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

(Plates 25—30)

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Three new species of polychaete jaw apparatuses from glacio-marine sediments of Cape Melville Formation (Lower Miocene) are reconstructed and described: *Ophryotrocha antarctica* sp. n., *Drilonereis polaris* sp. n., and *Lumbrineris fossilis* sp. n. Incomplete jaw apparatuses: *Ophryotrocha* sp. A and *Ophryotrocha* sp. B, and isolated jaws of *Glycera* sp. are also described. Fossil jaw apparatus of juvenile ontogenetic stage of *Ophryotrocha* CLAPERÈDE et METSCHNIKOV is here reported for the first time. Comparative analysis of fossil and Recent jaw apparatuses from Antarctic seas is given.

Key words: Polychaeta, scolecodonts, Cape Melville Formation, Miocene, Recent, King George Island, Antarctica.

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SZCZĘKI WIELOSZCZETÓW Z OSADÓW FORMACJI CAPE MELVILLE (DOLNY MIOCEN) WYSPI KRÓLA JERZEGO, ANTARKTYKA ZACHODNIA

Streszczenie. — W pracy opisano skolekodonty z lodowcowo-morskich osadów dolnomiocenickich Wyspy Króla Jerzego w Antarktyce Zachodniej. Na podstawie izolowanych i połączonych elementów zrekonstruowano trzy aparaty szczękowe wieloszczetów i ustanowiono trzy nowe gatunki: *Ophryotrocha antarctica* sp. n., *Drilonereis polaris* sp. n. oraz *Lumbrineris fossilis* sp. n. Ponadto opisano aparaty młodocianych osobników *Ophryotrocha* sp. oraz szczęki i podpory z rodzaju *Glycera* SAVIGNY. Opisano także kilka izolowanych szczęk należących do nieokreślonej rodziny wieloszczetów. Kopalne aparaty szczękowe z rodzajów *Drilonereis* CLAPERÈDE i *Lumbrineris* BLAINVILLE nie były dotychczas znane. Aparat szczękowy *Lumbrineris fossilis* sp. n. jest pierwszym przykładem aparatu kopalnego o budowie typu labidognatha należącego do współczesnej rodziny wieloszczetów. Wszystkie opisane

skolekodonty są bardzo zbliżone do elementów aparatów szczękowych wieloszczetów współczesnych i mezozoicznych, natomiast różnią się znacznie od paleozoicznych. Przedyskutowano możliwość odtworzenia linii ewolucyjnych niektórych wieloszczetów współczesnych oraz możliwość łączenia parataksonomii izolowanych skolekodontów z systematyką naturalną wieloszczetów.

INTRODUCTION

Fossil polychaete jaw apparatuses were hitherto almost completely unknown from the Cenozoic. Although isolated scolecodonts were described from Eocene flysch sediments in France (JAN du CHÊNE and GORIN 1974) and various members of the Cenozoic in Jamaica (GERMERAAD 1980), they were assigned to parataxonomic genera established for isolated Paleozoic jaws. Good preservation of the here described material, especially the jaws joined in natural arrangement, made possible the reconstruction of jaw apparatuses and their comparison with Mesozoic and Recent forms and a further attempt to combine the parataxonomy of isolated jaws and the natural systematics of polychaetes.

Field sampling was carried out by A. GAŹDZICKI and R. WRONA during the Fifth Polish Antarctic Expedition 1980—1981, led by Professor K. BIRKENMAJER. The field work and this study have been carried out under the auspices of the Research Project MR. I. 29 of the Polish Academy of Sciences.

A collection of Recent polychaetes from the Admiralty Bay of King George Island was made available for comparative studies through the courtesy of Dr. J. SICIŃSKI (Institute of Environmental Biology, Łódź University).

The SEM micrographs were taken at the Laboratory of Electron Microscopy of the Nencki's Institute of Experimental Biology, Warsaw.

The collection of polychaete jaws is housed in the Institute of Paleobiology, Polish Academy of Sciences, Warsaw (abbr. ZPAL).

GEOLOGICAL SETTING

King George Island is the outermost, north-eastern element of the South Shetland Islands arc in Western Antarctica (fig. 1). The islands are mainly built of volcanic, intrusive, and pyroclastic rocks. Subordinate occurrences of marine sedimentary rocks are known from King George Island and Livingston Island (see: SMELLIE *et al.* 1984, BIRKENMAJER 1985, 1987, this volume). Glacio-marine sediments of the Cape Melville Formation, in which fossil polychaete jaws were found, crop out along very narrow and long Melville Peninsula, the easternmost part of the King George Island (fig. 1). The formation is represented by 200 m sequence of almost flat lying, highly fossiliferous shales with intercalations of siltstones, marls, and sandstones (BIRKENMAJER 1982, 1984, 1987 this volume, GAŹDZICKI and WRONA 1982, BIRKENMAJER *et al.* 1983). Scolecodonts are accompanied by numerous microfossils: coccolithophorinales, diatoms, chryomonad cysts, silicoflagellates, and calcareous and arenaceous foraminifers (GAŹDZICKI and WRONA 1982), as well as macrofossils: solitary corals (RONIEWICZ and MORYCOWA 1987, this volume), bivalves, gastropods (KARCZEWSKI 1987, this volume), scaphopods, crabs (FÖRSTER *et al.* 1985, 1987, this volume), echinoids (JESIONEK-SZYMAŃSKA 1987, this volume), asteroids, bryozoans, and fish remains. The glacial character of

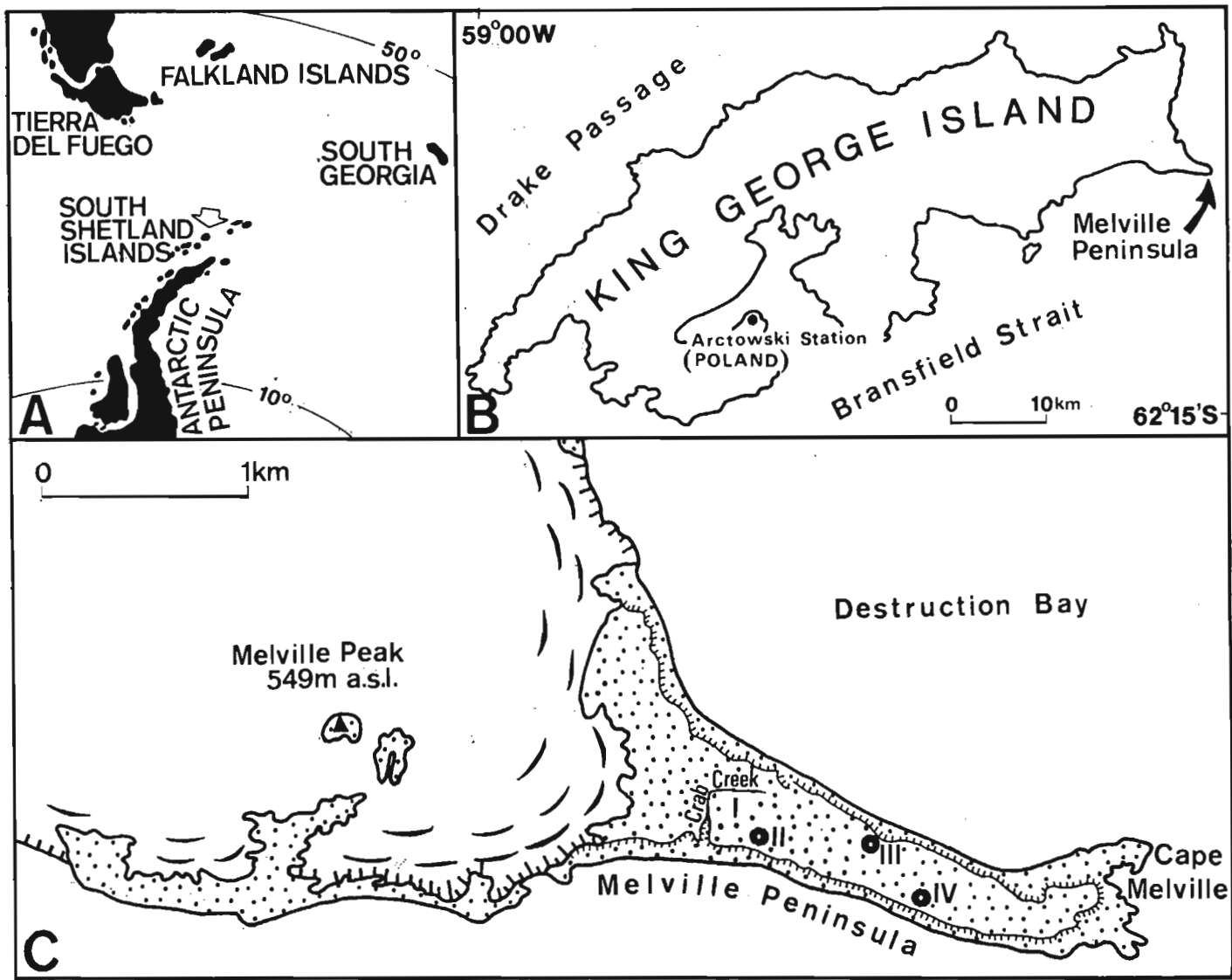


Fig. 1
 Location maps of the King George Island (A), Melville Peninsula (B), and sampled sections I—IV (C).

the sediments of the Cape Melville Formation is evidenced by the presence of numerous dropstones of rocks (up to 2 m in size) known from the Antarctic continent (BIRKENMAJER 1982, 1984, 1985; GAŹDZICKI and WRONA 1982). The strata also yield Cretaceous belemnites (BIRKENMAJER *et al.* 1987, this volume), and calcareous nannoplankton (DUDZIAK 1984).

The whole sequence of the Cape Melville Formation is cut by numerous basalt and andesite dykes. The dykes have been dated with the use of K-Ar method at about 20 Ma, i. e. Lower Miocene, so the sedimentary rocks must be still older (BIRKENMAJER *et al.* 1985).

MATERIAL

The polychaete jaws described below come from the residuum of mainly marly and calcareous nodules and burrow casts etched with 10% acetate acid. The burrow casts are formed of compact marly bituminous limestone which also yields numerous micro- and macro-fossils (see Geological Setting). Nodules were gathered at the erosional surface of the Melville Peninsula (fig. 1) in sections I—III, where they were exposed by weathering. Polychaete jaws were also etched from samples of a marly siltstone intercalation (sample np. 10) from the section IV, which was systematically sampled. On the whole about 4 kg of the rocks was dissolved to obtain about 60 isolated and joined polychaete jaws.

DISCUSSION

All the scolecodonts described here are similar to jaws of Recent polychaetes. This is not surprising, as most Mesozoic polychaete apparatuses display close phylogenetic affinities with Recent forms. It should be also noted that all the polychaete genera recorded in Miocene sediments from King George Island have their representatives among forms living at present in the Antarctic region (HARTMAN 1964, AVERINCEV 1972). Most of the earlier described Tertiary scolecodonts (JAN du CHÊNE and GORIN 1974, GERMERAAD 1980) probably belong also to Recent genera. Several morphological forms assigned in the above papers to the genus *Anisocerasites* ELLER actually differ from Devonian type species of this genus and, like the scolecodonts placed by the authors in the genus *Staurocephalites* HINDE, almost undoubtedly belong to the Recent family Dorvilleidea CHAMBERLAIN. The specimen described by GERMERAAD (1980 : 17) as Type JAM 2123 of the *Anisocerasites* group most probably does not belong to polychaetes at all whereas affinity of the genus *Paragnathites* JAN du CHÊNE and GORIN with polychaetes is still to be proven. The remaining specimens described in the above papers represent unidentifiable fragments of various scolecodonts.

Identification of the Tertiary forms in the natural taxonomic system fills partly gaps in our knowledge of evolution of polychaetes. The families Dorvilleidae and Arabellidae are known from the Mesozoic. However representatives of the genus *Drilonereis* CLAPARÈDE were still unknown in the fossil state.

Jaws of Recent polychaete families with apparatuses of the labidognath type (Lumbrineridae, Eunicidae and Onuphidae) were completely unknown in the fossil state, which may be due to their lower resistance to weathering (see Remarks on the family Lumbrineridae).

The knowledge of phylogenetic affinities of Meso- and Cenozoic polychaetes with the Paleozoic ones still remains unsatisfactory. The majority of evolutionary lines probably become extinct towards the end of the Paleozoic, which may explain why Mesozoic fauna is less diversified and markedly different from the former. Tertiary polychaetes appear similar to both Mesozoic and Recent forms. The most common scolecodonts in Tertiary rocks are jaws of dorvilleids

and glycerids. Unfortunately, systematic of the isolated scolecodonts of the families is difficult because of the similarity of individual jaws belonging to various apparatuses and, in the case of *Ophryotrocha*, the great ontogenetic variability of the apparatuses. Detailed anatomical-comparative studies on fossil and Recent apparatuses, carried out with the use of SEM, may often appear very helpful. In the case of dorvilleids, which are characterized by very small, multielement and diversified jaw apparatuses the knowledge of details of the structure and ontogenetic development of Recent apparatuses may be of great importance for the systematics of both the Recent and the fossil forms. Unfortunately, most of the jaw apparatuses of the Recent species are still not well known.

The development in anatomical comparative studies on fossil and Recent jaw apparatuses makes possible the gradual replacement of parataxonomy of the isolated scolecodonts with natural systematics of polychaetes. We are convinced that in the future it should appear possible to unite the two systematics in a single system consistent with the zoological code. However, some of the isolated scolecodonts, especially anterior jaws, most probably would remain under terminable to the specific level.

SYSTEMATIC DESCRIPTIONS

Superfamily *Eunicea* SAVIGNY, 1820

Family *Dorvilleidae* CHAMBERLAIN, 1919

Remarks. — This family is mainly known from Recent material. The systematic appears fairly troublesome as the family comprises polychaetes small in size and poorly differentiated in morphology and diagnostic features of individual species and genera are difficult to note. The differentiation of jaw apparatuses is greater than the morphology of body and new systematic revision of that family was recently based on the structure of the apparatuses (JUMARS 1974). Jaw apparatuses of dorvilleids markedly differ from those of all the remaining Recent *Eunicea*. They are composed of numerous denticulated elements arranged in two or four symmetric rows and in some species additional rows of single teeth. One row may comprise up to 40 elements. First maxillae are usually much larger than the remaining ones. Typical carriers are missing but there occur elements similar in shape and function (trägerartiges Kieferorgan of WOLF 1980). Mandibulae usually display denticulated anterior margin and shaft slightly bent outwards and, when connected, look X-like in outline.

Dorvilleidae are regarded as most primitive of Recent *Eunicea* (KIELAN-JAWOROWSKA 1966, DAY 1967). According to KIELAN-JAWOROWSKA (*op. cit.*) they evolved from Early Paleozoic Tetraprionidae. TZETLIN (1980) and IVANOV and TZETLIN (1981) regard them as descendants of Silurian Symmetropirionidae but this view seems poorly substantiated. The knowledge of jaw apparatuses of Mesozoic polychaetes is still insufficient for reliable reconstruction of affinities of the Dorvilleidae and Paleozoic forms. We think that some genera of that family such as *Schistomeringos* JUMARS and *Dorvillea* PARFITT are the closest to the Mochtyellidae. The latest mochtellids are known from the Upper Permian ((SZANIAWSKI 1968) but similar isolated jaws are also known from Cenozoic strata. The latter, assigned to *Staurocephalites* HINDE (JAN du CHÊNE and GORIN 1974, GERMERAAD 1980), may belong to the Dorvilleidae. Undoubted fossil dorvilleids are known from the Lower Jurassic upwards (VAN ERVE 1981). They belong to *Schistomeringos expectatus* SZANIAWSKI and GAŹDZICKI, resembling Recent forms even in the finest morphological details (SZANIAWSKI and GAŹDZICKI 1978), so it may be assumed that this evolutionary line is even older.

Genus *Ophryotrocha* CLAPARÈDE and METSCHNIKOV, 1869

Remarks. — Recent species of this genus (except for one parasitic) comprise forms less than 10 mm in length. High similarity in morphology of different species and small size resulted in numerous errors in systematics. In some cases identification of species appears impossible without studies of reproductive patterns (ÅKESSON 1984).

Representatives of the genus display jaw apparatus markedly different from those of other dorvilleids. They are so different from all other Eunicia apparatuses that in accordance with criteria used in paleontology the genus should be placed in a separate family.

Jaw apparatuses of mature individuals of the majority of species of *Ophryotrocha* are characterized by large forceps-like MI. The remaining maxillae are small, plate-like, finely denticulated and arranged in 2 or 4 rows. The rows comprise relatively small number (usually 7 or 8) elements. MII are connected with MI by a thin shaft. Carrier-like elements adhere MI and adjoin one another along planar surfaces and not inner margins as proper carriers in other apparatuses of Eunicia. Jaw apparatuses of this genus display great changes in structure during ontogeny (see TZETLIN 1980). Two types of structure of the apparatuses, denoted with letters P (primitive) and K (kompliziert) by German authors, are recognized (see MÜLLER 1962). Apparatuses of the P-type (fig. 4) do not display large forceps-like MI whereas anterior maxillae are similar in both types. In some species jaw apparatus remains to be of the P-type throughout the ontogeny, despite of several moults, and in others it changes into the K-type. A change in the type of apparatus structure may also take place due to a change in the sex of an individual. The apparatus of the K-type (fig. 2) represents the final maxillary apparatus and is never moulted again (see KEGEL and PFANNENSTIEL 1983). TZETLIN (1980) described a third type — PP, resembling the P-type in the lack of forceps-like MI and characterized by anterior maxillae arranged in 4 rows with 7 elements in each. When fossil material comprises apparatuses of both the types P and K, difficulties in identifications are impossible to overcome at the present state of knowledge. This is due to the fact that the question whether an apparatus of the P-type belonged to a juvenile individual of the same species as an apparatus of the K-type or to a different species can not be solved. Anterior jaws are of negligible diagnostic value, as they are still insufficiently known, and some data show that they may be similar in different species.

In the fossil state the genus *Ophryotrocha* was hitherto known on the basis of apparatuses of the K-type found in Upper Cretaceous rocks of the Appenines (CORRADINI and SERPAGLI 1968, pl. 1 : 1, 2) and Jurassic of Poland (SZANIAWSKI 1974). The material from the Miocene of King George Island, described here, comprises apparatuses of both the type P and K. Unfortunately, the two best preserved apparatuses of the latter type, with MI and MII pairs, were destroyed during SEM studies.

Ophryotrocha antarctica sp. n.

(pl. 25 : 2—8; pl. 26 : 1, 2; fig. 3)

Holotype: An incomplete maxillary apparatus composed of joined left and right MI and carrier-like elements; pl. 25 : 3, ZPAL Sc. V/1/5.

Type horizon: Cape Melville Formation (Lower Miocene).

Type locality: Melville Peninsula (section no. I), King George Island, Antarctica.

Derivation of the name: after Antarctica, where this species has been found.

Diagnosis. — Final maxillary apparatus of the K-type. Falx MI equal or slightly longer than a third of length of the whole jaws. Basal cavity tripartite. Falx of right MI with splitted point. MII small, with about 8 denticles at anterior margin, situated at a long shaft adhering to basal part of MI.

Material. — In addition to holotype, another apparatus consisting of right MI, carrier-like element and right II, ZPAL Sc. V/2/16; and 20 isolated jaws MI, including 3 with well-preserved carrier-like elements.

Description. — Length of MI (without carrier-like element) varying from 0.2 to 0.36 mm, and the width is equal about 0.20 of length. Falx gently bent in the form of regular arc with point directed inwards, equal or longer than a third of length of the whole jaw. Point of right MI falx split in two in fully grown individuals. Basal part clearly separated from falx with inner margin straight and the outer — slightly arcuate, postero-medially oriented in posterior part and joining the inner margin at posterior end. Pulp cavity tripartite, with three openings situated at outer side of jaw (pl. 26 : 1, 2). Posterior opening the largest, triangular in outline and leading to cavity in basal part of jaw. Central opening the smallest, ovate in outline and situated closer to ventral side. Anterior opening similarly small and ovate as the above, leading to falx cavity. Jaw gently arcuate in lateral view, concave from ventral side. Inner wall of basal jaw part flat, with outline of high isosceles triangle widening towards the base.

Carrier-like element formed by extension of inner wall of the basal part of MI towards the posterior, flat, semicircular in side view, with sharply rounded posterior margin, equal about a quarter of length of jaw. It is inseparable from basal part of MI but well preserved in some elements only. Studies under large magnifications (pl. 26 : 1c) showed that this element differs from jaw by absence of the compact outer layer.

MII in shape of narrow rake with a long shaft adherent to inner wall of basal part of MI, small, plate-like, subtriangular in outline, and with denticulated anterior margin. The only available specimen displays 8 denticles bent perpendicular to the jaw surface and gradually decreasing in size towards outer margin.

Remarks. — *Ophryotrocha antarctica* sp. n. is similar to the Recent *Ophryotrocha* sp. (pl. 25 : 1), known from single specimen collected in Admiralty Bay, King George Island. Soft parts of that specimen were incompletely preserved, which precluded specific identification. Maxillary apparatus of this specimen differs from the above described in the lack of splitting of point of the right falx. A detailed comparison of the shape of the openings of the MI basal cavities is impossible, as they are obscured in the Recent specimen. As far as we know, *O. claparedii* STUDER is the only species of the genus *Ophryotrocha* recorded until now from the Antarctic region (HARTMAN 1964) but the jaw apparatus of this species remains still poorly known.

Ophryotrocha antarctica sp. n. differs from the only fossil species recorded so far, *O. lukowensis* SZANIAWSKI, in a longer falx of MI and its weak separation from the basal part, split point of right falx, and pulp cavity not bi- but tripartite.

Ophryotrocha cf. *antarctica* sp. n.

(pl. 29 : 1, 2)

Material. — Four joined left and right mandibulae ZPAL Sc. V/2/19; ZPAL Sc. V/1/9 and two single ones were found, but two best specimens of joined mandibulae became destroyed in the course of SEM studies.

Description. — The available specimens varying from 0.3 to 0.47 mm in length. Joined mandibulae almost X-like in outline. Left and right mandibulae joined in anterior part almost along a half of length of the specimens, in place where ligament was previously developed. Shafts of the mandibulae gently bent outwards in posterior part. Anterior plates laterally extended with finely denticulated anterior margin (except for its outer section).

Remarks. — Polychaete mandibulae are much scarcer in the fossil state than are the jaws. Up to the present, only a few specimens have been reported from the Mesozoic: mandibulae preserved along with imprints of soft parts from the Solenhofen limestones in Bavaria (EHLERS, 1869), a single specimen of isolated joined mandibulae from the Cretaceous of France, descri-

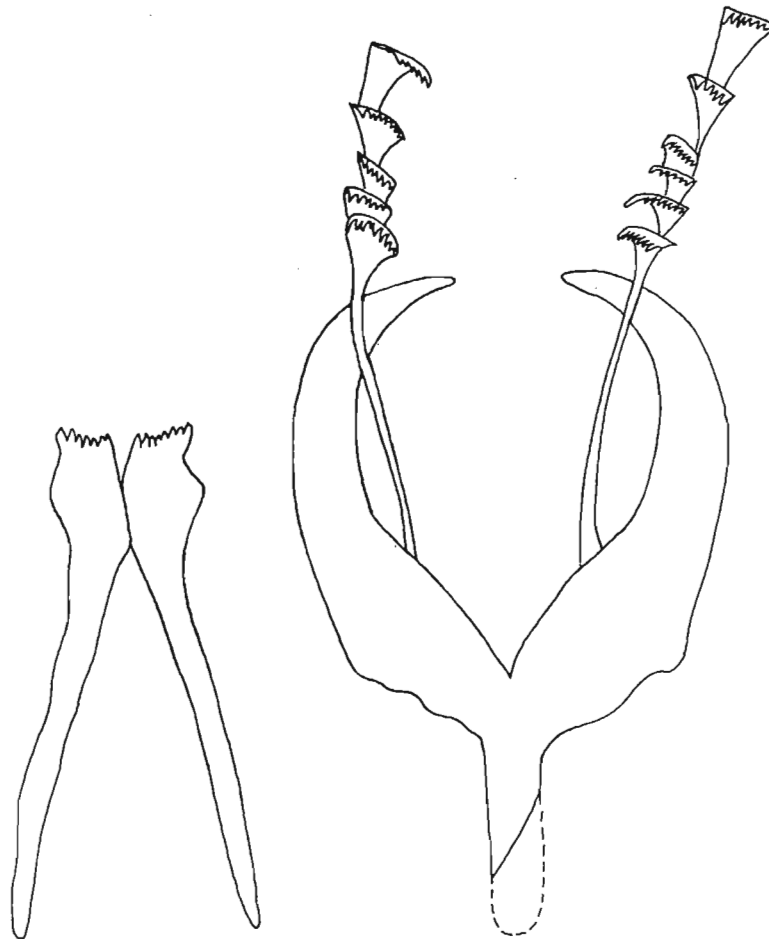


Fig. 2

Diagram of K-type jaw apparatus of the mature *Ophryotrocha puerilis* CLAP. et METSCHN. Mandibles and maxillary apparatus in dorsal view. Recent (original drawing after micrograph of DÜSING 1961, fig. 1 d).

bed as *Diopatraites cretaceous* within the frame of parataxonomic system (DEFLANDRE and TAUGORDEAU, 1969), three single mandibulae from the Jurassic of Poland, tentatively assigned to apparatus *Arabella diversimaxillata*, reconstructed on the basis of material found in the same strata (SZANIAWSKI and GAŹDZICKI, 1978), and a single unidentifiable mandibula from the Middle Triassic of Poland (ZAWIDZKA 1971). This scarcity of mandibulae in the fossil state is possibly due to internal microstructure different of that of the jaws. Mandibulae of polychaetes of the superfamily Eunicea (or at least a large part of them) differ from maxillae in the lack of outer compact layer and, therefore, porous surface (pl. 29 : 3c).

The above described mandibulae are assigned to *Ophryotrocha* cf. *antarctica* sp. n., taking into account their similarity to Recent mandibulae of that genus, appropriate size ratios in relation to jaws of the species, and statistical data. The available material comprises, besides the mandibulae, only one more specimen (shown in pl. 29 : 3), and markedly more jaws of *O. antarctica* than other elements of Eunicea. Only jaws of the genus *Glycera* SAVIGNY are more frequent than the latter but representatives of that genus do not have mandibulae.

DEFLANDRE and TAUGOURDEAU (1969) compared the studied mandibulae *Diopatraites cretaceous* with those of the Recent genus *Lumbriconereis* BLAINVILLE. However, *D. cretaceous* appear more similar to the *O. cf. antarctica* and, according to us, they most probably belong to the family Dorvilleidea.

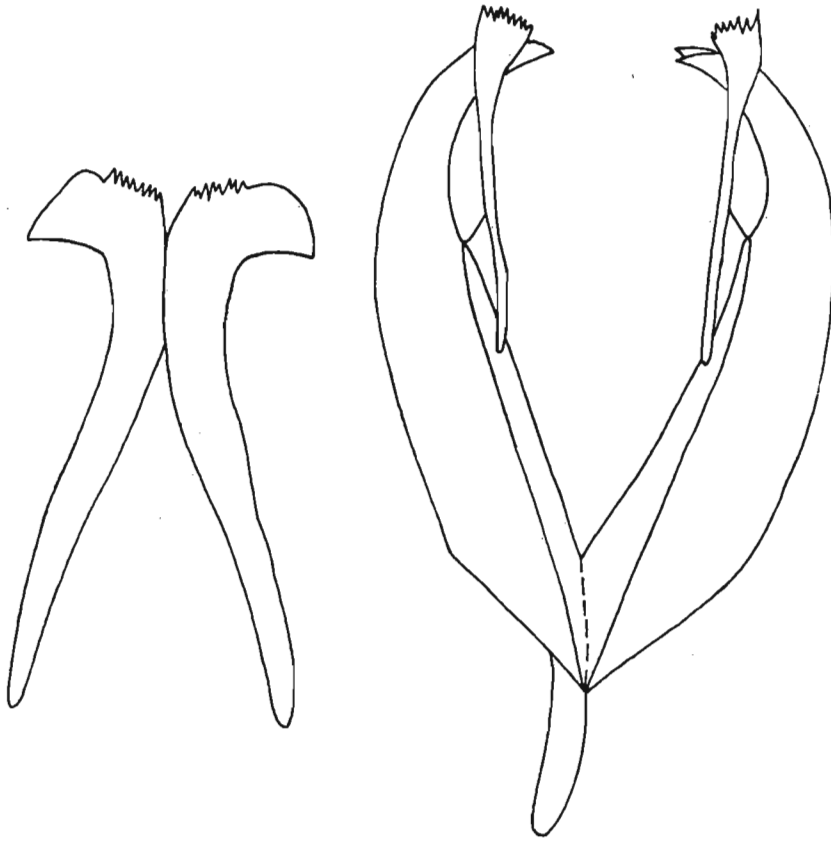


Fig. 3

Schematic reconstruction of K-type jaw apparatus of *Ophryotrocha antarctica* sp. n., Mandibles carrier-like elements and maxillae I and II in dorsal view, anterior maxillae unknown. Drawing after SEM micrographs. Cape Melville Formation (Lower Miocen), Melville Peninsula, King George Island, Antarctica.

Ophryotrocha sp. A
(pl. 26 : 3; fig. 5)

Material. — Joined right and left MI and MII and carrier-like elements: ZPAL Sc. V/1/8.

Description. — The P-type apparatus 0.37 mm long. Carrier-like element long, plate-like adjoining one another along planar surfaces in posterior part and diverging in the anterior and, therefore, Y-shaped.

MI and MII similar in shape, right and left ones symmetrical, plate-like, elongate and semicrescentic in outline. Inner margin straight and denticulated along its whole length. Denticles bent towards dorsal side, almost normal to jaw surface. First denticle clearly the largest, the remaining ones — either alternating short and long or represented by groups of a few short, separated by single longer ones. Jaws MI with over 20 denticles, and the MII — with over 40.

Remarks. — The specimen may represent a juvenile form of the apparatus *O. antarctica* sp. n. but the available material and the knowledge of the ontogeny of jaw apparatuses of this genus are insufficient for an identification at the specific level.

The described apparatus resembles the Recent P-type apparatus of *O.* sp. from the Antarctic region known to is from slide preparate of a single specimen and studied under the light microscope only (fig. 2).

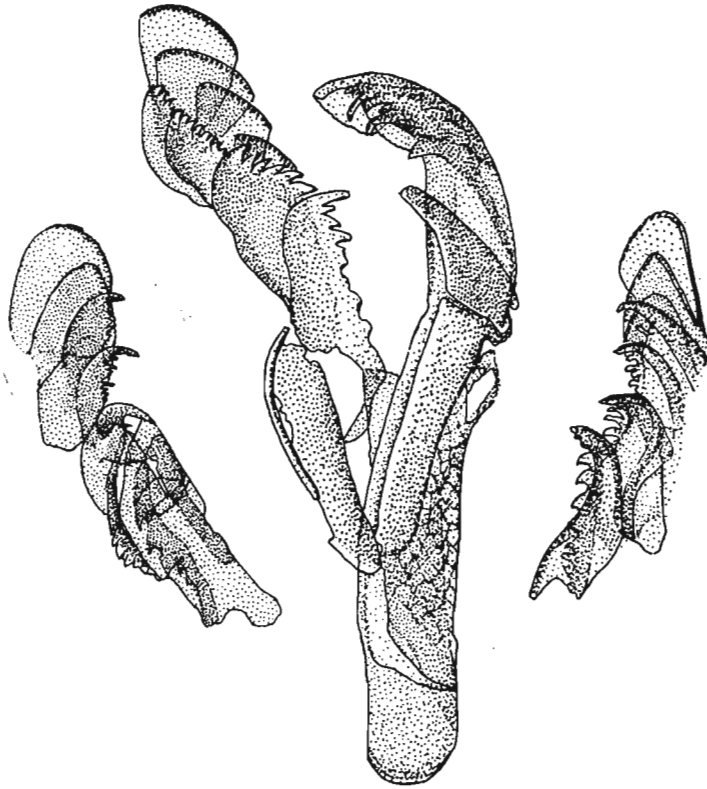


Fig. 4

P-type (juvenile) jaw apparatus of *Ophryotrocha* sp. in dorsal view, partly deformed. Recent, Admiralty Bay, King George Island, Antarctica. Drawing from slide prepareate.

Ophryotrocha sp. B
(pl. 27 : 1—2)

Material. — Joined left and right MI and carrier-like elements, ZPAL Sc. V/2/20, and left MI with carrier-like element, ZPAL Sc. V/2/23.

Description. — Apparatus of the P-type. Specimens 0.28 and 0.35 mm long. Maxillae I and carrier-like elements represent a unity, and the boundary between them may be conventionally drawn along posterior end of second row denticles. When this is the case, MI appear two times shorter than c.-l. elements whereas the maximum width of both MI and these elements is the same, equal about 0.2 of length of the whole specimen.

MI is triangular in outline in anterior part, becoming narrower towards the anterior, and rectangular in posterior part. Further towards the posterior it passes into carrier-like element. Left MI of the specimen shown in pl. 3 : 1 displays two rows of denticles arranged roughly normal to jaw surface. The first, major row is traceable from anterior end of the jaw along inner margin towards postero-medial end. It comprises over twenty denticles, the first of which is clearly the largest, the next two small, and the remaining alternatively small and large, except for the posterior part of the row, where the large denticles are separated by pairs of small ones. The second row begins in the central part of the jaw and continues along the medial line of it towards the posterior. It comprises 14 denticles, the largest of which are situated in the middle, but the remaining ones are not much smaller. All the denticles of the two rows are spine-like. The specimen shown in pl. 3 : 2 displays the major rows of both MI similar to the above described, whereas the second rows are obscured.

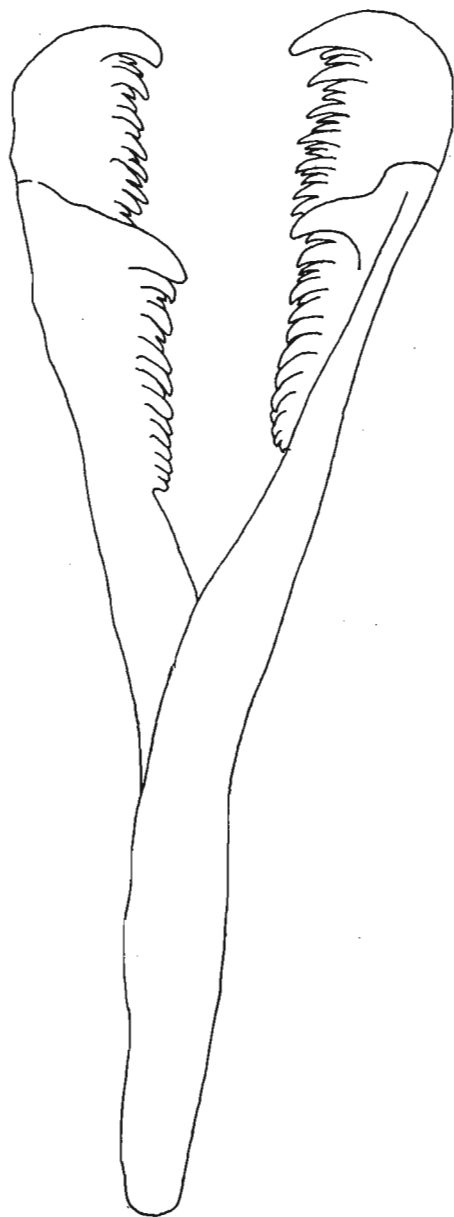


Fig. 5

Schematic reconstruction of P-type jaw apparatus of *Ophryotrocha* sp. A consisting of joined carrier-like elements and maxillary plates (I, II), in dorsal view, anterior maxillae unknown. Drawing after SEM micrographs (cf. pl. 26 : 3). Cape Melville Formation (Lower Miocen), Melville Peninsula, King George Island, Antarctica.

Opening of pulp cavity at ventral side, gaping, occupying the whole posterior part of jaw.

Carrier-like elements are straight along their whole length and built of two flat walls set at almost right angles to each other. The wall representing an elongation of the posterior part of the dorsal wall of MI is wider and markedly longer than the other — an extension of outer part of ventral wall of MI.

Remarks. — *Ophryotrocha* sp. B is similar to juvenile apparatuses of recent *O. puerilis*, shown in Pl. 4. MI of both species display two rows of denticles, similar in the course and shape of denticles. Carrier-like elements represent extensions of MI, being longer than the jaws but in *O. sp. B.* they are comparatively longer.

O. sp. B is not much similar to *O. sp. A* but the differences in structure may be due to the fact that they represent different ontogenic stages. Therefore, it cannot be excluded that both *O. sp. A* and *O. sp. B* are conspecific with *O. antarctica*.

Family *Arabellidae* HARTMANN, 1944

Remarks. — The family *Arabellidae* is hitherto mainly known on the basis of Recent forms assigned to about 40 species and eight genera. Fossil jaw apparatuses of arabellids are known from the reconstructions of two species of *Arabellites* and *Notocirrus* made on the basis of an assemblage of isolated elements from the Jurassic of Poland (SZANIAWSKI and GAŻDZICKI 1978) and a few isolated scolecodonts from the Cretaceous of the G. D. R. (KOZUR 1971). To that family most probably also belong some scolecodonts described from the Cretaceous of the U. S. A. by CHARLETTA and BOYER (1974) and figured from the Cretaceous of Italy by CORRADINI and SERPAGLI (1968). MIERZEJEWSKI (1984) recently assigned to that family Silurian jaw apparatus *Synclinophora synclinalis* EISENACK. This apparatus is very similar in structural patterns and possibly phylogenetically close to Recent arabellids. However, as a long part of this evolutionary line (from the Silurian to Jurassic) remains unknown the assignment of *Synclinophora* to the *Arabellidae*, must be regarded as tentative.

Genus *Drilonereis* CLAPARÈDE, 1870

Type species: Drilonereis filum (CLAPARÈDE, 1868).

Remarks. — This genus comprises about 35 Recent species (ORENSANZ 1974) and 3 fossil species described on the basis of isolated scolecodonts from the Cretaceous of the G. D. R. (KOZUR 1971). Moreover, 2 scolecodont species assigned to *Drilonereisites* Eller from the Cretaceous of the U. S. A. by CHARLETTA and BOYER (1974) and right MI figured from the Cretaceous of Italy by CORRADINI and SERPAGLI (1968, pl. 1 : 4) most probably belong here. In creating *Drilonereisites* on the basis of Devonian scolecodonts ELLER stated: „*Drilonereisites* is based on the existing genus *Drilonereis* CLAPARÈDE which has an extremely long fang or hook and rather small base” (ELLER 1964: 233). It follows that he characterized MI only (fig. 6). Very similar MI are also found in Paleozoic apparatus of the genus *Skalenoprion* KIELAN-JAWOROWSKA. However, right MI of the latter displays relic basal plate. This may be also the feature of some Paleozoic species of *Drilonereisites* but it was still not noted. It follows that both *Drilonereisites* and *Skalenoprion* are possibly closely related to the Recent *Drilonereis* but, similarly as in the case of *Synclinophora*, there remains a large time gap in knowledge of their evolution.

Drilonereis polaris sp. n.

(pl. 29 : 4, 5; pl. 30 : 6; fig. 7)

Holotype: Left MI figured in pl. 29 : 4, ZPAL. Sc. V/2/9.

Type horizon: Cape Melville Formation (Lower Miocene).

Type locality: Melville Peninsula (section no. I), King George Island, Antarctica.

Derivation of the name: *polaris* — found in the polar region.

Diagnosis. — Left MI slightly wider than a half of length. Falx stout, bent towards dorsal side, equal about 0.6 of jaw length. Inner margin with a few teeth slightly bent towards dorsal side and decreasing in size towards the posterior. Posterior margin oriented postero-medially. Dorsal side of jaw strongly convex. Inner wing small. Opening of basal cavity occupying the whole posterior part of jaw.

Material. — In addition to the holotype there is one incomplete right MI, one right MII, ZPAL Sc. V/2/10; and two pairs of joined carriers, ZPAL Sc. V/2/25.

Description. — Left MI as in diagnosis. The specimen displays four denticles quickly decreasing in size towards the posterior. Inner wing in dorsal view is visible at the height of second

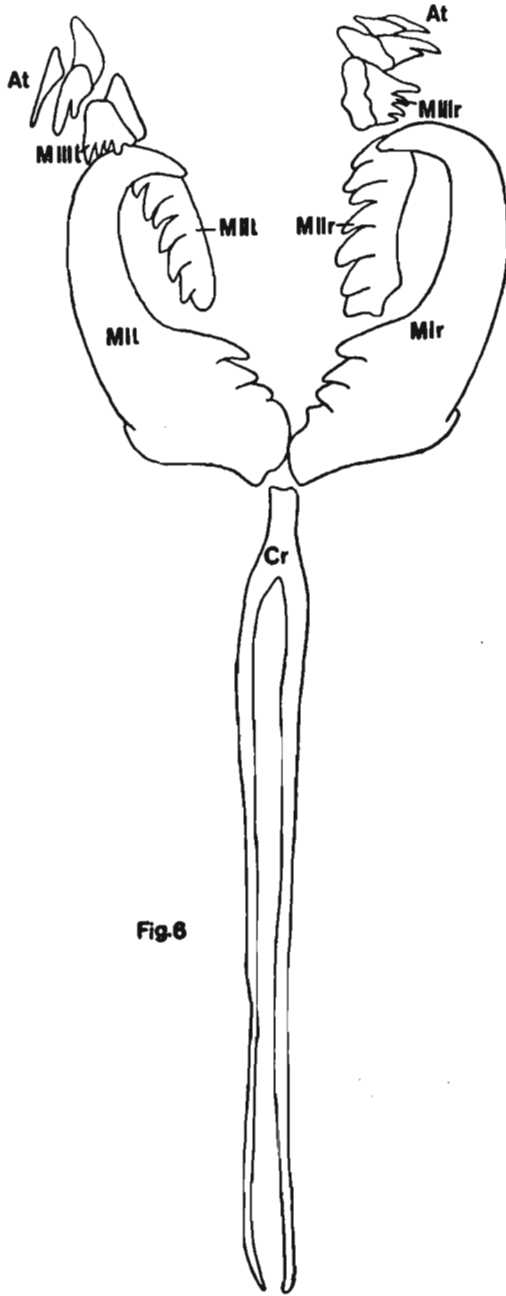


Fig. 6

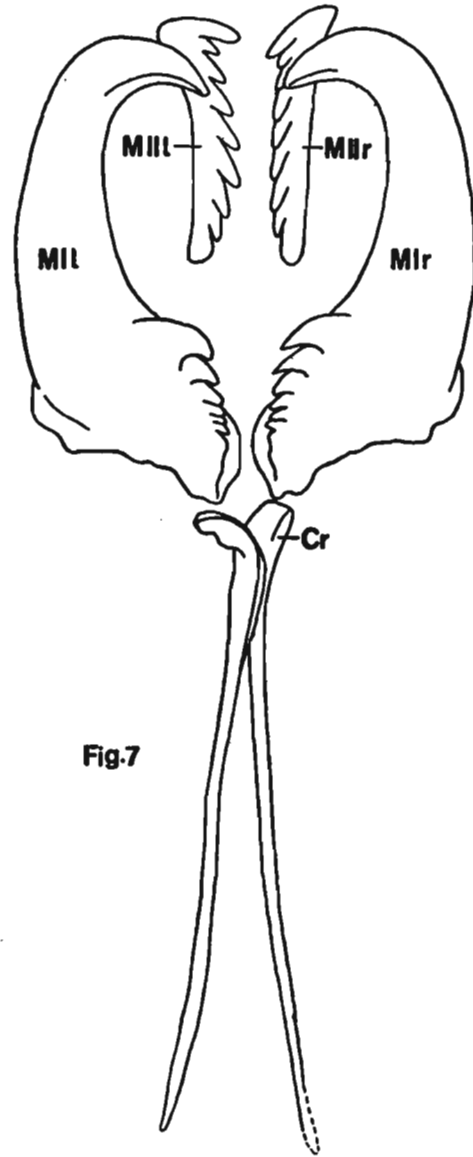


Fig. 7

Fig. 6

Diagram of jaw apparatus of *Drilonereis tenuis* (EHLERS 1900), in dorsal view. Recent, Argentinian Biogeographic Province (after ORENSANZ 1974, fig. 8 : 2).

Fig. 7

Schematic reconstruction of jaw apparatus of *Drilonereis polaris* sp. n., in dorsal view. Anterior jaws unknown. Drawing after SEM micrographs (cf. pl. 29 : 4, 5; pl. 30 : 6). Cape Melville Formation (Lower Miocen), Melville Peninsula, King George Island, Antarctica.

denticle and is subovate in outline. Posterior margin slightly bent inwards in middle part, corresponding to strong convexity of jaw in that place.

Right MI is represented by a posterior part only. The available fragment is almost a mirror image of the left MI, differing in somewhat more numerous (six) but finer denticles and larger inner wing.

Reight MII narrow, long, elongate subrectangular in outline in lateral view. Width maximum in middle part, equal about 0.23 of length. Inner margin with eight denticles oriented dorsally and inclined towards the posterior. First denticle the longest, the remaining ones initially increasing in size towards the posterior to decrease thereafter. Opening of pulp cavity gaping and occupying the whole ventral side.

Carriers very long and narrow, semioval in transverse section, wider and laterally flattened in the anterior part, connected with planar surfaces along a short section, widely open in the most anterior part and, therefore, V-shaped in longitudinal — section.

Family *Lumbrineridae* MALMGREN, 1867

Remarks. — This family was hitherto known on the basis of Recent forms only. Its jaw apparatuses are assigned to the labidognath type, differing from most apparatuses of that group (*Eunicidae*, *Onuphidae*) in the lack of unpaired elements and, therefore, symmetrical construction (fig. 8.) Carriers are relatively narrower than in other labidognathic apparatuses and in several species (especially those of the genus *Lumbrineriopsis* ORENSANZ) fairly long. Jaws MI are usually narrow, forceps-like undenticulated, and MII — triangular in outline and denticulated, usually with wide and blunt denticles. Jaws MIII and MIV small and often developed in the form of single teeth.

Recent jaw apparatuses of the labidognath type differ from Recent ones of the prionognath type (*Arabellidae*, *Lysaretidae*) in both structural pattern and probably chemical composition, being markedly lighter coloured and less hard than the latter and easy to deform in the course of drying. The differences in chemical composition may explain why they are so rare in fossil record. Neither jaw apparatuses nor isolated elements assignable to Recent families with apparatuses of the labidognath type were hitherto known in fossil state. The below described scolecodonts were presumably preserved because of especially favourable fossilization conditions, related to rapid lithification of crab burrow infillings of the carbonate nodule type. Preservation of the described elements is, however, much less satisfactory than that of other scolecodonts of *Eunicea*.

Genus *Lumbrineris* BLAINVILLE, 1828

Type species: Lumbrineris latreilli AUDOUIN and MILNE-EDWARDS, 1834.

?*Lumbrineris fossilis* sp. n.

(pl. 30 : 4, 5; fig. 9)

Holotype: Joined right MI and carrier figured in pl. 6 : 4, ZPAL. Sc. V/2/14.

Type horizon: Cape Melville Formation (Lower Miocene).

Type locality: Melville Peninsula (Section no I), King George Island, Antarctica.

Derivation of the name: Lat. *fossilis* — fossil, to emphasize that is the first species of the family *Lumbrineridae* found in the fossil state.

Diagnosis. — Right MI with width equal about 0.22 of length. Falx equal about a third of length of jaw, strongly bent, medially directed. The remaining part of jaw straight. Lateral margins straight, parallel, posterior margin horizontal. Opening of pulp cavity equal about 0.4 of length of jaw. Carrier slightly shorter than MI, with width equal about 0.3 of length, narrowing towards the posterior and ending with point.

Material. — In addition to the holotype, left carrier joined with fragments of MI, ZPAL Sc. V/2/15; and isolated left carrier.

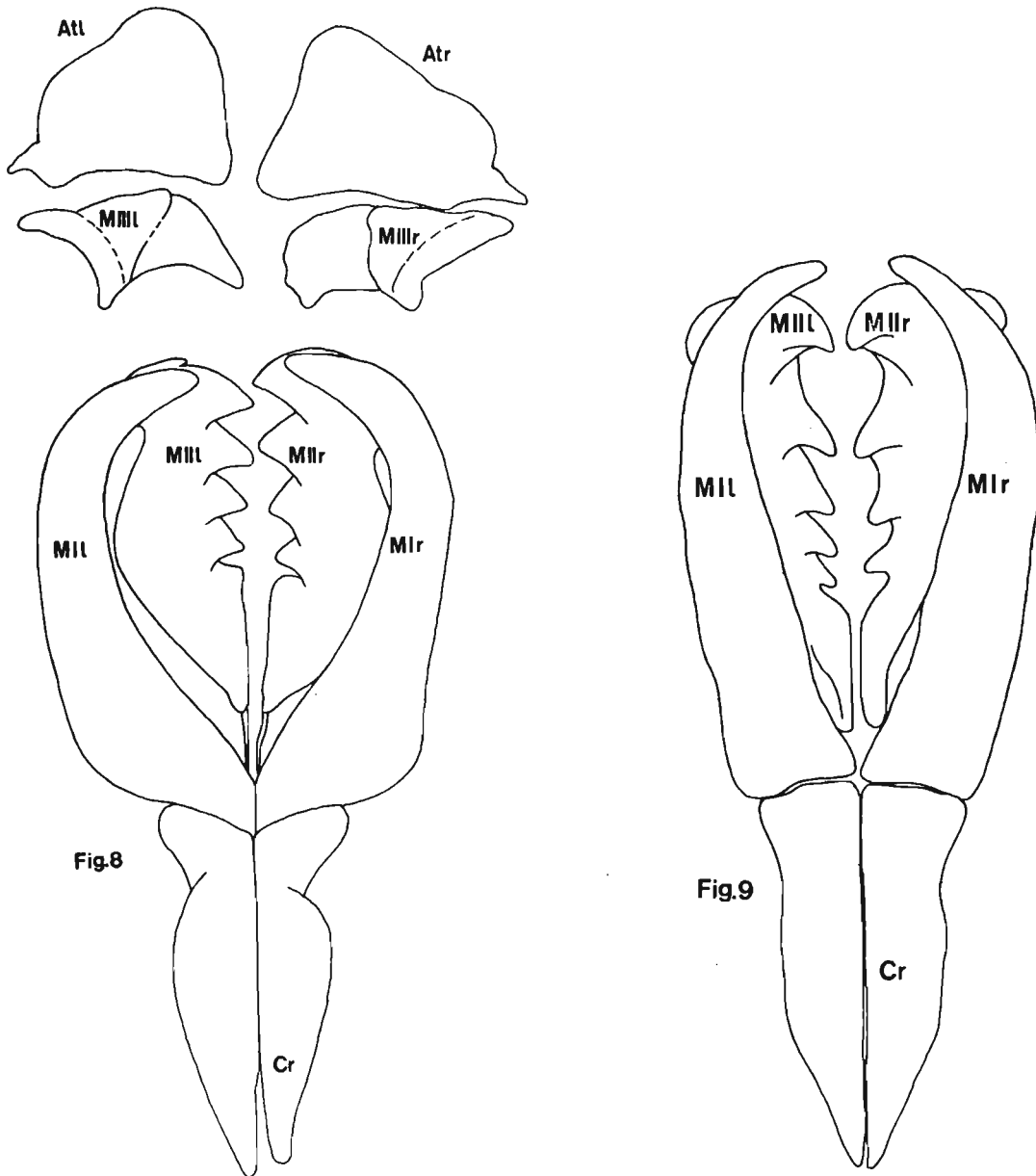


Fig. 8

Diagram of jaw apparatus of *Lumbrineris cingulata* (EHLERS 1897), dorsal view. Recent, Argentinian Biogeographic Province (after ORENSANZ 1973, fig. 8 : 8).

Fig. 9

Schematic reconstruction of jaw apparatus of *Lumbrineris fossilis* sp. n., dorsal view. Drawing after SEM micrographs (cf. pl. 30 : 4, 8). Cape Melville Formation (Lower Miocen), Melville Peninsula, King George Island, Antarctica.

Remarks. — Assignment of the above species to the genus *Lumbrineris* remains tentative as similar elements are known in other genera of that family such as *Augeneria* MONRO and *Ninoe* KINBERG.

Lumbrineris sp.

(pl. 30 : 8)

Material. — Isolated right MII, ZPAL Sc. V/2/12.

Description. — Right MII displaying natural lateral flattening, triangular in outline in lateral view. Anterior and inner margins straight, outer margin sinusoidal and denticulated. Four

denticles, dorsally oriented, loosely spaced, related short and blunt, decreasing in size towards the posterior. Posterior part of inner margin smooth. Inner wall extending into attachment lamella in middle part.

Remarks. — The structure of the jaw is characteristic of the Lumbrineridae. Similar jaws are known from Recent representatives of the genus *Lumbrineris*, also from the Antarctic region (pl. 6 : 7; cf. also ORENSANZ 1973, figs. 8 : 1 and 7 : 8). The state of preservation of the jaw is similar to that of MI of *Lumbrineris fossilis* sp. n., and it is possible that it also belongs to the latter species.

Family, genus and species undetermined 1
(pl. 29 : 6)

Material. — Isolated left MII, ZPAL Sc. V/2/11.

Remarks. — Similar jaws MII are known from apparatuses of Recent Polychaetes of the families Eunicidae SAVIGNY, Onuphidae KINBERG, and Lysaretidae KINBERG. The specimen is very well preserved which suggests that it belonged to an apparatus of the prionognath type (see Remarks on the family Lumbrineridae), i. e. to Lysaretidae KING. Similar jaws MII occur in lysaretid genus *Aglaurides* EHLERS.

Family, genus and species undetermined 2
(pl. 29 : 3)

Material. — Isolated right mandible, ZPAL Sc. V/2/18.

Remarks. — The specimen resembles mandibles of the Dorvilleidae but the latter are usually wider in relation to their length and display slightly bent shaft.

Studies of surface of the mandible under large magnifications (pl. 29 : 3c) showed that it differs from jaws in the lack of compact outer layer.

Superfamily *Glyceræ* GRUBE
Family *Glyceridae* GRUBE, 1850
Genus *Glyceræ* SAVIGNY, 1818

Remarks. — The genus *Glyceræ* comprises about 40 Recent species and three extinct, known from Mesozoic rocks. The Recent species are omnipresent throughout the world and in various bathymetric zones. Fossil jaws of that genus belong to most common scolecodonts in Mesozoic and Cenozoic strata. They were for a long time assigned to *Paranereites* EISENACK, 1939, until their systematic position was recognized in 1974 (CHARLETTA and BOYER 1974, SZANIAWSKI 1974). Jaws of all the species of that genus are, unfortunately, very similar to one another and their identification requires detailed knowledge of structure and relief. The studies on Recent material (WOLF 1977) showed that evaluation of diagnostic value of jaw structure is impeded by intraspecific variability and requires further studies. It follows that rich and well preserved material is needed for identification of fossilized specimens. Jaw supports (ailerons) appear more diversified in morphology than jaws, but the supports are much scarcer in the fossil state and usually poorly preserved. The state of preservation of fossil jaws of the *Glyceræ* is usually different of that of the superfamily Eunicæ. This may be explained as due to very large content of iron in organic material building the *Glyceræ* jaws (MICHEL, FONZE-VIGNAUX VOSS-FOUCART 1973).

Glycera sp.
(pl. 30 : 1—3)

Material. — 44 isolated jaws and 2 isolated jaw supports (ailerons).

Remarks. — Jaws of *Glycera* sp. appear similar in outline to those of Jurassic *G. baltica* (EISENACK) and *G. pilicae* SZANIAWSKI. However, preservation of *Glycera* sp. is insufficient for any reliable specific identification. Moreover, there remains an open question whether or not all the jaws and ailerons of the collection belong to a single species. Both specimens of jaw supports are incomplete.

REFERENCES

- AVERINCEV, V. G. (Аверинцев В. Г.). 1972. Донные многощетинковые черви Errantia Антарктики и Субантарктики по материалам советской антарктической экспедиции. (Benthic polychaetes Errantia from Antarctic and Subantarctic collected by the Soviet Antarctic Expeditions). In: Исследования фауны морей. Exploration of the fauna of the seas. XI (XIX). Результаты биологических исследований антарктических экспедиций (Biological results of the Soviet Antarctic Expeditions, 5). 88—293. — Акад. наук СССР Зоол. инст. Изд. „Наука“. Ленинград. (Russian with English summary).
- ÅKESSON, B. 1984. Speciation in the genus *Ophryotrocha* (Polychaeta, Dorvilleidae). In: A. Fischer and H.—D. Pfannenstiel (eds.), Polychaete Reproduction. Fortschritte der Zoologie, 29, 299—316. Gustav Fischer Verlag, Stuttgart.
- BIRKENMAJER, K. 1982. Pre-Quaternary fossiliferous glacio-marine deposits at Cape Melville, King George Island (South Shetland Islands, West Antarctica). — *Bull. Acad. Polon. Sci., Terre*, 29, 331—340.
- 1984. Geology of the Cape Melville area, King George Island (South Shetland Islands, Antarctica): pre-Pliocene glaciomarine deposits and their substratum. — *Stud. Geol. Polonica*, 79, 7—36.
- 1985. Onset of Tertiary continental glaciation in the Antarctic Peninsula sector (West Antarctica). — *Acta Geol. Polonica*, 35, 1—31.
- 1987. Oligocene-Miocene glacio-marine sequence of King George Island (South Shetland Islands), Antarctica. In: A. GAŹDZICKI (ed.), Palaeont. Results Polish Antarctic Exped. I. — *Palaeont. Polonica*, 49, 9—36.
- , GAŹDZICKI, A. and WRONA, R. 1983. Cretaceous and Tertiary fossils in glacio-marine strata at Cape Melville, Antarctica. — *Nature*, 303, 56—59.
- , GAŹDZICKI, A., KREUZER, H. and MÜLLER, P. 1985. K-Ar dating of the Melville Glaciation (Early Miocene) in West Antarctica. — *Bull. Acad. Polon. Sci., Terre*, 33, 15—23.
- , GAŹDZICKI, A., PUGACZEWSKA, H. and WRONA, R. 1987. Recycled Cretaceous belemnites in Lower Miocene glaciomarine sediments (Cape Melville Formation) of King George Island, Antarctica. In: A. GAŹDZICKI (ed.), Palaeont. Results Polish Antarctic Exped., I. — *Palaeont. Polonica*, 49, 49—62.
- CHARLETTA, A. C. and BOYER, P. S. 1974. Scolecodonts from Cretaceous greensand of the Jersey coastal plain. — *Micro-paleontology*, 20, 2, 354—366.
- CORRADINI, D. and SERPAGLI, E. 1968. Preliminary report on the discovery and initial study of large amounts of „scolecodonts” and polychaete jaw apparatuses from Mesozoic formations. — *Boll. Soc. Palaeont. Italiana*, 7, 3—5.
- DAY, J. H. 1967. A monograph on the Polychaeta of Southern Africa, Part I. Errantia. British Museum, Natur. Hist. Publ., 656, 1—458, London.
- DEFLANDRE, G. and TAUGOURDEAU, P. 1969. *Diopatraites cretaceous* nov. spec. Réflexion sur la distribution stratigraphique des vestiges d'annelides et leur systematique. — *Cahiers Pal.*, I, 12, 1—6.
- DUDZIAK, J. 1983. Cretaceous calcareous nannoplankton from glaciomarine deposits of the Cape Melville area, King George Island (South Shetland Islands, Antarctica). — *Stud. Geol. Polonica*, 79, 37—51.
- DÜSING, H. 1961. Die Umwandlung des Kauapparates in Abhängigkeit vom sexuellen Zustand bei *Ophryotrocha puerilis* CLAPARÈDE u. METSCHNIKOFF — *Naturwiss.*, 48, 532—533.
- EHLERS, E. 1869. Über fossile Würmer aus dem lithographischen Schiefer in Bayern. — *Palaeontographica*, 17, 145—175.
- ELLER, E. R. 1964. Scolecodonts of the Delaware Limestone, Devonian of Ohio and Ontario. — *Ann. Carnegie Mus.*, 36, 229—266.
- FÖRSTER, R., GAŹDZICKI, A. and WRONA, R. 1985. First record of homolodromiid crabs from Lower Miocene glaciomarine sequence of West Antarctica. — *N. Jb. Geol. Paläont. Mh.*, 6, 340—348.

- FÖRSTER, R., GAŹDZICKI, A. and WRONA, R. 1987. Homolodromiid crabs from the Cape Melville Formation (Lower Miocene) of King George Island, Antarctica. In: A. GAŹDZICKI (ed.), *Palaeont. Results Polish Antarctic Expeds.*, I. — *Palaeont. Polonica*, 49, 147—162.
- GAŹDZICKI, A. and WRONA, R. 1982. Skamieniałości górnej kredy i trzeciorzędu z osadów talasoglacjalnych na Półwyspie Melville'a, Wyspa Króla Jerzego, Zachodnia Antarktyka (Late Cretaceous and Tertiary fossils from glaciomarine sediments of Melville Peninsula, King George Island, West Antarctica). — *Przegl. Geol.*, 8 (352), 399—404. (in Polish with English summary).
- GERMERAAD, J. H. 1980. Dispersed scolecodonts from Cainozoic strata of Jamaica. — *Scripta Geol.*, 54, 1—24.
- HARTMAN, O. 1964. Polychaete of Antarctica. — Antarctic Research Series, 3, 131 pp. American Geophysical Union, Baltimore.
- IVANOV, D. L. and TZETLIN, A. B. (Иванов, Д. Л., Цетлин, А. Б.) 1981. Бозникновение и эволюция кутикулярного голоточного вооружения у трохофорных животных с вентральной глоткой. (Origin and evolution of the cuticular pharyngeal armature in trochophore animals having the ventral pharynx). — *Зоол. ж.*, 60, 10, 1445—1454. (Russian with English summary).
- JAN du CHÊNE, R. and GORIN, C. 1974. Découverte de Scolécodontes dans l'Eocène des Voirons (Haute-Savoie, France). — *Arch. Sci. Genève*, 27, 1, 99—110.
- JESIONEK-SZYMAŃSKA, W. 1987. Echinoids from the Cape Melville Formation (Lower Miocene) of King George Island, Antarctica. In: A. GAŹDZICKI (ed.), *Palaeont. Results Polish Antarctic Expeds.* I — *Palaeont. Polonica*, 49, 163—168.
- JUMARS, P. A. 1974. A generic revision of the Dorvilleidae (Polychaeta), with six new species from the deep North Pacific. — *Zool. J. Linn. Soc. Lond.*, 54, 2, 101—135.
- KARCZEWSKI, L. 1987. Gastropods from the Cape Melville Formation (Lower Miocene) of King George Island, West Antarctica. In: A. GAŹDZICKI (ed.), *Palaeont. Results Polish Antarctic Expeds.*, I. — *Palaeont. Polonica*, 49, 127—146.
- KEGEL, B. and PFANNENSTIEL, H.-D. Evaluation of the pair-culture effect in *Ophryotrocha puerilis* (Polychaeta: Dorvilleidae). II. Conditions for the moult of the upper jaw. — *Helgoländer Meeresunters.* 36, 215—222.
- KIELAN-JAWOROWSKA, Z. 1966. Polychaete jaw apparatuses from the Ordovician and Silurian of Poland and a comparison with modern forms. — *Palaeont. Polonica*, 16, 1—152.
- KOZUR, H. 1971. Die Eunicida und Phyllococida des Mesozoikums. — *Freib. Forschungsh.*, C 267, 73—III.
- MICHEL, C., FONZE-VIGNAUX, M.-T. and VOSS-FOUCART, M.-F. 1973. Données nouvelles sur la morphologie, l'histochimie et la composition chimique des machoires de *Glycera convoluta* KAUFERSTEIN (Annélide Polychete). — *Bull. Biol. Frans. Belg.*, 107, 310—321.
- MIERZEJEWSKI, P. 1984. *Synclinophora synclinalis* EISENACK — the oldest arabellid polychaete. — *Rev. Palaeobot. Palynol.*, 43, 285—292.
- MÜLLER, H. 1962. Über die Sexualität des Polychaeten *Ophryotrocha puerilis*, ihre Determination und ihren Einfluß auf Drüsentätigkeit und Kauapparatentwicklung. — *Z. Morph. Ökol. Tiere*, 52, 1—32.
- ORENSANZ, J. M. 1973. Los anelidos poliquetos de la provincia biogeografica Argentina. IV. Lumbrineridae. — *Physis* (A) Buenos Aires, 32, 85, 343—393.
- 1974. Los anelidos poliquetos de la provincia biogeografica Argentina. VI. Arabellidae. — *Ibidem*, 33, 87, 381—408.
- RONIEWICZ, E. and MORYCOWA, E. 1987. Development and variability of Tertiary *Flabellum variseptatum* (Scleractinia), King George Island, West Antarctica. In: A. GAŹDZICKI (ed.), *Palaeont. Results Polish Antarctic Expeds.*, I. — *Palaeont. Polonica*, 49, 83—104.
- SMELLIE, J. L., PANKHURST, R. J., THOMSON, M. R. A. and DAVIES, R. E. S. 1984. The geology of the Southern Shetland Islands: VI. Stratigraphy, Geochemistry and Evolution. — *Sci. Repts. Brit. Antarct. Surv.*, 87, 44—84.
- SZANIAWSKI, H. 1968. Three new polychaete jaw apparatuses from the Upper Permian of Poland — *Acta Palaeont. Polonica*, 13, 255—281.
- 1974. Some Mesozoic scolecodonts congeneric with Recent forms. — *Ibidem*, 19, 179—199.
- and GAŹDZICKI, A. 1978. A reconstruction of three Jurassic polychaete jaw apparatuses. — *Ibidem*, 23, 3—29.
- TZETLIN, A. B. (Цетлин, А. Б.), 1980. *Ophryotrocha schubravyi* sp. n. и проблема эволюции челюстного аппарата (*Ophryotrocha schubravyi* sp. n. and the problem of evolution of the mouth parts in the Eunicemorpha (Polychaeta). — *Зоол. ж.* 59, 666—676. (Russian with English summary).
- VAN ERVE, A. W. 1981. Lower Jurassic scolecodonts from the Vicentinian Alps (northeastern Italy), representing the family Dorvilleidae CHAMBERLIN, 1919. — *Rev. Palaeobot. Palynol.*, 34, 225—235.
- WOLF, G. 1977. Kieferorgane von Glyceriden (Polychaeta) — ihre Funktion und ihr taxonomischer Wert. — *Senckenbergiana marit.*, 9, 261—283.
- 1980. Morphologische Untersuchungen an den Kieferapparaten einiger rezenter und fossiler Eunicoidea (Polychaeta). — *Ibidem*, 12, 1—182.
- ZAWIŃCZKA, K. 1971. A polychaete jaw apparatus and some scolecodonts from the Polish Middle Triassic. — *Acta Geol. Polonica*, 21, 361—377.

EXPLANATIONS OF THE PLATES 25—30

All figures are stereoscan micrographs

PLATE 25

Ophryotrocha sp.

Recent, Admiralty Bay, King George Island, Antarctica

- 1a. Almost complete K-type jaw apparatus consisting of joined carrier-like elements left and right MI, and anterior jaws, dorsal view, fragment of the basal part of MII broken off. ZPAL Sc. V/3/2, $\times 130$.
- 1b. Fragment of the same showing detail of the anterior part of MII, MIII and MIIIr, $\times 550$.

Ophryotrocha antarctica sp. n.

Cape Melville Formation, Lower Miocene, King George Island, Antarctica

- 2a. Right MI with carrier-like element joined with right MII, oblique dorsal view. ZPAL Sc. V/2/16, $\times 250$.
- 2b. The same, dorsal view; note attachment lamella joining MI and MII, $\times 250$.
- 2c. Detail of the anterior part of the falx of MI and MII, $\times 1000$.
3. Incomplete maxillary apparatus consisting of joined left and right MI and carrier-like elements. Holotype, ZPAL Sc. V/1/5, $\times 300$.
4. Left maxilla I in dorsal view. ZPAL Sc. V/2/21, $\times 250$.
5. Left maxilla I, inner lateral view. ZPAL Sc. V/2/22, $\times 250$.
6. Left maxilla I, ventral view. ZPAL Sc. V/4/1, $\times 280$.
- 7a. Right maxilla I, dorsal view. ZPAL Sc. V/2/24, $\times 250$.
- 7b. The same jaw in oblique inner lateral view; note bifid distal part of the falx, $\times 280$.
8. Distal part of the right maxilla I with broken-off end of one peak. Fragment of the specimen illustrated on pl. 2 : 2. ZPAL Sc. V/2/20, $\times 1000$.

PLATE 26

Ophryotrocha antarctica sp. n.

- 1a. Left maxilla I with carrier-like element in outer lateral view; note apertures of tripartite pulp cavity. ZPAL Sc. V/2/23, $\times 220$.
- 1b. Fragment of the same specimen (arrowed-detail shown in fig. 1c), $\times 500$.
- 1c. Detail of the same specimen, note a porous structure of the wall, $\times 3000$.
- 2a. Right maxilla I in oblique dorso-inner lateral view; the most posterior part of jaw is broken off, $\times 175$. The same specimens on pl. 1 : 8.
- 2b. The same in detail, note the tripartite pulp cavity and a porous structure of the inner wall, $\times 500$.

Ophryotrocha sp. A

- 3a. Incomplete P-type maxillary apparatus consisting of joined carrier-like elements and left and right maxillae I and II, with mineral patches and slightly deformed, dorsal view. ZPAL Sc. V/1/8, $\times 300$.
- 3b. Anterior part of the same specimen, left MII in unnatural position and partly broken, $\times 600$.
- 3c. Right maxillae of the same specimen in dorsal view, $\times 450$.
- 3d. The same apparatus in ventral view, left MII detached and placed in dorsal view, $\times 175$.
- 3e. Right maxillae in ventro-lateral view, $\times 500$.
- 3f. Left maxilla I in ventro-inner lateral view, note arrangement of the denticles, $\times 500$.

All specimens are from Cape Melville Formation (Lower Miocene), King George Island, Antarctica.

PLATE 27

Ophryotrocha sp. B

- 1a. Left maxilla I with carrier-like element in dorso-outer lateral view, note wide opening of pulp cavity. ZPAL Sc. V/1/6, × 400.
- 1b. The same specimen in inner lateral view, × 400.
- 1c. Anterior part of the same, note arrangement of denticles, × 1350.
- 2a. Joined right and left maxillae I with carrier-like elements oblique dorso-left lateral view. ZPAL Sc. V/1/7, × 300.
- 2b. Anterior part of the same specimen in dorsal view, × 750.
- 2c. The same specimen in oblique ventro-left lateral view, × 300.
- 2d. Anterior part of the same specimen in ventral view, × 750.

All specimens are from Cape Melville Formation (Lower Miocene), King George Island, Antarctica.

PLATE 28

Ophryotrocha puerilis CLAPARÈDE and METSCHNIKOV

- 1a. P-type maxillary apparatus in oblique dorsal view. ZPAL Sc. V/3/3, × 250.
- 1b. Anterior part of the same specimen, × 750.
- 1c. Detail of the left and right maxillae I in dorsal view; note two ridges of denticles on each maxilla, × 1000.
- 2a. Left half of P-type jaw apparatus in slightly deformed arrangement composed of maxilla I with carrier-like element, maxilla II and incomplete set of the anterior jaws, dorso-inner lateral view. ZPAL Sc. V/3/12, × 440.
- 2b. Anterior part of the left maxilla I; note arrangement of the denticles, × 1000.
- 2c. Maxilla II and anterior jaws in dorso-inner lateral view, × 1000.
- 2d. The same in ventro-outer lateral view, × 1500.
3. Falx of the maxilla I and anterior jaws of the specimen illustrated on pl. 1, fig. 1 in dorsal view.

Specimens 1 and 2 Recent, Mediterranean Sea.

PLATE 29

Ophryotrocha cf. *antarctica* sp. n.

- 1a. Joined left and right mandible soiled with minerals, dorsal view. ZPAL Sc. V/2/19, × 250.
- 1b. Detail of the anterior part, × 750.
2. Joined left and right mandible, considerably soiled and broken, in ventral view. ZPAL Sc. V/1/9, × 170.

Drilonereis polaris sp. n.

- 4a. Left maxilla I in dorsal view. Holotype. ZPAL Sc. V/2/9, × 180.
- 4b. Detail of the posterior part in dorso-outer lateral view, × 450.
5. Right maxilla II in outer lateral view. ZPAL Sc. V/2/10, × 200.

Family, genus and species undetermined

- 3a. Isolated left mandible in ventral view (arrowed-detail shown in fig. 3c). ZPAL Sc. V/2/18, × 280.
- 3b. Anterior part of the same, × 670.
- 3c. Fragment of shaft surface, note porous structure of the cuticle, × 4000.
6. Isolated left maxilla II in dorsal view. ZPAL Sc. V/2/11, × 400.

All specimens are from Cape Melville Formation (Lower Miocene), King George Island, Antarctica.

PLATE 30

Glycera sp.

1. Right jaw in dorsal view. ZPAL Sc. V/2/2. × 190.
2. Slightly deformed right jaw filled with mineral matter in ventral view. ZPAL Sc. V/2/6, × 200.
3. Incomplete ailerone (jaw support). ZPAL Sc. V/2/3, × 250.

Lumbrineris fossilis sp. n.

4. Joined right carrier and slightly deformed maxilla I in ventral view. Holotype. ZPAL Sc. V/2/14, × 150.
5. Left carrier joined with posterior part of the maxilla I in ventral view. ZPAL Sc. V/2/15, × 100.

Drilonereis polaris sp. n.

- 6a. Carriers in ventral view. ZPAL Sc. V/2/25, × 45.
- b. Most anterior part of the same, × 250.

Lumbrineris cf. *cingulata* (EHLERS 1897)

7. Complete maxillary apparatus in dorsal view. ZPAL Sc. V/3/1, × 40.

Lumbrineris sp.

8. Deformed right maxilla II in outer lateral view. ZPAL Sc. V/2/12, × 200.

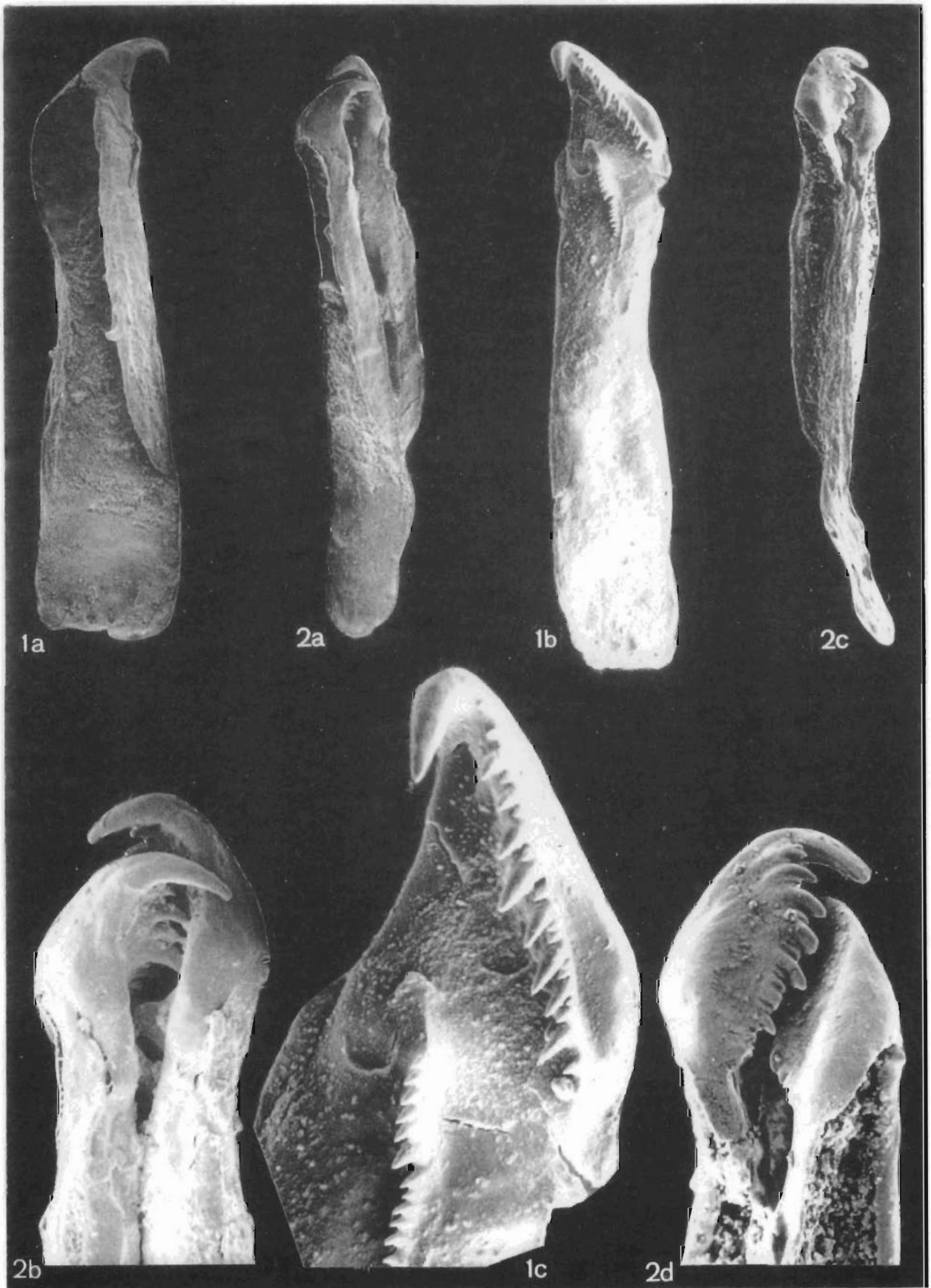
All specimens, excluding shown on fig. 7, derived from Cape Melville Formation (Lower Miocene) King George Island, Antarctica. Specimen in fig. 7. Recent, Admiralty Bay, King George Island, Antarctica.



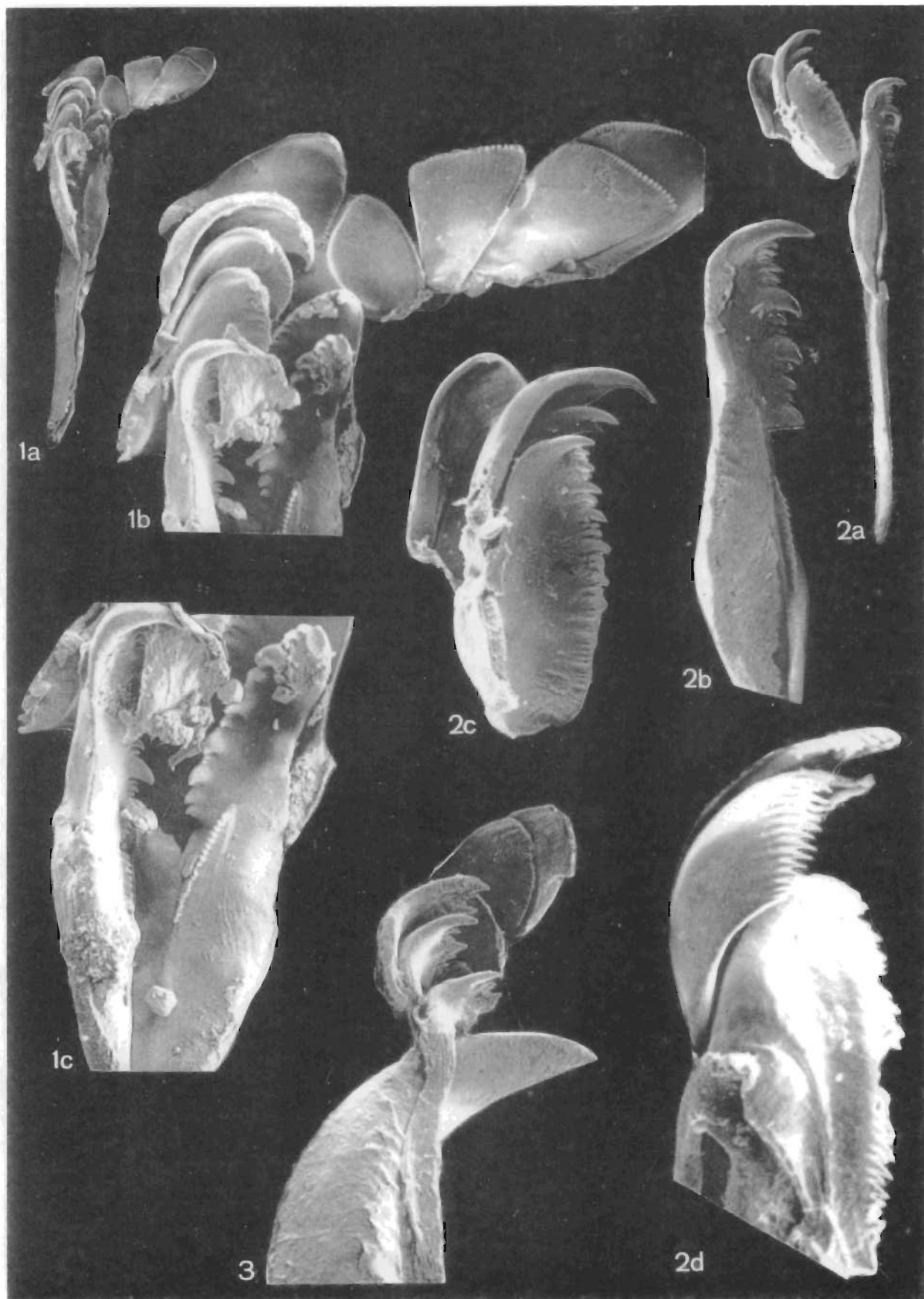
H. SZANIAWSKI AND R. WRONA: POLYCHAETE JAWS FROM THE CAPE MELVILLE FM.



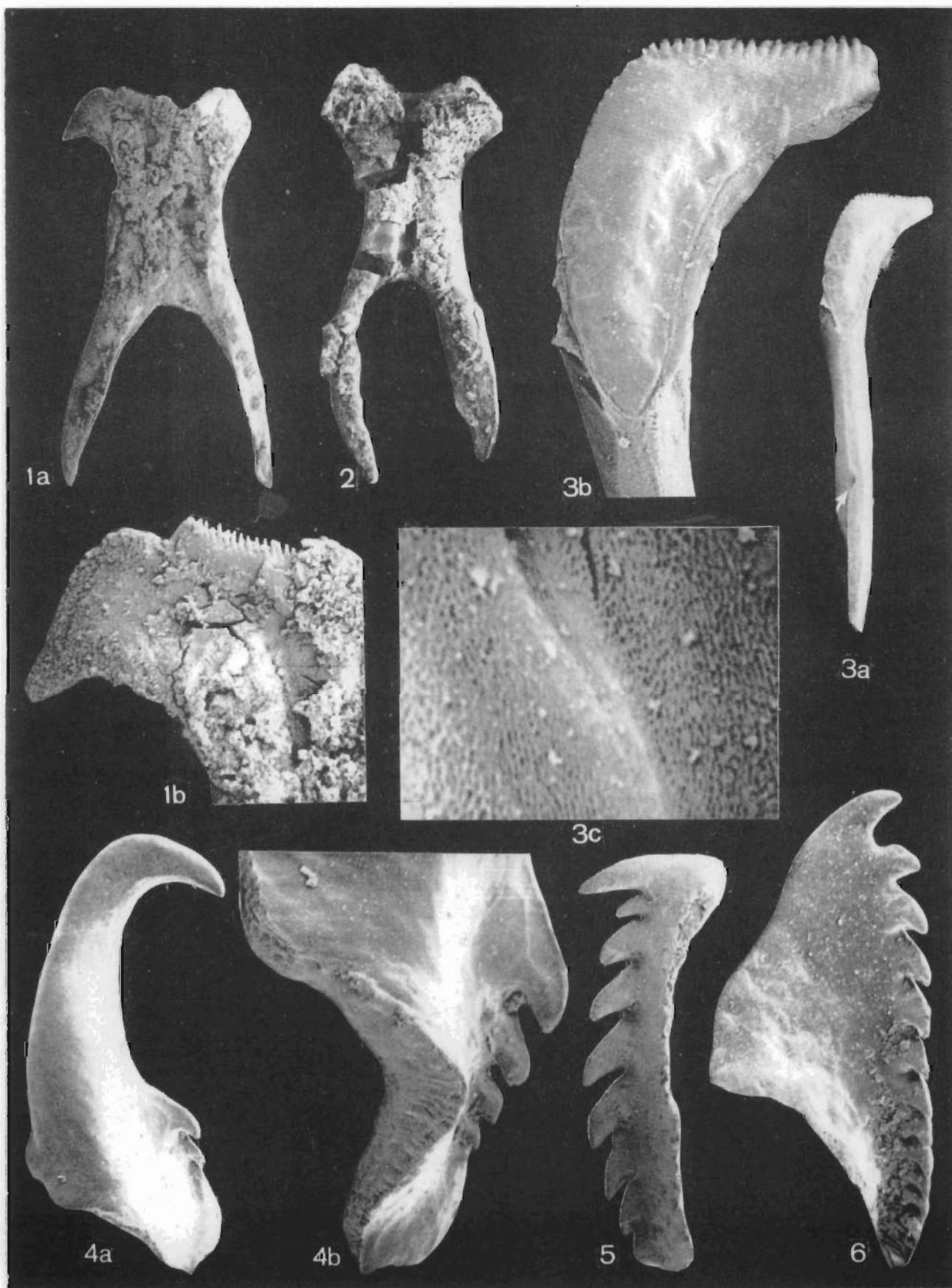
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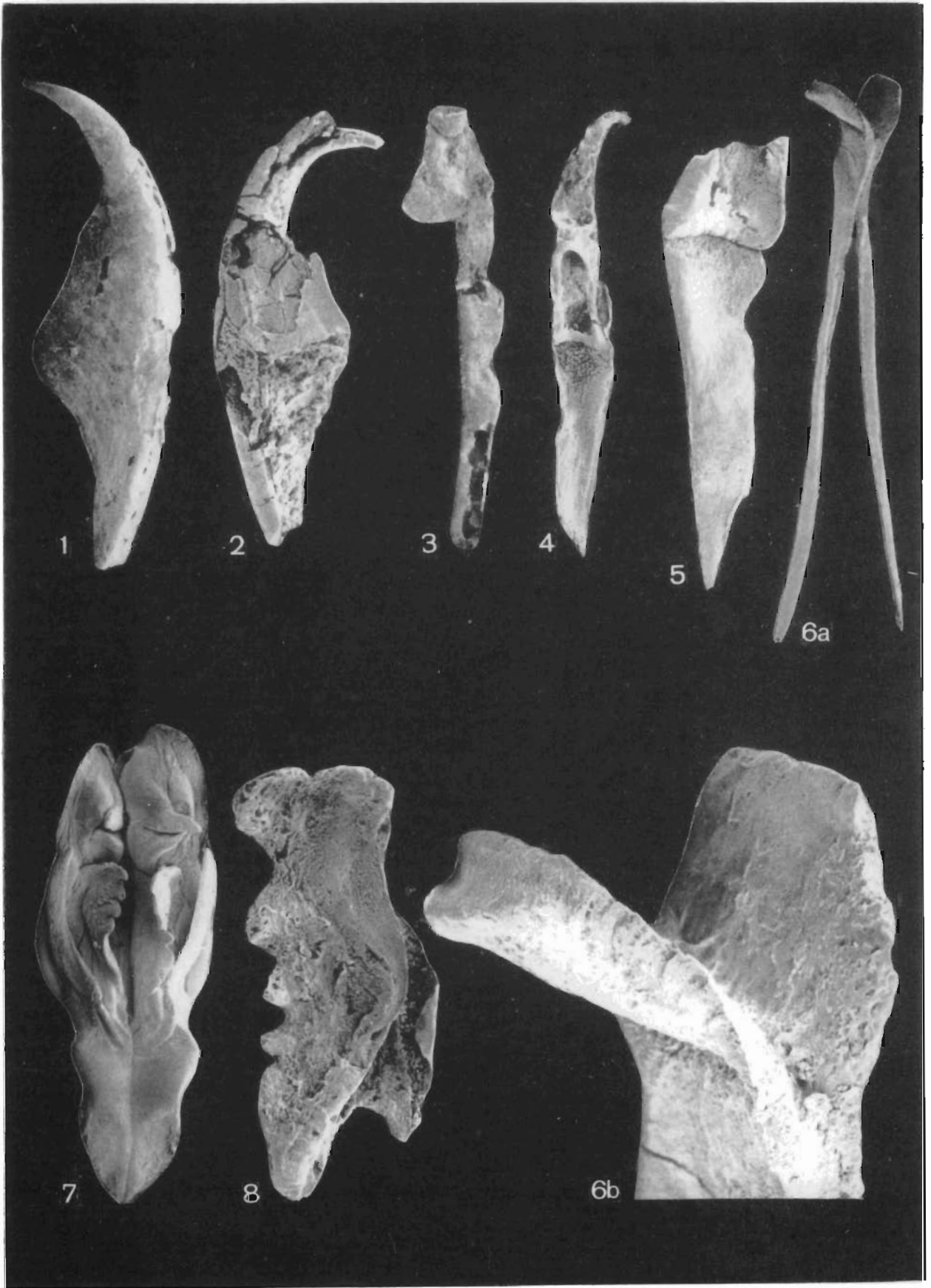
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