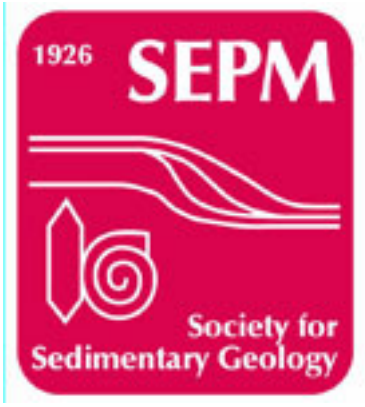

JOURNAL OF PALEONTOLOGY, V. 54, NO. 3, P. 542–547, 1 PL., 2 TEXT-FIGS., MAY 1980

MISCELLANEOUS LATE PALEOZOIC MALACOSTRACA OF THE SOVIET UNION

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ABSTRACT—Various Late Paleozoic malacostracan Crustacea from the Soviet Union are reviewed. The original literature on these species has been heretofore only available in Russian. The descriptions and systematic positions of this material are revised in light of the more complete understanding of Late Paleozoic Malacostraca that has developed in the past decade. *Eopterum devonicum* Rohdendorf, 1961 and *Eopteridium striatum* Rohdendorf, 1970 are parts of malacostracan tailfans. New information on the anatomy of the isopod *Palaeophreatoicus sojanensis* Birshtein, 1962 is presented. The holotype of *Protoclytiopsis antiqua* Birshtein, 1958 is illustrated. And an undescribed Late Devonian caridoid eumalacostracan is discussed.

INTRODUCTION

ALTHOUGH THE EUROPEAN part of the Soviet Union was the eastern end of the Late Paleozoic equatorial continent of Laurentia, Schram (1977) indicates the malacostracan faunas of that area are not particularly abundant. They are not as abundant, for example, as the copious materials of the Carboniferous crustacean faunas of Britain (Schram, 1979). In addition, the descriptions of these specimens in Russian journals have been somewhat inaccessible to western workers, some of them obscure and difficult to find in western libraries.

The Soviet fossil record does contain some noteworthy crustacean material of Late Paleozoic age. Schram (1978) described an unusual Permian pygocephalomorph *Jerometichenoria grandis*; and Schram (pers. observ.) dealt with an extensive collection of the Upper Carboniferous form, *Brooksocaris aisenvergi* Birshtein, 1966 and reassigned the species to the genus *Pygocephalus*. To complete the updating of descriptions on the miscellany of other Soviet Late Paleozoic crustacean material and make knowledge of these more accessible to western workers, these notes are put forth. Recent advances in our understanding of the Late Paleozoic malacostracan record also require some changes in taxonomic assignment of these fossils.

SYSTEMATIC PALEONTOLOGY

Class MALACOSTRACA Latreille, 1806
Subclass uncertain
EOPTERUM DEVONICUM Rohdendorf, 1961
Text-fig. 1B

EOPTERIDIUM STRIATUM Rohdendorf, 1970
Text-fig. 1A

Material.—*Eopterum devonicum* 1454/1; *Eopteridium striatum* 3087/1 in the Paleontological Institute, Soviet Academy of Sciences, Moscow.

Localities.—*E. devonicum,* borehole no. 65, 229 m, Ukhta region, Timan peninsula, Komai Autonomous Socialist Soviet Republic; *E. striatum,* Belaya Tserkov, Ukraine; Upper Devonian.

Description.—*Eopterum devonicum* (Text-fig. 1B) is a uropod and remnants of a telson. The exopod had a blade-like outer margin and membranous and setose inner margin. The exopod appears to have been longer than the endopod. The endopod also has setose margins. The telson is present but incompletely preserved along it margins with no details as to its exact shape and size available.

Eopteridium striatum (Text-fig. 1A) is the distal end of a uropod. The exopod had a blade-like outer margin and a broadly membranous setiferous inner margin. The endopod was about equal in size to the exopod, with a thick reinforcing median element, and membranous and setiferous margins.

Remarks.—Both these species were originally described as insect wings (Rohdendorf, 1961, 1970). They were placed in a separate family in a distinct order, Eopterida (Archaeoptera). Later Rohdendorf (1972) recognized these specimens as malacostracans and suggested they were tailfans of Palaeostomatopoda. But the closest palaeostomatopod form they resemble is *Perimecturus* (see Schram,

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1979; or Schram and Horner, 1978), and that only remotely. The membranous medial portion of the uropodal exopods are too extensive and setose for the known palaeostomatopods. They resemble more the tailfans assigned to *Anthracophausia* (Schram, 1979; Schram and Horner, 1978) though there is some considerable uncertainty even to this suggestion. Devonian malacostracan material seems to have been only slightly sclerotized and as a result poorly preserved. So while these specimens are malacostracan (probably eumalacostracan), it seems best to reserve the use of these names only to the two specimens involved until such time as more, hopefully better material will some day allow more definite assignment and probable synonymy.

Subclass EUMALACOSTRACA Grobben, 1892
Superorder uncertain
Pl. 1, fig. 3

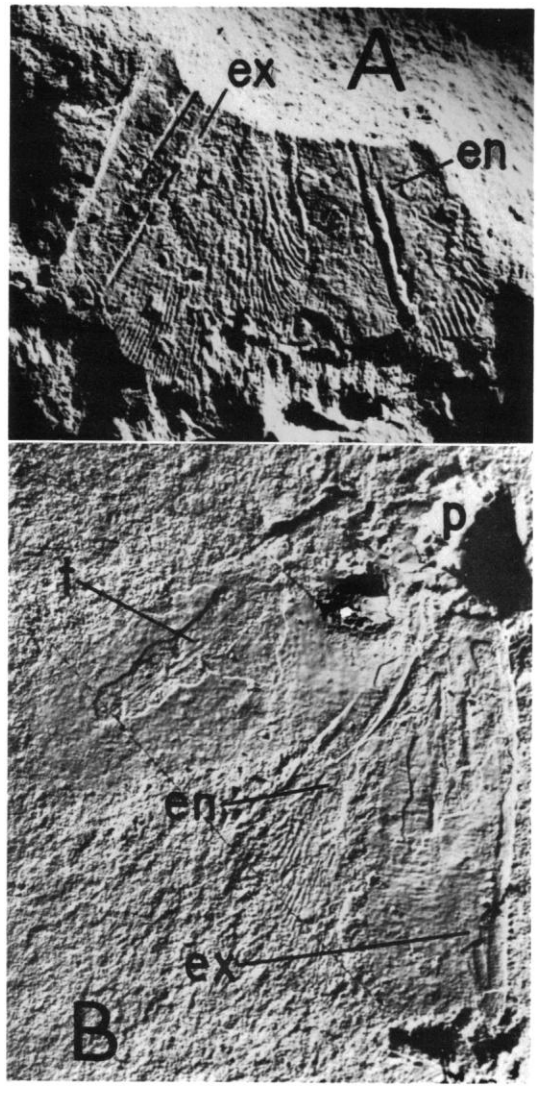
Material.—In 59828, British Museum (Natural History).

Locality.—Borehole no. 13, at Kaluga, near Moscow; Upper Devonian.

Remarks.—While examining the fossil crustacean collections of the British Museum in 1974, I found a mold (B.M. [N.H.] In 59828) of a small caridoid creature sent there by Birshtein from the Devonian of the Soviet Union. The associated label read "Exploration Bore #13 at Kaluga near Moscow, 653–659 m collected by C. V. Tikhomirova, presented by I. A. Birshtein." In 1977, I looked for the original specimen at the Paleontological Institute in Moscow. It was not there and the curators felt it might have been lost in the disposition of the later Professor Birshtein's personal effects.

Without the actual specimen no formal description or naming of this animal can occur. It appears to be a eumalacostracan (Pl. 1, fig. 3). It is small, only about 9 mm in total length. The carapace appears to have a pair of lateral and possibly a medial longitudinal ridge. The abodmen is narrow. The tail fan is well-developed with broad uropods and a subtriangular telson. There seem to be remnants of eyes and antennae on the mold but no clear details can be discerned.

Structural details and taxonomic affinities are difficult to determine without the actual specimen. The clear development of the carapace and the narrow abdomen are reminiscent of *Tealliocaris* and the pygocephalomorph mysidaceans. On the other hand the small size, tail fan, and general "feel" of the body might suggest a new family of eocaridaceans. These questions will never be answered without some real specimens; however, the material is important enough to deserve some mention in the literature. Devonian malacostracan material is scarce and



TEXT-FIG. *1*—Devonian malacostracan tail fans. *a, Eopteridium striatum* Rohdendorf, 1970, exopod (ex) and endopod (en); note long setae along membranous margins, ×8.5. *b, Eopterum devonicum* Rohdendorf, 1961, exopod (ex), endopod (en), protopod (p), and telson (t), ×8.5.

poorly preserved. Even material such as this "plastotype" crustacean affords us some relevant knowledge pending more and better material.

Superorder PERACARIDA Calman, 1904
Order ISOPODA Latreille, 1817
Suborder PHREATOICIDEA Stebbing, 1893
Family PALAEOPHREATOICIDAE Birshtein, 1962
Genus PALAEOPHREATOICUS Birshtein, 1962
PALAEOPHREATOICUS SOJANENSIS Birshtein, 1962
Pl. 1, figs. 1, 2

Materials.—94/1315 (holotype), 3353/1076, 3353/1077; Paleontological Institute, Soviet Academy of Sciences, Moscow.

Locality.—Iva Gora, right bank Soyana River, 62 km above the estuary. Kazanian, Middle Permian.

Description.—The cervical furrow is deep and extends almost to the dorsum. Only the small proximal-most joints of the antennae have been preserved. The mandible is massive.

Thoracomeres 2 through 8 are subequal and marked with a lateral groove half way along their length. The pleura of the thoracomeres are decorated on their posterior margins with a slight furrow. The maxilliped is not clearly preserved. Thoracopods 2 through 8 are generally composed of small somewhat subequal joints except for the propodus which appears to be somewhat longer than any of the others.

Pleomeres 1 through 4 are subequal, short, and their combined lengths are about equal to the length of the very large pleomere 5. The pleotelson is pointed terminally. None of the pleopods were preserved on any specimens at hand. The uropods articulate into a slight notch in the pleotelson, the protopod is small, the distal elements are incompletely preserved.

Remarks.—*Palaeophreatoicus sojanensis* and *Palaeocrangon problematicus* (von Schlotheim, 1820), from the Permian of England and Germany, bear several similarities to each other. Both have an enlarged fifth pleomere, the four anterior pleomeres are shorter than the thoracomeres (though those of *Palaeocrangon* are not as short as those of *Palaeophreatoicus*), and the thoracomeres are marked with a groove. However, *Palaeocrangon* has triangular pleura, grooves on the pleomeres, a very deep fifth pleomere, and a body somewhat more laterally compressed than cylindrical. This last could be due to preservation. No appendages or ventral features of the cephalon are preserved on *Palaeocrangon* material.

Both these Permian phreatoicids are thus somewhat similar to each other but quite distinct from *Hesslerella shermani* Schram, 1970 of the Pennsylvanian (Text-fig. 2). *Hesslerella* is decorated with ridges on the thoracomeres; has a less robust mandible than *Palaeophreatoicus*; has inflated thoracic bases with possibly fused coxae on the anterior thoracomeres; and a large notch on the pleotelson for the uropods. As Schram (1970, 1974) observed, the position of *Hesslerella* seems to be intermediate between palaeophreatoicids and amphisopids.

The two new specimens of *P. sojanensis,* in addition to the original holotype, allow a more complete reconstruction than those offered by Birshtein (1962) and Hessler (1969). Comparative reconstructions of all three palaeophreatoicid genera are offered in Text-fig. 2.

Birshtein (1962) observed that the fauna and sediments at Iva Gora indicated a probable brackish lagoonal setting with some access to the sea for these Kazanian deposits. The fauna associated with *P. sojanensis* contains insects, molluscs including *Aviculopinna ivanisciana, Pecten sericeum,* and *Pseudomonotis specularia,* brachiopods such as *Lingula orientalis, L. credneri, Rhynchopora genitziana,* and *Productus cancrini,* and some fragmentary

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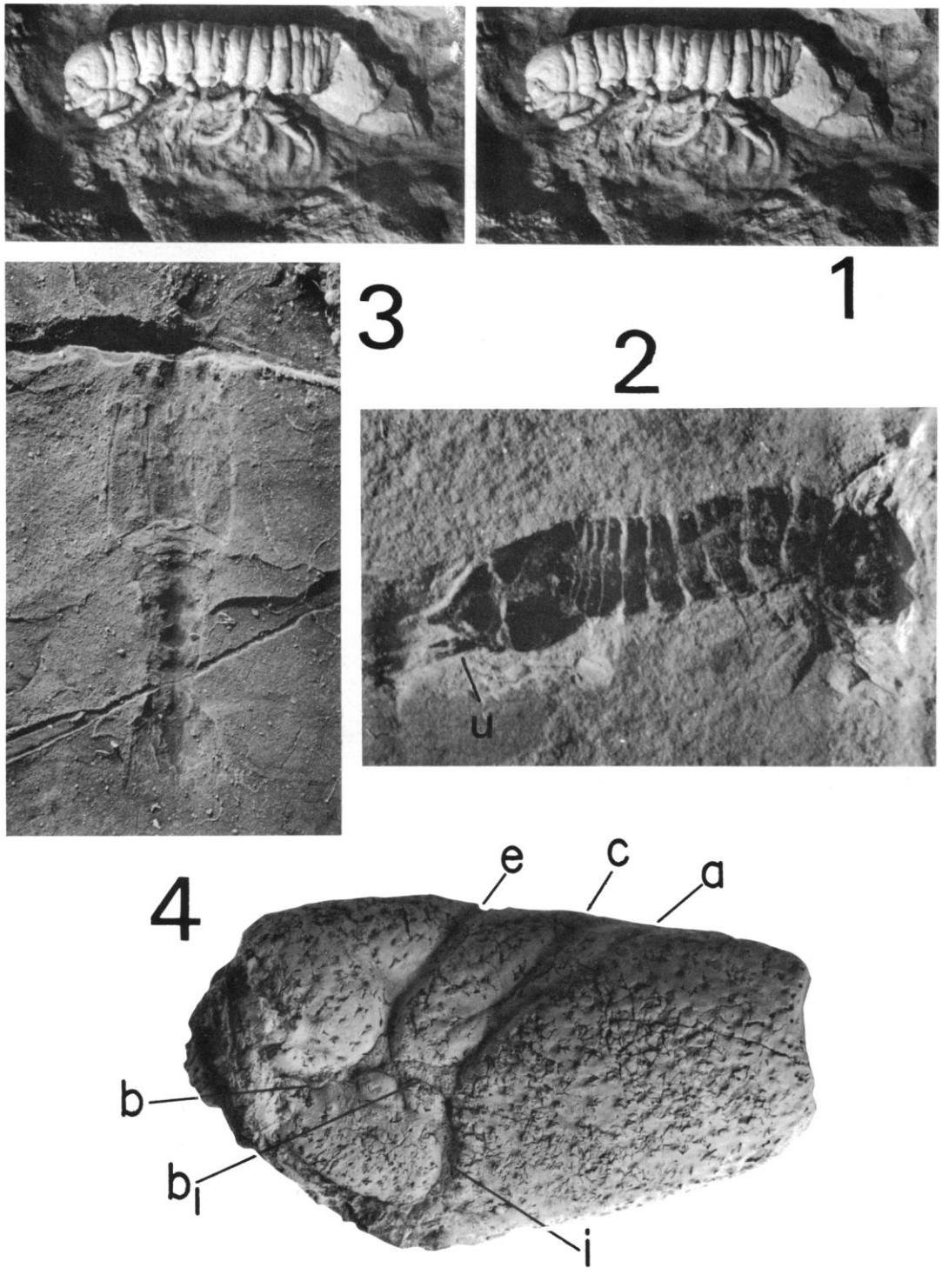
EXPLANATION OF PLATE 1

FIGS. *1,2*—*Palaeophreatoicus sojanensis* Birshtein, 1962. *1,* holotype, 94/1315, stereopair, ×5.6. *2,* 3353/1076, displaying pointed terminus of pleotelson and uropod (u), ×8.3.

3—Latex cast of mold of unnamed Upper Devonian eumalacostracan from Kuluga, near Moscow, pressing deposited in BM(NH) In 59828, ×7.2

4—*Protoclytiopsis antiqua* Brishtein, 1958, holotype 1453; displaying carapace grooves, brachiocardiac (a), antennar (b), hepatic (b_1), postcervical (c), cervical (e), inferior (i), ×1.3.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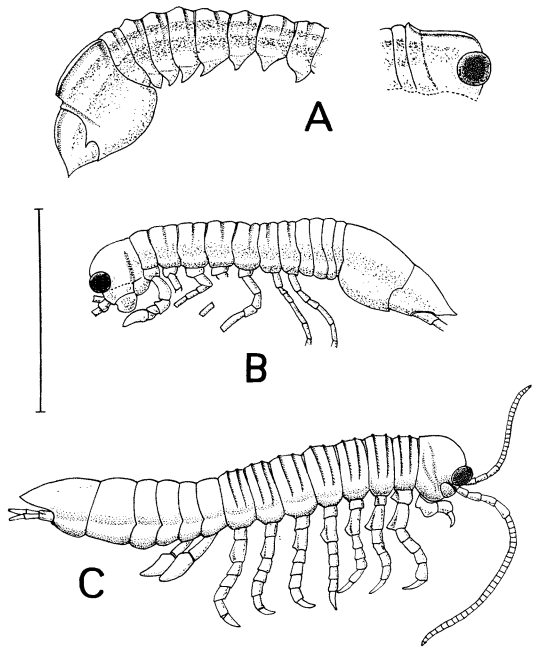

TEXT-FIG. 2—Reconstructions of Paleozoic palaeophreatoicids. *a, Palaeocrangon problematicus. b, Palaeophreatoicus sojanensis. c, Hesslerella shermani*; scale 5 mm.

crinoid remains. The Carboniferous *Hesslerella* is a marine form though in some proximity to a delta. *Palaeophreatoicus* is a brackish species in the Permian. Modern phreatoicideans are freshwater forms with a Gondwana distribution (Schram, 1977). Thus a habitat shift from the Paleozoic for phreatoicideans may be indicated.

During a sojourn in Britian in 1974 I searched for the British material of *Palaeocrangon* which Kirkby (1857) described. The material was apparently lost or was never deposited in a museum. Consequently, that material cannot be verified. The reconstruction in Text-fig. 2A is redrawn from Hessler, 1969 with some modifications based on a study of the original descriptions and a drawing of head and body to the same scale.

Superorder EUCARIDA Calman, 1904
Order DECAPODA Latreille, 1803
Suborder PLEOCYEMATA Burkenrood, 1963
Infraorder ASTACIDEA Latreille, 1803
Family ERYMIDAE Von Straelen, 1924
Genus PROTOCLYTIOPSIS Birshtein, 1958

PROTOCLYTIOPSIS ANTIQUA Birshtein, 1958
Pl. 1, fig. 4

Material.—1453, holotype, Paleontological Institute, Soviet Academy of Sciences, Moscow.

Locality.—From a borehole in the region of Ust-Yenissei, Siberia, 1,200–1,800 m; uppermost Permian.

Remarks.—This species, mentioned only in passing by Glaessner (1969) and Schram (1969), had a central position in the phylogeny of early decapods as discussed by Förster (1967). In view of the new understanding we now have concerning the antiquity of decapod origins in the Devonian (Schram et al., 1978), *P. antiqua* becomes very important indeed. But, heretofore, no adequate illustration of the holotype, 1453 (Pl. 1, fig. 4) has been readily available to western workers (Birshtein, 1958). The single known specimen is generally well-preserved, but consists of only a carapace with the rostral region missing.

Measurements of the holotype are: length of carapace from approximate level of orbit to posterior-most point of carapace—66 mm; length from junction of cervical and hepatic grooves to posterior-most point of carapace—49 mm; length from dorsal trace of postcervical groove to posterior-most point of carapace—28 mm; height of carapace—39 mm. The measurements are somewhat different than those few recorded in Birshtein (1958), but are comparable to those of Feldmann et al. (1977). A plaster cast of the holotype is in the San Diego Natural History Museum, SDSNH 4328.

ACKNOWLEDGMENTS

Thanks must be extended to Dr. A. P. Rasnitsyn and the late Prof. B. B. Rohdendorf of the Paleontological Institute of the Soviet Academy of Sciences, Moscow. Dr. E. S. Richardson, Jr., Field Museum of Natural History, read the manuscript and offered comment. Photographs of type specimens were done by Dr. Rasnitsyn. The reconstructions were drawn by Mr. Anthony D'Attilio of the San Diego Natural History Museum. Research was supported in part by NSF International Travel Grant BBS 76-82234 and DEB 7903602.

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MANUSCRIPT RECEIVED APRIL 26, 1979
REVISED MANUSCRIPT RECEIVED JULY 16, 1979

TAXONOMIC NOTE

PARAKRITHELLA PETERSENI NOM. NOV., REVISION OF AN OSTRACODE SPECIES NAME

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In a former publication (Teeter, 1975) I introduced the new ostracode species *Parakrithella hanaii* for marine Holocene specimens collected from Belize. This species name is a homonym of *Parakrithella hanaii* Hartmann 1962 named for specimens found in the eulittoral zone of the Chilean and Argentinian coast. In honor of H. E. E. Petersen of the University of Hamburg Zoological Institute and Museum, who kindly called my attention to the preoccupied name, I rename the Belize species *Parakrithella peterseni.*

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MANUSCRIPT RECEIVED MARCH 10, 1980