see RASMUSSEN 1968).

Material. — Two well preserved specimens.

Dimensions: shell 19 mm high and 17 mm wide (ZPAL Ga IV/8)

shell 30 mm high and 19 mm wide (ZPAL Ga IV/58)

Description. — Shells characterized by very sharp apical part and very large last whorl, equal 80% of their length, and strongly convex. Aperture elongate, narrow. Other whorls low, with smooth surface. Sutures obscured by shell of the next whorl, being reflected by gentle depressions at its surface. The second layer of shell characterized by reticular structure when exposed. Umbilicus obscure.

Remarks. — The species *Scaphella bolli* (KOCH) was reported from numerous localities of the Tertiary in Europe, which made possible evaluation of its variability. The specimens from Antarctica are the closest to its holotype and those described from Denmark by RASMUSSEN (1968), differing in slightly smaller dimensions only.

Occurrence. — King George Island, Melville Peninsula (locality III), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Denmark and northern FRG, Upper Miocene of the Netherlands, and Middle Miocene of Belgium.

Family **Olividae** d'ORBIGNY, 1852

Genus *Ancilla* LAMARCK, 1799

Ancilla (Ancilla) obsoleta BROCCHI, 1814

(pl. 35: 6, 7)

1952. *Ancilla (Ancilla) obsoleta* BROCCHI; M. GLIBERT, 113, pl. 8: 14 (for full synonymy see GLIBERT 1952).

Material. — Two specimens.

Dimensions: shell 54 mm high and 21 mm wide (ZPAL Ga IV/52)

shell 51 mm high and 20 mm wide (ZPAL Ga IV/53)

Description. — Shell elongate, conical, with sharp-pointed apical part. Whorls relatively high. Sutures poorly visible. Whorl surface smooth. The last whorl ending with aperture slightly widened in upper part. Siphonal channel well developed. Umbilicus obscure.

Remarks. — According to GLIBERT (1952), the species is characterized by low variability. The specimens from Antarctica appear almost identical with those of GLIBERT which gives further support for this statement.

Occurrence. — King George Island, Melville Peninsula (locality II), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Belgium, Switzerland, France and Poland.

Family **Cancellariidae** H. and A. ADAMS, 1853

Genus *Cancellaria* LAMARCK, 1799

Cancellaria (Charcolleria) cf. terryi OLSSON, 1942

(pl. 35: 14)

Material. — One damaged specimen.

Dimensions: shell 39 mm high and 20 mm wide (ZPAL Ga IV/36)

Description. — Shell conical, with strongly convex whorls. Sutures distinct, depressed. Surface of whorls damaged in several places. Ornamentation of the first three apical whorls obliterated, except for relic outlines of riblets and reticular structure. The last whorl large, ending with elongate aperture. Siphonal channel damaged.

Occurrence. — King George Island, Melville Peninsula (locality II), Cape Melville Formation, Lower Miocene. The species known from the Miocene of the USA.

Cancellaria sp.
(pl. 35 : 10a, b)

Material. — One poorly preserved specimen.

Dimensions: shell fragment 25 mm high and 21 mm wide (ZPAL Ga IV/51)

Description. — Mould of two incomplete whorls. The last whorl relatively high and strongly convex. Whorls arranged step-wise. Suture deep, distinct. Aperture elongate in outline.

Occurrence. — King George Island, Melville Formation (Crab Creek locality, I), Cape Melville Formation, Lower Miocene.

Superfamily **Conacea**
Family **Turridae** FISCHER, 1887
Genus *Austrotoma* FINLAY, 1924
Austrotoma antarctica sp. nov.
(pl. 32 : 11, 12a, b)

Holotype: ZPAL Ga IV/4, pl. 32 : 12a, b.

Type horizon: Cape Melville Formation, Lower Miocene.

Type locality: Melville Peninsula (locality III).

Derivation of the name: After Antarctica.

Material. — Five well-preserved specimens.

Dimensions: shell 95 mm high and 45 mm wide (ZPAL Ga IV/4)

shell 41 mm high and 24 mm wide (ZPAL Ga IV/5)

shell (incomplete) 69 mm high and 35 mm wide (ZPAL Ga IV/6)

shell (incomplete) 62 mm high and 32 mm wide (ZPAL Ga IV/7)

Diagnosis. — Shell large, conical. Whorls wide, step-wise arranged; the last whorl very wide, ending with elongate aperture with siphonal channel. Whorl sides ornamented.

Description. — Shells massive, large, conical. Whorls high, with a break of surface at the angle of about 45° in the middle. The break divides the surface into two parts: a vertical and inclined. All the whorls ornamented with bands of the first and second order, varying in convexity but generally clearly marked, as well as parallel striae, marked between them. The last whorl very large, equal a third of length of shell and ending with elongate aperture. A fragment of siphonal channel visible in lower part of aperture.

Remarks. — *Austrotoma antarctica* sp. nov. is the closest to *A. nervosa* POWELL (1942), differing from the latter in dimensions and ornamentation. The largest specimens of *A. nervosa* are up to 44 mm long, and those of *A. antarctica* — 95 mm long. Vertical parts of whorl sides of *A. nervosa* are ornamented with uniform, thick bands, and the inclined — with uniform, fine and densely spaced ones, and in *A. antarctica* both the former and latter are ornamented with bands assignable to the first and second order. The species also differ in angle of break of the whorl surface.

Occurrence. — King George Island, Melville Peninsula (locality III), Cape Melville Formation, Lower Miocene. Species of the genus *Austrotoma* are mainly known from the Miocene.

Genus *Aforia* DALL, 1889
Aforia clallamensis (WEAVER, 1916)
(pl. 31 : 8)

1916. *Turris clallamensis* WEAVER; C. E. WEAVER, 52, pl. 4 : 59.

1963. *Aforia clallamensis* (WEAVER); E. J. MOORE, 47, pl. 10 : 16, 18.

Material. — Two specimens.

Dimensions: shell 50 mm high and 26 mm wide (ZPAL Ga IV/27)

shell 33 mm high and 25 mm wide (ZPAL Ga IV/28)

Description. — Shell conical, with relatively high whorls. Whorls strongly convex in the middle which gives rise to a convexity marked as a dorsal swelling parallel to sutures. Sutures distinct, depressed. The last whorl two times larger than the remaining ones, ending with aperture subtriangular, elongate in outline. Aperture with short siphonal channel. Apical part damaged.

Remarks. — The specimens of *A. clallamensis* (WEAVER) from Antarctica do not differ from those described from the Astoria Formation (Oregon, USA) by MOORE (1963).

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. The species is known from the Oligocene and Miocene of the USA.

Superfamily Cylichnacea ADAMS, 1850

Family Cylichnidae ADAMS, 1850

Genus *Scaphander* MONTFORT, 1810

Scaphander yonabaruensis MAC NEIL, 1960

(pl. 35 : 3)

1960. *Scaphander yonabaruensis* MAC NEIL; F. S. MAC NEIL, 128, pl. 6:28.

Material. — One specimen.

Dimensions: shell 11 mm high and 5 mm wide (ZPAL Ga IV/26)

Description. — Shell small, cylindrical, somewhat widened in anterior part. Apex blunt, narrowed. Outer shell layer damaged. Aperture elongate, relatively high.

Remarks. — The specimen from Antarctica is almost identical with the holotype, differing in somewhat larger size only.

Occurrence. — King George Island, Melville Peninsula (Crab Creek locality, I), Cape Melville Formation, Lower Miocene. The species is known from the Miocene of Japan (Okinawa).

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EXPLANATIONS OF THE PLATES 31—35

All specimens are from Melville Peninsula; Cape Melville Formation, Lower Miocene.

PLATE 31

Neptunea despecta cobboldiae (HARMER)

1. Side view, $\times 2$; ZPAL Ga — IV/35, locality III.
2. Side view, $\times 1$; ZPAL Ga — IV/34, locality III.

?Neptunea sp.

- 3a. Fragment of shell, side view; *a* apertural view, $\times 1$; ZPAL Ga — IV/9, locality I.

Psephaea (Miopleiona) weaveri (TEGLAND)

4. Side view, $\times 1$; ZPAL Ga — IV/1, locality I.
5. Apertural view, $\times 1$; ZPAL Ga — IV/3, locality IV.
6. Side view, $\times 1$; ZPAL Ga — IV/2, locality I.

Sycostoma sp.

7. Apertural view, $\times 2$; ZPAL Ga — IV/44, locality III.

Aforia clallamensis (WEAVER)

8. Apertural view, $\times 1$; ZPAL Ga — IV/27, locality I.

PLATE 32

Turritella ocoyana CONRAD

1. Apertural view, $\times 1$; ZPAL Ga — IV/55, locality II.
2. Side view, $\times 1$; ZPAL Ga — IV/54, locality II.
10. Apertural view, $\times 1$; ZPAL Ga — IV/56, locality III.

Buccinaria sp.

3. Apertural view, $\times 1$; ZPAL Ga — IV/29, locality I.
5. Side view, $\times 2$; ZPAL Ga — IV/30, locality I.

Cerithium sp.

- 4a. Apertural view, *b* side view $\times 1$; ZPAL Ga — IV/60, locality I.
9. Apertural view, $\times 2$; ZPAL Ga — IV/59, locality III.

Turritella sp.

- 6. Internal mould, $\times 2$; ZPAL Ga — IV/40, locality V.
- 7. Internal mould, $\times 2$; ZPAL Ga — IV/41, locality I.
- 8. Side view, $\times 2$; ZPAL Ga — IV/43, locality I.

Austrotoma antarctica sp. nov.

- 11. Side view, $\times 2$; ZPAL Ga — IV/5, locality I.
- 12a. Side view; *b* apertural view, $\times 1$; ZPAL Ga — IV/4 holotype, locality I.

PLATE 33

Scaphella bolli (KOCH)

- 1a. Apertural view; *b* apical view, $\times 2$; ZPAL Ga — IV/8, locality III.
- 4a. Apertural view; *b* side view, $\times 2$; ZPAL Ga — IV/58, locality III.

?Aporrhais sp.

- 2a. Apertural view; *b* side view, $\times 2$; ZPAL Ga — IV/50, locality I.

Gibbula sp.

- 3a. Apertural view; *b* apical view, $\times 2$; ZPAL Ga — IV/57, locality I.

Scalina whitei (KEEN)

- 5. Apertural view, $\times 2$; ZPAL Ga — IV/39, locality III.

Sipho sp.

- 6a. Side view, $\times 1$; *b* apertural view; $\times 2$; ZPAL Ga — IV/14, locality I.

Beringius gądzicki sp. nov.

- 7a. Side view, $\times 1$; *b* apertural view, $\times 2$; ZPAL Ga — IV/13, locality I.
- 8. Apertural view, $\times 1$; ZPAL Ga — IV/15, holotype, locality III.

PLATE 34

Natica sp.

- 1. Umbilical view, $\times 2$; ZPAL Ga — IV/24, locality III.
- 6. Apical view, $\times 1$; ZPAL Ga — IV/21, locality III.
- 8. Side view, $\times 1$; ZPAL Ga — IV/32, locality I.

Margarites semiornata ZINSMEISTER

- 2a. Apical view; *b* side view × 1; ZPAL Ga — IV/32.
- 3. Apical view, × 2; ZPAL Ga — IV/47.
- 5. Side view, × 2; ZPAL Ga — IV/45, all from locality I.

Natica (Natica) tigrina DEFRANCE

- 4. Apical view, × 2; ZPAL Ga — IV/23, locality III.
- 7a. Apical view; *b* side view, × 2; ZPAL Ga — IV/20, locality I.
- 9a. Apical view; *b* side view, × 1; ZPAL Ga — IV/17, locality I.
- 10a. Apertural view, *b* apical view × 1; ZPAL Ga — IV/25, locality I.
- 11a. Apertural view, × 1; *b* apical view, × 2; ZPAL Ga — IV/19, locality I.
- 12a. Side view; *b* apical view × 2; ZPAL Ga — IV/18, locality III.
- 13. Side view, × 2; ZPAL Ga — IV/22, locality III.

PLATE 35

Archimediella cf. *subangulata* (BROCCHI)

- 1. Side view, × 2; ZPAL Ga — IV/31, locality III.

Mitrella sp.

- 2. Apertural view, × 2; ZPAL Ga — IV/42, locality I.

Scaphander yonabaruensis MAC NEIL

- 3. Apertural view, × 2; ZPAL Ga — IV/26, locality III.

Perissodonta cf. *exilis* (PARTSCH)

- 4a. Side view; *b* apertural view, × 2; ZPAL Ga — IV/12, locality III.

Liomesus cf. *fossulatus grippi* HINSCH

- 5a. Apertural view; *b* side view, × 2; ZPAL Ga — IV/37.
- 8. Apertural view; × 2; ZPAL Ga — IV/38.
- 12. Side view; × 2; ZPAL Ga — IV/10, all from locality III.

Ancilla (Ancilla) obsoleta BROCCHI

- 6. Side view, × 1; ZPAL Ga — IV/52, locality II.
- 7. Apertural view, × 1; ZPAL Ga — IV/53, locality II.

Ficus (Ficus) sp.

- 9. Side view, × 1; ZPAL Ga — IV/49, locality I.

Cancellaria sp.

10a. Fragment of shell; *b* side view, $\times 1$; ZPAL Ga — IV/51, locality I.

Nassarius (*Zeuxis*) cf. *subbalteatus* MAC NEIL

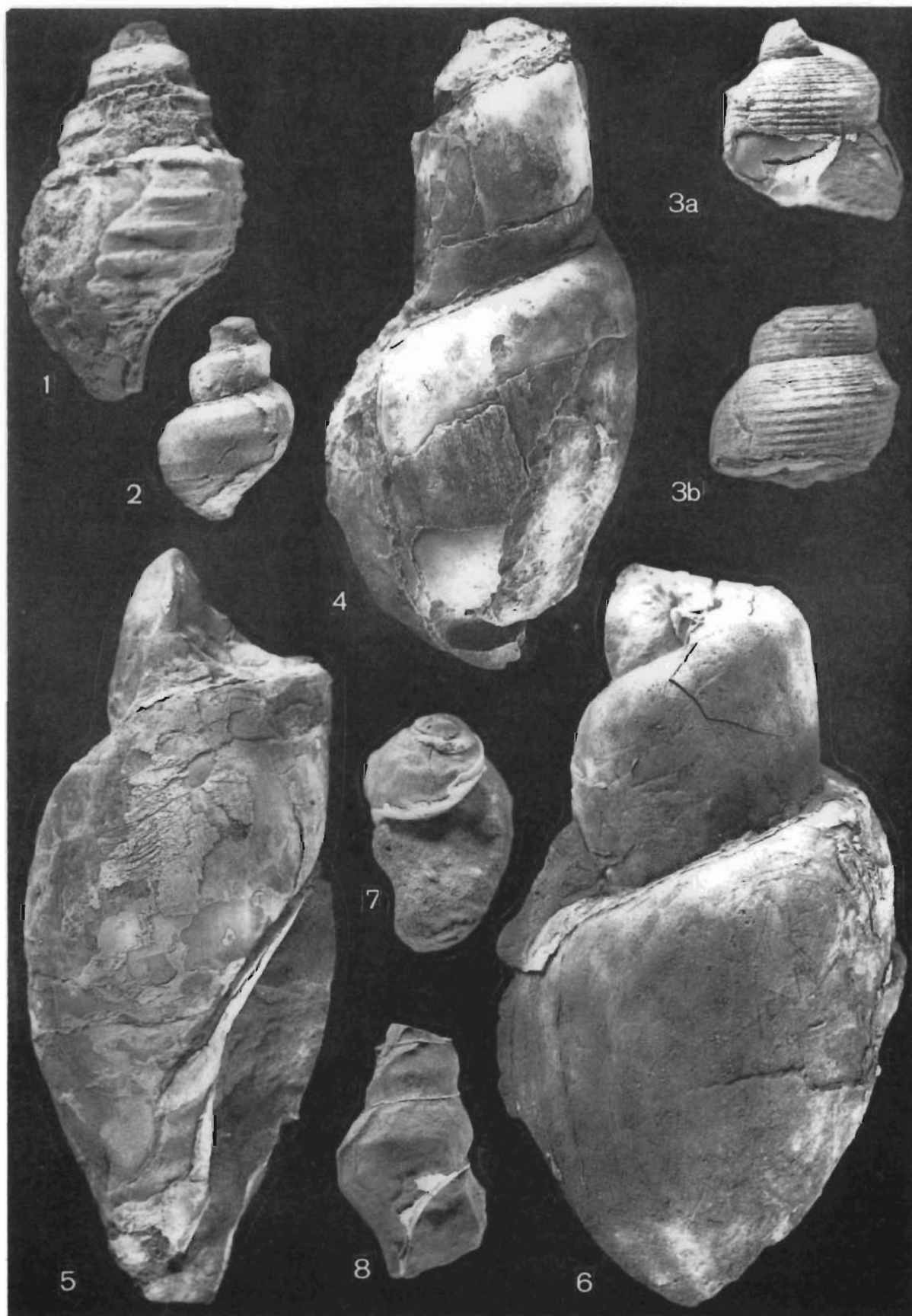
11. Apertural view, $\times 2$; ZPAL Ga — IV/11, locality II.

Streptochetus abruptus (BEYRICH)

13a. Apertural view; *b* side view, $\times 2$; ZPAL Ga — IV/33, locality I.

Cancellaria (*Charcolleria*) cf. *terryi* OLSSON

14. Side view, $\times 2$; ZPAL Ga — IV/36, locality II.



L. KARCZEWSKI: GASTROPODS FROM THE CAPE MELVILLE FM.

