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MARINE ISOPODA

OF THE FAMILIES SEROLIDÆ, IDOTHEIDÆ, PSEUDIDOTHEIDÆ, ARCTURIDÆ, PARASELLIDÆ AND STENETRIIDÆ MAINLY FROM THE SOUTH ATLANTIC

ACADEMICAL DISSERTATION

BY

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Preface.

The following work deals with the bulk of the very abundant material of marine Antarctic and subantarctic Isopoda preserved in the Swedish State Museum (Riksmuseum) at Stockholm. It treats of the sub-orders *Asellota* and *Valvifera* and within the sub-order *Flabellifera*, the family *Serolidae*. The other families within the sub-order *Flabellifera* and the entire sub-order *Epicarida* have thus not been included.

By far the larger part of the material investigated is derived from the Swedish Antarctic Expedition (1901—1903) under the direction of Professor O. Nordenskjöld and was collected by K. A. Andersson, Ph.D., Director of the Department of Fisheries at Stockholm. Moreover, I have included the material preserved at the Riksmuseum collected by the following expeditions:

The Swedish »Eugenie» Expedition (1851—1853): material collected by I. G. H. Kinberg Ph.D.

The Swedish Expedition to Tierra del Fuego (1895—1897): material collected by A. Ohlin Ph.D. and Mr. H. Åkerman.

The Swedish Magellanian Expedition (1907—1909) under the direction of Professor C. Skottsberg: material collected by Professor Skottsberg.

In addition, some scanty material has been included which was collected by G. C. Westergren Ph.D. ('Gefle Expedition') 1866, material from South Georgia collected by Mr. E. Sörling (1905), as well as material collected by Captain Larsen (1894), and by Captain E. G. Högberg (1890?)

With a view to securing a more thorough investigation of the distribution of the species examined. I have included some finds made by S. Vallin Ph.D. in 1923—1924 from the Campbell Islands. This latter material belongs to the Zoological Museum of Lund, and I desire to express my cordial thanks to Mr. Vallin and the directors of the Museum in question for kindly placing it at my disposal.

For the purpose of comparative study I have procured material of Isopoda, partly consisting of type specimens, from the Museums at Paris, Berlin and Hamburg. I take this opportunity of expressing my gratitude to the directors of these Museums for kindly supplying me with this material. I have also paid a short visit to the British Museum in order to study type specimens.

In addition to a systematic investigation of the material, my treatise also contains a morphological investigation of setae and scale-processes, mainly performed on specimens of the genus *Serolis*.

I desire to express a general debt of gratitude to all those who have facilitated and encouraged this work by the kind assistance they have rendered or the friendly interest which they have displayed.

My special thanks are due to the late Professor A. WIRÉN, who introduced me to the study of Zoology, and to the late Professor A. APPELLÖF, who directed my attention to carcinological research.

I also wish to express my cordial thanks to my esteemed teachers Professor N. v. HOFSTEN and Professor S. EKMAN for their valuable instruction. Professor N. v. HOFSTEN, under whose direction my studies have been pursued, has followed my investigations with unflagging interest, has provided special accommodation for me at the Zoological Institute at Uppsala, and has enabled me to obtain grants in aid of my researches.

Especially it is both a duty and a pleasure to express my extreme gratitude to the superintendent of the Evertebrate Department of the Swedish State Museum (Riksmuseum), Professor S. BOCK. Both in Upsala and at the Riksmuseum in Stockholm I have enjoyed his valuable advice and guidance and benefited by his interest in my researches. In spite of shortage of accommodation, he provided me with comfortable quarters at the Riksmuseum, where this investigation was completed. He has moreover secured me a grant from the Museum funds to defray my expenditure for drawings, at the same time placing at my disposal the services of the Museum draughtsman and the photographer of the Evertebrate Department. I wish to place on record that without his kind efforts on my behalf the appearance of this work would have been considerably delayed.

I am particularly indebted to Mr. NILS ODHNER Ph. D. at the Evertebrate Department of the Swedish State Museum (Riksmuseum) and desire to express my great appreciation to him for a further grant from the Museum funds towards the expenses of my work. He has greatly promoted my work in many ways, especially by allowing me to benefit by his great experience and by putting before me his own interesting points of view.

I am furthermore indebted to the Royal Swedish Academy of Science for a grant from one of their funds.

I desire to acknowledge my indebtedness to Professor W. T. CALMAN, London and Professor M. DOELLO-JURADO, Buenos Aires, as well as to Mr B. BOHLIN, Ph. D., Peking, and Mr. O. NYBELIN, Ph. D., Inspector of Fisheries, Stockholm.

Most of the drawings reproduced in this treatise were first drawn in pencil by myself; for their execution in Indian ink and for some original drawings I am indebted to Mr. S. EKBLOM of the Swedish State Museum and Miss S. OLSSON, Upsala. For the photographs my thanks are due to Mr. S. SVEDÉN of the Swedish State Museum.

Mr. S. ALLWOOD, of the Swedish Board of Education, Mr. G. GROVE, of the British Legation in Stockholm, and Mr. S. J. CHARLESTON, Reader in English at »Stockholms Högskola» have helped me with the English text, and to these gentlemen I wish to express my appreciation of their ever-ready assistance.

SECTION I.

Historical.

The Antarctic and subantarctic Isopod fauna is as yet by no means so well known as the fauna of the corresponding northern latitudes. The Belgian Antarctic Expedition (1897—1899), whose collection of Isopods is the latest that has been elaborated (by MONOD, 1926) increased the known number of Isopods belonging to the families dealt with in this treatise by four, and moreover reported the occurrence of two additional species which, owing to the shortage of material, were inadequately described. »*Ianthopsis nasicornis*», one of the species dealt with in MONOD'S work, must be regarded as a new species, for the reasons stated in the sequel. In the present study I have found it necessary to introduce no less than 19 new species, all of them obtained during the Swedish Antarctic Expedition (1901—1903). Most of the new species are of diminutive size. It may therefore be presumed that the Antarctic and subantarctic regions still contain many species which have escaped attention owing to their minuteness.

The first data regarding the Isopod fauna of these regions were given by FABRICIUS, (1775). Since then the most important contributions to our knowledge of the Isopod fauna of these regions have been obtained mainly by the elaboration of material collected by expeditions. The following studies deserve special mention: EIGHTS (1833), AUDOUIN and MILNE EDWARDS (1841), DANA (1852), STUDER (1884), BEDDARD (1884 and 1886), PFEFFER (1887), DOLLFUS (1891), OHLIN (1901), HODGSON (1902 and 1910), STEBBING (1900, 1914, 1919), RICHARDSON (1906, 1908, 1913), VANHÖFFEN (1914), TATTERSALL (1921), MONOD (1926 and 1931).

For the classification of Isopods the works of G. O. SARS[1] have been of fundamental importance. By his thorough researches, especially those reported in »Crustacea of Norway» (1899), SARS laid the foundation of the modern classification of Isopods. His system, in accordance with which the Isopods are divided into six tribes, distinguished mainly by differences in the uropods and pleopods, still holds good in essentials. Each of the tribes into which the Isopods were divided by G. O. SARS comprises a number of families, which he sharply defined.

SARS' classification of Isopods has been supplemented in connection with the extension of our knowledge and the discovery of new and interesting species. Considerable additions have thus subsequently been made to our knowledge of the sub-orders dealt with in this treatise.

[1] As regards the history of the classification of Isopods prior to SARS, vide GERSTECHER and ORTMANN, 1901: Crustacea, in BRONN: Klassen und Ordnungen des Thierreichs.

The sub-order Asellota, which was divided by SARS into the five families *Asellidae, Ianiridae, Munnidae, Desmosomidae* and *Munnopsidae,* was revised by HANSEN (1905 and 1916). In 1905 HANSEN divides the sub-order into the three families *Asellidae, Stenetriidae* and *Parasellidae,* according to the conformation of the pleopods. The family *Asellidae* is the same as that defined by SARS; the family *Parasellidae* corresponds to the four remaining families into which SARS (1899) divided the sub-order Asellota. HANSEN points out that the families into which SARS divides the Asellota, with the exception of the *Asellidae,* contain transitional forms which render it impossible to retain the latter's classification. In his important later work HANSEN (1916) divides the *Parasellidae* into a large number of groups, basing this classification in the main on a thorough study of the appendages, especially the oral appendages. The Antarctic and subantarctic *Asellota* still contain many species which are by no means so well known as the northern ones dealt with by HANSEN (1916). Hence many southern species cannot as yet be assigned with certainty to HANSEN's groups. In this study I have found it necessary to suggest one new group, and to sub-divide one of the groups previously proposed by HANSEN. By this arrangement a clearer view has been obtained of the relation of the genera to one another.

As regards the sub-order Valvifera, a new family, the *Pseudidotheidae,* was added by OHLIN (1901) to the three families which SARS included in this sub-order.

The fam. *Idotheidae* was divided by MIERS (1881) into two sub-families *Idotheinae* and *Glyptonotinae.* To these RACOVITZA and SEVASTOS (1910) add the sub-family *Mesidoteinae* in connection with their interesting investigations on their new fossil genus *Proidotea.* In proposing their new sub-family they discuss the position of the genus *Macrochiridothea,* which will be dealt with in the sequel.

Historical notes on the families *Arcturidae* of the sub-order Valvifera and *Serolidae* of the sub-order Flabellifera, which have been treated more thoroughly than the others will be given later on in connection with the discussion of their morphology and classification.

As the systematic classification presupposes thorough morphological studies, the investigators are obliged to tackle many a morphological problem. The Isopod studies of RACOVITZA are in this respect significant. In the course of his very conscientious investigations on Isopods (the first published 1907), this author discusses a number of interesting morphological problems, carefully considering their bearings on classification and on the relations between the units of the system. His conclusions are supported by minute descriptions and excellent figures. At quite an early stage of his researches on Isopods, his attention was attracted to the different kinds of setae and other chitinous projections; in this treatise these will be dealt with in a separate section.

RACOVITZA's investigations, especially those on the families *Trichoniscidae* (1907 and 1908), *Sphaeromidae* (1910) and *Cirolanidae* (1912), show that in these families the setae are highly polyform. It should by observed, however, that the morphological nature of the setae and other kinds of chitinous projections can scarcely be satisfactorily elucidated unless comparative researches are concentrated on this special subject. As regards the terrestrial Isopods a comparative study of chitinous processes was made by WAHRBERG (1922).

WAHRBERG, partly by dissection and partly by comparative morphological studies, ascertained that the thoracopod setae in terrestrial Isopods are of a composite nature, consisting of an axial setal part, enveloped by a scale, which has coalesced, more or less, with the setal part. WAHRBERG did not examine very thoroughly the variations in the form of the freely projecting scales. He holds, however, that the rows of bristle-like »hairs» with which the basipodite of the maxilliped is occasionally beset are not setae proper, being presumably nothing but pectinate scales.

In order to embrace all chitinous processes under a single comprehensive term, RACOVITZA (1923), coins the word »phanere» which he explains as follows (p. 85, note):

»Ce terme de médecine, antonyme de 'crypte', désigne toutes les productions apparentes (φανεϱοσ) de la peau. Je le trouve commode pour réunir sous un vocable commun toutes les productions superficielles, si variées, de la carapace des Crustacés: écailles, peignes, poils, soies, tiges, crochets etc. L'étude de ces productions se nommerait Phanérotaxie ou Chaetotaxie terme déjà usuel chez les Entomologistes.»

In sequel to WAHRBERG's investigations on thoracopod setae in terrestrial Isopods RACOVITZA (1923) laid down the rule that »Les phanères des Isopodes sont des modifications de deux organites primitifs, différents par l'origine et la structure: l'écaille et le poil sensitif, ou bien le résultat de la combinaison des deux organites (p. 86)». In this paper RACOVITZA quite rightly claims that he had shown before WAHRBERG that the thoracopod setae in terrestrial Isopods were composed of different parts, and refers to his earlier work of 1907, where he states (p. 183): »Ces productions, à rôle sensitif, sont formées par deux écailles: l'une lancéolée, dans laquelle s'épanouit le nerf, et l'autre en forme de cornet, qui joue probablement un rôle protecteur» etc. This shows, however, that RACOVITZA has not here properly grasped the distinction between the simple setae and the scale elements, which was brought into clear relief by WAHRBERG (1922). »L'écaille lancéolée, dans laquelle s'épanouit le nerf» is a rather rough description of the organ which RACOVITZA afterwards more correctly termed »poil sensitif».

RACOVITZA's thorough researches on representatives of the fam. *Cirolanidae* (1912) have shown that in this family the thoracopod setae externally resemble the setae of terrestrial Isopods; like the latter setae they frequently assume a trilobate shape. This resemblance in external form, however, is not in itself sufficient evidence of a composite structure. On the other hand, it has been pointed out by WAHRBERG (1922) that even setae which present the appearance of a simple cylindrical structure may be of a composite character. Thus in order to determine the morphological nature of the setae in marine Isopods, it will be necessary to make a careful comparison of the various kinds of setae.

In this treatise the morphological investigation of phaneres has been confined mainly to the family *Serolidae*. The abundant material of *Serolis* preserved at the Swedish State Museum (Riksmuseum) has enabled me to examine the phaneres in 15 species of this genus.

A distinguishing feature of the family is that the species are as a rule provided with two rows (exceptionally one row) of curiously transformed setae on the lower margin of the propodus of the first pereiopod. The characteristic structure of these setae early attracted the attention of investigators. The reports on this subject are, however, inadequate and, in part, contradictory.

The earliest data[1] regarding these setae have been supplied by AUDOUIN and MILNE EDWARDS (1841). They figure setae from the lower margin of the propodus of the first pereiopod as well as from the same place on the second pereiopod, in the full-grown male of the species, *S. gaudichaudi*. The latter setae are described as »tubercules coniques aigus» (p. 24). According to AUDOUIN and MILNE EDWARDS, the setae on the lower margin of the propodus in *Serolis* are (p. 19): »Les unes externes larges et courtes, les autres internes plus grêles et plus longues». In regard to the species *S. gaudichaudi* these authors have observed the marked difference in the shape of the setae in the two rows. But in regard to the corresponding setae in *S. paradoxa* they state (p. 27): »Ces lanières sont également sur deux rangs, mais les supérieures ne diffèrent des secondes que par un peu plus de longueur; elles sont dépourvues de poils et se terminent par un petit article pointu».

GRUBE (1875) made a careful study of the setae on the propodal edge in four species, namely *S. paradoxa, gaudichaudi, schythei* and *tuberculata*. Referring to the genus at large, he states (p. 215): »Die Stachelchen sind von dreierlei Gestalt, in der unteren Reihe etwas lanzettförmig, dicht quergestreift, an den Rändern dicht und fein gewimpert, mit einer zarten, an der Spitze frei hervorragenden, öfters wie mit einem Knöpfchen endenden Mittelrippe, in der dicht darüber befindlichen Reihe mehr drehrund; und länger, je nach den Arten verschieden, glatt oder ebenfalls kurz behaart, einfach griffelförmig oder in eine kurze Gabel auslaufend». As regards the setae on the propodal edge of the first pereiopod in *S. paradoxa* GRUBE states (p. 226): »Die Zähnchen der äusseren Reihe, welche den Innenrand des Handgliedes am 1:ten Fusspaar besetzen, sind nicht stumpfgabelig und glatt wie bei *S. Schythei* sondern einfach und dicht behaart, wie bei *S. Gaudichaudi*, nur nicht so viel länger als die der Innenreihe, letztere sehen schmäler als bei *S. Schythei* aus». GRUBE has here confused the setae of the rostral row (= setae of the upper or inner row) and those of the caudal row (= lower or outer row). In *Serolis* the setae of the rostral row are always the longest (also in *S. gaudichaudi*, see AUDOUIN and MILNE EDWARDS, 1841, Pl. I, Fig. 13 and the explanation of the figure).

In the case of the species *S. schythei*, GRUBE describes and figures the setae on the lower margin of the propodus of the first pereiopod[2] but incorrectly states that the long setae are in the outer row, which is just the reverse of the actual facts. He gives illustrations of setae from the lower margin of the propodus of the second pereiopod in the case of the species *S. schythei, gaudichaudi, tuberculata* and *paradoxa*. His figures show that in *schythei, gaudichaudi* and *tuberculata* the setae were taken from full-grown male specimens, in *paradoxa* from a sub-adult male.

With regard to the setae-armature on the propodus of the second pereiopod in *S. paradoxa*, GRUBE states that it is similar in males and females (p. 226). In reality this is only the case in immature specimens. The very considerable difference in the shape of these setae in the full-grown male of *S. paradoxa* was subsequently demonstrated by BEDDARD (1884).

BEDDARD (1884) supplies us with a great deal of new information on the setae and

[1] EIGHTS (1833) describes the lower margin of the propodus of the first pereiopod as ciliate, in *S. trilobitoides*.

[2] GRUBE (1875, p. 224; Pl. VI, Fig. 1 b).

scales in the family *Serolidae*. He illustrates the setae on the lower margin of the propodus of the first pereiopod in the species *S. schythei*, *naera*, *convexa*, *minuta* and *pallida*. As regards *S. septemcarinata* BEDDARD gives descriptions, but no figures. With reference to the above-mentioned setae in *S. septemcarinata* he says (p. 48) that »the longer spines terminate in a bifid extremity, of which the anterior bifurcation is the longest; the axis of the spine extends between the two branches, and is rather longer than either». The setae from the lower margin of the propodus of the first pereiopod figured by BEDDARD in the case of *S. convexa* have been taken from an adult male. BEDDARD devotes much attention to secondary sexual differences in *Serolis*, including those which are expressed in the transformed setae-armature of the male. Thus he shows that the full-grown male in *S. paradoxa* is distinguished from the female by bearing two rows of »plumose hairs» on the lower margin of the ischium, merus and carpus of the first pereiopods, and by the modified appearance of the setae on the lower margin of the propodus of the second pereiopod. Setae from this place in the adult male are figured in detail in the case of the species *septemcarinata*. The second pereiopod with its setae is also figured in the male of the following species: *schythei*, *convexa*, *antarctica*, *bromleyana*, *naera*, *minuta*, *paradoxa* and *pallida*. BEDDARD is the only author who has observed the projections which usually occur in *Serolis* on the ventral side of the central joints of the flagellum of the antennae.[1] He describes them with reference to the species *paradoxa*, *schythei* and *trilobitoides* and figures them in the two last-mentioned species. BEDDARD moreover states that similar formations occur in the species *septemcarinata*, *bromleyana* and *gracilis*. In *S. paradoxa* they assume the shape of »recurved hooks». According to this author these processes, though similar to those in *S. paradoxa*, are less marked in the species *bromleyana*, *gracilis*, *septemcarinata* and *schythei*. In the last-mentioned species there occurs[2] on the lower side of the central flagellum joints in the female, distally, a transverse row of »curved spines», as in *S. paradoxa*, whilst in male specimens there occurs besides »a series of delicate lamellar processes arranged in a single line along the inner side of most of the joints» (BEDDARD, 1884, p. 43). BEDDARD considers it probable that these »lamellar processes» have a sensory function. In *S. trilobitoides* BEDDARD maintains that the antennal processes consist of »short lancet-shaped spines», saying (p. 51) that »these spines which are present upon the antennae of both sexes are like those which are found in *Serolis paradoxa* and which have been described».

PFEFFER (1887) gives a detailed description of *S. septemcarinata*, inclusive of its setae-armature, with figures comprising the setae on the lower margin of the propodus of the first pereiopod. His description and figures of these setae[3] differ considerably from the description of setae on the propodal edge in the same species previously given by BEDDARD (1884). For example, the longer setae in the rostral row are illustrated as, single-pointed and broadly flattened, not trilobate, as described by BEDDARD. PFEFFER gives the first detailed figures, as regards any species of *Serolis* of the two stout setae occurring on the free distal edge of the carpus of the first pereiopod, saying, with reference to *S. septemcarinata* (p. 70): »sie sind solide Zapfen mit einem axialen längsstrei-

[1] The second pair of cephalic appendages; for the first pair of appendages (= first pair of antennae) I use the term antennulae.
[2] According to BEDDARD, 1884.
[3] PFEFFER, 1887, Taf. III, Figs. 13, 14, 15.

figen Teile und einem darum liegenden Mantel, dessen Streifung in einem Winkel auf die Axe stösst, sodass es scheint, als entspreche diese Streifung einer ursprunglichen Zusammensetzung des Mantels aus Fiedern». Also in regard to S. *septemcarinata* PFEFFER gives the first detailed figures of some of the characteristically shaped setae occurring on the second and third joints of the mandibular palp.

HODGSON (1910) after a thorough examination of S. *trilobitoides*, reports various new observations, especially regarding the setae on the lower margin of the propodus of the first pereiopod. Referring to the setae of the rostral row HODGSON points out that they have »a strongly-marked 'mid-rib' which, however, is not quite straight, and terminates in a delicate elongate sensory structure» (p. 28). He has, however, wrongly drawn the setal canal, which actually terminates in a pore at the end of the axial part of the setae. HODGSON made some interesting observations on the foliate setae in the caudal row, which he calls »leaf-like organs». He says (p. 28) that »the 'leaf-like' organ also has a distinct 'mid-rib', but that the blade is very unequally developed on the two sides, and exhibits a much coarser striation than the tooth. The 'mid-rib' terminates in precisely the same way and in a similar sensory structure». HODGSON thus shows that the structure of these setae is different on their caudal and on their rostral sides, but does not make it clear wherein the difference consists. HODGSON has moreover given a detailed figure of one of the setae of the mandibular palp in S. *trilobitoides*.

COLLINGE (1918) studied *Serolis septemcarinata*. In contradistinction from BEDDARD (1884) and PFEFFER (1887) he found in this species only one row of setae on the lower margin of the propodus of the first pereiopod. COLLINGE figures one of the setae which, he says, is divided into three of four finger-like processes.[1]

On the other hand TATTERSALL (1921) referring to the setae in question in S. *septemcarinata*, states (p. 228): »My own observations agree absolutely with those of PFEFFER, whose account of this species has evidently been overlooked by COLLINGE.»

SECTION II.

Scales and setae in the family Serolidae.

I. The ordinary Structural scales.[2]

The structural scales in the *Serolidae* are of the usual triangular shape, overlapping, and distally, as a rule, rounded. Generally speaking, they are somewhat indistinct, but here and there, as, for example, on the lower surface of the flagellum of the antennae their structure is very distinctive (Fig. 1 g. and h.). It will be seen from a comparison of these two figures that the shape of the structural scales may vary in different species. In S. *paradoxa* (Fig. 1 g.) they are evenly rounded anteriorly, whilst in S. *pagenstecheri* (Fig. 1 h.) they are acutely triangular. I have found a pointed shape in

[1] See COLLINGE, 1918, Pl. II, Fig. 9.
[2] Structural scales is a translation of the German »Strukturschuppen».

all the structural scales only in the latter species. Structural scales occur also on the tergites, but here they are often ill-defined or sparse. Some well-defined, though sparse,

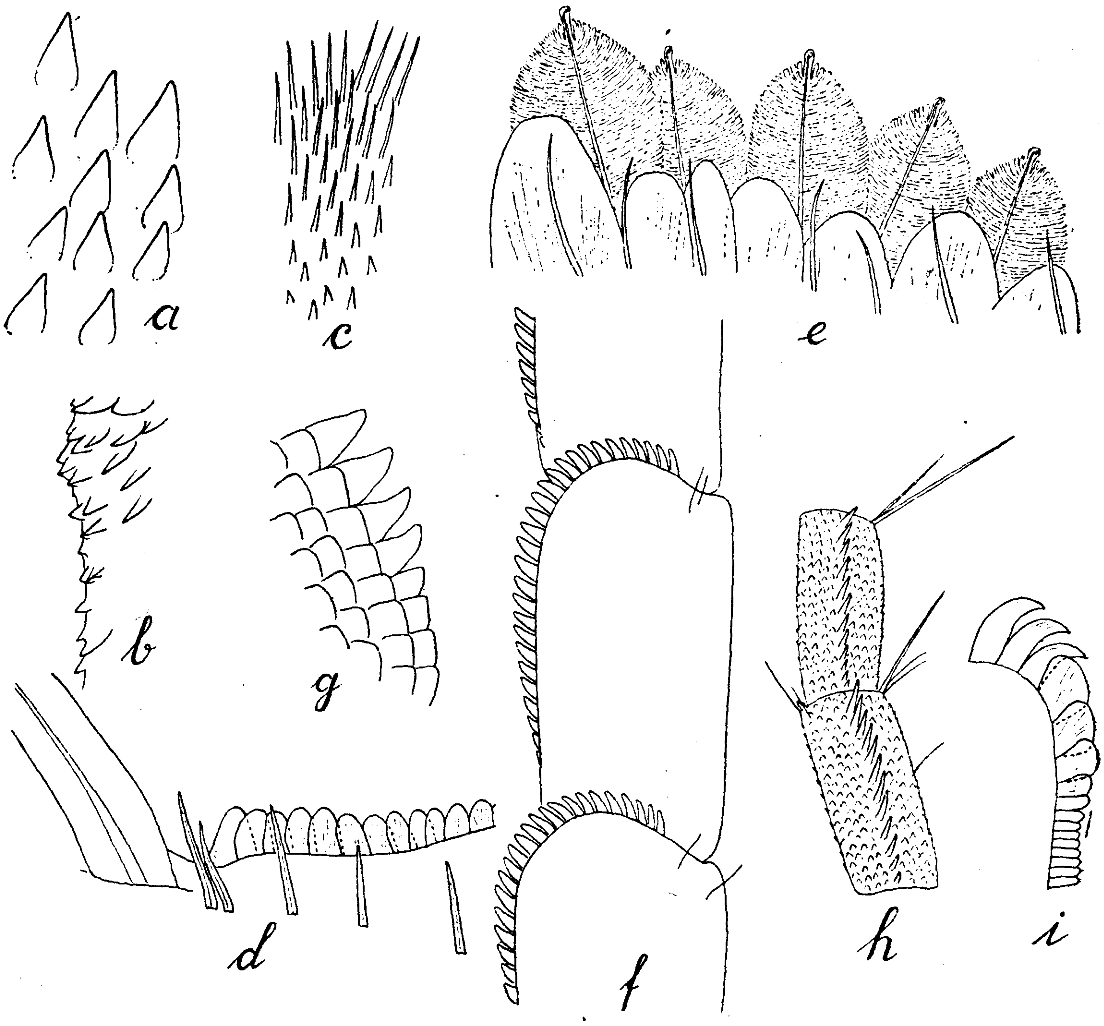

Fig. 1. Scales in *Serolis*. a. Structural scales from the tergum of *S. pagenstecheri*, 435 ×. b. Slightly projecting structural scales close to the lower margin of the propodus of the second pereiopod, adult male of *S. schythei*, 235 ×. c. Spine-like scales from the same spot in an adult male of *S. pagenstecheri*, 240 ×. d. Part of the free distal margin of the carpus of the first pereiopod in *S. septemcarinata*, 240 ×. e. Setae and projecting scales from the lower margin of the propodus of the first pereiopod seen from the caudal side, in *S. polita*, 80 ×. f. Antennal processes on the eighth and part of the seventh and ninth joints of the antennal flagellum, *S. paradoxa*, 80 ×. g. Structural scales and antennal processes from the flagellum of the antenna, *S. paradoxa*, 240 ×. h. Two joints of the antennal flagellum of *S. pagenstecheri*, seen from below, 50 ×. i. Antennal processes from the flagellum of the antenna, female of *S. schythei*, 240 ×.

structural scales from the tergum of *S. pagenstecheri* are shown in Fig. 1 a. Here too we observe the pointed shape of the structural scales, which is characteristic of the species. Generally speaking, however, the structural scales in *Serolis* have a tendency to be effaced and coalesce with one another.

II. Transformed scales.

This general tendency towards the effacement of the distinctive structural scales is not only due to a coalescence of individual scales. In some places they are transformed into chitinous projections of varying shape, which not infrequently assume a spine-like or setiform appearance. This transformation may take place in either of two ways. (1) Each scale increases in size and changes in shape. Or (2) the individual scales split up into several distinct elements.

1. Projections formed by increase in size.

The freely projecting scales of enlarged size occur especially at places where two surfaces meet at an angle. Thus the chitinous processes of varying appearance (hook-like lamellar or fan-shaped), which are situated on the ventral side of the central flagellum joints of the antenna in the angle between the rostral and ventral surfaces,[1] consist of transformed and enlarged structural scales.

An examination of the antennal processes in e. g. *S. paradoxa* shows that the hook-like processes in this species[2] are gradually transformed through transitional forms into the typical scale covering (compare Fig. 1 g. and Fig. 1 f.). A similar transformation is observable in *S. pagenstecheri* (Fig. 1 h.), though only on a few of those joints which are provided with antennal processes, viz. on one or two of those joints, which are situated proximally and one or two of those situated distally. In the species all the spine-like antennal processes attain greater length and assume a more bristle-like appearance as one approaches the centre of the flagellum. The characteristic conformation of the antennal processes in the species *S. schythei* has been illustrated by BEDDARD (1884). I have not been able to detect any such difference in the shape of the processes in male and female specimens as BEDDARD claimed to have observed. The processes which BEDDARD believed to be distinctive of the male are similarly developed also in the female (see Fig. 1 i.). There is therefore no ground for BEDDARD's assumption that certain of the antennal processes — all of which are merely scale formations —, have a sensory function.

Antennal processes occur in most species of *Serolis*. Like BEDDARD (1884)[3] I have found them in the species *paradoxa, trilobitoides* and *schythei*. I have also discovered them in *gaudichaudi, convexa, longicaudata, australiensis, polita, pagenstecheri, glacialis* var. *austrogeorgiensis*, and *exigua*.

In the various species these processes differ not only in shape[4] but also in degree of distinctness. I found them quite faintly developed in full-grown specimens (one male and one female) of *S. convexa*, whilst in three immature females of that species they were entirely lacking. In a sub-adult male specimen of *S. bouveri*[5] they were indistinct and scarcely larger than the structural scales. In *S. paradoxa* on the other hand I found antennal processes typical of the species even in young removed from the marsupium, though only in a row along the distal margin; they were entirely absent on the rostral margin of the ventral

[1] Described and figured by BEDDARD (1884) with reference to certain species of *Serolis* (see p. 13).
[2] Cf. BEDDARD, 1884.
[3] See p. 13.
[4] The reader is referred to the following descriptions of the several species.
[5] The only specimen of this species which I have been able to examine.

surface. In the species *S. latifrons*, — which, together with *S. beddardi*, forms a divergent group within the genus *Serolis* —, antennal processes were entirely wanting, even in full-grown specimens.

Elongated structural scales occur in *Serolis* also in several other places. Occasionally they occur in the full-grown male, on the propodus of the second pereiopod, submarginally, close to the lower margin. This is the case in *S. pagenstecheri* (Fig. 1 c.). The more dorsally situated, pointed structural scales, which are characteristic of the species, increase successively in length towards the lower margin of the propodus, so that near the margin they assume the form of setae. A corresponding part of the propodus of the second pereiopod in *S. schythei* is illustrated in Fig. 1 b. Though the scales in this part have assumed a pointed shape, they scarcely project further than the other structural scales.[1]

We occasionally find a longitudinal row of elongated structural scales on the lower margin of the dactylus of the second pereiopod. In the species *S. schythei* I found them both in males and females. See Fig. 13 d. The scale processes here have a claw-like appearance, and the one most distally situated assumes the form of a distinct claw at the point of the propodus. In different specimens the processes varies in degree of distinctness.

Enlarged and freely projecting scales occur close to the lower margin of the propodus as well as on the distal margin of the carpus of the first pereiopod. In *S. polita* large leaf-like scales are found in a longitudinal row, submarginally, close to the lower margin of the propodus on the caudal side. See Fig. 1 e.[2]

Elongated scales of similar shape are found at the same spot also in *S. minuta, australiensis, longicaudata* and in *S. paradoxa*. In the last-mentioned species they are rather small. In *S. exigua* we find on the lower margin of the propodal joint one longitudinal caudal row of scales and, in contradistinction from other species of *Serolis*, only one longitudinal row of setae (Fig. 4 c.). Similar scale formations from the distal edge of the carpus of the first pereiopod in *S. septemcarinata* are illustrated in Fig. 1 d. In this species they are distinctly developed in a few specimens only.

The masticatory processes on the mandibles, which always are devoid of a setal canal, may be a kind of scale-processes. They differ considerably in shape in the several species, being, as a rule, of a scale-like or spine-like appearance (Figs. 12 c. and d., 13 a. and b., 14 b. and c., 15 c. and d., 19 b. and c., 21 b. and c.); exceptionally they are pectinate at their distal ends (Fig. 17 c. and d.).

2. The pectinate scales[3] and their division into false setae.

We find a variety of the structural scales proper in the pectinate scales. The characteristic feature of these scales is that they are produced distally into a number of slender and acute points. In *Serolis* the size of the part which forms the common basis of these pointed ends, as also the length of the points, varies in individual scales. Indeed in many instances we find no trace of the basal part. In such cases the hair-like points of the scale form regular rows of »hairs». This feature was seized upon by WAHRBERG (1922) as a

[1] The typical form of structural scale in *S. schythei* is much the same as in *S. paradoxa* (see Fig. 1 g).

[2] This figure also shows the caudal row of short leaf-like setae on the lower margin of the propodus as well as the sub-marginal row of slender setae lying close to the projecting scales. The rostral row of long trilobate setae on the lower margin of the propodus has not been figured.

[3] Kammschuppen in German.

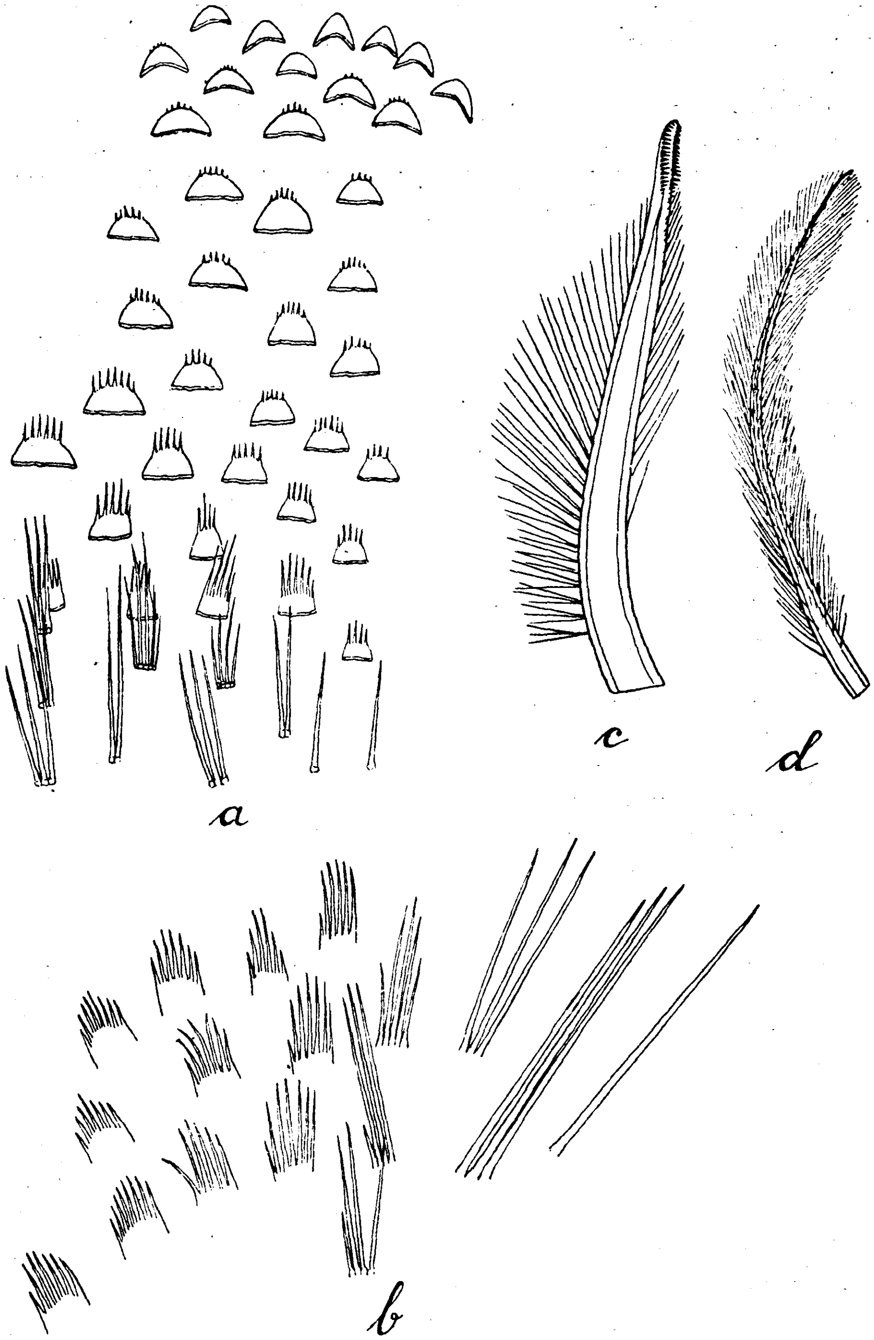

Fig. 2. a. Scales and setae in *Serolis*. Structural scales, pectinate scales and setae-like »hairs». Chitinous tegument from the dorsal surface of the basipodite near its distal margin, maxilliped of *S. paradoxa*, low adjustment of the microscope, 490 ×. b. Pectinate scales and setae-like hairs from the same spot, in *S. paradoxa*, high adjustment of the microscope, 600 ×. c. Seta from the inner proximal angle of the basipodite of the first pleopod, subadult male of *S. polita*, 150 ×. d. Seta from the lower margin of the basipodite of the second pereiopod, adult male of *S. paradoxa*, 115 ×.

plausible explanation of the occurrence of regular rows of hair-like projections without a setal canal on the maxillipeds of terrestrial Isopods (see p. 11). Where a chitinous area is observed proceeding from the basipodite of the maxilliped near its distal margin, we find the features illustrated in Fig. 2 a. Next to the distal edge we see typical structural scales. These are succeeded in a proximal direction by pectinate scales. Those nearest the structural scales are, however, provided with very inconspicuous points. As we advance proximally the hair-like points become longer and longer and their common basal part smaller and smaller, being reduced to nil on the most proximal of the scales figured. In other words we find continuous series of structures forming transitions (1) between the typical structural scales and the pectinate scales and (2) between the pectinate scales and the regular rows of independent setiform projections. It is thus indubitable that each of the structural scales can split up into several separate phaneres.

Further proximally on the basipodite of the maxilliped the surface is covered by a dense nap of long, thin, setae-like »hairs» of considerably greater length than those shown in Fig. 2 a. In this nap the »hairs» are still farther apart. The regular row has in fact been partially dissolved. Here and there one finds solitary hair-like projections at some distance apart from the rest (cf. Figs. 2 a. and b.) Most of these »hairs», however, are grouped together, two and two, in transverse rows; here and there we find groups of three. The distance between the »hairs» in the transverse rows is always greater than in the more distally situated free »hairs» illustrated in Figs. 2 a. and b.[1]

These very slender setae-like »hairs» — which may thus be produced by the separation of the ends of the pectinate scales and which, unlike the setae proper, are devoid of a setal canal —, are widely distributed in marine Isopoda being almost as common as the setae proper. They often form a covering of »hair» on the margins of the pleopods, but also occur abundantly elsewhere, especially on the mouth-parts. Their occurrence is a character which normally applies to all Isopoda.

In the species of *Serolis* examined by me they are very abundant. They occur on the mouth-parts (see for example Fig. 15 f., Fig. 16 and Fig. 17 f.), and on the antennulae (Fig. 21 a.). In all the species of *Serolis* examined by me they are developed on the rostral[2] (medial) margin of the second peduncular joint of the antennae, where they cover a triangular area (see Fig. 12 c. as compared with Fig. 12 a. and b.). They occur also on the pereiopods. In *S. polita*, for example, they form a nap on the upper and lower margin of the sixth pereiopod (Fig. 3 a.). In *S. exigua* they occur on the upper margin of both the basipodite and the ischium of the fifth to seventh pereiopods (Fig. 18 b.), as well as on the upper margin of the basipodite of the second to fourth (Fig. 18 a.). On the pleopods they are very abundant (see Figs. 18 c., d. and e., Fig. 19 d.), as well as on the uropods (Fig. 21 d.).

The antennal processes on the flagellum of the antennae in *Serolis* sometimes likewise assume a pectinate character. I found this to be the case in the species *S. longicaudata* (see p. 92), where the antennal processes are distally produced into points. They deviate, however, from typical pectinate scales in that the central and furthest projecting process is robust and spine-like.

[1] The double lines shown at the foot of the scales and free »hairs» in Fig. 2 a., in contradistinction from Fig. 2 b., are due to the low adjustment of the microscope in the former picture.

[2] When the antennae are in their natural position this margin is the inner (= median or medial) margin. As regards the orientation of the appendages and the terminology of their margins, I have, in the main followed RACOVITZA (1923).

Similar features occur also in other Isopods. In *Edotia tuberculata*, we find, distally, on the penial filament of the second pleopod in the male (see Figs. 22 c. and d.) a covering of slender projections, arranged in rows and increasing in length towards the proximal end. Here they assume a setiform appearance, the rows being entirely dissolved.

In *Eurycope* sp. (cf. *frigida* VANHÖFFEN) the last joint of the mandibular palp is ventrally covered by pectinate scales. See Fig. 78 d. In the distal part of the rostral margin of the joint, however, the pectinate scales form free projections of a somewhat setiform appearance, but furnished, like the typical pectinate scales, with a number of forward-facing points.

III. General considerations on the setae in marine Isopoda.

The setae of the Isopods, as has already been pointed out, are very variable in conformation. In terrestrial Isopods, according to WAHRBERG (1922), they consist of two morphologically distinct kinds of setae, viz. simple and composite, the latter comprising a more or less coalesced complex consisting of a setal and a scale portion.

A comparison between the thoracopod setae occurring in the terrestrial Isopods and those obtained from species of the family *Cirolanidae* (see RACOVITZA, 1912) indicates that thoracopod setae similar in conformation to the composite thoracopod setae in terrestrial Isopods occur also in marine Isopods. Such setae are also common in the *Serolidae*. If we compare one of the setae from the rostral row on the lower margin of the propodus of the first pereiopod in *S. trilobitoides* (see Fig. 5 a. and HODGSON, 1910, Pl. IV, Fig. 8) with a thoracopod seta in *Ligia italica* (see WAHRBERG, 1922, Fig. 5, 4), we shall find that the setae in these two widely separated species are actually of the same shape. A characteristic feature of such setae, also in marine Isopoda, is that they consist of an axial, cylindrical median part of more or less prominence, surrounded by an outer mantle, which distally terminates in two free lappets, between which the axial point of the median part stands forth freely.

The above-mentioned type of thoracopod setae, which presents a distinct resemblance to the evidently composite setae in terrestrial Isopods, is commonly found in various sub-orders and families of the marine Isopods and must therefore be regarded as a character common to the Isopods. They occur, for example in various groups of the *Parasellidae* (see Figs. 40 c., 72 h. and k.). Within the sub-order Valvifera I found setae of a similar character in the genus *Macrochiridothea*, where they occur on the lower margin of the robust seroliform propodus of the first pereiopod (Fig. 26).

In marine Isopods stout setae are often found together with very slender ones. In *Cirolana microphtalma* and *Eurydice pulchra* (according to G. O. SARS 1899, Pl. 307), for example, the pereiopods are furnished with numerous slender hair-like setae together with a smaller number of setae of a shorter and stouter type. On the uropods of species of the fam. *Cirolanidae* (RACOVITZA, 1912) these types of setae are found in conjunction with typical plumose setae.

A common feature of the setae in marine Isopods is that they are furnished with two rows of triangular or hair-like sub-branches. Thus in the genus *Antarcturus*, for example, the propodus and dactylus of the first pereiopod are usually beset with long and rather narrow setae, provided with two longitudinal rows of slender triangular sub-branches, the setae ending distally in two fine hair-like points. The setae on the remaining pereiopods in *Antarcturus* are devoid of the two rows of sub-branches and are single-pointed. The external resemblance to the primitive plumose setae — notably the two rows of sub-branches — does not necessarily show that the setae in *Antarcturus* are modified plumose setae.

In the following report on my examination of the setae in *Serolis*, I shall compare the various kinds of setae which occur in the family *Serolidae*. It will be shown that some of the setae are manifestly composite. I have arranged my material accordingly.

When the setal part and the scale part of the composite seta have entirely coalesced they may present the same appearance as simple setae. Hence, as will be shown in the sequel, a mere morphological investigation is not always sufficient to determine the category to which a seta belongs.

IV. Non-composite setae.

Non-composite setae of the plumose type occur in marine Isopoda abundantly on the pleopods but sometimes also on the pereiopods (in e. g. the *Eurycopini*). In *Antarcturus* we find setae of a similar plumose type on the expanded coxopodite of the maxilliped in the ovigerous female (Fig. 33 b.).

From the typical plumose setae with their two rows of sub-branches there is a transition to that type of setae where the sub-branches are irregularly situated. I found setae intermediate between the plumose and the penicillated type on the exopodite of the third pleopod in *Ianthopsis bovallii*, where the proximal ends of the setae may be covered by irregularly situated sub-branches, whilst, distally the sub-branches are inserted into faint incisions arranged in two rows.

The sub-branches of the plumose setae may be wholly or partially reduced. Thus on the pleopods of species belonging to *Antarcturus*, in addition to plumose setae of typical development, we find setae with short and sparse sub-branches as well as those in which the sub-branches have been entirely reduced (see Figs. 33 d. and e.).

In the genus *Serolis* the typical plumose setae occur only on the pleopods. On the first three pairs where they fringe the margins of the exopodite and the endopodite, they attain a considerable length (see Fig. 19 d.). In this figure it is faintly indicated that the sub-branches of the plumose setae are fixed in very marked incisions, except at the proximal third of the setae where incisions are missing. The distal ends of the plumose setae are prolonged into hair-fine points. In conjunction with the plumose setae, we find on the first three pairs of pleopods some very short and slender hair-like setae.

Plumose setae, though reduced in size, occur on the distal and lateral margins of the exopodite of the fourth pleopod (Fig. 18 e.). The plumose setae on the lateral margin become still shorter proximally than towards the distal end, being in *S. paradoxa* and *schythei* provided on the proximal part of the margin merely with sparse sub-branches, and passing further proximally into very slender, hair-like setae without any sub-branches. It is thus seen that the plumose setae of typical development may pass over by transitional forms into the very slender type of hair-like setae.

The fifth pleopod is, as a rule, devoid of setae. *S. exigua* forms an exception in this respect; the exopodite of the fifth pleopod in the latter species being provided with two long setae of the typical plumose type (Fig. 18 f.).

In the inner proximal angle of the basipodite of the first three pairs of pleopods, we find that the plumose setae have been more or less modified (Fig. 19 d. and 2 c.). »Plumose hairs»[1] occur at this spot in most of the species of *Serolis*. Their distal ends are always rounded; the sub-branches are not fixed in incisions, but are arranged more or less regularly in two longitudinal rows. In many species the setae are transformed into a kind of setae which are slightly reminiscent of the coupling-setae of the first pleopods in the *Parasellidae* and *Arcturidae*. See Fig. 2 c. and cf. Fig. 35 d. The sub-branches are very slender except at the distal end of the setae, where they pass over into two adjacent rows of shorter and somewhat broader sub-branches.

On an examination of the pereiopods, we find that the setae also on these appendages often assume a shape similar to that of the setae on the pleopods. On one of the last fifth pairs of pereiopods in a species of *Serolis* we find the following kinds of setae (Fig. 3 a.): —

1. Sensory setae of a plumose type (on the upper margin of the basipodite).
2. Very slender and, as a rule, very short hair-like setae similar to those hair-like setae which sometimes occur on the lateral margin of the exopodite of the fourth pleopod. This type of setae occurs on all the joints.
3. Stout sword-shaped[2] setae, usually provided with two rows of short sub-branches, (occurring on all the joints, except the basipodite and the dactylus). The setae are sometimes devoid of sub-branches. In exceptional cases the sub-branches are moderately long, whence the shape of the setae is similar to that of plumose setae (see Fig. 3 a.).

The ordinary stout sword-shaped setae will be treated in detail on p. 34—36. As regards the hair-like setae, they may exceptionally pass over by a series of transitional forms into those of the stout sword-shaped type. This occurs on the second pereiopod of the sub-adult male in *S. paradoxa* (Fig. 3 b.). It would therefore be tempting to conclude that also the stout sword-shaped pereiopod setae are non-composite. It will, however, be shown in the sequel, by a comparison of the sword-shaped setae with those of the composite kind, that this is not necessarily the case.

The slender setae of a hair-like type occur on all the joints of every pereiopod, though they are often minute and difficult to detect. As a rule, they are easily distinguished from those of the stout type by their extreme slenderness.

Slightly longer setae of the hair-like type are always found in a submarginal row on either side of the lower margin of the propodus of the first pereiopod, as well as on the distal margin of the carpus in the same appendage. See for example Figs 1 d. and 1 e. In *S. exigua* they are sparsely distributed over the whole of the rostral and caudal surfaces of the propodus of the first pereiopod.

In the adult male the setae, as a rule, are more abundant than in the female. As a secondary sexual character of the male sex, the non-composite setae may form a dense nap on the lower surfaces of some of the pereiopods. Such a dense covering of non-composite setae we find, for instance, on the lower surface of the ischium, merus and carpus of the second pereiopod in the adult male of *S. paradoxa*. The setae are here densely provided with slender irregularly situated sub-branches (Fig. 2 d.). Similar penicillated setae are found on the lower margin of the carpus of the first pereiopod in the adult

[1] According to BEDDARD (1884).
[2] According to BEDDARD (1884).

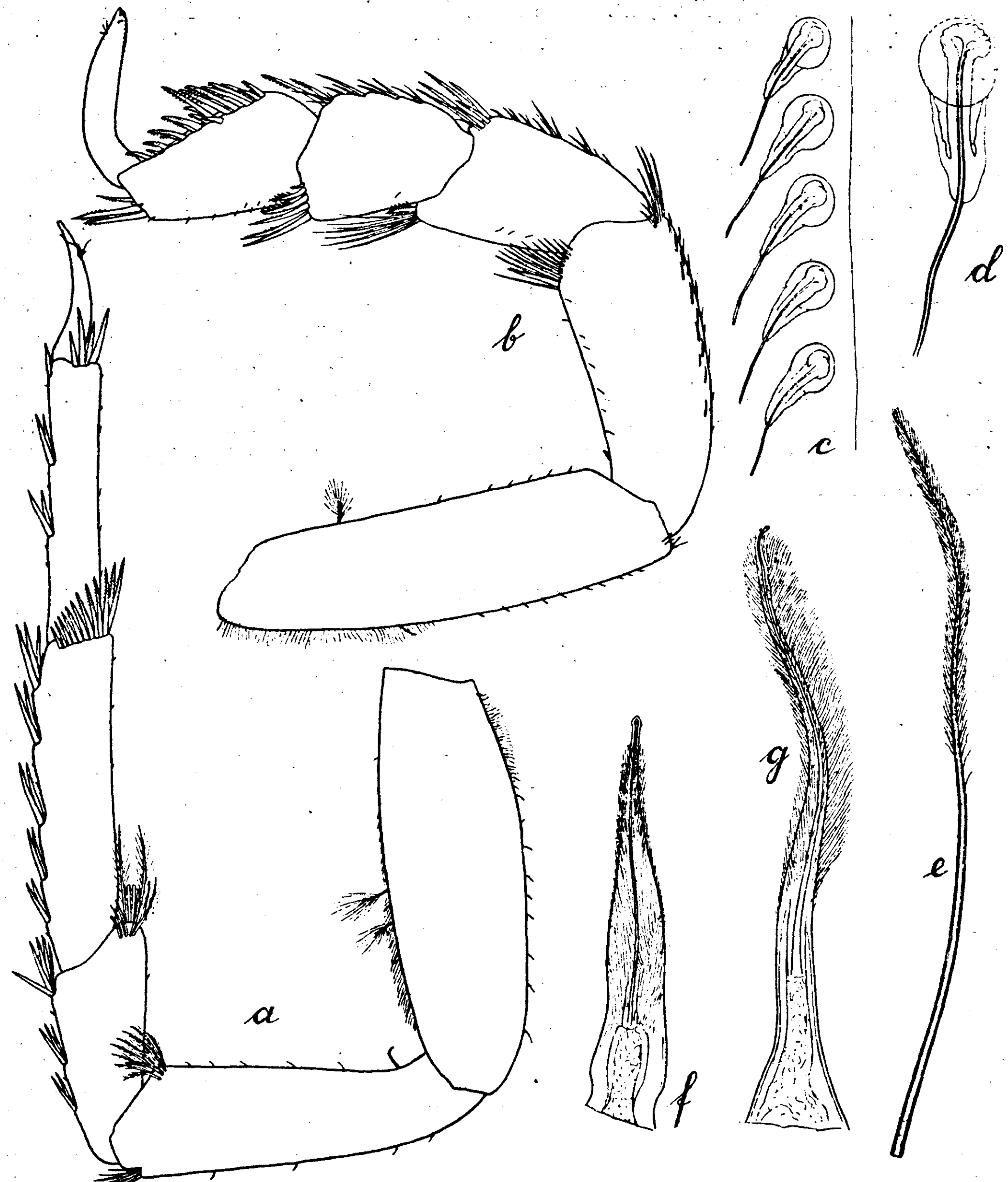

Fig. 3. Setae-armature in *Serolis*. a. Sixth pereiopod, right, female of *S. polita*, 20 ×. b. Second pereiopod, right, sub-adult male of *S. paradoxa*, 25 ×. c. Row of submarginal pores and setae at the lower margin of dactylus of the first pereiopod, seen from the caudal side; immature specimen taken out of the marsupium, *S. paradoxa*, 665 ×. d. Seta from the same row, seen from the rostral side; adult specimen of *S. paradoxa*, 665 ×. e. Non-composite seta from the carpus of the first pereiopod, adult male of *S. gaudichaudi*, 115 ×. f. Composite seta from the carpus of the first pereiopod in the same specimen, 115 ×. g. Seta from the rostral row on the lower margin of the propodus of the first pereiopod, adult male of *S. gaudichaudi*, 115 ×.

male of *S. gaudichaudi*, (Fig. 3 e.).[1] The same kind of setae likewise forms in the adult male of *S. gaudichaudi* a dense nap on the lower surfaces of the basipodite, ischium, merus and carpus of the seventh pereiopod.[2]

Along the lower margin of the dactylus of the first pereiopod, submarginally on the rostral side, there is a row of short setae which may be referred to the non-composite kind; at any rate there is no indication of a composite character. In some species they are sunk in pores from which only their extreme ends project. GRUBE (1875, p. 224) is the only author who mentions this feature. Referring to the species *S. schythei*, GRUBE states: »an der Basis der Zähne sieht man eine Reihe heller runder Flecke und ähnliche auch am Innenrand der Klaue durchschimmern, deren Aussenrand Stachelchen trägt».

In the species *paradoxa*, *schythei*, *polaris* and *convexa* there is a row of pores along the lower margin of dactylus on the rostral side. In *S. convexa* the setae the pointed ends of which project out of the pores are hair-like. In *paradoxa*, *schythei* and *polaris* they are distally bullet-shaped and swollen, and the setal canal has a rather wide opening at the distal end. Their appearance in *S. paradoxa* is illustrated in Fig. 3 c. and d.

V. The occurrence of composite setae in the Fam. Serolidae.

It has already been mentioned (p. 20) that the characteristically transformed setae in the rostral row on the lower margin of the propodus of the first pereiopod present a striking resemblance to the composite thoracopod setae of the terrestrial Isopods. Their characteristic three-pointed shape in both cases may possibly be due to the same causes, in which case these setae in *Serolis* would likewise be of a composite character. In some species of *Serolis*, at any rate, the composite character of the setae in question is manifest.

In the species *S. exigua*, unlike all other previously described species of *Serolis*, there is only a single row of setae on the lower margin of the propodus of the first pereiopod. This row corresponds probably to the rostral row of other species; instead of the short, flattened and leaf-shaped setae of the caudal row in other species of *Serolis*, we find in *S. exigua* a row of projecting scales (see Fig. 4 c.).

The phaneres of the rostral row consist of setae in which there is an evident combination of setal and scale parts (see Figs. 4 a, b and c). From a common base there issue two branches, one longer, rounded at the distal end, and containing the setal canal, which at its extremity opens out into a pore, the other shorter, pointed at the distal end, and without any setal canal. The longer branch is similar in shape to a typical non-composite seta. The shorter branch is smooth and resembles an elongated structural scale. These parts, which are separated from one another, almost throughout, constitute different morphological elements. This is evident from the fact that a suture-line between them can be distinguished, sometimes very distinctly, in the common base.

In *S. convexa* there is another feature which brings into still clearer relief the composite character of the setae on the lower margin of propodus of the first pereiopod. In the female of this species, in the rostral and caudal rows respectively, the setae normally

[1] See also AUDOUIN and MILNE EDWARDS, 1841, Pl. I, Fig. 13'.
[2] See AUDOUIN and MILNE EDWARDS, 1841, Pl. I, Fig. 16".

have the appearance illustrated in Fig. 4 e and d. Near the carpus, however, the setae assume the modified structure illustrated in Fig. 4 f.

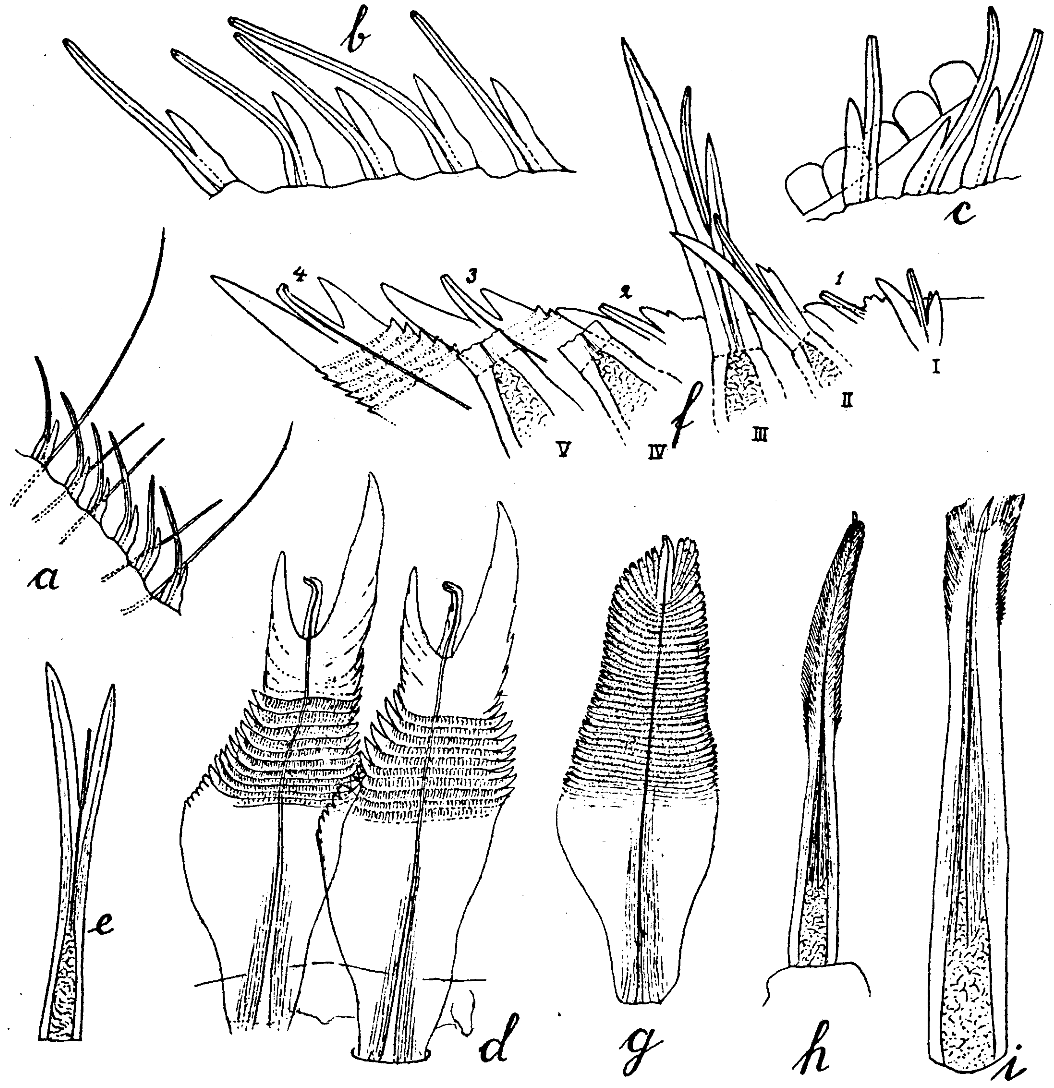

Fig. 4. Setae in *Serolis;* from the lower margin of propodus of the first pereiopod. a. and b. Setae in the female of *S. exigua,* 270 and 600 ×. c. Setae and scales from the lower margin of the propodus, *S. exigua* (female), 490 ×. d. Setae from the caudal row, seen from the caudal side, female of *S. convexa,* 465 ×. e. Seta from the rostral row in the same specimen, 160 ×. f. Proximal part of the lower margin of the propodus in a female of *S. convexa,* 350 ×. g. Seta from the caudal row seen from the caudal side, adult male of *S. convexa* (from a specimen collected by the German »Gazelle» Expedition), 270 ×. h. and i. Setae from the rostral row in the same specimen, 90 and 160 ×.

The setae adjacent to the carpus gradually diminish in size, assuming a stunted appearance close to that joint. Adjoining the carpus in the caudal row there is a non-composite seta (Fig. 4 f, *1*) with a projecting scale on either side of it. The scale furthest from the carpus is subtriangular and pointed, whilst the one nearest the carpus is very small and bifid. If we compare the phaneres in the caudal row with one another (Fig. 4 f, *1—4*), we shall find that the non-composite seta adjoining the carpus together with the two surrounding scales corresponds to merely a single phanere elsewhere in the row.

If we pass to the second seta of the caudal row, beginning from the carpus (Fig. 4 f, *2*), we shall see that a median non-composite seta has coalesced at the base with two surrounding scales, forming, together with the latter, a composite seta, the base of which, however, is very small. That margin of the scale part which adjoins the carpus is provided with an incision, whilst that most remote from the carpus is unbroken. The freely projecting terminal lappets of the scale part thus are similar in shape to the previously described freely projecting scales, which appear in the vicinity of the non-composite seta adjoining the carpus.

The following phaneres in the setal row (Fig. 4 f, *3* and *4*) deviate very slightly from the normal appearance. The lateral margins of the scale part are furnished in the fourth seta (Fig. 4 f, *4*) with a row of incisions; the only feature which distinguishes this phanere from the typical one illustrated in fig. 4 d is its relative shortness.

The above description of *S. convexa* indicates that phaneres which, in view of their structure and position in the same setal row, must be considered to be homologous consist of (1) a number of apparently homogeneous setae and (2) one seta with a separate scale on either side of it. We are thus forced to the conclusion that all the setae in the caudal row with the exception of the one nearest the carpus are composed of a setal part and a scale part.

The setae of the rostral row in the female of *S. convexa* likewise belong to the composite category. In this row the phanere nearest to carpus has the appearance illustrated in Fig. 4 f, I. From a short common base there issue three branches, the median one of which is traversed by the setal canal, whilst the lateral branches are subtriangular and pointed. The phanere thus resembles, in its main features, the second phanere of the caudal row, reckoned from the carpus (Fig. 4 f, *2*). Thus in the rostral row, in contradistinction from the caudal, the series of phaneres illustrating the coalescence of a non-composite seta with the surrounding scaly elements is incomplete.

In the female of *S. gaudichaudi*, in which the normally developed setae in both the caudal and rostral rows have the same structure as those of *S. convexa* (cf Figs. 4 d and e), we find, however, that the phanere, nearest to the carpus, in the rostral row, consists of a small non-composite seta with a rounded distal end, situated very close to a small pointed scale. The seta and the scale may possibly have coalesced in a slight degree at their proximal ends, but even there their outlines are quite distinct. The following phaneres of the rostral row form a series of transitional forms leading up to the normally developed composite seta typical of the female in *S. convexa* and *gaudichaudi* (Fig. 4 e).

Thus, in the case of *S. gaudichaudi*, a comparison of the phaneres in the rostral row of female specimens shows that all the setae in this row with the exception of the small one nearest to the carpus are of a composite character. As regards the females of *S. convexa* there is a slight difference from *S. gaudichaudi* in that the setae of the rostral row only form a somewhat incomplete series leading up to the type of seta characteristic of both species (Fig. 4 e). It must be assumed, however, that even in the case of *S. convexa* this type of seta belongs to the composite category.

As regards the setae of the rostral row in the female of *S. convexa*, we find that in the phanere next to the carpus (Fig. 4 f, I) the freely projecting setal part is nearly twice as long as the common base of the setal and scale-parts.

In the immediately succeeding phanere in the setal row (Fig. 4 f, II) the common base is considerably longer, but here too the freely projecting setal part is of great length. In the next phanere the common base is still longer, the freely projecting setal part here being only of about the same length as the base. In the following phaneres the common base increases successively in length, as also the two free branches of the scale part, whilst the freely projecting distal portion of the setal part becomes shorter and shorter, so that the setae finally assume the typical appearance illustrated in Fig. 4 e.

If we compare the setae adjoining the carpus (Fig. 4 f, I—V) with the typical setae situated further distally (Fig. 4 e) in the rostral row, it will be found that they differ from the latter in yet another respect. The first and second setae reckoned from the carpus, (Fig. 4 f, I—II) merge at their proximal ends into a basal part situated below the cuticle.[1] In the third seta the distal end of the basal part protrudes freely beyond the cuticle. In the succeeding setae the entire basal part is situated outside the cuticle.

In the second to eighth setae, reckoned from the carpus, we find on the caudal side (but not on the rostral) a faint suture-line between the base and the remaining part of the seta. These sutures are indicated in Fig. 4 f by dotted lines. In the ninth seta there are vestiges of such a suture-line, whilst in the tenth it has completely vanished.

The above comparison of setae on the lower margin of the propodus of the first pereiopod in the female of *S. convexa* shows that setae in the same row form a continuous series of transitional forms between (1) a non-composite seta plus one or two free scales and (2) large trilobate composite setae. As regards the setae of the rostral row, it has been shown that they form a series of phaneres differing continually in the degree of coalescense between their setal and scale parts, as well as in the development of their basal parts.

It may thus be referred that the above described series of phaneres in the same row, each differing in a slight degree from those immediately adjacent to them, possibly illustrates, in some measure, the normal process of development of the composite setae. The implication is that the phaneres nearest to the carpus have assumed their stunted appearance owing to an arrestment of their growth. In that case the most stunted phanere or group of phaneres, that nearest to the carpus, would correspond to a comparatively early stage of development.

VI. Composite setae on the first pereiopods.

It has been shown above that the setae on the lower margin of the propodus of the first pereiopod in *S. exigua*, *convexa* and *gaudichaudi* belong to the composite category and that their trilobate shape in the females of the two latter species is due to an incomplete coalescence between their setal and scale parts. In immature male specimens of *S. gaudichaudi* the setae are equal to those of the female, whilst in the adult

[1] This basal part of the first seta has not been drawn, though it could be brought into view by a low adjustment of the microscope.

males they have, in part, lost their trilobate shape (see p. 30). The composite setae on the propodus of the first pereiopod may thus vary considerably in shape in the same

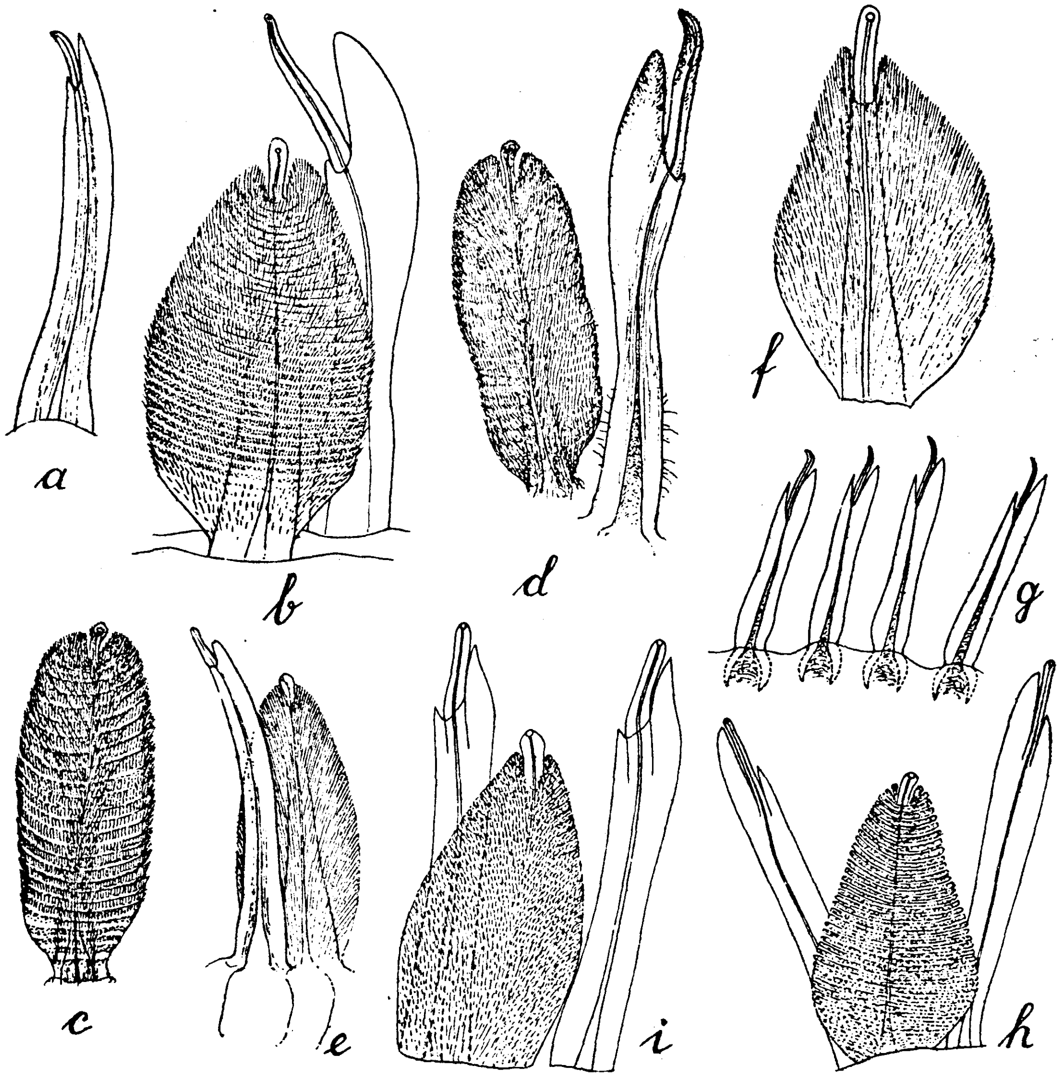

Fig. 5. Setae in *Serolis;* from the lower margin of propodus of the first pereiopod. a. Seta from the rostral row in *S. trilobitoides*, 270 ×. b. Setae from *S. paradoxa*, 265 ×. c. Seta from the caudal row seen from the caudal side, *S. schythei*, 270 ×. d. Setae seen from the rostral side, *S. schythei*, 270 ×. e. Setae, seen from the rostral side. *S. pagenstecheri*, 180 ×. f. Seta from the caudal row, seen from the rostral side, female of *S. polita*, 465 ×. g. Setae from the rostral row, female of *S. polita*, 160 ×. h. Setae from *S. septemcarinata*, seen from the caudal side (high adjustment of the microscope) 270 ×. i. Setae from *S. bouvieri*, seen from the caudal side (high adjustment of the microscope), 270 ×.

species. On a comparison of the setae on the lower margin of the propodus in the several species of *Serolis* we will find that they all are of exactly the same type as those of *S. convexa* and *gaudichaudi*, agreeing with the setae of the two latter species even in their minute, chitinous structure. As a rule, their shape is characteristic of each species, but the difference between setae of the different species is not as marked as that between corresponding setae from young and adult males in *S. gaudichaudi*. Setting aside *S. convexa* and *S. gaudichaudi*, the setae adjacent to the carpus differ from the remaining setae in the rows only in their smaller size. Even in young removed from the marsupium, I found the setae on the propodal edge to be of exactly the same shape and structure as in adult specimens (in *S. paradoxa* and *schythei*).

Except in *S. exigua* (see p. 24), two longitudinal rows of setae occur on the lower margin of the propodus. The setae in the two rows always show rather considerable differences in their detailed structure. They are equal in both sexes, except in *S. convexa* and *gaudichaudi*.

In the caudal row they are short, thin, leaf-like phaneres whose setal part is always freely projecting. At a somewhat low adjustment of the microscope, the setal part becomes, as a rule, dimly discernable in its entire length (see Figs. 5 b, e and f). The setae are traversed throughout by a narrow setal canal, opening into a pore at the tip of the setal part; this pore is situated more or less towards the caudal side (see Figs. 5 b, c, f, i, h). The lateral margins of the scale part are often, more or less distinctly split up into pointed triangular lappets.[1]

As was pointed out by HODGSON (1910) with reference to *S. trilobitoides*, the rostral and caudal surfaces of the setae of the caudal row differ in appearance, a difference which I could observe in all the species examined by me. Viewed from the rostral side, the setae have a more or less distinct longitudinal striation (Fig. 5 f and d), whereas from the caudal side, they are seen to have transverse streaks (Fig. 5 c). This is due to the caudal surface of the setae being traversed by fine transverse grooves, running parallel to one another and issuing into the lateral incisions between the triangular marginal lappets. Between the transverse grooves the longitudinal striation[2] of the setae is visible, as minute streaks or dots, also on the caudal side. The striated structure of the setae leads to the formation of minute hair-like points, which occur sparsely at the margins, for example in *S. trilobitoides* (Fig. 5 f) and *S. paradoxa* (Fig. 5 b); in the latter species they occur moreover on the proximal part of the caudal surface. The sculpturing of the caudal surface in setae of *S. bouvieri* deviates from other species in another respect. As will be seen from Fig. 5 i, the leaf-like setae in this species have well-defined grooves only at the distal end, close to the margins.

The typical structure of the setae of the caudal row in several species is illustrated in Fig. 5 with reference to *S. paradoxa* (b), *schythei* (c and d), *pagenstecheri* (e), *polita* (f), *septemcarinata* (h), and *bouvieri* (i). As shown by the figures, setae from different species differ mainly from one another in their shape, as well as in having the lateral margins of the scale part more or less split up into pointed, triangular lappets.

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[1] See, for example *S. schythei* (Fig. 5 c and d) and *S. convexa* (Fig. 4 d and g).

[2] I found a similar chitinous structure at the tip of the dactylus of the first pereiopod in *S. gaudichaudi*. The tip of the dactylus, except its extreme distal end, forms a subtriangular portion which has the appearance of an »impressed» seta of the leaf-like type. The rostral surface of the subtriangular portion is traversed by parallel transverse grooves terminating in faint incisions on the lower margin of the dactylus; its caudal surface is either faintly striated in a longitudinal direction (in the adult male) or, as the rostral surface, traversed by faint parallel transverse grooves (in the female). The subtriangular part is moreover traversed by a narrow longitudinal canal, which, however, does not reach quite up to its distal end. The extreme tip of the »impressed seta» projects freely.

The setae of the rostral row, unlike those of the caudal row, are always long and subcyindrical. The setal part is not discernible within the scale part, but may be indistinctly indicated by a faint longitudinal striation (see Fig. 5 a). As in the setae of the caudal row, the setal part is always freely projecting. As a rule, the scale part is produced at its distal end into two triangular lappets, one on either side of the freely projecting tip of the setal part. The setae are thus trilobate at their distal ends. Only setae from the adult males of S. *convexa* and *gaudichaudi* deviate in this respect (see Fig. 4 h and 3 g). As a rule, the setae of the rostral row in the different species are distinguished by the distal lappets of the scale part being dissimilar in shape and length, and by the varying length of the free terminal portion of the setal part. This feature is illustrated in Fig. 5 with reference to the species *trilobitoides* (a), *paradoxa* (b), *schythei* (d), *pagenstecheri* (e), *polita* (g), *septemcarinata* (h) and *bouvieri* (i). In S. *paradoxa*, for example, the setae of the rostral row have the usual trilobate shape and are not single-pointed, as GRUBE (1875) asserted (see p. 12). As regards the setae in S. *septemcarinata*, which have been variously, described and figured by BEDDARD (1884), PFEFFER (1887) and COLLINGE (1918), my observations agree with those of BEDDARD.

In S. *convexa* and *gaudichaudi* we find a marked difference in structure between setae from female specimens and corresponding setae from adult males.

In S. *convexa* the setae of the caudal row in the female have the structure shown in Fig. 4 d. As in other species they are leaf-like, flattened, and shorter than the setae of the rostral row; but at the distal end the scale part is produced into triangular lappets, one on either side of the free setal part, a feature which is usually peculiar to the setae of the rostral row. Viewed from the rostral side the longitudinal striation is, as usual, visible. The transverse grooves of the caudal surface are well-marked only in the middle part of the setae.

A corresponding seta of the full-grown male is shown in Fig. 4 g.[1] It will be seen that the terminal lappets of the scale part have disappeared, and that the entire distal portion of its caudal surface, from a point situated somewhat proximally from the centre, is traversed by transverse grooves. The setae thus have the general shape and structure which characterizes setae of the caudal row in most species of *Serolis*. A feature peculiar to the setae in the male of S. *convexa* is, however, that each marginal lappet of the scale part terminates in slender hair-like processes.

The setae of the rostral row in the female of S. *convexa* have the usual cylindrical and trilobate shape (Fig. 4 e). The distal end of the setal part projects freely between the two terminal lappets of the scale part, which protrude beyond the free portion of the setal part.

In the corresponding setae of the full-grown male (Fig. 4 h) the free terminal lappets of the scale part are missing, and the setal part projects freely from the tip of the scale-part. The distal portion of the scale-part is obliquely striated, so that it seems to be split up into slender »hairs». This, however, is actually the case only at the proximal end of the obliquely striated portion. Some of the setae of the rostral row in the single male specimen of S. *convexa* which I have been able to examine differs in shape from the rest (see Fig. 4 i). These setae show somewhat less deviation from the corresponding,

[1] Cf. BEDDARD, 1884, Pl. VI, Fig. 11.

trilobate setae in the female, in that their scale parts are distally produced into two short lappets.

The material at my disposal did not allow of an investigation of the setae in immature male specimens of *S. convexa*. It may, however, be presumed that they are similar in structure to those of the females; this at least is the case in the allied species *S. gaudichaudi*, whose setal armature is very similar to that of *S. convexa*.

In *S. gaudichaudi* the setae of the full-grown female have the same shape and structure as in the female of *S. convexa* (cf. Figs. 4 d and e); in the full-grown male of *S. gaudichaudi* the setae of the caudal row are similar to those of the caudal row of *S. convexa*, whilst in the rostral row the setae have the structure illustrated in Fig. 3 g. As was pointed out by AUDOUIN and MILNE EDWARDS (1841), they are provided with very densely situated hair-like sub-branches. A comparison between a seta in the adult male of *S. gaudichaudi* (Fig. 3 g)[1] and a corresponding seta in the adult male of *S. convexa* (Fig. 4 h) shows, that the obliquely striated part in the latter seta has, in *S. gaudichaudi*, been split up into slender »hairs».

In sub-adult[2] male specimens of *S. gaudichaudi*, the setae in the caudal row have already acquired the same character as in the adult male, whilst in the rostral row they are similar to those of the female. The only way in which these last-mentioned setae differ from those in the rostral row of the female is that the freely projecting terminal part of the setal portion is longer, being of about the same length as the free terminal lappets of the scale part. The setal part has thus almost acquired the length characteristic of the setal part in setae of full-grown males.

In immature males[3] the setae of *S. gaudichaudi* in both rows have the same structure as in female specimens.

As shown above, the setae in the two rows on the lower margin of the propodus usually have a structure peculiar to each species. The setae of the caudal row are thin, leaf-like and flattened, their lateral margins are often provided with more or less distinct incisions, which on the caudal surface are produced into transverse parallel grooves. The setae of the rostral row are longer than those of the caudal row, subcylindrical and — setting aside full-grown male specimens of the species *S. convexa* and *gaudichaudi* —, distally trilobate. The trilobate form is occasionally found even in setae from the caudal row.[4]

The deviations in *S. exigua* have been pointed out above (p. 24).

The type of composite setae found on the lower margin of the propodus recurs also in some of the setae on the carpus. All the species of *Serolis* which I examined are provided, on the lower margin of the carpus or on its free distal edge, with two stout setae, surrounded by a varying number of slender setae. The stout setae on the carpus in the species examined by me are sub-cylindrical in shape and similar in structure to the setae of the rostral row on the propodus; in some cases, however, they may exhibit features which, as shown by the above description, are characteristic of the leaf-shaped setae in the caudal row.

[1] See also AUDOUIN and MILNE EDWARDS (1841, Pl. I Fig. 13II and 13III).
[2] Male specimens possessing semi-developed penial filaments and a slightly swollen propodus on the second pereiopod.
[3] Male specimens possessing minute penial filaments and with no swelling of the propodus of the second pereiopod.
[4] In female specimens of *S. convexa*, as well as in female and immature specimens of *S. gaudichaudi*.

In the two stout setae which may thus be referred to the composite kind, the setal part, as a rule, has a freely projecting tip which is exactly like the distal end of the surrounding slender non-composite setae. See Fig. 6 f, illustrating a composite seta from the carpus of *S. paradoxa* and Fig. 6 g, which shows one of the surrounding non-composite setae. See also *S. exigua*, Fig. 6 e.

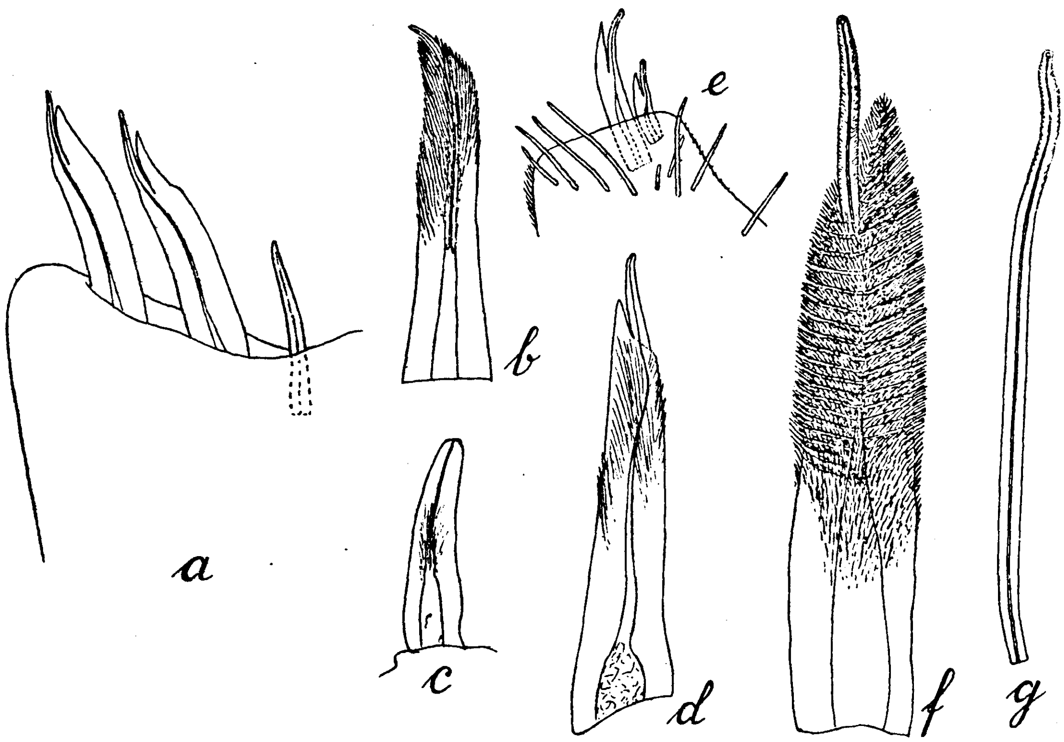

Fig. 6. Setae in *Serolis;* from the carpus of the first pereiopod. a. *S. septemcarinata*, female, 270 ×. b. *S. polita*, female, 270 ×. c. *S. pagenstecheri*, female, 90 ×. d. *S. convexa*, female, 465 ×. e. Distal part of the carpus with setae in a female of *S. exigua*, 160 ×. f. Composite seta in *S. paradoxa*, 270 ×. g. Non-composite seta in *S. paradoxa*, 270 ×.

In *S. exigua* (Fig. 6 e) the composite setae on the carpus are of the same type as the setae on the lower margin of the propodus in this species, where there is only a single row. They differ, however, in the following respects: the base common to the setal and scale part is longer; no line of demarcation between the setal and scale parts is observable within this base; and the freely projecting tip of the setal part is shorter.

In *S. septemcarinata* (Fig. 6 a) the two stout setae on the carpus are similar to the setae in the rostral row on the propodus, but differ in the scale-part having only a single free terminal lappet.

In the female of *S. convexa* (Fig. 6 d) their structure is similar to that in *S. septemcarinata*, except that the distal half of the scale part is distinctly striated. In *S. gaudichaudi* these setae differ slightly in structure in adult males and females. In the adult male (Fig. 3 f) they are provided with hair-like sub-branches at the distal end of the scale part; in female and immature specimens as well as in sub-adult males the scale part is instead obliquely striated.

In *S. polita* (Fig. 6 b) the setal part is dimly discernable within the scale part. The scale part appears to be longitudinally grooved distally but is split into short sub-branches at the margins.

In *S. pagenstecheri* (Fig. 6 c) the setae have a compact structure, being entirely devoid of a freely projecting setal part.

In *S. paradoxa*, the composite setae on the carpus (Fig. 6 f) show resemblance to the setae in the caudal row on the propodus in that the caudal surface of the scale part is traversed by transverse, parallel grooves, but they differ from the latter setae in having a sub-cylindrical shape and in being densely provided with short hair-like sub-branches.

In *S. schythei* the structure of the setae is much the same as in *S. paradoxa*.

VII. Setae of the composite type on the second pair of pereiopods.

The same type of stout setae which occurs on the propodus and carpus of the first pereiopod occurs also on the propodus of the second pereiopod. The setal armature of this pereiopod differs, however, with the sex. In female and immature specimens all the

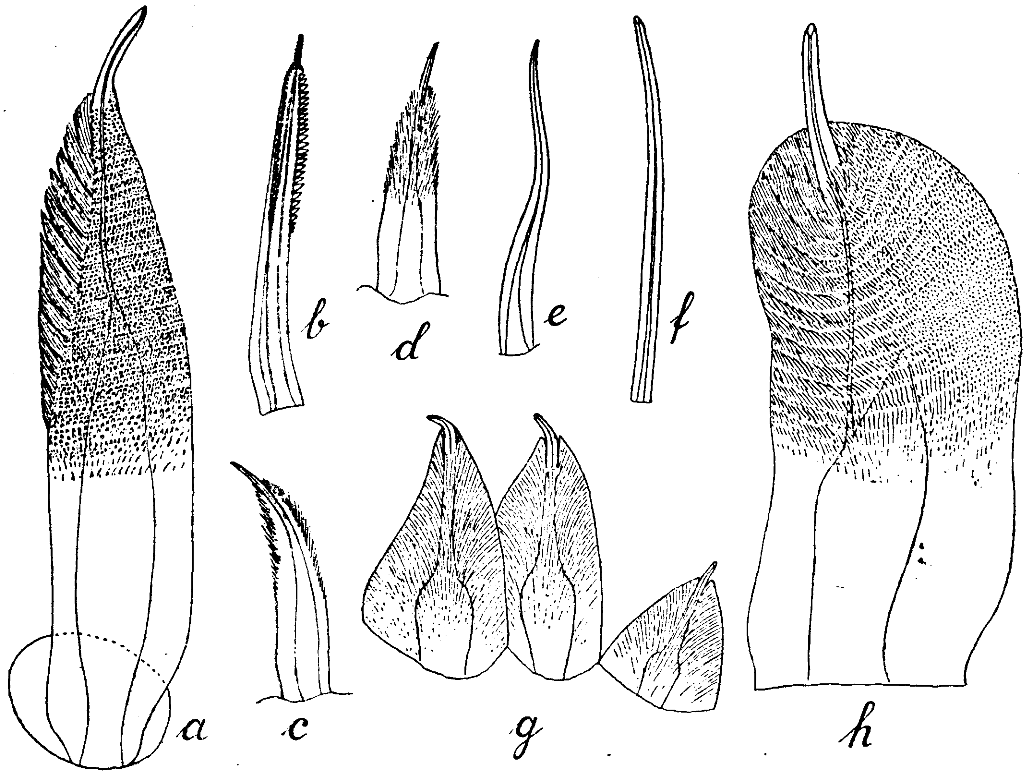

Fig. 7. Setae in *Serolis;* from the propodus of the second pereiopod in the male. a. From the lower margin of the propodus, adult male of *S. paradoxa*, 240 ×. b. From the same spot in a sub-adult male, 140 ×. c. Seta from the proximal part of the lower margin of the propodus, seen from the caudal side, adult male of *S. pagenstecheri*, 80 ×. d. The same seta seen from the rostral side, 80 ×. e. A seta from the distal part of the lower margin of the propodus, adult male of *S. pagenstecheri*, 80 ×. f. One of the submarginal setae near the lower margin of propodus, adult male of *S. pagenstecheri*, 200 ×. g. Seta from the proximal part of the lower margin of the propodus, adult male of *S. septemcarinata*, 240 ×. h. Seta from the lower margin of the propodus, adult male of *S. schythei*, 535 ×.

stout setae on this pereiopod agree with those of the ordinary sword-shaped type which occur on the other pereiopods (see Fig. 3 h). In adult male specimens, we find, however, that the stout setae on the lower margin of the propodus have always been transformed. These setae, in the adult male, agree in their main features with those of the composite kind on the first pereiopod.

The setae are always equal in shape in both the rows. Setae from these rows in adult males of *S. paradoxa* and *schythei* are illustrated in Figs. 7 a and h. Exactly as in composite setae on the first pereiopod the distal end of the setal portion projects freely from the tip of the scale part, and the caudal surface of the scale part is traversed by transverse grooves. The rostral surface, on the other hand, is devoid of transverse grooves in all the setae.

In *S. paradoxa* (Fig. 7 a) the scale part is approximately cylindrical in shape, except at its distal end, where it is markedly three-sided, that side which is directed towards the dactylus being most markedly flattened. The distal half of that portion of the scale part which is directed towards the dactylus differs from the one directed towards the carpus in being obliquely striated, and in having its margin provided with faint incisions. Towards the centre these incisions are produced into oblique grooves. That portion of the scale part which is directed towards the carpus is minutely sculptured, in the manner shown in Fig. 7 a.

In the full-grown male of *S. septemcarinata* the setae on the lower margin of the propodus (Fig. 7 g) are compact and have a conical form and the setal part can be discerned within the scale part.

In the adult male of *S. pagenstecheri* the structure of the setae differs at the proximal and distal ends of the setal rows. The proximal setae have the appearance shown in Figs. 7 c and d. The part directed towards the propodus is somewhat concave. Distally the setae are abundantly provided with hair-like sub-branches; the latter, however, are absent on the caudal surface (Fig. 7 c). The setal part which projects freely at the tip agrees even in minute detail with the distal ends of the slender non-composite setae which occur in a submarginal row on either side of the lower margin of the propodus. (Fig. 7 f). The more distally situated setae on the lower margin of the propodus (Fig. 7 e) are sub-cylindrical, tapering towards the end. They are thus similar to non-composite setae, but are much stouter and thicker.

VIII. The ordinary conspicuous sword-shaped pereiopod setae.

The above described type of stout setae on the lower margin of the propodus of the second pereiopod is found in the adult males only. In sub-adult males the setae on this spot agree with, or are very similar to, the ordinary sword-shaped thoracopod setae.

In sub-adult[1] males of *S. paradoxa* the setae on the lower margin of the slightly swollen propodus (Fig. 3 b) are arranged in two adjoining rows, except in the region near the dactylus, where they converge into a single row. All the setae in the proximal half of the propodus are about twice as long as those more distally situated. Most of the setae have the appearance illustrated in Fig. 7 b. They are distinctly three-sided, except at their

[1] Male specimens with semi-developed penial filaments and with a slightly swollen propodus on the second pereiopod.

proximal ends. They are furnished with two rows of short sub-triangular sub-branches. The setae agree with the ordinary sword-shaped thoracopod setae, except that they have a freely projecting tip at the distal end. Some of the most distally situated setae, however, preserve the same structure as ordinary thoracopod setae of the sword-shaped type; they thus differ from the seta illustrated in Fig. 7 b by tapering continuously towards the tip. All the setae have their rows of sub-branches directed towards the dactylus. The sub-branches thus correspond to the obliquely striated portion in setae of adult males (cf. Fig. 7 a). Even in the latter setae the triangular sub-branches can be dimly discerned, though they are coalesced with one another and separated only by grooves, except at their extreme ends. The three-sided shape which is characteristic of the distal parts of the setae in adult males is characteristic also of the setae in sub-adult males, though it is here still more marked.

In immature males[1] the setae on the lower margin of the propodus are likewise situated in a longitudinal row, which, in the vicinity of the carpus, divides into two; the setae adjacent to the carpus have shorter and narrower sub-branches than the rest. It is not possible to observe any difference whatsoever between a setal part and a scale part.

The setae on the same spot in the female are arranged in a single longitudinal row; in the vicinity of the carpus this row is sometimes broken up into two adjoining rows. The setae adjoining the carpus are provided with two rows of slender, minute, almost hair-like sub-branches. As we approach nearer the dactylus the sub-branches become more triangular. Between the setae with triangular sub-branches and those with hair-like sub-branches there occur setae which exhibit a continuous series of transitional forms in regard to the structure of the sub-branches.

As mentioned above, the setae on the lower margin of the propodus of the second pereiopod in female and immature specimens correspond to the ordinary stout, sword-shaped setae which occur on all the pereiopods, except the first. On the third to seventh pereiopods the sword-shaped setae occur in groups on all the joints, except the basipodite and the dactylus. In each group the setae may vary in structure and slenderness. In *S. paradoxa* and *schythei* the most conspicuous setae in the groups are distinctly three-sided at their distal ends, the surface facing the joints being the broadest. From each margin of this surface there issue a row of short, flattened subtriangular sub-branches. The more slender setae differ from the stouter, ones in being furnished with hair-like sub-branches; they are likewise three-sided at their distal ends, but the surface which faces the joints is narrower than in the more conspicuous setae. As for the most slender setae, they are sub-cylindrical also at their distal ends and either furnished with minute hair-like sub-branches or devoid of sub-branches. Exceptionally[2] the sub-branches of the ordinary stout pereiopod setae are long and slender (see Fig. 3 a). On examining the second pereiopod in a sub-adult male of *S. paradoxa*, we find (see Fig. 3 b and cf. p. 22) that the stout kind of setae on the ischium gradually diminish in size, so that on the proximal part of this joint they are quite similar to the short and hair-like non-composite setae. Hence it is no longer possible here to distinguish the composite and none-composite type of setae.

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[1] Male specimens with extremely short penial filaments and with no swelling of the propodus of the second pereiopod.

[2] I have only found this type of setae in *S. polita*.

The above study of the setae on the pereiopods has shown the existence of a series of transitional forms between composite setae and the ordinary sword-shaped setae on the pereiopods. It should be noted, however, that there is also a continuous series of transitional forms between the latter setae and those of the hair-like, apparently non-composite type.

IX. The setae on the oral appendages.

Maxillipeds. Most of the setae are slender, sub-cylindrical and devoid of sub-branches. On the distal margin of the basipodite, however, we always find two setae[1] of another type; they are distinguished from the rest by considerably greater thickness as well as by their sculpturing. The latter agrees with that characteristic of the composite type of setae.

In *S. paradoxa* (Fig. 8 a) the ventral surface of the stout setae on the basipodite of the maxilliped is provided with oblique transverse rows of freely projecting »hairs» which proximally assume the form of ridges. The dorsal surface of the seta agrees with the ventral, except that a distinct longitudinal striation is observable at the proximal end and that the projecting »hairs» are shorter and sparser.

In *S. pagenstecheri* (Fig. 8 b) a longitudinal striation of the surface is clearly visible. Freely projecting scale-like processes are found in sparse transverse rows on the ventral surface of the setae; the dorsal surface is smooth.

In *S. polita* (Fig. 8 c) the setae are covered with stout spiny points, which are more scanty on the dorsal surface.

In the species *S. schythei*, *convexa*, *exigua* and *septemcarinata* the corresponding setae are similar to those of *S. paradoxa*.

First and second maxillae. On the distal margins of the lobes of the first and second maxillae we find setae of a sub-cylindrical shape, in many cases provided with two rows of short sub-branches. On the outer lobe of the first maxilla the setae are stout and spine-like, whilst on the inner lobe a single slender seta is seen at the tip.

The second pair of maxillae has the same type of setae as the first pair, though somewhat weaker and longer. Occasionally, however, the setae on the distal margin of the inner lobe vary greatly in length and thickness (see Fig. 15 f).

Mandibles. The somewhat modified setae on the second and third joints of the palp[2] resemble those of the sword-shaped kind on the pereiopods in being provided with two rows of sub-triangular sub-branches, but differ from the latter setae in terminating at the distal end in a distinct knob. In the species *S. paradoxa*, *schythei*, *pagenstecheri*, *polita*, *convexa*, *septemcarinata* and *exigua* the sub-branches of the setae have the same structure as in *S. tribolitoides*.[3] PFEFFER[4] (1887), however, figures the setae of the mandibular palp in *S. septemcarinata* as having slender hair-like sub-branches. The end-knob of the setae varies in shape in different species. In *S. septemcarinata*, as correctly figured by PFEFFER (1887) it is of elongated oval shape; in *S. convexa* it is still more elongated, almost lancet-

[1] In isolated specimens occasionally three.

[2] Described and figured by PFEFFER (1887) with reference to *S. septemcarinata* and by HODGSON (1910) with reference to *S. trilobitoides*.

[3] See HODGSON, 1910, p. 27, Pl. IV, Fig. 6.

[4] PFEFFER, 1887, Pl. III, Fig. 19.

shaped, and terminally pointed; in *S. exigua* it is oblong-oval; in *S. paradoxa* it is of about the same shape as in *S. trilobitoides*, but tapers less anteriorly.

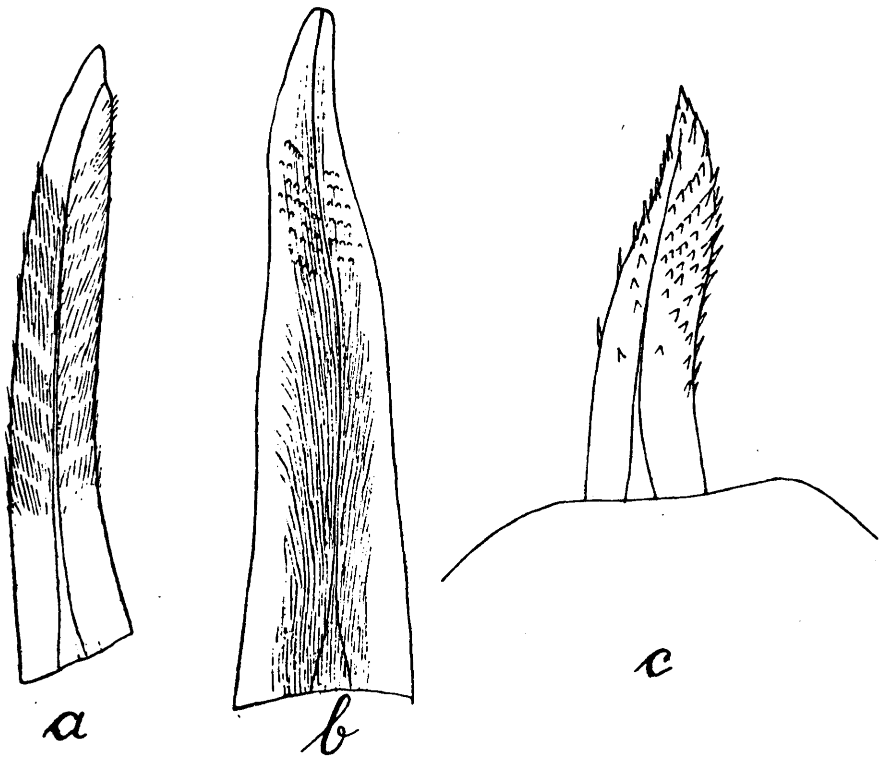

Fig. 8. Setae in *Serolis;* from the distal margin of the basipodite of the maxilliped. a. Seta seen from the ventral side, *S. paradoxa*, 360 ×. b. Seta seen from the ventral side. *S. pagenstecheri*, 360 ×. c. Seta seen from the ventral side, *S. polita*, 470 ×.

X. Summary.

A comparative study of the setae in *Serolis* makes it clear that some of the setae are composite. The composite character is apparent as regards the setae on the lower margin of the propodus of the first periopod. The occurrence of composite seteae is thus not only restricted to terrestrial Isopods. A distinction between the composite and the non-composite category of setae cannot, however, always be made merely by a morphological examination, but requires further investigation of the development of the setae.

Morphological examination makes it clear, however, that the structural scales play an important rôle as phanere-builders, whether independently or by coalescence with non-composite setae.

The part played by scales and setae in phanere-formation may be succinctly described as follows:

1) By the transformation and enlargement of single scales, lamellar, fan-shaped, spiniform, hook-like and even setiform processes may be formed.

2) A nap of delicate chitinous hairs may be formed by a division of the different scales.

3) The plumose seta may be deprived of its sub-branches partially or entirely.

4) The formation of setae is often complicated by the coalescence of the non-composite seta with one or more structural scales.

5) The degree of coalescence between the setal and the scale part of the composite setae shows great variations, ranging between very slight and complete coalescence. In the latter case the composite setae may assume the external appearance of simple setae.

Attention has been drawn to the tendency of the structural scales to be divested of their typical form partly by coalescing with one another, partly by giving rise to heteromorphic and, in many cases setiform processes. In view of this inconstancy of the structural scales it is not surprising that they should lead to the formation of phaneres by coalescence with the primitive non-composite kind of setae. The occurrence of phaneres where the setae and the scales are only slightly coalesced and, broadly speaking are entirely unconnected with one another, seems to indicate that in such cases coalescence has taken place at a relatively late stage of phanere-formation. In the case of setae where this coalescence is complete, it is possible that composite setae may even assume a structure similar to that of the plumose setae. In order to solve this problem it will necessary to study the setal development. The distinction between composite and non-composite setae would be manifested by the number and position of the cells which partake in the phanere-formation.

SECTION III.

Morphology and Classification of the Fam. Serolidae.

I. Morphology.

Suppression of segmentation and reduction of segments.

The family *Serolidae* comprises the single genus *Serolis*. It deviates from the usual type of Isopods in having its first pereion segment (= second thoracic segment) partially fused with the head, and in having dorsally only five complete and distinctly demarcated segments.

GRUBE (1875) and BEDDARD (1884) supposed that the first pereion segment, which is partially fused with the head, had been developed by the coalescense of two segments (viz. that of the maxillipeds and that of the first pereiopods). This view is based on the fact that in certain species the first pereion segment is traversed by two transverse ridges, one on either side of the head. These ridges extend in a transverse direction to a point opposite the centre of the eyes, thus dividing the segment into a small anterior and a large posterior area on either side. GRUBE (1875) and BEDDARD (1884) regarded them as vestigial segment sutures.

In opposition to this view, CALMAN (1920) states: »As a matter of fact, in *Serolis*, as in all other Malacostraca with the exception of *Bathynella*, the first thoracic somite (that of the maxillipeds) is completely incorporated in the head» (p. 301).

The above-mentioned transverse ridges on the epimera of the first pereion segment occur only in certain of the species. In some of the species we find, on either side, yet another ridge situated submarginally behind the anterior margin. The occurrence of both an anterior and a posterior ridge is characteristic of the species *S. trilobitoides, glacialis* and *pagenstecheri*.

In the species *paradoxa, schythei* and *polaris* we find only the posterior ridge, whilst in *septemcarinata, polita* and *australienses* the anterior ridge only is distinctly developed.

The species *exigua, convexa, gaudichaudi, longicaudata, latifrons* and *bouvieri* are devoid of ridges on the epimera of the first segment.

On the epimera of the other pereion segments we frequently find similar ridges, situated submarginally along the anterior margin. They are distinct in *S. paradoxa, septemcarinata, pagenstecheri* and *bouvieri*, indistinct in *polita*, and almost missing in *trilobitoides;* in *latifrons* they are distinct on the fifth an sixth segments, but entirely missing or very indistinct on the second to fourth segment. Submarginal ridges on segments 2—6 are lacking in the species *gaudichaudi, convexa, exigua, minuta, longicaudata,* as also in the species *schythei* and *polaris*. In the latter two species, however, a posterior ridge has been developed on the epimera of the first pereion segment.

S. australienses, which has a submarginal ridge on the epimera of the first segment, is furnished with two transverse rows of tuberculae on the epimera of the other segments.

The last thoracic segment in *Serolis*, as a rule, is not developed on the dorsal side. CALMAN (1920) shows, however, that in two species, *S. beddardi* and *S. latifrons*, the tergum of the last thoracic segment still exists as two minute plates, one on either side laterally from the first abdominal segment.[1] These plates are traversed by a suture, which separates the tergite proper from its coxal plate.

The considerable deviation of the two species *S. latifrons* and *S. beddardi* from other species of *Serolis* is shown in another respect. Their uropods are transformed in a manner reminiscent of the family *Sphaeromidae*. According to the views of STUDER (1879, p. 31) and CALMAN (1920, p. 300) regarding the structure of the uropods, the protopodite is produced into a long point; CALMAN (1920) holds the view that the single branch of the uropod is the exopodite, whilst the endopodite has entirely disappeared.

In her »Analytical key to the families of the *Cymotheidea* or *Flabellifera*», RICHARDSON (1905, p. 55) says that the family *Serolidae*, in contrast to the *Sphaeromidae*, is distinguished by »uropoda with both branches movable». In her diagnosis of the family *Serolidae* RICHARDSON states: »seventh thoracic segment» (actually the eighth thoracic segment) »entirely wanting on dorsal side» and »uropoda lateral, with both branches free and subequal» (p. 320). As these characters do not hold good of *S. latifrons* and *beddari*, RICHARDSON's diagnosis of *Serolis* is not applicable to the genus at large.

Just as the tergum of the seventh pereion segment in *Serolis* shows a tendency to disappear, so does also that of the sixth pereion segment. In some species (*S. tuberculata* and the other Australian species, with the exception of *minuta*[2] the middle part of the tergum of the sixth pereion segment has likewise been reduced, so that the first abdominal segment in the centre comes into direct contact with the posterior margin of the fifth

[1] They were regarded by BEDDARD (1884) as the epimera of the first abdominal segment.
[2] Including its varieties *bakeri* CHILTON and *eugeniae* n. var.

pereion segment. In *S. minuta* a similar reduction of the dorsal central portion of the sixth pereion segment is merely incipient; the first abdominal segment in the centre of the dorsal side has coalesced with the sixth pereion segment, so that the posterior suture of the latter is interrupted in the middle. In this respect *S. minuta* agrees with the species *S. pagenstecheri* and *bouvieri*.

Another process which is unequally developed in this family is the coalescence of the coxal plates with the segments. The number of segments in which the dorsal sutures of the coxal plates are developed varies in different species.

The process of coalescence (with corresponding suppression of segmentation) between the head and the first pereion segment as well as between the last pereion segments should appear also in the sternal parts of the segments. On this point, however, only incomplete information is available.

SCHIOEDTE (1866), whose studies are not referred to in BEDDARD's monograph on *Serolis* (1884), figures and describes in detail the ventral side of the head and the first pereion segment in *S. paradoxa*[1]. On the ventral surface the suture-line between the head and the first segment is distinct laterally and posteriorly, being interrupted only for a short distance medially from the articular foramina for the first periopods (see Fig. 9). Cf. also SCHIOEDTE (1866)[2]. In the posterior part of the head caudally from the maxillipeds a ridged centre-piece is discernible, and laterally therefrom two small, well-defined oval chitinous plates, situated caudally and laterally from the maxillipeds.

The ventral surface of the first pereion segment is furnished in the middle with a trapezoidal area, which is demarcated by longitudinal limits and anteriorly provided with a longitudinal carina. The ventral side of the first pereion segment shows a rather uniform development in the different species. The above-mentioned carinated central plate (described by SCHIOEDTE (1866) in the case of *S. paradoxa*) is always found[3]. The details of its sculpturing as also the course of its lateral limits vary, however, in the different species. Moreover we always find laterally from the central plate the two small oval chitinous plates mentioned by SCHIOEDTE (1866). In the young of *S. paradoxa* and *schythei* taken from the marsupium the small oval chitinous plates were missing; hence they are not indicative of a primitive organization.

In all the species of *Serolis* examined by me, in addition to the longitudinal sutures which mark off ventrally the central plate of the first pereion segment, we find on either side a distinct laterally situated longitudinal suture passing through the articular socket for the first pereiopod (Fig. 9). This longitudinal suture has not been figured by SCHIOEDTE. One of these sutures has been illustrated by AUDOUIN and MILNE EDWARDS as regards the species *S. gaudichaudi*[4]. These authors, on the other hand, do not figure the longitudinal sutures which mark off the central plate of the first segment.

The ventrally developed sutures passing through the sockets for the first pereiopod mark off externally the epimera of the segment. In view of the course which they run, it may be presumed that these sutures at the same time mark off the coxal plates of the

[1] SCHIOEDTE (1866, Pl. X, Figs. 2 a and b).
[2] SCHIOEDTE (1866, Pl. X, Fig 2 a).
[3] E. g. in *S. paradoxa* (Fig. 9.).
[4] AUD. and EDW. (1841, Pl. 2, Fig. 1).

first segment. Even in young specimens removed from the marsupium the sutures are quite distinct.

No epimeral sutures are developed on the dorsal side of the first pereion segment. On the remaining segments there are epimeral sutures on the dorsal side only.

Ventral sutures are found also on the last three pereion segments, which are more or less fused with one another. The course of these sutures (shown in Figs. 10 and 11) is fairly uniform in the different species. On the other hand, the coalescence of the sternal parts of the last pereion segments has apparently been carried further in some species than in others. The varying degree of reduction of the last two pereion segments, which is noticeable in their terga (see p. 39 and 40), is set off on the ventral side by a corresponding coalescence of their sternal parts.

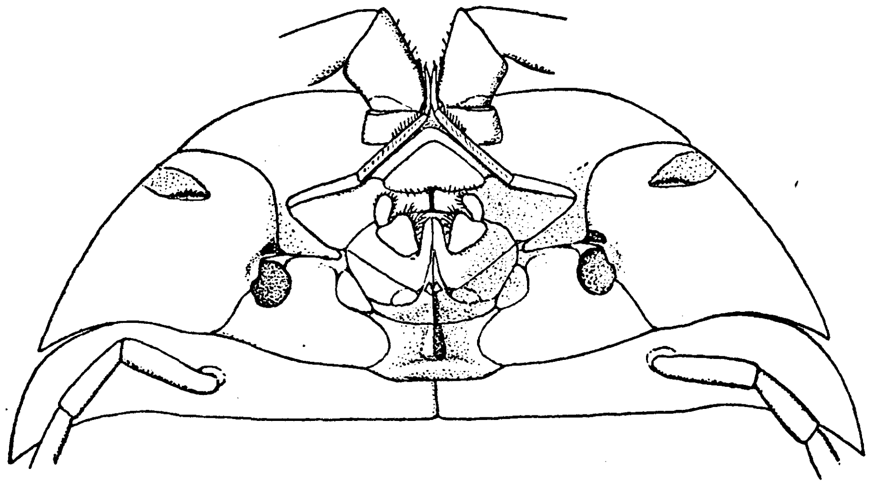

Fig. 9. Ventral surface of the head and first two pereion segments of *S. paradoxa*, sub-adult male, 5 ×.

In *S. latifrons* (Fig. 10 a) which in this respect belongs to the most primitive group of species and in which vestiges of the tergite of the seventh pereion segment are still found, the sternite of this segment is distinctly marked off from the sixth segment.

In *S. paradoxa* (Fig. 10 b) the suture-line between the sixth and seventh segments is clearly defined only laterally, whilst medially it is feebly indicated by a groove on either side of the middle line. The suture-line between the sternites of the fifth and sixth segment is distinct in its entire length in immature specimens, in females and sub-adult males, being, however, interrupted in the middle in adult males (Fig. 10 b). In young removed from the marsupium and thus having the seventh pereiopods not yet developed the suture-line between the sternites of the fifth and sixth segments is very distinct (Fig. 10 c).

I found the suture-line between the sternites of the fifth and sixth segments distinct in its entire length in females of the following species: *paradoxa, schythei, polaris, polita, septemcarinata, glacialis* (var. *austrogeorgiensis*), *gaudichaudi* and *convexa*. As regards *convexa* this feature is illustrated in Fig. 10 d. The suture-line is interrupted in the middle in adult males of *S. paradoxa* (see above) and *schythei*, or indistinct medially: in *S. polaris;* but it is distinct in its entire length in female and immature specimens of these three species also. In *septemcarinata, polita* and *convexa* the suture-line is distinct in its entire length in adult males as well as in female and immature specimens. In *trilobitoides* I found a distinct suture-line in two immature specimens.

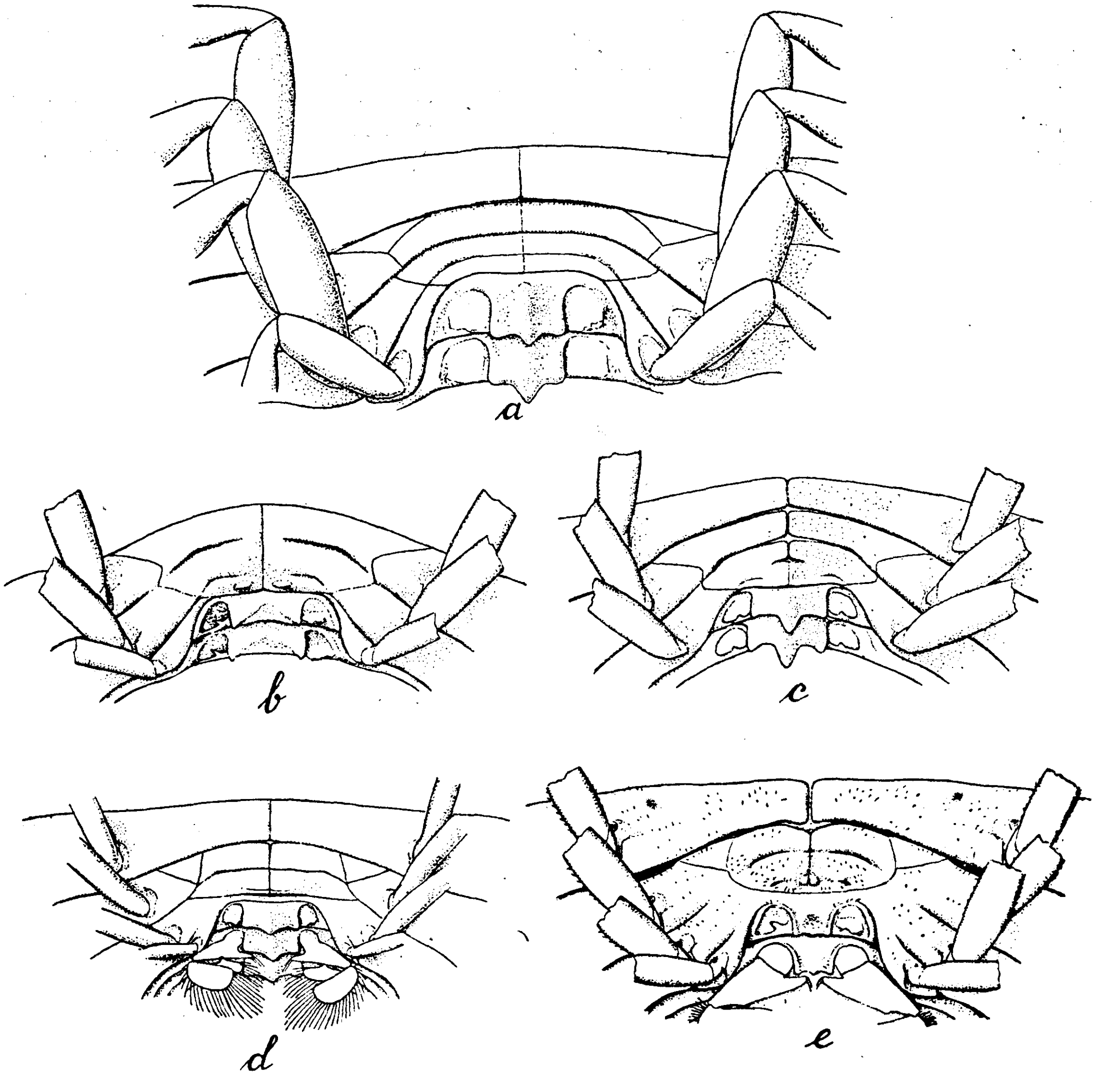

Fig. 10. Ventral surface of the last pereion segments and the first two abdominal segments in *Serolis*. a. *S. latifrons*, immature specimen, 8 ×. b. *S. paradoxa*, adult male, 3.5 ×. c. *S. paradoxa*, immature specimen taken out of the marsupium, 10.5 ×. d. *S. convexa*, female, 5.5 ×. e. *S. pagenstecheri*, adult male, 2.5 ×.

In the species *minuta, pagenstecheri* and *bouvieri*, which agree with each other in having the tergum of the sixth pereion segment fused in the middle with the first abdominal segment (see p. 39 and 40), the sterna of the last two pereion segments are more fused with one another than in the above-mentioned species of *Serolis*.

In *S. pagenstecheri* (Fig. 10 e) a suture-line between the sternites of the seventh and sixth pereion segments is developed laterally, whilst medially it is indicated by two

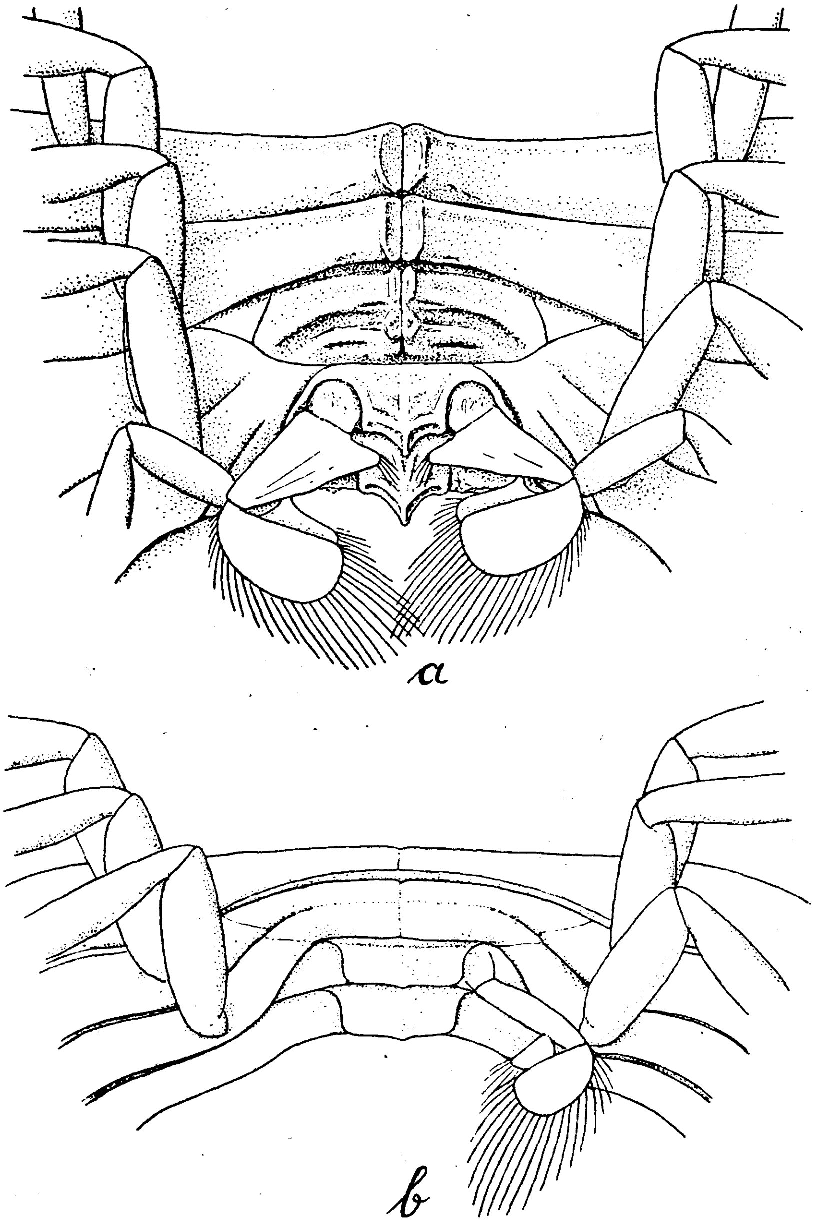

Fig. 11. Ventral surface of the last pereion segments and the first two abdominal segments in *Serolis*. a. *S. bouvieri*, immature male, 7 ×. b. *S. minuta*, var. *eugeniae*, immature specimen taken out of the marsupium, 55 ×.

extremely faint grooves one on either side of the middle line. The suture-line between the fifth and sixth pereion segment is also distinct laterally, whilst medially it is indicated merely by two grooves one on either side of the middle line.

In *S. bouvieri* (Fig. 11 a.) the sternites of the seventh, sixth and fifth segments are fused with each other similarly as in *S. pagenstecheri*. There are two grooves one on either side of the middle line (somewhat more distinct than in *S. pagenstecheri*), which indicate the suture-lines between the seventh and sixth segments.

As regards *S. minuta*[1], I have been in a position to study in this respect only a single specimen taken out of the marsupium; in the specimen the seventh pereion segment as also its pereiopods were not yet developed. In this young specimen the suture-line between the sixth and fifth segments is distinct laterally, whilst medially the sternites of these segments are fused; we find, however, traces of a suture proper in an extremely faint and narrow groove.

Owing to lack of adequate material, I have not been in a position to examine the ventral side of any species of *Serolis* with the tergum of the sixth pereion segments imperfectly developed.

A morphological feature which is connected with the copulation.

GRUBE (1875) states that in *S. paradoxa*, close to the upper lateral angle of the epimera of the first pereion segment, there occurs an attenuated chitinous area of oval shape[2], which, according to him, represents an organ of sense. I have found this chitinous area only in the species *S. paradoxa*, *schythei* and *latifrons*, and merely in some of the specimens. In *S. paradoxa* it occurs in females with semi-developed oostegits, in sub-adult males (see Fig. 9) and in young specimens.[3] It is wanting in full-grown males and, as a rule, also in females with a fully developed marsupium.

In one specimen this thin chitinous tegument was broken up into two lateral incisions (in a ♀ with fully developed marsupium), whilst in another it was provided with an aperture (in a ♀ with semi-developed oostegits).

The place occupied by this chitinous area corresponds exactly to the spot gripped by the claw of the second pereiopod of the male in clasping the female during copulation. In the Swedish Antarctic Expedition's collection of *S. pagenstecheri* there is a specimen which clearly illustrates this feature. The specimen, a ♀ with semi-developed oostegits, shows the »chela» of a male still attached to the first pereion segment in such wise that its dactylus grips the ventral side of the epimeron exactly at the spot where the attenuated chitinous area is found in *S. paradoxa*. It is therefore evident that the chitinous areas on the first pereion segments in *S. paradoxa* and *schythei* mark the place where the »chela» of the male is attached during copulation, whence it may be presumed that they facilitate the attachment of the male to the female. In view of the fact that the male »chela» in the above-mentioned specimen of *S. pagenstecheri* was attached to a female with semi-developed oostegits, it may be presumed that copulation takes place in the females at this stage of development. It has been ascertained that all females of *S. paradoxa* with semi-developed oostegits have the attenuated chitinous areas developed. It is significant that they are usually missing in females with a fully developed marsupium,

[1] The var *eugeniae* of this species.
[2] See GRUBE, 1875, Taf. VI, Fig. 3 a.
[3] It is absent, however, in young removed from the marsupium.

which seems to indicate that at this stage they no longer have any function to fulfil. It is moreover interesting to note that the attenuated chitinous areas are found also in subadult males and in immature specimens.

The antennae.[1]

The antennal peduncle consists of five complete joints. PFEFFER (1887) has, however, shown that in *S. septemcarinata*, between the first and second joints, there is a vestige of yet another small »joint», developed imperfectly and only laterally.[2] This imperfectly developed »joint» I found in all species of *Serolis* examined, as a rule exactly as described by PFEFFER in regard to *S. septemcarinata*. In the case of *S. paradoxa* it is illustrated in Figs. 12 a and b. Viewed from the ventral side (Fig. 12 a), the »joint» is well defined and of an irregularly triangular shape. The dorsal side of the same »joint» (Fig. 12 b) is imperfectly delimited, its suture-line gradually vanishing towards the inner (rostral) side. *S. exigua* (Fig. 17 b) differs in having a very faint suture-line on the ventral side and none at all on the dorsal side.

The development of »the joint» in young specimens removed from the marsupium agrees (in *S. paradoxa*) exactly with that of adult individuals.

The inner (rostral) surface of the second peduncular joint, (according to PFEFFER 1887, the third) in all species of *Serolis* carries a fine nap of slender »hairs», which occupies an area of triangular shape having its broadest part proximally situated (Fig. 12 c).[3] In all preserved specimens the third joint of the mandibular palps are inserted between these »hairy» areas on the second peduncular joints, so that the nap serves to protect the last joint of the mandibular palp and its marginal setae.

The ventral side of the flagellum of the antenna is provided, as a rule, with antennal processes of varying shape. These are lacking in the species *S. minuta* (var. *eugeniae*) and *S. latifrons*. This is presumably the case also in *S. beddardi*, which is closely allied to *S. latifrons*. On this assumption, the two divergent species *S. latifrons* and *beddardi* differ from the rest in yet another character.

The mandibles.

Of fairly uniform structure in all the species of the genus. The cutting edge is more or less dentated[4]. The mandibles near the cutting edge carry two masticatory processes; the inner and somewhat more anteriorly situated process on the left mandible possibly corresponds to a lacinia and is usually very marked; usually it is attached by a broad base and is completed distally by a long dentated edge. In some species this masticatory process, instead of being expanded, is similar to the lateral somewhat more posteriorly situated process. This applies to the species *S. exigua*, *australiensis* and *longicaudata*. In *S. exigua* (Fig. 17 c and d) the anterior masticatory process is more marked than the

[1] The second pair of appendages. For the first pair of appendages (= first pair of antennae) I use the term antennulae.

[2] PFEFFER, 1887, Pl. III, Fig. 1.

[3] Cf. Fig. 12 a and b.

[4] According to BEDDARD (1884, p. 10—11) the cutting edge is more sharply dentated in young specimens. I found, however, that in young removed from the marsupium of *S. paradoxa*, the cutting edge was similar to that of adult specimens.

posterior one. In *S. convexa* (Figs. 19 b and c) the anterior masticatory process on both the left and the right mandibles are much expanded.

The first pair of maxillae.

The inner lobe in most species is distally expanded and usually ends in an oval area, which usually is narrowly rounded at the tip or truncate; its shape, however, varies in different species; its distal margin is always furnished with a small seta.

The second pair of maxillae.

The two lappets of the outer lobe have, as a rule, only two or three apical setae. A larger number of setae on the lappets of the outer lobe is found only in the species *S. convexa* and *gaudichaudi* (in the former species 6, in the latter 7 or 8 on each lappet) and in *S. latifrons*, in which the outer lappet of the outer lobe is furnished with two apical setae; the inner lappet of the outer lobe has eight setae on the left maxilla, only four on the right.

In *S. glacialis* var. *austrogeorgiensis* the outer lobe of the left maxilla was uncleft and furnished with five apical setae; the right maxilla had the outer lobe cleft in the usual way into two lappets, each lappet being provided with two apical setae.

The maxillipeds.

Usually divided into four distinct plates, two of which are situated proximally and two larger ones distally, there being in addition a palp, generally three-jointed. Three of these plates consist of the coxopodite, the basipodite and the epipodite; the fourth must have developed from a division of either the coxopodite or the epipodite. PFEFFER (1887) supposes that the epipodite has split up into two plates.[1]

The attachment of the epipodite to the lateral margin of the coxopodite is a feature common to all Isopods.

In *Serolis*, as also in the *Idotheidae* and the *Arcturidae*[1], it may therefore be presumed that the extra chitinous plate at the proximal lateral angle of the maxilliped has developed from a division of the epipodite. Had this chitinous plate been formed by a division of the coxopodite, the distal epipodite plate would have issued from the lateral margin of the extra chitinous plate, which is not the case.

In some species of *Serolis* the distal epipodite is more or less coalesced with the basipodite, so that the suture-line between them has been effaced.

This has occurred in the species *S. paradoxa, schythei, gracilis* (see BEDDARD, 1884)[2], in *S. carinata*[3] and in the species *S. minuta, S. polaris* and *exigua*. In all these species, except *exigua* and probably also *carinata*[3], there is a distal incision between the epipodite and the basipodite.

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[1] In the families *Idotheidae* and *Arcturidae* we likewise find maxillipeds provided with an extra joint, which must have developed from a division of either the epipodite or the coxopodite. HANSEN (1916), after comparing the maxillipeds in *Astacilla granulata* and *Mesitodea sabinei*, shows that in the latter species the epipodite, but not the coxopodite, has been divided into two plates. COLLINGE (1916, 1916 a, 1917), on the other hand, contends that in the genera *Pentias, Idothea* and *Mesidotea* the coxopodite has been divided.

[2] BEDDARD (1884, p. 35, 43, 62, Pl. II, Fig. 10; Pl. III, Fig. 10).

[3] See RICHARDSON (1905, Fig. 354 d).

In *S. exigua* (Fig. 17 g) the coalescence is very marked, the distal incision between the distal epipodite and the basipodite having also disappeared.

The palp of the maxilliped usually consists of three joints; occasionally a fourth vestigial joint is found. In the species *S. pagenstecheri* and *bouvieri* this joint, though small, is well demarcated from the third palp joint. The same is the case in *S. gerlachei*[1]. In *S. schythei*[2] there is an indication of a fourth palp joint, which, however, is not clearly demarcated from the third joint; the distinctness of its demarcation varies in different specimens. *S. polita* resembles *S. schythei* in this respect (see Fig. 15 g). In *S. glacialis* var. *austrogeorgiensis* the vestigial joint is not delimited from the third joint. See Fig. 16. The figure shows that the third palp joint in this species carries distally two small projecting lappets, the outer one of which certainly corresponds to a fourth palp joint.

In some species also the third palp joint is reduced in size. This is the case in *S. gaudichaudi*[3] and still more in *S. convexa*[4].

The second palp joint is always large and in most species approximately cordate.

In the Australian species of *Serolis* with the exception of *S. minuta* (with its varietys *bakeri* and *eugeniae*) the second palp joint is of a different shape; instead of being cordate it is curved, having the outer margin concave and the inner margin convex[5]. The maxilliped has been figured in the case of *S. australiensis* by BEDDARD (1884)[6], and in the case of *S. tuberculata* by CHILTON (1917)[7]. I may mention that also in *S. longicaudata* the palp of the maxilliped has the same characteristic shape as in the two abovementioned species.

S. minuta, which in other respects also diverges from other Australian species, has the second joint of the palp of the maxilliped irregularly cordate. See Fig. 20.[8]

The pleopods.

The first, second and third pairs of pleopods have a small first peduncular joint, viz. the coxopodite[9]. The inner proximal angle of the basipodite on the first three pleopods is in most species triangularly extended and furnished with three setae on the first pair, and two on the second and third pair. This triangular extension is lacking in the Australian species, even in *S. minuta*,[10] as well as in the species *S. paradoxa, schythei* and *polaris*. The endopodite of the fourth pair is generally triangular; in *S. naera*, according to BEDDARD (1884), it is divided into two lappets by a distal incision. This is the case also in *S. paradoxa, schythei* and *polaris*.

The uropods.

Characteristically transformed in *S. latifrons* and *beddardi*, otherwise fairly uniform; they are reduced in size in *S. bouvieri* (see RICHARDSON 1906).

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[1] MONOD (1926, Fig. 37 F).
[2] Cf. BEDDARD (1884, p. 43, Pl. II, Fig. 10).
[3] AUDOUIN and MILNE EDWARDS (1841, Pl. I, Figs 12 and 12').
[4] BEDDARD (1884, Pl. VI, Fig. 15).
[5] Cf. BEDDARD (1884, p. 67).
[6] BEDDARD (1884, Pl. VI, Fig. 6).
[7] CHILTON (1917, Fig. 7).
[8] The figure illustrates the maxilliped of the var. *eugeniae* of *S. minuta*.
[9] Figured only by PFEFFER (1887, Pl. III Figs. 22, 23, 24) in the case of *S. septemcarinata*.
[10] In *S. minuta* var. *eugeniae*. The main species and the var. *bakeri* have not been examined in this respect.

II. Classification.

Genus **Serolis** (LEACH), 1818.

For diagnosis of the genus see BEDDARD (1884, p. 7) and RICHARDSON (1905, p. 320). RICHARDSON's diagnosis must be slightly modified so as to include also the species *S. latifrons* and *beddardi* (see p. 39); the latter two species are assigned below to the new sub-genus *Spinoserolis*.

Since the great work on *Serolis* by BEDDARD (1884) the following species have been established:

bouvieri, RICHARDSON (1906); *meridionalis*, HODGSON[1] (1908); *polaris*, RICHARDSON (1911); *beddardi*, CALMAN (1920); *glacialis*, TATTERSALL (1921); *gerlachei*, MONOD (1926).

To these species I can add the new species *S. exigua*, described below, whilst I regard »*S. bakeri*», CHILTON (1917), as a variety of *S. minuta*.

Division into sub-genera.

BEDDARD (1884) assigned the six Australian species of *Serolis* to a special group within the family.

A distinguishing feature of all these species, with the exception of *S. minuta*, is that the middle part of the tergum of the sixth pereion segment has disappeared, whilst the second palp joint of the maxilliped is characteristically developed, not being cordate, but of almost uniform breadth. *S. minuta*, in which the tergum of the sixth pereion segment is preserved in its entirety but coalesces in the middle with the first abdominal segment, thus represents a transitional form leading up to *S. paradoxa* and allied species.

BEDDARD neither describes nor figures the maxilliped in *S. minuta*, but points out that, except in the characters of the sixth pereion segment, *S. minuta* more closely resembles *S. paradoxa* and allied species than *S. tuberculata*. He does not follow up his groups by a division into sub-genera.

Nor was the genus divided into subgenera by CALMAN (1920). He showed, however, that the two species *S. beddardi* and *latifrons* deviate considerably from the other species of *Serolis*, firstly in the continued existence of vestiges of the tergum of the last thoracic segment and secondly in the characteristic transformation of their uropods. These characters are regarded by CALMAN (1920) as being of almost generic importance.

CALMAN divides the family into three groups, viz. the *S. latifrons* group, the *S. paradoxa* group and the *S. tuberculata* group. Of these the *S. latifrons* group comprises *S. latifrons* and *S. beddardi*, while the two other groups are the same as those established by BEDDARD. CALMAN includes *S. minuta* in the *S. tuberculata* group, which, according to him, is characterized by having »tergum of penultimate thoracic somite interrupted in the middle so that the first abdominal comes in contact with the antepenultimate thoracic tergum» (CALMAN, 1920, p. 299); *S. minuta*, however, deviates from his group diagnosis.

As has been pointed out above the tergum of the penultimate thoracic segment in *S. minuta* is fused in the middle with the first abdominal segment; this is the case

[1] Fide VANHÖFFEN (1914).

also in the species, *pagenstecheri* and *bouvieri*[1]. Thus, as regards the fusion and partial reduction of the last thoracic terga, the above-mentioned species occupy an intermediary position between the *S. paradoxa* group and the *S. tuberculata* group. The reduction of the dorsal middle part of the sixth pereion segment has been carried further than in the species of the *S. paradoxa* group, but is not complete as in the *S. tuberculata* group.

If the different degree of coalescence between the tergal parts of the posterior thoracic segments is consistently taken as a systematic character, these species must be assigned to a special group.

That these species constitute a special type within the family, quite as much as the *S. paradoxa* and *S. tuberculata* groups, is clearly shown also by an examination of the sternal parts of the segments. It has been pointed out above that only in the species *S. minuta, pagenstecheri* and *bouvieri* is the coalescence between the sternites of the fifth and sixth pereion segments so far advanced that the greater part of the suture-line between them has been effaced.

In contrast to the four above-mentioned species, all the species of the *S. paradoxa* group which I have been in a position to study have the suture-line between the sterna of the fifth and sixth pereion segments developed in its entirety (see p. 41 and 42)[2].

The genus *Serolis* thus exhibits four different constantly recurring types, which differ in regard to the degree of the reduction of, and the coalescence between, the last three pereion segments. Moreover these »types» of the genus sometimes have other characters in common (particularly in the uropods and the maxillipeds). We are, therefore, warranted in dividing the genus into four sub-genera, for which I propose the following terminology:

1. *Spinoserolis* (= *S. latifrons* group, CALMAN);
2. *Serolis* (= *S. paradoxa* group, CALMAN);
3. *Homoserolis* (= *Serolis minuta, pagenstecheri* and *bouvieri*);
4. *Heteroserolis* (= *Serolis tuberculata* group, CALMAN).

Spinoserolis n. subg.

Diagnosis. Uropods spiniform, two-branched, lacking endopodite. Vestiges of the tergum of the seventh pereion segment persist laterally. The sternum of the seventh pereion segment completely demarcated from the sixth pereion segment. Coxal plates marked off by dorsal sutures on second to sixth pereion segments. Second joint of the palp of the maxilliped cordate. Antennal processes on the antennal flagellum missing[3]. Basipodites of the first three pairs of pleopods with their inner proximal angles projecting and furnished with setae.

Serolis n. subg.

Diagnosis. Uropods two-branched (not spiniform). Tergum of seventh pereion segment entirely vanished. Tergum of sixth pereion segment well demarcated from first abdominal segment in its entire length. Suture between the sterna of seventh and sixth pereion segments partially effaced; suture between sixth and fifth segments complete. Coxal

[1] In *S. bouvieri* the tergum of the sixth pereion segment also coalesces in the middle with that of the fifth.

[2] A short median part of this suture is missing in adult males of *S. paradoxa* and *schythei* (see p. 41 and Fig. 10 b), but the suture-line is distinctly developed in its entirety in female and young male specimens of these species (Fig. 10 c).

[3] Established only in the case of *S. latifrons.*

plates marked off by dorsal sutures on a varying number of segments. Second joint of the palp of maxilliped cordate. Antennal processes developed on the antennal flagellum. Basipodites of first three pairs of pleopods with or without triangular extension at their inner margins.

Homoserolis n. subg.

Diagnosis. Uropods two-branched (not spiniform). Tergum of seventh pereion segment entirely missing; that of sixth pereion segment in the middle short and coalesced with abdomen so that the suture-line between this segment and abdomen has been effaced in the middle. Suture-lines between the sterna of seventh and sixth as also between sixth and fifth pereion segments developed only laterally. Coxal plates marked off by dorsal sutures on second, third and fourth pereion segment. Second palp joint of the maxilliped cordate. Antennal processes developed on the flagellum of the antennae. Basipodite of the first three pairs of pleopods with or without triangular extension at its inner margin.

Heteroserolis n. subg.

Diagnosis. Uropods two-branched (not spiniform). Tergum of seventh pereion segment entirely missing; likewise middle of tergum of sixth pereion segment. Second joint of palp of maxilliped non-cordate, with outer margin concave and inner margin convex. Antennal processes developed on the flagellum of the antennae. Basipodites of first three pairs of pleopods without triangular extension at their inner margins.

Group-division of the sub-genus Serolis.

The subgenus *Serolis* includes the main part of the species. In the subgenus the dorsal sutures of the coxal plates are developed in a varying number of segments. In addition there are differences in the second pair of maxillae and in the shape of the maxillipeds and the pleopods. On the basis of these characters, the subgenus may be divided into the following five groups: —

Group I. Coxal plates marked off from the tergum on second to sixth pereion segments. Third palp joint of maxilliped well-developed. Basipodites of first three pairs of pleopods with their inner proximal angles projecting and furnished with setae.

The group comprises only *S. gracilis* BEDDARD. The second pair of maxillae is not known in the species. As regards the last pleopods BEDDARD (1884, p. 63) states: »The suture which divides the exopodite of the opercula is oblique; the exopodite of the gill appendage is bifurcate».

Group II. Coxal plates marked off from the terga of the second to fifth pereion segments. Outer lappet of outer lobe of second pair of maxillae provided with two or three apical setae, inner lappet of the same lobe with four to seven. Basipodite of first to third pleopods with proximal part of the inner margin slightly convex and lacking setae. Endopodite of the fourth pleopod divided into two lappets by a distal incision.

Comprises the species *paradoxa*, *schythei* and *polaris*.

Group III. Coxal plates marked off from the terga of the second, third and fourth pereion segments. Third palp joint of the maxilliped well developed[1]. Lappets of outer lobe on

[1] The maxillipeds of *S. meridionalis* have not been described or figured.

second pair of maxillae provided with a small number of setae[1]. Basipodites of the first three pairs of pleopods each provided at their inner proximal angles with a triangular extension which is furnished with setae[2]. The endopodite of third pleopod, as a rule, entire (exceptionally bifid)[3].

Comprises the species *trilobitoides, septemcarinata, antarctica, naera, bromleyana, polita, meridionalis, glacialis, gerlachei* and *exigua.*

Group IV. Coxal plates marked off from the terga on second to fourth pereion segments. Third palp joint of maxilliped minute. Lappets of outer lobe on the second pair of maxillae provided with a large number (6—8) of apical setae. Basipodites of first three pairs of pleopods with inner proximal angles triangularly projecting and furnished with setae. Endopodite of third pleopod entire (not bifid).

Species belonging to this group deviate also in having the setae on the propodal edge of the first pereiopod differently shaped in females and adult males.

The group comprises the species, *S. gaudichaudi, convexa* and *plana.* Our knowledge of *S. plana* is inadequate; it has been examined only with reference to the first character in the group-diagnosis. In its general aspect it is, however, very similar to *S. convexa* and may possibly be identical with that species.

Group V. Dorsal sutures of coxal plates lacking on all pereion segments. Third palp joint of maxilliped well developed.

Comprises only the species *S. carinata* LOCKINGTON, which, as regards most of the characters taken as a basis for the group diagnoses, is inadequately known. The second joint of the palp of the maxilliped in this species is of almost uniform width (cf. RICHARDSON 1905, Fig. 354 d.)

Remarks. Groups II and IV are the most distinctly demarcated groups. Only in Group II, notably in the subgenus *Serolis,* do we find that the coxal plates are dorsally delimited on four of the pereion segments, and that the basipodites of the first three pairs of pleopods have the proximal parts of their inner margins slightly convex.

The species belonging to group IV have, indeed, the same number of demarcated coxal plates as is characteristic of group III, but they are distinguished from all other species of the genus by differences in the second pair of maxillae and in the palp of the maxilliped, as also in the setal armature on the propodus of the first pereiopod.

Subgenus *Serolis*[4], Group II[5].

Serolis (*Serolis*) paradoxa (FABRICIUS, 1775).

Text figs. 1 f and g, 2 a, b and d, 3 b, c and d, 5 b, 6 f and g, 7 a and b, 8 a, 9, 10 b and c, 12 a—f.

Oniscus paradoxus. FABRICIUS, 1775, p. 296.

Serolis Fabricii. LEACH, 1818, p. 339—340; MILNE EDWARDS, 1840, p. 231—232; NICOLET, 1849, p. 821—282; GRUBE, 1875, p. 233.

Serolis Orbignyana. AUDOUIN and MILNE EDWARDS 1840, in MILNE EDWARDS 1840, p. 232; AUDOUIN and MILNE EDWARDS, 1841, p. 25—27, Pl. 2 Figs 8—9; SCHIOEDTE, 1866, p. 181—183, Pl. X, Figs. 2 a—2 g; GRUBE, 1875, p. 225—227, p. 233, Pl. V Figs. 3 and 3 a, Pl. VI Fig. 3 a; SCHMELZ, 1876, p. 161.

[1] The second pair of maxillae are unknown in *S. antarctica, naera* and *meridionalis.*
[2] The pleopods are unknown in *S. meridionalis.*
[3] In *S. naera.* The shape of the third pair of pleopods is unknown in *antarctica, meridionalis* and *gerlachei.*
[4] For diagnosis see p. 49—50.
[5] For diagnosis see p. 50.

Serolis Orbigniana. CUNNINGHAM, 1870, p. 498.
Serolis paradoxa. AUDOUIN and MILNE EDWARDS, 1841, p. 28—29, Pl. 2 Fig. 10; MIERS, 1875, p. 116—117; 1881, p. 76; BEDDARD, 1884, p. 33—36, Pl. V, Figs 12—14; DOLLFUS, 1891, p. 61—62, Pl. VIII Fig. 4; ORTMANN, 1911, p. 650; NIERSTRASZ, 1917, p. 110.
For synonomy and literature see also MILNE EDWARDS (1840), AUDOUIN and MILNE EDWARDS (1841) and BEDDARD (1884).

Diagnosis. Anterio-lateral angles of the head triangularly prolonged. Coxal plates delimited by dorsal sutures on the second to fifth pereion segments. Posterior epimeral angles on the second to sixth segments of pereion all successively reach further back than the epimeral angles of the preceding segments. Posterio-lateral epimeral angles of the second and third abdominal segments extend to the lateral margins of the pleotelson. Pleotelson with three longitudinal diverging ridges. Inner lobe of first maxilla expanded distally. Outer lappet of outer lobe of second maxillae with two, and inner lappet of the same lobe with five or six, apical setae. Maxilliped without suture between the distal epipodite and the basipodite, the distal epipodite being fused proximally with the basipodite to about half its length; second joint of the palp cordiform. Basipodite of the first three pairs of pleopods with proximal part of the inner margin slightly convex. Fourth pair of pleopods with the endopodite bifid.

Supplementary Description.

Body. Body with lateral margins slightly serrate and furnished with minute setae. Dorsal surface with dark ramose pigment spots.

Colour. Slightly yellowish to brownish.

Head. Anterior margin laterally from the proximal joints of the antennae, slightly bent downwards; there is a submarginal ridge at the base of the downturned part, extending from the second peduncular joint of the antennulae to the anterio-lateral angle of the head.

First pereion segment. Dorsal surface of the epimera with a transverse ridge on each side of the head, extending to a point opposite the centre of the eyes. Close to the anterio-lateral angle of the segment there is a small oval area of very thin chitin (see Fig. 9).

Ventral surface (see Fig. 9) with four longitudinal sutures, the lateral ones passing through the articular sockets for the first pereiopods[1]. Along the middle line there is a broad longitudinal carina, extending from the anterior margin of the segment to about two-thirds of its length and increasing in width backwards. Posteriorly the keel is limited by a transverse furrow from a crescent-shaped elevation along the hinder margin.[1]

The other segments of the pereion. Epimera with faint transverse ridges near their anterior margins. All the segments with a longitudinal furrow ventrally in the middle line. For the ventral surface of the last three segments see Figs. 10 b and c.

Antennulae. Second and third peduncular joint on each of the anterior and posterior sides with a longitudinal row of slender setae. Each joint of the flagellum with one sensory filament and three setae. Last joint of the flagellum with three setae.

Antennae (Fig. 12 a, b and c). First peduncular joint short and visible only from below. Second peduncular joint about twice as long as the first, with an incomplete suture proximally (cf p. 45). Second and third peduncular joints ventrally with groups of

[1] Cf. SCHIOEDTE, 1866, Pl. X Fig. 2 a.

setae arranged in transverse rows, each group consisting of four to six setae. The rows stretch from about the centre of the joints to the anterior margin, the setae being shorter in the groups situated more anteriorly. Second peduncular joint with three rows of groups of setae, third and fourth joint with five rows.

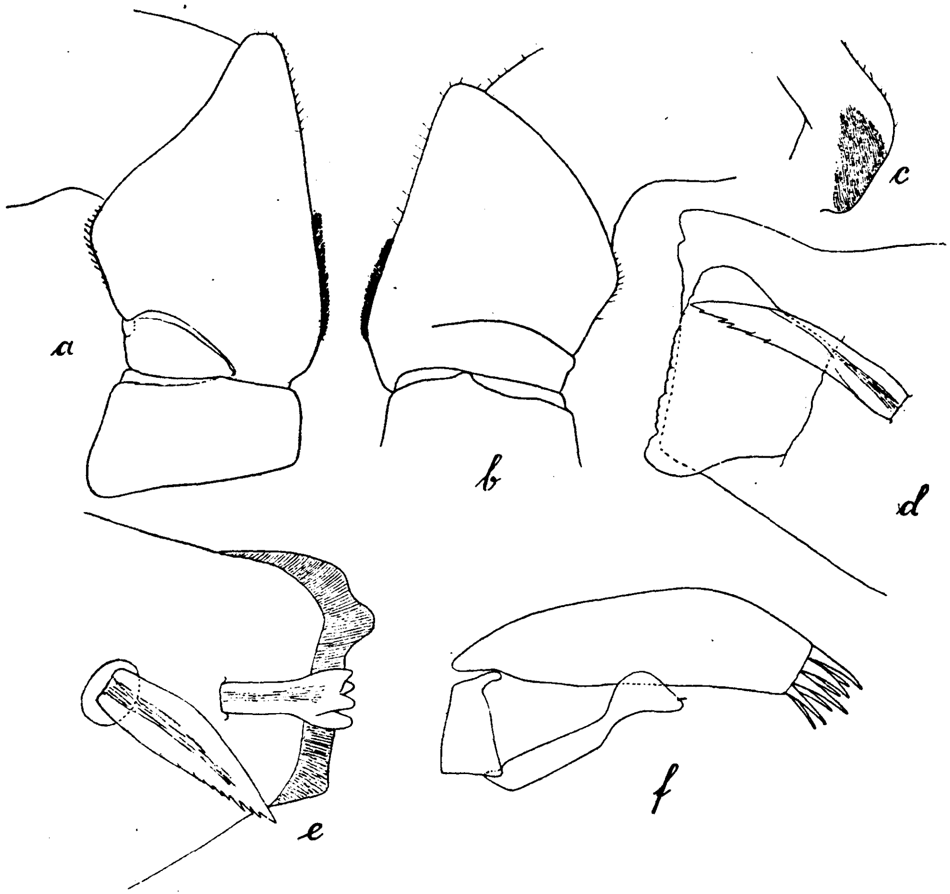

Fig. 12. *Serolis paradoxa* (FABR.) a. Proximal joints of the antenna, seen from below, 13 ×. b. The same, seen from above, 13 ×. c. Part of the peduncular joint of the antenna, seen from the rostral (= medial) side, 10 ×. d. Inner part of the left mandible seen from above, immature specimen taken out of the marsupium, 60 ×. e. Inner part of the right mandible, seen from above, the same specimen, 60 ×. f. First maxilla, male, 20 ×.

Mandibles (Figs. 12 d and e). The inner masticatory process of the right mandible provided at the tip with a number of irregularly placed obtuse teeth, the lateral seta with a row of saw-teeth along its caudal margin.

Setae on the second and third joints of the palp as in *S. trilobitoides*.[1]

First pair of maxillae (Fig. 12 f). Cf. SCHIOEDTE (1866, Pl. X, Fig. 2 b); BEDDARD (1884, Pl. V. Fig. 14).

[1] Cf. HODGSON, 1910, Pl. IV, Fig. 6.

Second pair of maxillae.[1] Outer lappet of outer lobe with two, and inner lappet of the same lobe with five or six, apical setae.

Maxillipeds.[2] Distal epipodite proximally coalesced with the basipodite to about half its length. Distal margin of the basipodite concave and furnished with two large setae (See Fig. 8 a), one in the middle of the margin and one at the inner distal angle.

First pair of pereiopods. Lower distal angle of the carpus prolonged into a short spine-like projection. Distal margin with two composite sub-cylindrical setae (See Fig. 6 f.) On both the rostral and the caudal side there is a submarginal row of slender setae along the lower part of the distal margin and the distal part of the lower margin.

For the setae on the lower margin of the propodus see Fig. 5 b.

Dactylus with a submarginal row of pores on the rostral side close to lower margin (See Fig. 3 c and d).

Second pair of pereiopods. For the setae on the lower margin of the propodus see Fig. 7 a and b. A dense covering of slender setae[3] on the lower surface of ischum, merus and carpus occurs only in adult males which have penial filaments of full length.

First three pairs of pleopods. Endopodite, decreasing in length but increasing in width, from the first to the third pair. Margins of exo- and endopodite with long plumose setae, mingled with very short »hairs», lacking setal canals.

Fourth pair of pleopods. Exopodite divided by an oblique transverse suture and obtusely pointed distally. Endopodite distally cleft into one narrow digitiform inner lobe and one larger outer lobe. Outer and inner margins of the exopodite provided proximally with branchless slender setae, which gradually become branched distally.

Fifth pair of pleopods. Peduncle short, exopodite and endopodite not divided by transverse limits. BEDDARD (1884, p. 36 and cf. p. 13—14) says that the exopodite of this appendage is bifurcate. This is really only the case with the endopodite of the fourth pleopod.

Uropods. Exopodite almost twice as broad as the endopodite. Outer, inner and distal margins of the branches serrate, each serration provided with one plumose seta; also the outer margin of the basipodite is serrate.

Localities*[4] *and material.

St. 33. South Georgia, Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 22 m. Clay and algae. 30/5 1902. 24 specimens, males and females, all sub-adult or immature. Largest specimen, a male with semi-developed penial filaments, length 27.5 mm.

St. 39. Falkland Islands, Port William, lat. 51°40′ S., long. 57° 41′W. 40 m. Sand and small stones with algae. 4/7 1902. Ovigerous female. Colour light yellowish to brownish. Length 28 mm.

St. 41. Falkland Islands, Berkeley Sound, Port Louis, lat. 51 ° 33′ S. long. 58° 9′ W. Shallow water. Gravel and sand. 23/7 1902. One ovigerous female.

St. 52. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 44′ W. 17 m. Sand. 3/9 1902. 33 specimens, males and females. Length of largest specimen, male, about 36 mm.

St. 54. Falkland Islands, Stanley Harbour, lat. 51° 42′ S., long. 57° 50′ W. 10 m. Mud with shells. 3/9 1902. 3 specimens of dark colour (one ovigerous female and two immature specimens).

Swedish Magellanian Expedition. Falkland Islands, Port William. Rocks. 20 specimens. Colour, light yellowish. Length of largest specimen 30 mm.

Swedish Expedition to Tierra del Fuego.

Tierra del Fuego, Lennox Island, Lennox Cove. 10—20 fathoms Floride bottom. 5/2 1896. 9 immature specimens. Colour, dark in the middle, small dark spots along the posterior margins of the segments and on the head and the pleotelson.

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1 Cf. BEDDARD, 1884, p. 35.

2 Cf. SCHIOEDTE, 1866, p. 182, Pl. X, Figs. 2 a and g.

3 Cf. BEDDARD, 1884, p. 35.

4 In the list of localities those visited by the Swedish Antarctic Expedition are placed first.

Tierra del Fuego, Paramo. Shore at low tide. Jan. and Febr. 1896. 7 large specimens of very dark colour, males and females. Length of largest specimen, an adult male, 31 mm.

Patagonia, Puerto Gallegos. Common on the shore at low tide. Clay mixed with sand. $^{16}/_{11}$ 1895. 17 specimens (6 adult, 11 immature). Colour of the adult specimens blueish black. Length of the largest specimen, a female with empty marsupium, 34 mm.

Magellanian Region, Gente Grande. $^{25}/_{11}$ 1895. 2—3 fathoms. Rocks and algae. 3 specimens of brownish black colour. Length of the largest specimen, a female, 32 mm.

Magellanian Region, Punta Arenas. Shore at low tide. Sand. $^{25}/_{11}$ 1895. 7 specimens, males, females and immat. Colour, dark brown. Length of the largest specimen (female with young) 38 mm. Length of largest male specimen 36 mm.

The »Gefle» Expedition (G. E. WESTERGREN legit). South Chile, Corral, at Valdivia Bay. 1866. Ovigerous female.

Falkland Islands. Port Stanley. 20 fathoms. 1866. Immature specimen.

Distribution. Coast of Central Chile (NIERSTRASZ 1917), Tierra del Fuego and Patagonia (AUDOUIN and MILNE EDWARDS 1841), Falkland Islands (BEDDARD 1884), South Georgia (Sw. Ant. Exped.)

The species has not previously been recorded from South Georgia. It occurs with certainty as far northwards as the coast of Central Chile. Perhaps it may also be distributed at the coasts of North Chile and Peru. In any case, there are at the Swedish State Museum two specimens, which are labelled: »Vanadis Expedition, Callao» (coast of Peru). This locality I regard, however, as uncertain.

Serolis (*Serolis*) schythei LÜTKEN, 1859.

Text fig. 1 b and i, 5 c and d, 7 h, 13 a—e.

Serolis schythei. LÜTKEN, 1859, p. 98—104, Pl. I A Figs. 12 and 13; GRUBE, 1875, p. 220—225; STUDER, 1884, p. 8; DOLLFUS, 1891, Pl. VIII a, Fig. 5; BEDDARD, 1884, p. 40—44, Pl. II Figs. 5—13; PORTER, 1917, p. 99; TATTERSALL, 1921, p. 227; GIAMBIAGI, 1928, p. 11—12; Pl. II, Fig. 3.

Diagnosis. Head of greatest width across the eyes. Coxal plates marked off by dorsal sutures on the second to fifth pereion segments. Epimeral angles of the second to sixth segments of pereion all successively extending beyond the epimeral angles of the preceding segments. Epimera of second abdominal segment extending further back than the posterior angles of the epimera of the fifth pereion segment, but not as far back as those of the sixth pereion segment. Pleotelson with three diverging longitudinal ridges. Posteriolateral angles of pleotelson prolonged into retroverted points. First maxillae with inner lobes expanded distally. Outer lappet of the outer lobe of second maxilla provided with two apical setae, inner lappet of the same lobe with six or seven. Maxilliped without suture between the distal epipodite and the basipodite, the distal epipodite being fused proximally with the basipodite to about half its length. Palp of maxilliped with a vestigial fourth joint. Basipodite of the first three pairs of pleopods with proximal part of the inner margin slightly convex and devoid of setae. Endopodite of fourth pleopod bifid.

Supplementary Description.

Head and pereion. The submarginal ridge on the anterio-lateral parts of the head indistinct. Transverse ridges on the first pereion segment more marked than in *S. paradoxa*. No transverse ridges on the other pereion segments. Ventral surface of pereion as in *S. paradoxa*[1].

[1] Cf. GRUBE, 1875, Pl. VI, Figs. 1 and 1 c.

Antennae. Antennal processes on the flagellum (Fig. 1 i) exactly alike in males and females.

Mandibles (Figs. 13 a and b). Anterior masticatory process on the right mandible (Fig. 13 c) with a great number of digitiform lobes. Posterior process with a row of teeth.

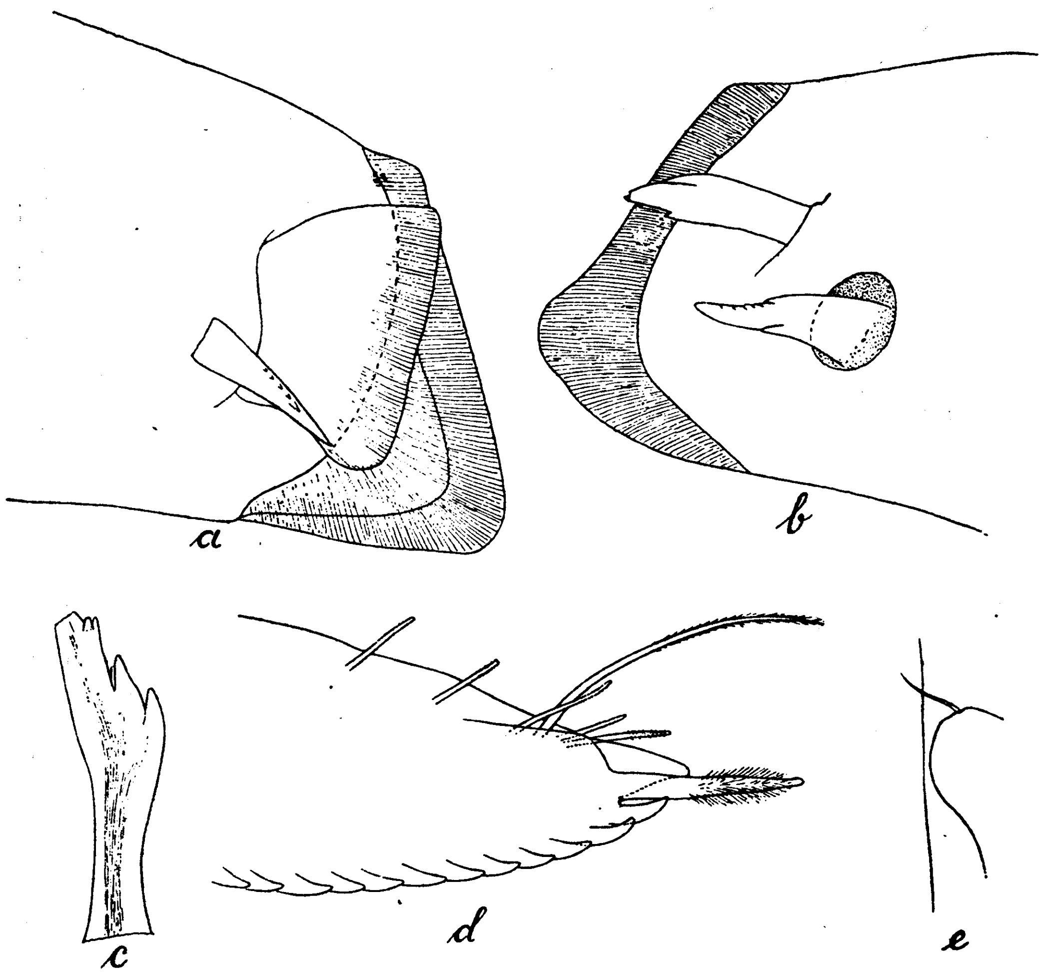

Fig. 13. *Serolis schythei*, LÜTK. a. Inner part of the left mandible, seen from above, 80 ×. b. Inner part of the right mandible, seen from above 80 ×. c. The rostral masticatory seta on the right mandible, 140 ×. d. Tip of the dactylus of the second pereiopod, in a female, 240 ×. e. Tuberculum and seta at the dorsal margin of the ischium of the fourth pereiopod (in an adult male) 115 ×.

First pair of maxillae. Outer lobe with about 12 apical setae, of which that at the posterior-distal angle is provided with two adjacent rows of short and slender sub-branches.

Second pair of maxillae: Outer lappet of outer lobe with two, inner lappet of the same lobe with six or seven, apical setae, most of the setae furnished with two rows of slender sub-branches.

Maxillipeds. Distal epipodite proximally fused with the basipodite to about half its length. Palp with a fourth vestigial joint, distinctly delimited by a suture only in certain specimens[1]. The composite setae on the basipodite as in *S. paradoxa.*

First pair of pereiopods. For the composite setae on the propodus see Figs. 5 a and d. The composite setae on the distal margin of the carpus as in *S. paradoxa.* On the rostral side of the dactylus, close to the lower margin, there is a submarginal row of pores with one seta protruding from each pore.

Second pair of pereiopods.[2] For the setae on the lower margin of the propodus of the adult male see Fig. 7 h. Along the lower margin of the dactylus there is a row of elongated, projecting structural scales (Fig. 13 d), of which the most distal one constitutes the short ventral claw of the joint. Between the two claws is a stout sensory seta. Only sparse setae on the lower margin of the ischium, merus and carpus, in the adult male.

The other pereiopods. In the adult male the seventh pereiopod differs from the same appendage in the female only in having a greater number of setae on the lower margin of the carpus and propodus. BEDDARD (1884, p. 43) states with reference to the third to seventh pereiopods »the second joint (in the males only) has a series of about fifteen tubercles close to the inner margin». Such tuberculae are found on the ischium in the adult male. Each tuberculum is furnished with a simple seta (Fig. 13 e and cf. BEDDARD, 1884, Pl. II, Fig. 9).

Pleopods and uropods. LÜTKEN, (1859, p. 102), GRUBE, (1875, p. 223—224, Pl. V, Figs. 1 c and 1 d.), BEDDARD, (1884, p. 43 and 44).

Localities and Material.

St. 2. Coast of North Argentina, lat. 37° 50′ S., long. 56° 11′ W. 100 m., Gravel mixed with sand. $^{23}/_{12}$ 1901. 9 specimens, males and immature. Length of largest specimen 23 mm. (adult male.)

St. 16. Between Falkland Islands and South Georgia, lat. 51° 40′ S., long. 57° 25′ W. 150 m. Sand. $^{11}/_{4}$ 1902. 8 immature specimens.

St. 33. South Georgia, off Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 22 m. Clay and algae. $^{30}/_{5}$ 1902. 35 specimens, males and females. Length of largest specimen 24 mm. (adult male.)

St. 40. Falkland Islands, Berkeley Sound, lat. 51° 33′ S., long. 58° 0′ W. 16 m. Bottom temp. + 2.75°. Gravel and shells with algae. $^{19}/_{7}$ 1902. 6 adult specimens. Length of the largest specimen 31.5 mm (male).

St. 48. Falkland Islands, Berkeley Sound, lat. 51 °34′ S., long. 57° 55′ W. 25 m. Bottom temp. + 2.75°. Sand and stones. $^{10}/_{8}$ 1902. 10 specimens, males and females. Length of largest specimen 28 mm (female with young).

St. 55. Falkland Islands, Port Albemarle, lat. 52° 11′ S., long. 60° 26′ W. 40 m. Sand bottom with algae. $^{8}/_{9}$ 1902. One sub-adult male (penial filaments about as long as the endopodite of second pleopod). Length 17.8 mm.

St. 57. Falkland Islands, Port Albemarle, lat. 52° 8′ S., long. 60° 33′ W. 18—30 m. Sand. $^{11}/_{9}$ 1902. 15 specimens, males and females. Length of largest specimen, a male, 21.5 mm. One female of a length of only 19.3 mm. was already mature and provided with a marsupium containing young.

St. 58. South of W. Falkland, lat. 52° 29′ S., long. 60° 36′ W. 197 m. Bottom temp. + 4.1°. Sand and gravel. $^{11}/_{9}$ 1902. Female with young. Length 17.3 mm.

Eugenie Expedition. Patagonia. Off Cape Corrientes, lat. 39° 14′ S., long. 57° 0′ W. 52 fms. Black sand. 3 specimens (females and immature specimen). Length of largest specimen, a female with an empty marsupium, 22 mm.

Magellan Straits, off. Cape Virgines, 32 fms. 10 immature specimens of yellowish colour. Length of largest specimen 22 mm, sub-adult male (with penial filaments slightly longer than the endopodite of second pleopod, but with sterna on the first three abdominal segments already transformed).

Swedish Expedition to Tierra del Fuego. Magellanian Region, Punta Arenas. Bottom: sand and algae. 7—8 fathoms. Not rare. $^{4}/_{12}$ 1895. Collected on the shore at low tide. 9 specimens with numerous black spots. Length of largest specimens, adult male and ovigerous female, 27 mm.

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[1] Cf. BEDDARD (1884, p. 43, Pl. II, Fig. 10).

[2] See GRUBE, (1875, Pl. V, Fig. 1 a, p. 224), BEDDARD (1884, Pl. II, Fig. 8).

Material collected by Captain LARSEN 1894. Graham Region, Terror and Erebus Golf. Adult male, yellowish with dark spots, length 23 mm.

Material collected by I. G. HÖGBERG. Argentina, Chubut Territorio. Golfo nuevo, Harbour, Madryn. One specimen, adult female.

Distribution. Coast of Central Chile (PORTER 1917), Argentina (Sw. Ant. Exped.), Patagonia (STUDER 1884, BEDDARD 1884, Tierra del Fuego (GIAMBIAGI 1925), Magellanian Region (LÜTKEN 1859), Falkland Islands (BEDDARD 1884, TATTERSALL 1921), Between Falkland Islands and South Georgia near Falkland Islands (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.), Graham Region (Capt. LARSEN 1894).

The species has previously been found at the Falkland Islands, Magellan Straits, Patagonia and Chile. Here it is for the first time recorded from Argentina, South Georgia and Graham Region; it is thus widely distributed.

Serolis (*Serolis*) polaris RICHARDSON, 1911.

Serolis polaris. RICHARDSON 1911, p. 396—398, Fig. 1.

Specific Characters and Remarks.

The species is closely allied to *S. schythei* and tallies with that species in most of the features mentioned above in the diagnosis of *S. schythei*. It differs in that the anterio-lateral angles of the head are more pointed and projecting and in that the posterior angles of the pleurae of the second abdominal segment project beyond the posterior angles of the coxae of the sixth pereion segment. There is also a slight, but distinctly marked, difference in the sculpturing of the pleotelson, as well as in some minor features mentioned below. As in *S. schythei* the adult male differs from the female in having the posterior margin of the first three abdominal segments concave.

Supplementary Description.

Colour. Yellowish, often with a brownish spot at the junction of the coxal plates and the thoracic segments.

Antennae. Antennal processes occur on the central joints of the flagellum and consist of 3—5 hook-like projections in a row along the distal margin of the joints.

First and second pairs of maxillae. Inner lobe of first maxilla with the distal end widened; distal margin sub-truncate (very slightly concave). Outer lappet of outer lobe with three apical setae, inner lappet of the same lobe with four or five.

Maxillipeds. As in *S. schythei* but without any trace of a fourth joint of the palp.

First pair of pereiopods. Setae on the lower margin of propodus as in *S. schythei*. Carpal joint (at its lower distal angle) with two composite setae subequal in structure to the corresponding setae in *S. schythei*.

Second pair of pereiopods. Similar to the same appendages in *S. schythei*. The second pereiopod of the adult male differs from *S. schythei* in that the lower margins of the ischium, merus and carpus are furnished with a dense covering of setae, which are abundantly provided with hair-like, sub-branches. The lower margin of the propodus in the adult male is furnished with two rows of setae. In the rostral row there are twelve setae similar in structure to the corresponding setae in *S. schythei* (cf. Fig. 7 h), in the caudal row eight setae, similar to those on the lower margin of ischium, merus and carpus, but with sub-branches on their central parts only.

Pleopods. Basipodites of the first three pairs of pleopods with proximal part of the inner margin slightly convex and devoid of setae. Endopodites of the fourth pair of pleopods bifid, as in *S. schythei* and *paradoxa.*

Localities and Material.

Eugenie Expedition. Argentina, South of La Plata, lat. 36° 50′ S., long. 55° 54′ W. 5 specimens, males and females. Length of largest specimen 21 mm., an adult female with empty marsupium.

Distribution. Argentina (Eug. Exped.), South Sandwich Islands (RICHARDSON 1911).
Thus this species presumably is widely distributed.

Subgenus *Serolis*, Group III.[1]

Serolis (*Serolis*) **trilobitoides** (EIGHTS, 1833).

Text fig. 5 a.

For synonymy and literature see RICHARDSON, 1913, p. 9. It may be added:
Serolis Brongniartiana. AUDOUIN and MILNE EDWARDS, in MILNE EDWARDS 1840, p. 232—233.
Serolis trilobitoides. MONOD, 1926, p. 38.

Diagnosis. Anterio-lateral angles of the head slightly extended; greatest width of the head in front. Coxal plates marked off by dorsal sutures on second to fourth pereion segments. Posterior angles of the coxal plates of the second to sixth pereion segments all successively projecting beyond those of the preceding segments; the pleurae of the second and third abdominal segments extending with their posterior angles about as far back as two-thirds the length of the pleotelson. Posterior angles of the epimera of the sixth pereion segment reaching further back than those of the second and third abdominal segments, about as far back as the tip of the pleotelson. Pleotelson with three dorsal longitudinal diverging ridges, the one in the middle line being narrow and denticulated. Lateral margins of pleotelson denticulated; pleotelson distally pointed, but without spine-like prolongation at the tip. Inner lobe of first pair of maxillae expanded distally. Lappets of outer lobe on the second maxillae, normally, each provided with two apical setae. Maxilliped with distal epipodite marked off from the basipodite by a distinct suture. Palp of maxilliped consisting of three joints, of which the second is approximately cordiform. Basipodites of first three pairs of pleopods their inner proximal angles projecting and furnished with »plumose setae». Endopodites of fourth pair of pleopods entire (not bifid).

Supplementary Description.

Pereion. Ventral surface of first pereion segment sculptured in the middle in the usual way (see HODGSON, 1910, p. 25) and with four longitudinal sutures, of which the lateral ones pass through the sockets for the first pereiopods. Ventral surfaces of the last three pereion segments have the apperance normally found in the subgenus.

Antennulae. In the flagellum the first joint is about three times as long as the others. In a young male, 24.5 mm. in length the flagellum consists, of 27 joints, in a young specimen of a length of 22.5 mm., of 22 joints.

Antennae. The antennal processes on the central joints of flagellum are spine-like.[2] Joints of the flagellum in a young male 24.5 mm. in length 16, in a young specimen 22.5 mm. in length 14, in number.

[1] For diagnosis see p. 51.
[2] See BEDDARD, 1884 Pl. I, Fig. 6.

Mandibles. See BEDDARD (1884, Pl. I, Figs. 7 and 8), HODGSON (1910, p. 26). Normal.

Maxillipeds. See BEDDARD (1884, Pl. I, Fig. 11), and HODGSON (1910, Pl. IV, Fig. 5). HODGSON (1910) was unable to find any suture between the coxopodite and the proximal epipodite. In my specimens this suture is distinct and has the appearance figured by BEDDARD (1884).

First pair of pereiopods. For the composite setae on the lower margin of propodus see Fig. 5 a and HODGSON (1910 Pl. IV, Figs. 7 and 8). Distal margin of the carpus close to its inner distal angle with two composite setae of sub-cylindrical shape, the setal part protruding freely at the tip. Around these setae there are slender setae of the non-composite kind. The structural scales around the two composite setae on the distal margin are triangularly prolonged.

First three pairs of pleopods. Peduncle composed of two joints, of which the proximal one is short.

Uropods. HODGSON (1910) states that the exopodite is two-jointed and that »the endopodite is a little longer than the first joint of the exopodite» (HODGSON 1910, p. 30). BEDDARD (1884, p. 52) observes »the exopodite being almost half again as long as the endopodite».

In the two specimens I have seen that the exopodite was single-jointed and somewhat shorter than the endopodite. Both the rami are distally pointed. The lateral margin of the exopodite in the larger specimen has seven teeth, in the smaller only five. Distal part of the inner margin of the same joint in the larger specimen with four, in the smaller one with two, teeth; the lateral margins of the endopodite in both specimens distally provided with two teeth; distal part of the inner margin of the endopodite has three teeth in both specimens.

The shortness of the exopodite in both the specimens examined is due, presumably, to immaturity, the largest being only of 24.5 mm. in length whereas the largest specimens examined by BEDDARD and HODGSON were 41 and 48 mm. The species can attain a length of 70 mm. (EIGHTS 1833), RICHARDSON (1913) records a length of 67 mm. in one specimen.

Localities and Material.

St. 8. Graham Region, lat. 64° 3' S., long. 56° 37' W. Situation as well as depth of the station uncertain, (360 m?). Soft clay. $^{11}/_{2}$ 1902. One immature male specimen, with a trace of penial filaments but with the propodus of the second pereiopods not at all transformed. Length of the specimen 24.5 mm.

St. 11. Graham Region, lat. 65° 19' S., long. 56° 48' W. 400 m. Clay mixed with gravel. $^{18}/_{2}$ 1902. One immature specimen. Length 22.5 mm.

Distribution. Patagonia (EIGHTS[1] 1833), Cape Horn (EIGHTS[1] 1833), Kerguelen (STUDER[1] 1879, BEDDARD 1884), South Shetland Islands (EIGHTS[2] 1833), West of Graham Region (MONOD 1926), Graham Region (Sw. Ant. Exped.), Off Victoria Land (HODGSON 1910).

The species has previously been found in the neighbourhood of Graham Region. Its ocurrence at Graham Region (st. 8 and 11) was therefore to be expected.

[1] Fide AUDOUIN and MILNE EDWARDS (1841).
[2] Fide BEDDARD (1884).

Serolis (*Serolis*) septemcarinata Miers, 1875.

Text. Fig. 1 d, 5 h, 6 a, 7 g, 14 a—c.

For synonymy and literature see Tattersall, 1921, p. 227. Moreover may be added:
Serolis septemcarinata. Richardson, in Murphy, 1914, p. 53; Monod, 1931, p. 26.

Diagnosis. Anterio-lateral angles of the head triangularly prolonged; greatest width of the head at the front margin. Coxal plates delimited by dorsal sutures on the second to fourth pereion segments. The posterio-lateral angles of the epimera of the segments (except those of the first abdominal segment) all projecting beyond those of the preceding segments. Pleotelson with seven longitudinal carinae. First maxilla with the inner lobe expanded distally into an oblong oval area. Outer lappet of outer lobe of second maxilla with two, inner lappet of the same lobe with five, apical setae. Distal epipodite of the

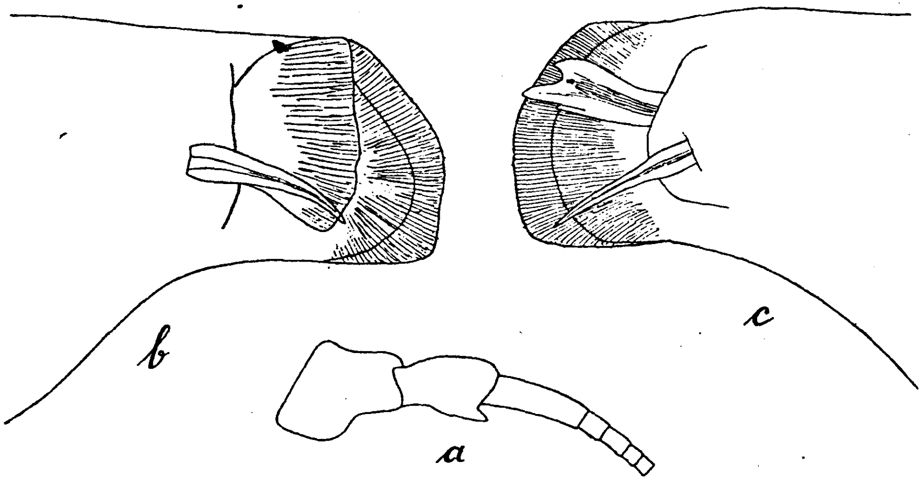

Fig. 14. *Serolis septemcarinata*, Miers. a. Peduncle and proximal joints of the flagellum of the antennula, male, 17 ×. b. Inner part of the left mandible, seen from above, 80 ×. c. Inner part of the right mandible, seen from above, 80 ×.

maxilliped delimited from the basipodite by a distinct suture. Palp of maxilliped consisting of three joints, of which the second is approximately cordate. Basipodites of first three pairs of pleopods with their inner proximal angles projecting and furnished with setae. Endopodite of fourth pair of pleopods entire, (not bifid).

Supplementary Desciption.

Head and pereion. Anterio-lateral parts of the head dorsally marked off by a ridge. There is a faint transverse anterior ridge on the first pereion segment. Ventral surface of the first pereion segment divided by longitudinal sutures and sculptured in the middle similarly as in *S. paradoxa*. Ventral surface of the last three thoracic segments have the appearance normally found in the subgenus (cf. Pfeffer, 1887, Pl. II, Fig. 7)[1].

[1] Pfeffer's explanation of the figures of his Pl. II (Pfeffer, 1887 p. 145) is incorrect as regards figures 1—7).

Antennulae (Fig. 14 a). See BEDDARD (1884, p. 48); PFEFFER (1887, p. 66, Pl. III, Fig. 2). Peduncle consisting of four joints, the first, second and third being of about equal length. The short fourth joint is one-fourth to one-third as long as the third. BEDDARD (1884) states that the second peduncular joint is about twice as long as the first.

Antennae[1]. The central joints of the flagellum, ventrally, with a row of approximately twelve triangular and pointed processes along the anterior margin. In a female specimen with not yet fully developed marsupium and with ten joints in the flagellum, the prolonged scales occur on the second to the seventh joints, no traces of them being observed on the eighth joint. In an adult male with ten joints in the flagellum, they were found even on the first joint already, but were not developed on the seventh.

Mandibles (Fig. 14 b and c)[2]. Third joint of the palp with typical pectinate scales near its lower margin. For the setae on the second and third joint of the palp see p. 36.

Maxillipeds[3]. The composite setae on the distal margin of the basipodite as in *S. paradoxa*.

First pair of pereiopods.[4] For the composite setae on the lower margin of the propodus see Fig. 5 h. Carpal joint distally with two composite and a few simple setae, (see Fig. 6 a), its distal margin (see Fig. 1 d) usually with a row of projecting rounded scales.

Second pair of pereiopods[5]. In the adult male there are two incomplete rows of setae on the lower margin of the propodus, setae being developed only at the proximal and distal parts of the joint. For the setae from the proximal portion of the lower margin see Fig. 7 g. The proximal and distal setae differ slightly in shape, the distal ones being somewhat more slender.

The other periopods.[6] Lower surface of merus, carpus and propodus in the adult male with a dense felt-like nap, extending also somewhat over to the caudal surface. The nap consists of hair-like points, devoid of a setal canal.

First three pairs of pleopods.[7] As observed by PFEFFER (1887), the peduncle consists of two joints, the proximal joint being, however, very short.

Fourth and fifth pairs of pleopods.[8] Expodites with a distinct transverse suture.

Localities and Material.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 125 m. Bottom temp. +1.45°. Gray clay with a few stones. 5/6 1902. 8 specimens. Length of the largest specimen 11 mm.

St. 34 b. Atlantic Ocean, North of Falkland Islands and East of Patagonia, lat. 44° 49′ S., long. 57° 34′ W. 700—500 m. 27/12 1901. 14 specimens, males and females. Length of largest specimen about 15 mm (male).
males and females, most of them immature. Length of largest specimen about 12.2 mm (female with marsupium).

South Georgia, Grytviken. From old kelp on the shore. 22 and 23 May 1902. More than 45 specimens,

Material collected by E. SÖRLING, 1905. South Georgia, Grytviken, Cumberland Bay. 15/1 1905. 3 adult specimens, male and 2 females. The largest specimen is the male, which measures 14.5 mm. in length.

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1 PFEFFER, 1887, Pl. III Fig. 1.

2 See also PFEFFER, 1887, Pl. III, Figs. 5, 6 and 12.

3 BEDDARD, 1884, p. 40; PFEFFER, 1887, p. 69—70, Pl. III, Figs. 9, 10 and 11.

4 PFEFFER, 1887, p. 70—71, Pl. III, Figs. 13—17.

5 BEDDARD, 1884, p. 49, Pl. VIII, Figs. 3 and 4; PFEFFER 1887, p. 71, Pl. III, Fig. 18; COLLINGE, 1918, Pl. III, Fig. 8.

6 BEDDARD, 1884, Pl. VIII, Fig. 5, PFEFFER, 1887, p. 71—72, Pl. III, Figs. 19—21.

7 BEDDARD, 1884 p. 49, PFEFFER 1887, p. 72, Pl. III, Figs. 22—24.

8 PFEFFER, 1887, p. 72, Pl. III, Figs. 25 and 26.

Distribution. South Atlantic Ocean E. of Patagonia N. of Falkland Islands (Sw. Ant. Exped.). South Georgia (PFEFFER 1887, TATTERSALL 1921), Prince Edward's Island (BEDDARD 1884), Crozet Islands (MIERS 1875), Kerguelen (STUDER 1879, 1884, COLLINGE 1918).

The species has not previously been recorded from a locality situated as far north as st. 34 b (Sw. Ant. Exped.).

Serolis (*Serolis*) polita PFEFFER, 1887.

Text Fig. 1 e, 2 c, 3 a, 5 f and g, 6 b, 8 c, 15 a—g.

S. polita. PFEFFER, 1887, p. 81—85, Pl. II, Figs. 4 and 5, Pl. IV, Figs. 4 and 5; RICHARDSON, 1906, p. 7; 1908, p. 5; 1911, p. 396; TATTERSALL, 1921, p. 231—232, Pl. VII, Fig. 6; MONOD, 1931, p. 26—27.

Diagnosis. Anterio-lateral angles of the head prolonged, so that the width of the head is greatest anteriorly. Coxal plates marked off by dorsal sutures on the second to fourth pereion segments. Posterio-lateral angles of the epimera of the pereion segments and those of the second and third abdominal segments all reach further back than those of the preceding segments. Tip of pleotelson sinuate. First pair of maxillae with the inner lobe slightly expanded distally. Second pair of maxillae with the lappets of outer lobe each furnished with two apical setae. Maxilliped with distal epipodite marked off from the basipodite by a distinct suture; palp generally consists of three joints, but sometimes with a vestigial fourth joint; second joint of the palp cordiform. Basipodites of first three pairs of pleopods with their inner proximal angles projecting furnished with setae. Endopodite of fourth pleopod entire (not bifid).

Supplementary Description.

Head, pereion, and abdomen. Anterio-lateral parts of the head demarcated by a ridge. Epimera of first pereion segment with a submarginal ridge at a short distance from their anterior margins. Ventral surface of the first pereion segment on each side with a longitudinal suture passing through the articular sockets for the first pereiopods. Ventral surface of the fifth to seventh pereion segments approximately as in *S. paradoxa.*

The adult male has a sub-circular shape of body, the female has a more oval form. In the adult male the longitudinal ridge in the middle of the sterna of the first to third abdominal segments is missing; the projection in the middle of the posterior margin of the sternum of the first abdominal segment is of smaller size and shorter than the lateral projections.

Antennulae (Fig. 15 a). Peduncle consisting of four joints; the last joint, which is not figured or mentioned by PFEFFER (1887), is one-third the length of the second.

Antennae. The antennal processes on the ventral side of the central joints of the flagellum are somewhat hook-like and resemble those in *S. paradoxa.* They fringe both the distal and rostral margins of the joints. They are longest at the rostro-distal angle.

Mandibles (Figs. 15 b, c and d). Rostral margin of the mandible corpus with a small rounded projection adjacent to the proximal part of the second joint of the palp. (Fig. 15 b). Left mandible (Fig. 15 c) with the posterior masticatory process cleft distally. Right mandible (Fig. 15 d) with the rostral masticatory process expanded. The setae on the second and third joints of the palp have oval and not very prominent end-knobs.

First pair of maxillae (Fig. 15 e). Inner lobe slightly expanded distally. The apical setae on the lobes generally branchless; only one seta, situated at the posterio-distal angle of the outer lobe, is furnished with two rows of short and slender sub-branches.

Second pair of maxillae (Fig. 15 f). Lappets of outer lobe each with two apical setae.

Maxillipeds (Fig. 15 g). Basipodite and distal epipodite marked off from each other by a distinct suture. Palp usually consisting of three joints, but sometimes with an indi-

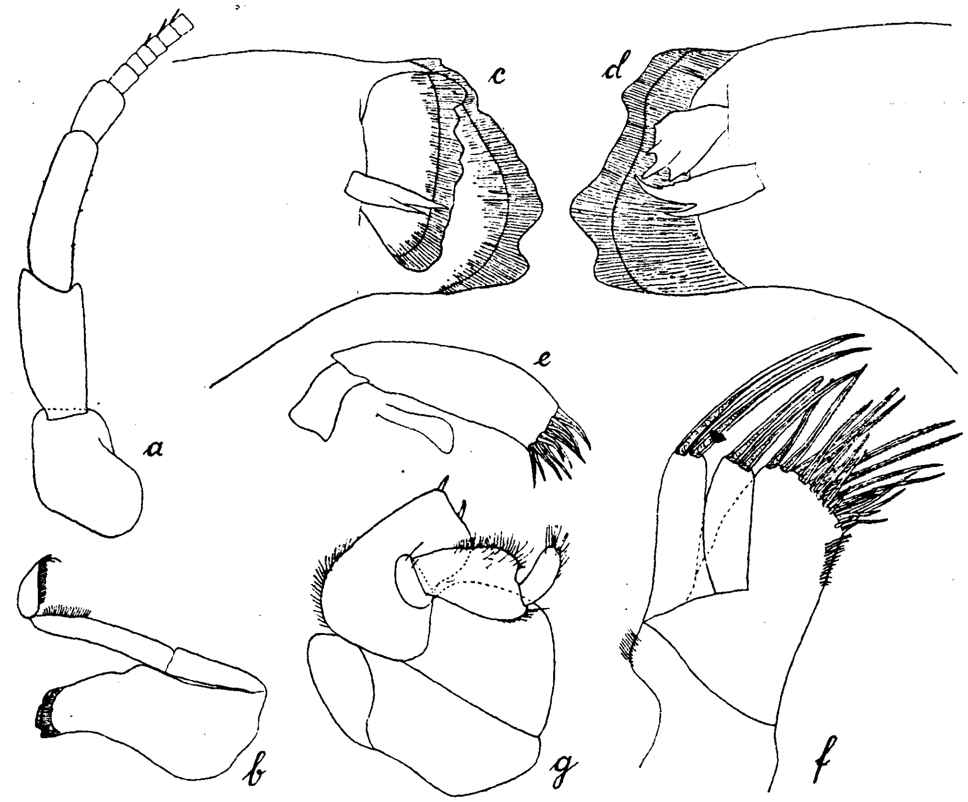

Fig. 15. *Serolis polita* PFEFF. a. Peduncle and proximal part of the flagellum of left antennula, male 13 ×. b. Left mandible, seen from below, 13 ×. c. Inner part of the left mandible, from above, 60 ×. d. Inner part of the right mandible, from above, 60 ×. e. Right first maxilla, female 23 ×. f. Second maxilla, male 60 ×. g. Left maxilliped, 23 ×.

cation of a fourth joint, appearing as a small prolongation, carrying some setae; this prolongation is indistinctly demarcated from the third joint. Composite setae on the basipodite (see Fig. 8 c) usually two; but in one specimen there was also a third seta.

First pair of pereiopods. Distal margin of the carpus with two composite subcylindrical setae (see Fig. 6 b) and about seven simple narrow bristles, provided with two rows of short hair-like sub-branches. For the composite setae on the lower margin of the propodus, see Figs. 5 f and g. On the caudal side of the propodus there is a sub-marginal row of prolonged scales close to the lower margin of the joint (see Fig. 1 e).

On both the rostral and caudal side of the propodus there is also a submarginal row of simple setae (see Fig. 1 e, which shows the caudal row of these setae).

Second pair of pereiopods[1]. In the adult male with two rows of composite setae on the lower margin of propodus, similar to those in *S. schythei*, but without transverse grooves on their caudal surfaces; the submarginal scales close to the lower margin of propodus are somewhat triangularly produced.

Pleopods. Coxopodite of the first three pairs very short and for about half of its length fused with the sternum. On the fourth and fifth pleopods the exopodite has an oblique transverse suture, on the fifth pair the exopodite is divided by a faint suture, which is distinct only near the margins.

Uropods. Inner margin of the protopodite with hair-like setae, its lateral margin with four large plumose setae. Exopodite with distal margin and distal half of the lateral margin obtusely denticulated, distally with plumose setae; inner margin without denticulation, but with hair-like setae. The endopodite has the distal margin and the distal part of the lateral margin serrate and furnished with plumose setae, its inner margin smooth and furnished with hair-like setae.

Localities and Material.

St. 34 b. Lat. 44° 49′ S., long. 57° 34′ W. Atlantic Ocean, North of Falkland Islands and East of Patagonia. 700—500 m. $^{27}/_{12}$ 1901. 8 specimens, males and females. Length of largest specimens 17.5 mm. (ovigerous female), 16 mm. (male).

South Georgia, Grytviken. 15—25 m. $^{14}/_{6}$ 1902. At the rocky islet outside the Bay. Stony bottom with algae. One female specimen with semi-developed marsupial plates, length about 15.5 mm.

Material collected by E. Sörling. South Georgia, Grytviken, Cumberland Bay. $^{15}/_{1}$ 1905. 5 specimens (3 adult males and 2 females). Colour brownish with a shade of blue. The largest specimen is a male 16 mm. in length, with the dorsal surface overgrown with algae.

Distribution. South Atlantic Ocean E. of Patagonia N. of Falkland Islands (Sw. Ant. Exped.), South Georgia (Pfeffer 1887, Tattersall 1921, Monod 1931), South Sandwich Islands (Richardson 1911), Graham Region (Richardson 1906 and 1908).

The most northerly locality where the species is known is the st. 34 b, Sw. Ant. Exped.

Serolis (*Serolis*) **glacialis** Tattersall var. **austrogeorgiensis** n. var.

Pl. I, Fig. 1; Text fig. 16.

Diagnosis. Anterio-lateral angles of the head only slightly prolonged in lateral direction; the width of the head at the front margin about equal to the width across the middle of the eyes. Coxal plates demarcated by dorsal sutures on the second to fourth pereion segments. Each posterior angle of the coxal plates of the pereion segments extends further back than that of the preceding segment. The posterior angles of the pleural plates of the second and third abdominal segments reach further back than the posterior angles of the coxal plates of the sixth segment of the pereion; pleural plates of the second and third abdominal segments extend about equally far back. First pair of maxillae with the inner lobe narrowly rounded (not expanded) distally. Left second maxilla with the outer lobe uncleft and furnished with five apical setae (one of the setae small); right second maxilla with the two lappets of the outer lobe each provided with two apical setae. Distal

[1] Tattersall 1921, Pl. VII, Fig. 6.

epipodite of the maxilliped marked off from the basipodite by a distinct suture. Palp of maxilliped consists of three joints, of which the second is approximately cordiform. Basipodite of first three pairs of pleopods with a medial extension furnished with setae. Endopodite of the fourth pair of pleopods entire (not bifid).

Description.

Type. Female with marsupial plates semi-developed; length 10.3 mm.

Shape of body. Pear-shape as in *S. glacialis.* There is a longitudinal convex elevation along the middle line, running from the head to the tip of the pleotelson. From this middle keel the segments of the pereion and the free abdominal segments slope in a lateral direction. Lateral margins of the epimera of the pereion segments and the second abdominal segment continuous, so that only the posterior angles of the pleurae of the second and third abdominal segments project freely. Posterior margins of the terga of the pereion segments and the first three abdominal segments without a triangular tip in the middle line.

Colour and sculpturing. The colour is brownish-yellow with scattered dots of dark brown pigment. Almost the whole dorsal surface is covered with a more or less marked network of anastomosing ridges. Anterior part of the pereion epimera slightly semitranslucent.

Head. Anteriorly with an indication of a small triangular rostrum. The front margin of the head between the distal margins of the first joint of the antennulae has a transverse ridge, which, continuing laterally, traverses the anterio-lateral parts of the head. The head is sculptured as in the main species of *S. glacialis.* Behind the rostrum is a subtriangular elevation, the anterior margin of which is convex, and the posterior concave; this elevation forms the anterior tuberculae of the head, which coalesce with each other in front. The posterior part of the head is sculptured exactly as in the main species. Between the eyes are three tuberculae covered with a distinct network of anastomosing ridges, the two lateral tuberculae being almost circular in shape.

Pereion. The second, third, and fourth pereion segments of about equal length in the middle; fifth and sixth segments in the middle together about as long as the fourth. The posterior margin of the tergites without a triangular tip in the mid-line. First pereion segment dorsally with two somewhat curved transverse ridges, the anterior one being a continuation of the transverse ridge on the head. Neither of the transverse ridges extends to the lateral margin of the segment, as they vanish laterally in a network of anastomosing ridges. Between the ridges near the head the surface is smooth; behind the posterior ridge there is a deep cavity, likewise devoid of network. Epimera of second to sixth pereion segments with dorsal submarginal ridges along their anterior margins.

The second, third, and fourth pereion segments have the coxal plates marked off by dorsal sutures; the sutures of the third and fourth coxal plates issue anteriorly somewhat medially of those of the second and third segments respectively.

First, second, third, and fourth segments of the pereion have, as in the main species, a faint rounded elevation on either side medially from the coxal plates; the elevations are covered with anastomosing ridges. They are situated more medially from the coxal plates, as one passes from the first to the fourth segment.

The posterior margins of the first, second and third pereion segments, medially from the coxal plates, are slightly convex. The coxal plates of the second, third and fourth segments are laterally 1.7 times as long as the length of the segments in the middle. Fifth and sixth pereion segment as in the main species.

Ventral surface of the first pereion segment with four longitudinal sutures, the two lateral ones passing through the sockets for the first pereiopods. In the middle it is sculptured in the usual way; posteriorly there is an elevated trapezoidal part with its narrow end pointing to the front; in the middle line anteriorly there is a longitudinal ridge, divided from the trapezoidal part by an incision.

Ventral surface of the second to seventh pereion segments with a longitudinal groove in the middle line. On the second, third, and fourth segment there is a faint longitudinal ventral ridge on each side of the mid-line, from these ridges transverse ridges extend to the coxal plates along the anterior and posterior margins of the segments. On the fifth segment the sternal sculpturing is much the same as on the fourth, but more indistinct. The sixth and seventh segments typical of the subgenus *Serolis*.

Abdomen. The pleurae of the second and third abdominal segments reach further back than the coxal plates of the sixth pereion segments and approximately to the proximal margins of the exopodites of the uropods. The sterna of the free abdominal segments each with a longitudinal carina along the middle line; their posterior margins, in the middle prolonged into large backward-directed points, which increase somewhat in length from the first to the third segment; the posterio-lateral angles of the sternal middle plates are also somewhat pointed and backward-directed.

The pleotelson, dorsally, with five longitudinal carinae, diverging from each other. The keel along the middle line is proximally broad and rounded; it narrows gradually backwards, being sharper from the middle to the distal end; distally it ends in an obtuse point. The middle carina has no trace of any basal point, but is covered with a network of anastomosing ridges. The keels laterally from the middle keel are faint. They are slightly curved, being somewhat concave at the inner side, and they reach proximally only about half the length of the pleotelson. These keels are separated by broad cavities from those most laterally situated. The two most laterally situated keels are moreover somewhat curved, with their inner margins concave. Each of them forms the inner limitation of a triangular elevation, which narrows caudally and is covered with anastomosing ridges. None of the carinae, except the middle one, has any indication of a terminal point.

Antennulae. The peduncle almost reaches the penultimate joint of the antennal peduncle. The flagellum is almost as long as the peduncle and consists of fifteen joints.

Antennae. Peduncle as in the main species; the last two peduncular joints subequal in length. The flagellum, which is about as long as the last peduncular joint, has twelve joints. Rostral margins of the second, third and fourth peduncular joints with groups of setae, one group on the second, and five on each of the third and fourth joints. Antennal processes triangular and pointed, situated along the caudal and distal margins of the central joints of the flagellum.

First pair of maxillae. Inner lobe narrowly rounded (not expanded) distally.

Second pair of maxillae. Outer lobe of left maxilla uncleft and furnished with five apical setae, the one at the posterio-distal angle being small. Outer lobe of right maxilla with two lappets, each furnished with two apical setae.

Mandibles[1]. Normal. Anterior masticatory process on the left mandible broad and strong and furnished with a cutting edge.

Maxillipeds. (Fig. 16.) Distal epipodite marked off from the basipodite by a distinct suture. Palp consists of three joints, second joint approximately cordiform, third joint long with an incision in the distal margin, thus dividing the tip of the joint into two lobes; the lateral lobe corresponds to a minute fourth joint. I was unable to find any suture between the coxopodite and the proximal epipodite.

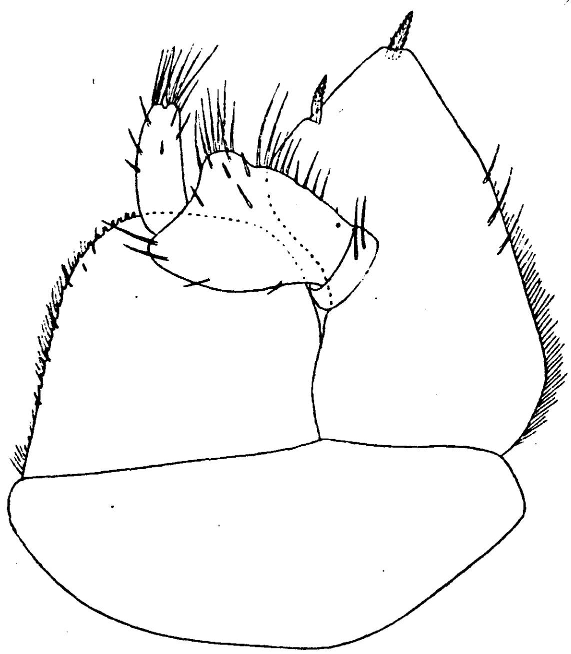

Fig. 16. *Serolis glacialis* TATT. var. *austrogeorgienses* n. var. Maxilliped, 63 ×.

First pair of pereiopods. As in the main species.[2] Propodal joint with a characteristic point at its upper distal angle. Rows of composite setae on the lower margin of propodus much as in *S. septemcarinata* (cf. Fig. 5 h). Thus the setae in the rostral row are more slender than figured by TATTERSALL (1921)[3] and approximately as illustrated by MONOD (1926)[4]. The setae in the caudal row have the distal margin of the scale-part rounded, but they are not as broad anteriorly as figured by MONOD[4] (1926).

First three pairs of pleopods[5]. Inner angle of basipodite triangularly prolonged and furnished on the first pleopod with three, on the second and third pleopods with two, setae.

Fourth pair of pleopods. Exopodite with a transverse suture at a distance from the distal end of one-third the length of the exopodite. Endopodite entire (not bifid).

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1 Cf. MONOD (1926, Figs. 34 A and B).
2 See TATTERSALL (1921, p. 229, Pl. VII, Fig. 2), MONOD (1926, Fig. 34 C).
3 TATTERSALL (1921, Pl. VII, Fig. 3).
4 MONOD (1926, Fig. 34 D).
5 Cf. MONOD (1926, Fig. 34 F).

Uropods. Shorter than in the main species; the exopodite about half as long as the endopodite. Exopodite and endopodite oval with distal margins broadly rounded.

Remarks. The species *glacialis* has previously been recorded from the Antarctic and is known from an adult male specimen of the length of 17 mm (TATTERSALL, 1921) and a small male specimen 11 mm in length (MONOD, 1926).

The Swedish Antarctic Expedition collected (at South Georgia) only one specimen, a young female with small oostegits, and measuring 10.3 mm in length. It differs from *S. glacialis* as described by TATTERSALL (1921) and MONOD (1926) in the following features: —

1. The lateral margins of the epimera of the pereion segments and the second abdominal segments are continuous with each other, so that the posterior angles of the pereion epimera do not protrude freely[1].

In the main species of *glacialis* the posterior angles of all the pereion epimera protrude freely, except the first. In the figure by TATTERSALL (1921, Pl. VII Fig. 1) the posterior angles of the epimera of the fifth and sixth segments of the pereion appear to protrude freely. The epimera of the sixth pereion segment and those of the second abdominal segment are separated laterally by an interspace, a feature which, in the variety *austrogeorgiensis*, is ohly slightly indicated on one side.

2. The second, third and fourth segments of the pereion are subequal in length in the middle.

In the main species the second pereion segment is medially twice as long as the third and longer than the second.

3. The distinct proximal spine in the middle line on the pleotelson is missing in *austrogeorgiensis*. The lateral keels are not so marked as in the main species and do not terminate in spines.

4. The uropods are shorter, the exopodite does not reach so far back as in the main species; moreover both rami are broader than in the main species and have their distal margins broadly rounded.

Other differences from the main species are: —

5. That the coxal plates of the second pereion segment are longer as compared with the length of the segment measured along the middle line, the proportion being 1.7:1 in var. *austrogeorgiensis* and 1:1 in the main species.

6. That the pleurae of the third abdominal segment reach as far back as those of the second abdominal segment.

7. That the sutures of the coxal plates are not continuous with each other.

8. That the triangular tips in the middle on the posterior margins of the tergites of the segments are minute.

9. That the var. *austrogeorgiensis* is not distinctly semi-translucent.

10. The shape of the setae on the lower margin of propodus of the first pereiopod is more slender than as figured by TATTERSALL (1921, Pl. VII, Fig. 3) and approximately as in *S. septemcarinata* (cf. Fig. 5 h).

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[1] On the right side, however, there is a small interspace between the posterior angle of the sixth pereion epimeron and that of the second abdominal somite.

As the female of *S. glacialis* has not been described, I am unable to determine whether these differences from *S. glacialis*, as described by TATTERSALL (1921) and MONOD (1926), are due merely to difference in sex.

At any rate the specimen from the Swedish Antarctic Expedition approaches very closely to *S. glacialis;* I therefore regard it as a variety of this species.

Localities and Material.

St. 23. South Georgia, off the mouth of Cumberland Bay, lat. 54° 23′ S., long. 36° 26′ W. 64—74 m. Bottom temp. + 1.65°. 16/5 1902. Female with semi-developed oostegits. Length 10.3 mm.

Distribution. South Georgia (Sw. Ant. Exped.)

Distribution of the main species: Off Oates Land (TATTERSALL 1921), East Antarctic, lat. 71° S., long. 87° W. (MONOD 1926).

Serolis (*Serolis*) **exigua** n. sp.

Pl. I Fig. 2; Text Figs. 4 a—c, 6 e, 17 a—i, 18 a—h.

Diagnosis. Head with anterio-lateral angles slightly prolonged in a lateral direction; greatest width of the head at the front margin. Coxal plates marked off by dorsal sutures on the second to fourth pereion segments. The posterio-lateral angles of the coxal plates of the pereion segments and pleural plates of the second and third abdominal segments all reaching beyond those of their preceding segments. Anterior masticatory process on the left mandible not expanded and without cutting edge. Inner lobe of first maxilla expanded distally. Outer lappets of outer lobe of the second maxilla each provided with two apical setae. Maxilliped with the distal epipodite fused with the basipodite in its entire length. Palp of maxilliped consisting of three joints, of which the second is approximately cordiform. Basipodites of the first three pairs of pleopods with their inner proximal angles projecting and furnished with setae. Endopodite of fourth pleopod entire (not bifid). Exopodite of the fifth pleopod with the lateral margin furnished with two long plumose setae.

Description.

Type. Female with young, about 7 mm. in length.

Shape of body and sculpturing (Pl. I Fig. 2, Text fig. 17 a). The head, except a submarginal part at its front margin, the tergites of the pereion segments and the free abdominal segments, except the greater part of their pleurae, are elevated as compared with the lateral parts of the body. A dorsal longitudinal carina along the mid-line passes from the centre of the head (= from a spot between the front margins of the eyes) along the body to the distal end of the pleotelson. Posterior margin of the tergites of the pereion segments and the free segments of abdomen all with a small backward-directed triangular tip in the middle line, (very indistinct on the first pereion segment).

Head (Pl. I Fig. 2, Text fig. 17 a). Slightly broader than it is long, posteriorly in the middle continuous with the first pereion segment without trace of any suture. The longitudinal keel in the middle line is faint, yet distinct in the posterior part of the head, as well as on the first pereion segment. The lateral parts of the posterior margin of the head are divided from the first pereion segment only by a slight groove, which develops anteriorly into a distinct suture. Front margin, in the middle, with a very small rostrum; laterally from the rostrum on either side it is somewhat concave;

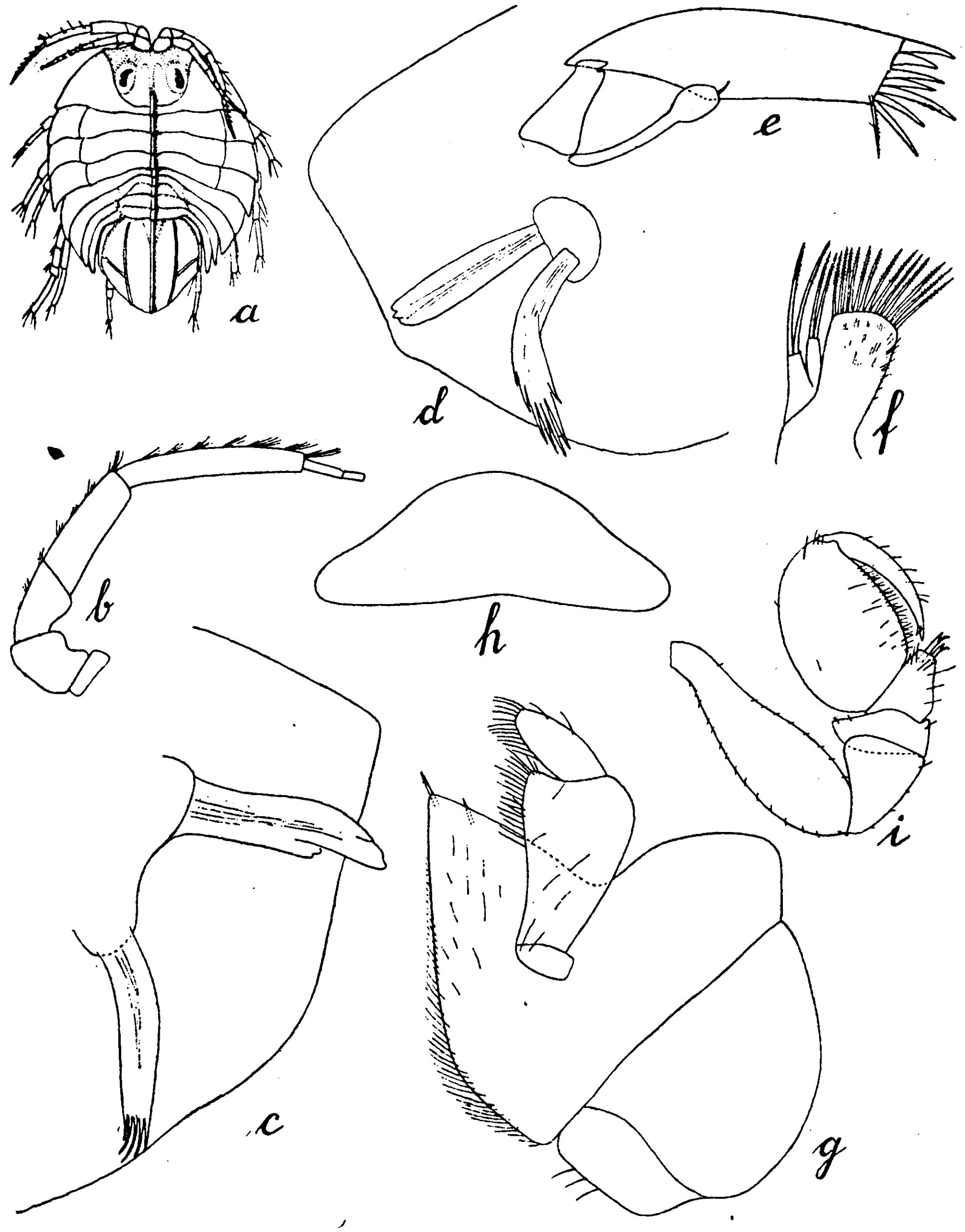

Fig. 17. *Serolis exigua*, n. sp., ♀. a. Female, from above, 5.3 ×. b. Peduncle and two proximal joints of the flagellum of the right antenna, 13 ×. c. Inner part of the left mandible, seen from above, 240 ×. d. Inner part of the right mandible, seen from above, 240 ×. e. Right first maxilla, 80 ×. f. Right second maxilla, 80 ×. g. Left maxilliped, 80 ×. h. Upper lip, 80 ×. i. First periopod, 80 ×.

between the first and second peduncular joints of the antennulae the front margin forms a small triangular point, which extends somewhat further in front than the rostrum. The anterio-lateral angles of the head are triangularly prolonged and slightly bent downwards. The eyes are small, reniform; the distance between the eye and the anterior margin of the head is about the length of one eye. Between the eyes and the longitudinal keel in the middle line there is, on either side, a short indistinct longitudinal ridge.

Pereion (Pl. I Fig. 2, Text fig. 17 a). The first pereion segment, ventrally, with a distinct longitudinal suture passing through the sockets for the first pereiopods. The ventral part of the segment is covered by the marsupium.

Second, third, and fourth segments, in the middle, of about equal length, the fifth and sixth in the middle each about half as long as the fourth. Posterior margin of the tergites of all the segments with a small backward-directed triangular tip in the mid-line (indistinct on the first segment).

Coxal plates demarcated by dorsal sutures on the second to fourth segment; the sutures are curved and not quite in a line with each other; on the second, third, and fourth segments there is a convexity of the posterior margins medially from the coxal plates; a similar convexity is also to be observed on the first segment. Lateral margins of the epimera of the first to fourth segments continuous with each other; only the extreme tips of the coxal plates of the fourth, fifth, and sixth segments protrude freely.

The ventral surface of the pereion segments is almost entirely covered by the marsupium.

Abdomen (Pl. I Fig. 2, Text fig. 17 a). On the first three segments the longitudinal keel along the mid-line is very distinct, whilst the triangular points in the middle of the posterior margins are small and indistinct.

From the median keel the dorsal surface slopes slightly; on the first segment to its lateral margins, on the second and third segments to their pleural plates. The lateral parts of the pleural plates of second and third segments have their posterior margins somewhat elevated compared with their anterior margins. The posterio-lateral angles of the pleural plates of the third abdominal segment extend further back than those of the second abdominal segment, reaching to about two-thirds the length of pleotelson.

The sternites of the first three abdominal segments are posteriorly protracted into one long point in the middle, and two short lateral points, one on each side; the sternites are sculptured, with a longitudinal ridge along the middle line.

Pleotelson, broadly cordiform. The longitudinal carina along the middle line is distinct. Anterior parts of the lateral margins each with a marginal ridge extending somewhat further back than the pleural plates of the second abdominal segment. Between these ridges and the longitudinal carina in the middle there is on either side yet another, longitudinal and somewhat curved, ridge, slightly concave on its inner side. These ridges and the marginal ridges are connected by a short ridge. The part of the pleotelson which is marked off distally by the latter ridge, medially by the ridge situated laterally from and nearest to the middle keel, and laterally and proximally delimited by the marginal ridge, is subtriangular and somewhat elevated.

Antennulae. The peduncle is longer than the flagellum and consists of four joints. Second peduncular joint slightly longer than the first. Third joint narrower and about as long as the second plus half the first. Fourth joint short, about two-fifths as long as the third. The flagellum consists of 16 joints, each joint carrying a sensory filament.

Antennae. (Fig. 17 b). First joint of the peduncle short and visible only from below. Second and third joints of about equal length, forming an angle with each other. Second peduncular joint proximally with a faint incomplete suture on the ventral side, but without suture dorsally. Fourth peduncular joint half again to twice as long as the third; fifth joint slightly longer and narrower than the fourth. Ventral surface of the third, fourth, and fifth joints, near the rostral margin, exhibits groups of setae forming transverse rows. On the distal part of the third joint there are two such rows, each consisting of two groups, on the fourth three rows, each, as a rule, with three groups of setae, on the fifth joint there are five rows.

The flagellum is slightly longer than the last peduncular joint and consists of ten joints. There is a row of prolonged triangular scale-processes along the rostral margin of the ventral surface on the central joints of the flagellum.

Mandibles (Figs. 17 c and d). Left mandible (fig. 17 c) with the rostral masticatory process stronger than the weak, caudal one, which is prolonged distally into bristle-like processes. Right mandible with two weak masticatory »setae».

Setae on the second and third joints of the mandibular palp with oblong-ovate end-knobs.

First pair of maxillae (Fig. 17 e). Distal margin of outer lobe with eleven setae, situated in two rows. Distal end of inner lobe elliptically expanded.

Second pair of maxillae (Fig. 17 f). Inner lobe much broader and longer than both lappets of outer lobe; its distal margin with about fifteen setae, situated in two rows. Lappets of outer lobe each with two apical setae.

Maxillipeds (Fig. 17 g). Distal epipodite fused with the basipodite in its entire length. Composite setae on the distal margin of the basipodite approximately as in *S. paradoxa.*

Upper lip (Fig. 17 h). Normal.

First pair of pereiopods (Fig. 17 i). Basipodite longer than ischium, merus and carpus together. Ischium markedly widening towards its distal end, about as long as the meral and carpal joints together. The merus is short, almost trapezoidal and somewhat broader than the carpus.

For the two composite setae at the upper distal angle of the carpus see Fig. 6 e. Close to the upper distal angle of the carpus there is a group of simple setae on the caudal surface, and on the distal margin there are hair-like points devoid of a setal canal (see Fig. 6 e).

The propodal joint is somewhat shorter than the ischium, merus and carpus together. On the lower margin of propodus there is only one row of composite setae, each seta consisting of a triangular scale which, proximally, is fused with a simple seta (see Figs. 4 a, b, c). The usual caudal row of leaf-like setae is replaced by a row of projecting, anteriorly rounded scales (Fig. 4 c). Close to the lower margin of the propodus on the caudal side there is a submarginal row of simple setae. The caudal and rostral surfaces of the propodus exhibits scattered shorter setae of the same non-composite kind.

The other pereiopods (Figs. 18 a, b). Carpal and propodal joints increasing in length from the second to the seventh pereiopod. Together they are shorter on the third pereiopod than the basipodite, but on the seventh longer than that joint. Upper margin of the

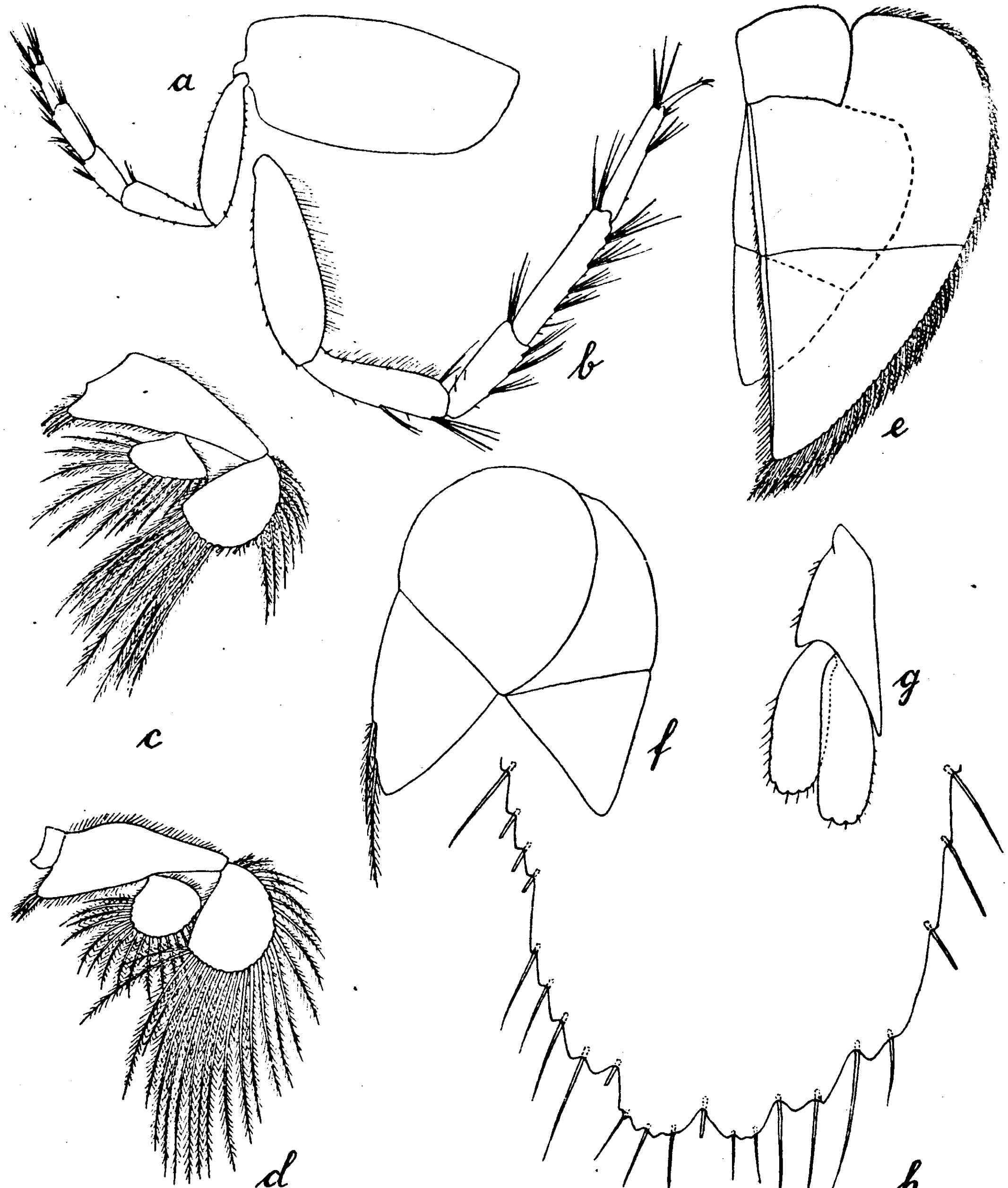

Fig. 18. *Serolis exigua* n. sp. ♀. a. Third pereiopod, 17.5 ×. b. Seventh pereiopod, 30 ×. c. Left first pleopod, 30 ×. d. Left third pleopod, 30 ×. e. Right fourth pleopod, 30 ×. f. Right fifth pleopod, 30 ×. g. Left uropod, 30 ×. h. Tip of the exopodite of the uropod, 240 ×.

basipodite on the second to fourth pereiopods has delicate »hairs» lacking a setal canal; on the fifth to seventh pereiopods such »hairs» occur also on the upper margin of the ischium. The »hairiness» of the limbs increases from the second to seventh, where the hairs cover almost the whole upper margin of the basipodite and the ischium.

First three pairs of pleopods (Figs. 18 c, d). Inner angle of the basipodite of the first pair exhibits three (two in one specimen) setae; on the second and third pairs two setae. Endopodite on the first and second pairs oval in outline, on the third almost circular.

Fourth pair of pleopods (Fig. 18 e). Exopodite and endopodite triangular, the endopodite somewhat smaller than the exopodite; both are divided by an almost transverse suture, somewhat distally from the middle. Lateral margin of the exopodite provided with plumose setae, its proximal margin and distal part of its inner margin furnished with hair-like setae. Margins of endopodite smooth.

Fifth pair of pleopods (Fig. 18 f). Exopodite divided by a transverse suture somewhat distally from the middle; its lateral margin close to the distal end furnished with two long plumose setae. Endopodite likewise divided by a transverse suture; about one-third of the joint is situated posteriorly from the suture.

Uropods (Figs. 18 g and h). Exopodite and endopodite subequal in length, but the exopodite does not extend quite as far back as the endopodite. Both the rami are broadly oval in outline and have their distal margins broadly rounded. Outer and inner margins serrate, distal margins (Fig. 18 h) serrate and in addition provided with some large incisions.

Remarks. In its general shape the new species most resembles *S. glacialis, septemcarinata* and *polita,* but is easily distinguishable, especially by the different sculpturing of the head and the pleotelson.

The single row of composite setae on the lower margin of the propodus of the first pereiopods and the two long plumose setae on the lateral margin of the exopodite of the fifth pleopod are features peculiar to the species, which have not been found in any other member of the genus.

Localities and Material.

St. 39. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 41′ W. 40 m. Sand and small stones with algae. 4/7 1902. 2 females possessing marsupia. Length of the specimens 6.8 and 6.5 mm.

St. 49. Falkland Islands, Berkeley Sound, lat. 51° 35′ S., long. 57° 56′ W. 25—30 m. Shells and stones. 10/8 1902. Mature female with its marsupium filled with young. Length about 7 mm (type specimen).

Distribution: Falkland Islands (Sw. Ant. Exped.).

Subgenus *Serolis*, Group IV[1].

Serolis (*Serolis*) gaudichaudi AUDOUIN et MILNE EDWARDS, 1840.

Text. figs. 3 e—g.

S. gaudichaudii. AUDOUIN and MILNE EDWARDS, in MILNE EDWARDS, 1840, p. 232; AUDOUIN and MILNE EDWARDS, 1841, p. 22—25, Pl. 1 Figs. 1—16, Pl. 2 Figs. 1—7; NICOLET, 1849, p. 282; CUNNINGHAM, 1871, p. 498; GRUBE, 1875, p. 231—232, Pl. V Figs. 4 and 4 a, Pl. VI Figs. 4 and 4 a.

Diagnosis: Anterio-lateral angles of the head prolonged in a lateral direction, so that the head has its greatest width anteriorly. Coxal plates marked off by dorsal sutures on the second to fourth pereion segments. Posterio-lateral angles of the coxal plates of the second to sixth pereion segments each successively reaching further back than those of the preceding segments. Posterio-lateral angles of the pleurae of the second and third abdominal segments extending to the lateral margins of the pleotelson. The pleotelson shows three faint longitudinal diverging ridges, of which the median one is interrupted in the middle; tip of pleotelson truncate. Inner lobe of the first maxillae narrowly rounded (not expanded) distally. Outer lappet of outer lobe of second maxillae with seven, inner lappet of the same lobe with eight apical setae. Distal epipodite of the maxilliped marked off from the basipodite by a suture; the palp consists of three joints, the last one small. Basipodite of the first three pairs of pleopods with its inner proximal angle prolonged and furnished with setae. Endopodite of the fourth pair of pleopods entire (not bifid). Setae on the lower margin of the propodus of the first pereiopod different in females and adult males.

Supplementary Description.

Pereion. The coxal plates are marked off by dorsal sutures on three segments only; on the fifth pereion segment there is no trace of any suture. The figures by AUDOUIN and MILNE EDWARDS (1841)[2] are in this respect inaccurate. Ventral surface of first pereion segment with four longitudinal sutures, exhibiting the arrangement usual, the lateral ones passing through the articular sockets for the first pereiopods; the left lateral suture has been figured by AUDOUIN and MILNE EDWARDS (1841)[3].

Mandibles.[4] Normal. Left mandible with the rostral masticatory process much expanded and provided with a cutting edge, right mandible with two masticatory »setae», of which the rostral one has a narrow base, but is much expanded distally and furnished with digitiform processes.

The modified setae on the second and third joints of the palp have two rows of triangular sub-branches, which proximally are more or less fused with each other. Their endknobs are oblong, lancet-like, distally pointed.

First pair of maxillae[5]. Inner lobe not expanded distally and with a narrowly rounded end.

Second pair of maxillae[6]. Outer lappet of outer lobe with seven apical setae, inner lappet of the same lobe with eight.

[1] For diagnosis see p. 51.
[2] AUDOUIN and MILNE EDWARDS, 1841 Pl. 1, Figs. 1 and 2.
[3] AUDOUIN and MILNE EDWARDS, 1841, Pl. 2, Fig. 1.
[4] AUDOUIN and MILNE EDWARDS, 1841, Pl. 1, Fig. 7.
[5] AUDOUIN and MILNE EDWARDS, 1841, Pl. 1, Fig. 10.
[6] AUDOUIN and MILNE EDWARDS, 1841, Pl. 1, Fig. 11.

Maxillipeds[1]. Distal epipodite marked off from the basipodite by a suture. Third joint of the palp very small, but longer than in the allied species *S. convexa*.

First pair of pereiopods.[2] The setae on the lower margin of the propodus in the female, as in *S. convexa*. For those on the propodus and the carpus in the adult male see Figs. 3 e, f, and g.

Second pair of pleopods. See AUDOUIN and MILNE EDWARDS (1841, Pl. I, Figs. 14, 14', 14'', 14''', 14'''') and GRUBE (1875, Taf. V, Figs. 4, 4 a).

Uropods. See AUDOUIN and MILNE EDWARDS, 1841, Pl. 2 fig. 7.

Localities and Material.

Eugenie Expedition. Chile, Valparaiso. 7 fms. and at the surface. Sand. 26/6 1852. Males, females and immature. Length of largest specimen 27.5 mm (adult ♂).

Distribution. West Chile (AUDOUIN and MILNE EDWARDS 1841), Chile (NICOLET 1849, CUNNINGHAM 1871).

Serolis (*Serolis*) **convexa** CUNNINGHAM, 1871.

Text. figs. 4 d—i, 6 d, 10 d, 19 a—e.

(?) *Serolis plana*. DANA, 1852, p. 794—795, Pl. 53, Figs. 1 a—1 c.
Serolis laevis. RICHARDSON, 1911, p. 399—400, Fig. 2.
Serolis convexa. CUNNINGHAM, 1871, p. 498—499, Pl. 59, Fig. 3; STUDER, 1884, p. 9—10, Pl. 1, Figs. 1 a—d; BEDDARD, 1884, p. 37—40, Pl. VI, Figs. 9—15.

Diagnosis. Width of the head at the front margin only slightly greater than across the eyes. Coxal plates marked off by dorsal sutures on the second to fourth pereion segments. Posterior angles of the coxal plates of the third to seventh pereion segments all extending successively further back than those of the preceding segments, the pleurae of second and third abdominal segments extend about as far back as to one-third the length of the pleotelson. Pleotelson, dorsally, with three faint longitudinal ridges, of which the median one is incomplete and interrupted in the middle; the lateral ridges each ending in a terminal point. First pair of maxillae with the inner lobe scarcely expanded distally. Outer lappets of outer lobe of the second maxillae each with six apical setae, inner lobe with nine apical setae. Distal epipodite of the maxilliped marked off from the basipodite by a suture. Palp of maxilliped consists of three joints, of which the last is small and short; second joint of the palp broadest across the middle, its proximal and distal margins subequal in length. Basipodites of the first three pairs of pleopods with their inner proximal angles projecting and furnished with setae. Endopodite of third pleopod entire (not bifid). Setae on the lower margin of the propodus of the first pereiopods different in females and adult males. Endopodites of the uropods, distally, with a small rounded non-setiferous tip.

Supplementary Description.

Head. With a well developed rostrum[3]. There is a very faint ridge along the anterior margin on either side of the rostrum. Anterio-lateral parts of the head triangularly pro-

[1] AUDOUIN and MILNE EDWARDS, 1841, Pl. 1, Figs. 12, 12'.
[2] AUDOIN and MILNE EDWARDS, 1841, Pl. 1, Figs. 13, 13,' 13,'' 13'''; GRUBE, 1875, Pl. VI, Figs. 4, 4 a.
[3] See RICHARDSON, 1911, Fig. 2.

longed and slightly bent downwards, but posteriorly not delimited by a transverse ridge. Eyes reniform, comparatively small, but situated on two marked sub-conical tubercles.

Pereion. First pereion segment without transverse ridges. Second and third pereion segments with the posterior margin dorsally prolonged in the middle into a small triangular tip directed backwards; a slight indication of such a prolongation is also visible on the fourth segment[1]. Lateral margins of the coxal plates of the pereion segments continuous, except those of the fourth and the fifth; the posterior angles of the coxal plates of the fourth segment protrude freely.[2] Measured along the middle line, the second and third pereion segments are of about equal length, the fourth somewhat shorter, the fifth not more than half the length of the fourth, and the sixth segment shorter still. The dorsal sutures of the coxal plates on segments 2, 3 and 4, are not continuous, those of the third segment issuing at the anterior margin of the segment somewhat medially to those of the second, those of the fourth somewhat medially to those of the third, as figured by DANA (1852).[3]

Ventral surface of the first pereion segment divided into five areas by four longitudinal sutures, of which the most lateral ones pass through the articular sockets of the first pereiopods. The caudal part of the middle area has a semi-circular elevation, the anterior margin of the elevated part being convex and extending in the middle at its most anterior point to about one-third the length of the segment. This posterior elevation is separated by a faint furrow from an anterior, wedge-shaped, elevated part, which decreases in width anteriorly and extends in an anterior direction almost to the head.

Ventral surface of the second to fourth pereion segments smooth and without sculpturing. In the middle line they are traversed by a longitudinal groove, which also passes along the middle of the remaining posterior segments of the pereion. Ventral surface of fifth to seventh pereion segments (Fig. 10 d) almost as in *S. paradoxa*, but the suture between the last two segments is more indistinct.

Abdomen. First three abdominal segments about equal in length in the middle, and of the shape figured by RICHARDSON (1911, Fig. 2). Posterior pleural angles of the third abdominal segment extending slightly further back than the pleurae of second abdominal segment. Dorsally, in the middle, the posterior margins of the first three segments have a small triangular tip, directed backwards. The shield-like middle areas of the sterna of the free abdominal segments have their posterior margins in the middle prolonged into a triangular tip directed backwards; their posterio-lateral angles are slightly produced, but rounded.

Shape of pleotelson approximately as figured by RICHARDSON (1911, Fig. 2), but its anterio-lateral angles are somewhat more rounded than shown in the figure and in that respect agree with the figure by STUDER (1884, Pl. I, Fig. 1 a). Its dorsal side is sculptured in three longitudinal ridges, one along the middle line, which is incomplete and interrupted in the middle, and two lateral ridges, the latter each ending in a small and obtuse distal point. The distal end of the pleotelson is thus elevated by a longitudinal ridge running along the middle of the truncate tip. The ventral surface to the tip of the pleotelson is concave.

[1] See CUNNINGHAM, 1871, Pl. 59, Fig. III; STUDER, 1884, Pl. 1, Fig. 1 a; DANA 1852, Pl. 53, Fig. 1 a; the triangular tip of the fourth segment is not illustrated in RICHARDSON's figure (1911, Fig. 2.)

[2] See RICHARDSON, 1911, Fig. 2.

[3] DANA, 1852, Pl. 53, Fig. 1 a.

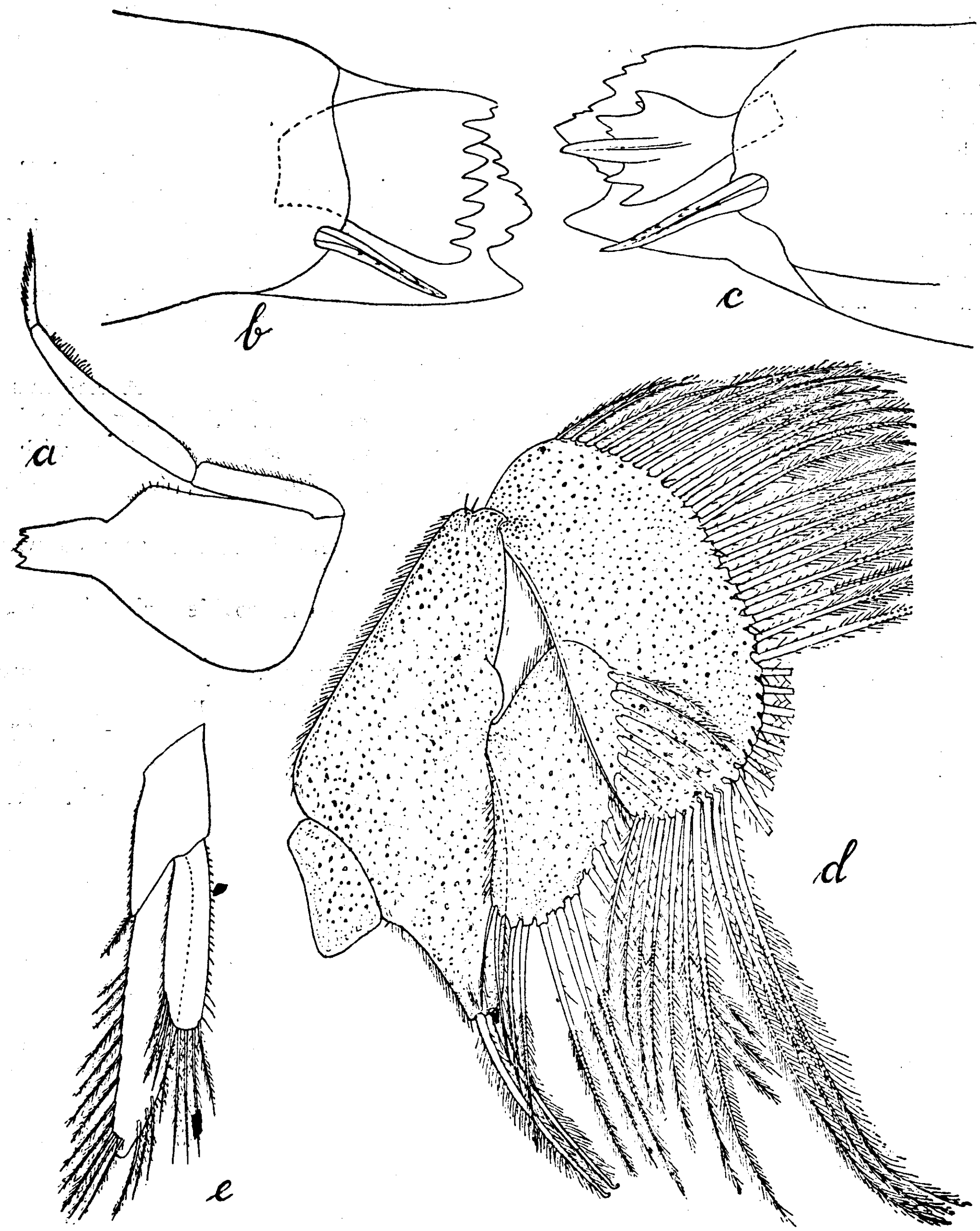

Fig. 19. *Serolis convexa*, CUNN., ♀. a. Left mandible, seen from below, 30 ×. b. Inner part of the left mandible, seen from above, 140 ×. c. Inner part of the right mandible, seen from above, 140 ×. d. Left second pleopod, 90 ×. e. Left uropod, 30 ×.

Antennulae. They extend slightly beyond the last peduncular joint of the antennae. The peduncle consists of four joints and reaches about to the distal margin of the fourth peduncular joint of the antennae. First and second joints of the peduncle subequal in length, third joint slightly longer than the second, fourth joint short, about one-third as long as the second. The flagellum consists of 15—17 joints (in the largest specimen 17 joints). On each joint there is a sensory filament.

Antennae. Extend slightly beyond the anterior margin of the third pereion segment. First peduncular joint very short, second and third joint subequal in length, each being two and a half times as long as the first; the fourth joint is about two and a half times as long as the third, and the fifth about as long as the fourth. Flagellum (in a specimen 17.8 mm. in length) consists of 17 joints. In two comparatively small specimens, 14 and 12.5 mm. in length, there are no projecting antennal scales on the joints of the flagellum, but in adult specimens[1] I could observe them.

Mandibles (Figs. 19 a, b and c). The cutting edge is markedly dentated[2]. Left mandible (Fig. 19 b) with the rostral masticatory process expanded. Right mandible with two masticatory »setae», of which the rostral one is hand-shaped and furnished with a number of finger-like processes. Setae on the second and third joints of the mandibular palp with oblong-oval, pointed end-knobs.

First pair of maxillae. Inner lobe very slightly expanded distally, furnished, with an apical seta.

Second pair of maxillae. Outer lappets of outer lobe each provided with six apical setae, inner lobe with nine apical setae.

Maxillipeds[3]. Distal epipodite marked off from the basipodite by a distinct suture. Palp consisting of three joints, of which the third is very small; second joint is broadest across the middle and has its proximal and distal margins about equal in length. The shape of the maxilliped is almost as in *S. gaudichaudi*, but the last joint of the palp is still shorter than in the latter species. The composite setae on the distal margin of the basipodite are similar to those in *S. paradoxa.*

First pair of pereiopods. The setae on the lower margin of the propodus differ in females and adult males (see Figs. 4 d—i). For the setae on the distal margin of the carpus see Fig. 6 d.

First three pairs of pleopods (Fig. 19 d). Basipodite of the first pleopod at its inner angle with three, of the second and third pleopods with two »plumose setae».

Uropods (Fig. 19 e). Inner margin of the basipodite microscopically serrate (not seen in the figure) and furnished with hair-like setae. Its inner distal angle is pointed; somewhat proximally of the tip there is a plumose seta. Endopodite almost twice as long as the exopodite and somewhat broader, distally and slightly laterally prolonged into a rounded tip; inner margin of the endopodite serrate; in each serration there is a plumose seta; distal margin, except on the tip, as well as the distal part of the outer margin, furnished with plumose setae. The exopodite has the distal margin serrate and furnished with a row of plumose setae, which are continued to the distal part of the in-

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[1] The adult specimens examined were obtained by the German Gazelle Expedition and were determined by STUDER (1884) as *S. convexa.*

[2] This character is perhaps due to the immaturity of the specimen examined (cf. BEDDARD, 1884, p. 10).

[3] BEDDARD, 1884, Pl. VI, Fig. 15.

ner margin; the inner margin is furnished with dense hairs lacking a setal canal. On the dorsal side close to the lateral margin there is a sub-marginal row of hair-like setae.

Remarks. As the name *convexa* indicates, the species, according to CUNNINGHAM (1871), is distinguished by a more convex shape of body than is usually the case in the genus *Serolis*. On examining the type specimens of the species at the British Museum, I found, however, that those specimens, which consist of a female with fully developed marsupium and an immature male specimen, had the dorsal surface only slightly vaulted. The female specimen certainly had the dorsal surface of the body somewhat more vaulted than the male, but this is common also in females of other species possessing a marsupium.

S. laevis RICHARDSON (1911) must be a synonym for *S. convexa*. According to the figure by RICHARDSON (1911), the shape of its body agrees in detail with that which characterizes the type specimens of CUNNINGHAM and all the specimens which I have been able to study, inter alia two specimens from the German Gazelle Expedition determined by STUDER (1884) as *convexa*. As seen in the figure by RICHARDSON (1911, Fig. 2) the epimeral tips of the fourth pereion segment protrude freely. One of the specimens from the Gazelle Expedition formed an exception in this respect. This specimen, a female, probably the one figured by STUDER (1884), differed in having the lateral margins of all the coxal plates continuous.

According to RICHARDSON, »*S. laevis*» differs from *S. convexa* in three respects: —

1) »In the absence of the three well marked ridges» (on the pleotelson) »a median interrupted in the middle and two lateral, each terminating in a sharp point[1]». Elswhere, however, RICHARDSON states that *S. laevis* differs (from *S. gaudichaudi*) »in having the median and lateral ridges of the terminal abdominal segment almost obsolete as well as the lateral tooth on either side».

2) »In the longer lateral angles of the sixth thoracic segment[2].» In CUNNINGHAM's type specimens, however, the epimeral angles of the sixth segment reach further back than figured by CUNNINGHAM (1871), extending backwards quite as far as is shown in the figure by STUDER (1884).

3) »The shape of the last abdominal segment is also different, being less pear-shaped in the specimen from the Sandwich du Sud» (= *S. laevis*) »and truncate at the tip[3].»

This is likewise a fictive difference, since the typical shape of the pleotelson in *S. convexa* is exactly like that figured by RICHARDSON. Neither CUNNINGHAM nor STUDER has figured the pleotelson quite accurately. Its correct shape (RICHARDSON, 1911, Fig. 2) is intermediate between the one figured by CUNNINGHAM and the one shown in the figure by STUDER.

The tip of the pleotelson in *S. convexa* is, moreover, truncate when seen from above, as described by RICHARDSON (1911). The tip was figured by CUNNINGHAM as convex, by STUDER as concave.[4]

It is highly probable that *S. plana* DANA also is identical with *S. convexa*. BEDDARD

[1] RICHARDSON 1911, p. 399.

[2] RICHARDSON, 1911, p. 399.

[3] RICHARDSON, 1911, p. 400.

[4] This difference must, I think, be due to the fact that the tip of pleotelson is dorsally vaulted and furnished with a faint longitudinal ridge, but has its ventral surface concave. Thus, when seen obliquely from the front, the tip exhibits the appearance shown in the figure by CUNNINGHAM (1871), but seen obliquely from behind it appears to be concave, distally.

(1884) found it almost impossible to distinguish *S. plana* from *S. convexa* with the aid of the description and figures given by DANA (1852). On comparing what is known of *S. plana*, with our knowledge of *S. convexa*, the following differences will be revealed:

1 *S. plana:* eyes subconical; *S. convexa:* eyes reniform, but situated on subconical tubercles.

2. *S. plana:* lateral margins of the coxal plates continuous[1].

3. Behind each of the lateral ridges of pleotelson there is a tooth. In *S. convexa* the teeth are extensions of the ridges.

4. Antennae shorter in *S. plana* than in *S. convexa*, their distal ends, extending beyond the anterior margin of the second segment of the pereion, whilst in *S. convexa* they almost reach the posterior margin of the third segment.

None of the above enumerated distinctions have any great systematic importance. If therefore, on examination of the type specimen of *S. plana*, this vaguely defined species should turn out to be identical with *S. convexa*, the name of the latter species must be altered to *S. plana*.

Localities and Material.

St. 33. South Georgia, Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 22 m. Clay and algae. $^{30}/_{5}$ 1902. 2 immature females, collected together with *S. paradoxa*. Length of largest specimen 14 mm; greatest width 11 mm; length of the pleotelson 4.7 mm. Length of the other specimen 12.5 mm.; width 10.2 mm.; length of the pleotelson 4.3 mm.

Swedish Magellanian Expedition. East Falkland, Sparrow Cove. Shell-gravel 11—13 m. Female with semi-developed oostegits; length 17.8 mm.; greatest width 14.8 mm.; length of the pleotelson 5.8 mm.

Distribution. Northern Tierra del Fuego (CUNNINGHAM 1871), Magellanian Region (STUDER 1884), Falkland Islands (BEDDARD 1884), South Georgia (Sw. Ant. Exped.), South Sandwich Islands (RICHARDSON 1911).

S. convexa is one of those species which are comparatively widely distributed. Having been found previously at the Falkland Islands and the South Sandwich Islands, its occurrence at South Georgia might have been expected.

Subgenus *Homoserolis.*[2]

Serolis (*Homoserolis*) **minuta** BEDDARD var. **eugeniae** n. var.

Pl. I Fig. 3; Text. fig. 11 b and 20.

Diagnosis. Anterio-lateral angles of the head only slightly prolonged in a lateral direction, so that the greatest width of the head is across the middle. Coxal plates marked off by dorsal sutures on the second, third and fourth pereion segments. Posterio-lateral angles of the epimera of the second to sixth pereion segments and of the second and third abdominal segments each reaching successively further back than those of the preceding ones. Pleotelson triangular with a longitudinal carina along the middle line;tip of pleotelson truncate. Inner lobe of first maxillae somewhat expanded distally, its distal margin straight. Outer lappets of outer lobe of second maxillae each with two apical setae. Maxilliped without suture between the distal epipodite, and the basipodite, but with

[1] Occurs exceptionally in *S. convexa* also (see p. 81).
[2] For diagnosis see p. 50.

a short distal incision between these plates; palp consisting of three joints, the second long and irregularly cordiform. Basipodites of the first three pairs of pleopods narrow proximally, with inner proximal angle not prolonged and without setae. Endopodite of fourth pair of pleopods entire (not bifid).

Description.

Type. Female with young; length 7.2 mm., greatest width 5 mm.

Colour. White-yellowish, semi-translucent.

Head. As in the main species.

Pereion. Third, fourth and fifth segments with a triangular tip in the middle of their posterior margins. Pereion segments with faint triangular elevations medially from the junction of the epimera with the terga.

The ventral surface of the first pereion segment is sculptured in the middle, in the usual manner and is traversed by four longitudinal sutures, the lateral ones passing through the articular sockets for the first pereiopods. The ventral surface of the other segments of the pereion is covered by the marsupium. In young removed from the marsupium, it can be seen that the median parts of the sternites of the fifth and sixth segments have coalesced with one other (Fig. 11 b); the suture between these segments is interrupted in the middle, being replaced by a faint groove. Compare Fig. 10 c (immature specimen taken out of the marsupium of *S. paradoxa*), where this suture is developed in its entire length.

The sterna of the free abdominal segments have their posterior margins produced into a triangular tooth in the middleline.

Antennulae and antennae. The flagellum of both the antennulae and the antennae consists of 10 joints. The usual row of prolonged scale-processes on the central joints of the antennal flagellum is missing.

Mandibles. Left mandible with the anterior masticatory process broad and expanded in the usual manner. Right mandible with weak masticatory processes. The modified setae on the second and third joints of the palp have, distally, two rows of hair-like sub-branches; their end-knobs are indistinct and broadly rounded distally.

First pair of maxillae. Inner lobe increasing in width towards the distal end, its distal margin straight and furnished with a short seta.

Second pair of maxillae. Outer lappets of outer lobe small and short, each with two apical setae.

Maxillipeds (Fig. 20). Distal epipodite coalesced with the basipodite, but there is a short distal incision between the two plates. The palp consists of three joints, the second joint being very long and widening towards the distal end.

First pair of pereiopods. Distal margin of the carpus with a row of distally rounded and freely projecting scales. Near the lower distal angle, somewhat on the caudal side, the distal margin is furnished with two sub-cylindrical composite setae, having their narrow setal part protruding freely at the distal end. The two large composite setae are surrounded by a group of slender non-composite ones.

Lower margin of the propodus with two rows of setae of the same form as those in the main species[1]. The long setae in the rostral row are characterized by having the two free

[1] See BEDDARD (1884, Pl. VII. Fig. 7).

distal lappets of their scale part subequal in length. The free distal end of the setal part is always longer than the lappets of the scale part, and thus much longer than figured by BEDDARD[1]. On the caudal side along the lower margin of the propodus there is a row of distally rounded, freely projecting scales, and also a submarginal row of non-composite setae.

Pleopods. The endopodite of the fourth pleopod is much shorter than the exopodite, which is traversed by a transverse suture.

Fig. 20. *Serolis minuta* BEDD. var *eugeniae* n. var. Right maxilliped, adult female, 140 ×.

Uropods. Endopodite about twice as long as the exopodite and reaching almost to the tip of the pleotelson; its distal margin is narrowly rounded. Exopodite of a uniform width; its distal margin subtruncate and slightly serrate.

Remarks. CHILTON (1917) described as a new species the Australian form »*S. bakeri*», which is very similar to *S. minuta*, and points out that his new species may possibly be only a variety of the latter species. The above described specimen shows close resemblances to both *minuta* and *bakeri* but does not correspond exactly with either of them. I am therefore of the opinion that both *bakeri* CHILTON and the above described new form should for the present be regarded as varieties of *S. minuta*.

[1] See BEDDARD, 1884, Pl. VII, Fig. 7.

The var. *eugeniae* differs from the var. *bakeri* in the following features: —

1) in its more oblong shape of body,

2) in having a slight tuberculum on each side of the pleotelson laterally from the uropods,

3) in having the epimera of the sixth pereion segment and those of the second and third abdominal segments reaching not quite as far back as in var. *bakeri*,

4) in having faint triangular elevations medially from the junction of the terga with their coxal plates,

5) in having an angular tip dorsally in the middle on the posterior margins of the third, fourth and fifth pereion segments and of the first three abdominal segments,

6) in having the exopodite of the uropods half as long as the endopodite.

From *S. minuta* as described by BEDDARD (1884) the var. *eugeniae* differs: the following respects: —

1) in its more oblong shape of body,

2) in that the free triangular tips of the pereion segments laterally, from their epimera are lacking.

3) in having two lateral tuberculae on the pleotelson,

4) in having the triangular tip in the middle of the posterior margins of the perion segments missing on the first and second segments.

In its uropods it agrees with the main species in having the exopodite half as long as the endopodite, but the distal margin of the exopodite is a little serrate, as is also the case in the var. *bakeri*.

It seems probable that the characters by which the two varieties are distinguished may be subject to variations in the same species.

Localities and Material.

Eugenie Expedition. Port Jackson (off Sydney), the lighthouse. 12 fm. Female with young, length 7.2 mm.

Distribution: Australia (N. S. Wales).

Distribution of the main species: Australia (Port Philip, Jibbon, St Francis Island). See BEDDARD (1884) and WHITELEGGE (1901).

Distribution of the var. *bakeri:* Australia (Encounter Bay). See CHILTON (1917).

Serolis (*Homoserolis*) **pagenstecheri** PFEFFER, 1887.

Text. figs. 1 a, c and h, 5 e, 6 c, 7 c—f, 8 b, 10 e, 21 a—d.

Serolis pagenstecheri. PFEFFER, 1887, p. 73—81, Pl. II, Figs. 2 and 3, Pl. IV, Figs. 1—3; TATTERSALL, 1921, p. 231; MONOD, 1931, p. 26.

Diagnosis. Anterio-lateral angles of the head markedly elongated in a lateral direction; greatest width of the head across the front. Coxal plates marked off by dorsal sutures on the second, third and fourth pereion segments. Posterio-lateral angles of the coxal plates of the second to sixth pereion segments all reaching successively further back than those of the preceding segments. Posterio-lateral angles of the pleurae of the second and third abdominal segments not extending beyond those of the coxal plates of the sixth pereion segment. Pleotelson with five longitudinal dorsal elevations, its distal end sinuate. Inner lobe of first maxilla expanded distally. Outer lappets of outer lobe of the second maxilla each provided with two apical setae. Maxilliped with distal epipodite marked off from the basipodite by a distinct suture; the palp consisting of four joints, the last of which is minute; second joint of the palp slightly cordiform. Inner proximal angles of the basipodite of the first three pairs of pleopods triangularly extended and furnished with setae. Endopodite of fourth pleopod entire (not bifid).

Supplementary Description.

Pereion. Ventral surface of the first pereion segment with four longitudinal sutures, the lateral ones passing through the articular sockets for the first pereiopods. The two

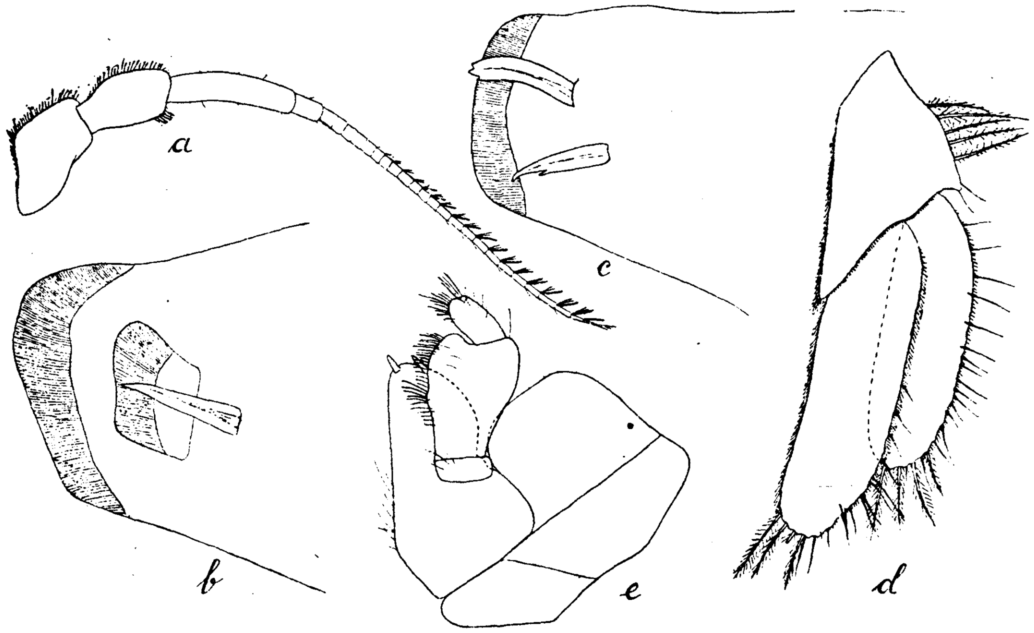

Fig. 21. *Serolis pagenstecheri* PFEFF. a. Left antennula, immature male specimen, 13 ×. b. Inner part of the left mandible, seen from above, 60 ×. c. Inner part of the right mandible, seen from above, 60 ×. d. Right uropod, in a male, 13 ×. e. Left maxilliped, of the var. *albida*, 23 ×.

other sutures are, as usual, situated one on either side of the middle line, thus marking off a middle plate of the sternite. As the longitudinal sutures are somewhat oblique, the middle plate assumes a trapezoidal shape, having the posterior margin slightly longer than the anterior. The middle plate is furnished with a crescent-shaped elevation at its posterior margin, separated by a broad furrow from an anterior rough tuberculum in the middle line. The ventral surface of the remaining segments[1] shows a furrow along the middle line.

Last three segments, as is characteristic of the subgenus, greatly coalesced with each other (see Fig. 10 e).

Antennulae (Fig. 21 a). The peduncle consists of four joints, there being a short last peduncular joint, not mentioned or figured by PFEFFER (1887).

The flagellum (in an adult male) consists of 26 joints (the proximal ones not distinctly demarcated from one another).

[1] PFEFFER, 1887, Pl. II, Fig. 3.

Antennae. Second to fifth peduncular joints provided with transverse rows of groups of setae on the rostral margin and the rostral part of the ventral surface. The distal part of the third joint has two such rows, the fourth and fifth joints six rows each.

Ventral surface of the central joints of the flagellum with a longitudinal row of prolonged spine- to bristle-like scales (see Fig. 1 h).

Mandibles (Figs. 21 b and c). Normal. The setae on the second and third joints of the palp taper towards the end and are furnished with two rows of triangular sub-branches; the setae have oblong, indistinct end-knobs.

Maxillae. Inner lobe of the first pair expanded distally. Outer lappets of outer lobe of second maxillae each provided with two apical setae. Distal margin of the inner lobe furnished with about ten setae.

Maxillipeds. For the composite setae on the distal margin of the basipodite, see Fig. 8 b and p. 36.

The palp has a minute fourth joint.

First pair of pereiopods. For the two composite setae on the distal margin of the carpus, near its lower distal angle see Fig. 6 c and p. 33. Above the lower distal angle, on the caudal surface of the joint, there is a group of slender non-composite setae.

For the composite setae on the lower margin of the propodus, see Fig. 5 e. In the short setae of the caudal row the setal part can be discerned in its entire length. In the setae of the rostral row the longest one of the free branches of the scale part is sometimes two-pointed.

Second pair of pereiopods. The lower margin of the propodus, in the female, is provided with sword-shaped setae lacking sub-branches. In the immature male there is the same kind of setae on the propodus, though smaller and more densely situated. In the adult male the propodus is provided with composite setae, arranged approximately in two longitudinal rows. Those setae which are situated proximally on the joint are of the structure illustrated in Figs. 7 c and d. Towards the distal end of the joint the setae gradually become slightly more slender and assume the structure illustrated in Fig. 7 e. On each of the caudal and rostral side, close to the lower margin of the propodus, there is a submarginal row of slender, non-composite setae (Fig. 7 f). The structural scales close to the lower margin of the propodus are prolonged and bristle-like in the adult male (Fig. 1 c).

Pleopods. Inner proximal angle of the basipodites of the first three pairs triangularly extended and furnished on the first pleopod with three »plumose» setae, on the second and third with two. Exopodite of the fourth pair with a somewhat oblique transverse suture[1]; endopodite sub-triangular, not bifid at the tip. The exopodite of the fifth pleopod is provided with a more oblique transverse suture than the exopodite of the fourth.

Uropods. See Fig. 21 d.

Secondary sexual differences. The adult males differ from the females in the usual way in their second pereiopods, and in the sternites of the first three abdominal segments. Further, the seventh pereiopods in adult males differ slightly from those of the females in having a stronger and more curved dactylus.

The penial filament in the adult male reaches almost to the distal margin of the pleotelson.

[1] PFEFFER, 1887, Pl. II, Fig. 3.

The sternites of the first three abdominal segments have been described by PFEFFER[1].

In the adult male (Fig. 10 e) the usual longitudinal ridges on the middle area of the sternites are absent. The posterior margin of the middle-area of the sternites is concave on the first segment, on each of the second and third segments it has a short point in the middle, this point being longest on the third segment.

The posterio-lateral angles of the sixth pereion segment reach slightly further back in the adult male than in the adult female. The male is also more circular in outline, while the adult female has a more oval shape. Very small immature specimens are oval in outline; in the sub-adult specimens the shape of body slightly oval, almost circular.

Localities and Material.

St. 20. South Georgia, Antarctic Bay, lat. 54° 12′ S., long. 36° 50′ W. 250 m. Small stones. $^{6}/_{5}$ 1902. 4 specimens. Length of largest specimen 40 mm., female with 12 embryos. One of the specimen is in moulting stage, the moulting having already occurred on the posterior part of the body, but not anteriorly.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. ÷ 1.5°. Clay, also some stones. $^{14}/_{5}$ 1902. 5 specimens. Length of largest specimen 25 mm. (sub-adult male). One immature female specimen 12 mm. in length already had minute oostegits developed.

St. 26. South Georgia, off Grytviken, lat. 54° 22′ S., long. 36° 27′ W. 30 m. Stony bottom overgrown with algae, outside the Macrocystis formation. $^{21}/_{5}$ 1902. Immature male specimen with very short penial filaments, and the second pereiopods not transformed. Length about 19.5 mm.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 12—15 m. Sand and algae. $^{24}/_{5}$ 1902. 3 specimens (2 males and 1 female). Length of the largest specimen 43 mm. (adult male). The female specimen has a »chela» of a second pereiopod of an adult male firmly fastened to the lateral margin of the left coxal plate of the first pereion segment. The specimen has semi-developed oostegits and measures 32.5 mm. in length.

St. 30. South Georgia, Morain Bay, lat. 54° 24′ S., long. 36° 26′ W. 125 m. Bottom temp. — 0.25°. Clay with sparse stones. 8 immature specimens. Length of largest specimen 17 mm.

St. 31. South Georgia, South Bay, off the Nordenskjöldglacier, lat. 54° 24′ S., long. 36° 22′ W. 210 m. Bottom temp. + 1.5°. Blue-gray clay with a few small stones. $^{29}/_{5}$ 1902. Adult male specimen, in moulting stage (the abdomen and the posterior part of pereion from the fifth pereion segment covered with fresh chitinous tegument, the old tegument still covering the head and first four segments of pereion). Length 32.5 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. $^{5}/_{6}$ 1902. 2 immature female specimens with minute oostegits. Colour uncommonly light, yellowish to whitish. Length of the largest specimen about 14.8 mm.

South Georgia, Grytviken, at the rock off the Bay. 15—25 m. Stony bottom with algae. $^{14}/_{6}$ 1902. 4 specimens, males and females. Length of largest specimen, adult male, 46 mm.

Swedish Magellanian Expedition South Georgia, Grytviken. 10 m. Stones. 4 specimens.

Material collected by E. SÖRLING. South Georgia, Cumberland Bay, Grytviken. March 1905. 2 adult males. Length of largest specimen, 44 mm.

Distribution. South Georgia (PFEFFER 1887, TATTERSALL 1921, MONOD 1931).

Serolis (*Homoserolis*) **pagenstecheri** PFEFFER var. **albida** n. var.

Pl. I, Figs. 4 and 5, Text fig. 21 e.

This variety differs from the main species in its smaller size and different colour. The adult specimens are about 23—24 mm. in length, whereas in the main species adult specimens are usually about twice as long. The colour is slightly yellowish, almost whitish. The adult male (Pl. I Fig. 4) has a slightly more oblong shape of body than the main species, in which the body of the adult male is almost circular in outline. The shape of the body in the adult female (Pl. I, Fig. 5) agrees with that of adult female specimens of the main species, thus being more oblong than in the adult male.

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[1] PFEFFER, 1887, p. 80, Pl. II, Fig. 3.

In other features the variety agrees with the main species. For the maxilliped see Fig. 21 e.

Localities and Material.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. + 2.05°. Gravel and sand. 19/1 1902. 18 specimens, males, females, and immature. Length of the largest specimens, adult male 23 mm., ovigerous female 21.8 mm. (type specimens).

Distribution. Shag Rock Bank (Sw. Ant. Exped.).

The main species has only been found off South Georgia.

Serolis (*Homoserolis*) bouvieri RICHARDSON, 1906.

Text. figs. 5 i and 11 a.

Serolis bouvieri. RICHARDSON 1906, p. 7—10, Pl. 1, Fig. 1, Text figs. 12 and 13; 1913, p. 8—9.

Diagnosis. Anterio-lateral angles of the head prolonged in a lateral direction, so that the greatest width of the head occurs anteriorly. Coxal plates marked off by dorsal sutures on the second, third and fourth pereion segments. Posterio-lateral angles of the coxal plates of the second to sixth segments of the pereion all extending further back than those of the preceding ones. Posterio-lateral angles of the pleural plates of the second and third abdominal segments reach not quite as far back as to the posterio-lateral angles of the coxal plates of the sixth pereion segment. Pleotelson with five longitudinal ridges, one long in the middle, the others short; tip of pleotelson sinuate. Inner lobe of first maxilla expanded distally. Outer lappets of outer lobe of second maxilla each with two apical setae. Distal epipodite of the maxilliped marked off from the basipodite by a distinct suture; palp consisting of four joints, the fourth minute, the second approximately cordiform. Inner proximal angle of the basipodite of first to third pleopods triangularly prolonged and furnished with setae. Endopodite of fourth pleopod entire (not bifid). Uropods very small.

Supplementary Description (Immature male specimen).

Head. Front margin of the head, posteriorly from the first peduncular joints of the antennulae, with a transverse ridge behind which there is a groove. The ridge and the groove continue in a lateral direction, thus demarcating the somewhat down-turned anterio-lateral parts of the head.

Pereion. Ventral surface of the first segment with four longitudinal sutures, the lateral ones passing through the articular sockets for the first pereiopods. The two other sutures, which mark off the median part of the sternite are somewhat curved, having their concave sides directed laterally. In the middle of the median part of the sternite there is a broad transverse groove. Anteriorly from this groove the part along the middleline rises into a pronounced oval elevation with ridge-like lateral margins.

Along the middle line of all the other segments of the pereion there is, ventrally, a longitudinal groove.

The ventral surface of the second pereion segment is provided with two sharp longitudinal ridges, one on each side of the middle line. The ridges are curved, with their convex sides directed laterally; the ends of the ridges meet both anteriorly and posteriorly. Each of the rostral ends of the ridges forms a free wing-like projection, which protrudes below the posterior part of the first pereion segment.

On the third and fourth segments, the ventral surface is sculptured in the same way by two curved ridges, between which there is a lower area, which on the third segment is approximately cordiform and on the fourth approximately elliptical.

Sculpturing comprising two longitudinal ridges occurs also on the following segments though more indistinctly (see Fig. 11 a). The sternites of last three segments, as is characteristic of the subgenus *Homoserolis*, are strongly coalesced.

Antennulae. These differ somewhat from the description by RICHARDSON (1906, inasmuch as they extend a little further than the peduncles of the antennae; the flagellum consists of 21 joints. In RICHARDSON's, much larger, specimen the peduncle was a little shorter, but the flagellum also consisted of 21 joints.

Antennae. The flagellum consists of 17 joints. Antennal processes small and indistinct, not much longer than typical structural scales. They are situated in a longitudinal row.

Maxillae. Inner lobe of the first maxilla strongly expanded distally; its distal margin convex. Outer lappets of outer lobe of the second maxillae each provided with two apical setae.

Maxillipeds. Distal epipodite marked off from the basipodite by a distinct suture. The palp has a minute fourth joint. The third joint of the palp is approximately cordiform; the setae on the inner margin of this joint are situated in two groups near each other.

First pair of pereiopods. Distal margin of carpal joint close to the lower distal angle provided with two composite setae and with a group of non-composite setae on the caudal side near the same angle. For the composite setae on the lower margin of propodus see Fig. 5 i.

Fourth pair of pleopods. Exopodite with a transverse suture at a distance from its proximal margin of about one-third the length of the joint.

Uropods. See RICHARDSON (1906, Fig. 13). Exopodite and endopodite minute.

Localities and Material.

St. 6. Graham Region, S. W. of Snow Hill Island, lat. 64 °36′ S., long. 57° 42′ W. 125 m. Stones and gravel. $^{20}/_{1}$ 1902. One immature male specimen, with very short penial filaments and with propodal joint of the second pereiopod not transformed.

Distribution: South Shetland Islands (RICHARDSON 1913), Graham Region (RICHARDSON 1906).

Subgenus *Heteroserolis*[1].

Serolis (*Heteroserolis*) **australiensis** BEDDARD, 1884.

Serolis australiensis. BEDDARD, 1884, p. 69—71, Pl. VI, Figs. 3—8; WHITELEGGE, 1901, p. [illegible]; CHILTON, 1917, p. 396—397, Fig. 10.

Diagnosis. Anterio-lateral angles of the head only slightly produced in a lateral direction, so that the greatest width of the head is across the middle. Coxal plates marked off by dorsal sutures on the second, third and fourth pereion segment. Posterio-lateral angles of the coxal plates of the second to sixth segments of the pereion each extending successively further back than those of the preceding segment; those of the sixth segment of the pereion

[1] For diagnosis see p. 50.

reaching further back than the posterio-lateral angles of the second and third abdominal segments. Dorsal surface of the body strongly tuberculated. Inner lobe of first maxilla not expanded distally and with distal margin narrowly rounded. Outer lappets of outer lobe of the second maxilla each with two apical setae. Distal epipodite of the maxilliped marked off from the basipodite by a distinct suture; palp consisting of three joints, its second joint with inner margin convex and outer margin concave (not cordiform). Basipodites of the first three pairs of pleopods narrow proximally, with proximal part of the inner margin slightly convex and without setae. Endopodite of the fourth pair of pleopods entire (not bifid).

Supplementary Description.

Pereion. Coxal plates separated by a suture from the tergites only on the second, third and fourth segments, but not, as was stated by BEDDARD (1884 p. 69) on the fifth and sixth segments.

Antennulae and antennae. The flagella of both pairs are broken off at the tip. The prolonged scales on the central joints of the flagellum of the antennae are spine-like and situated in a longitudinal row on the ventral side of the fourth to tenth joints.[1]

Mandibles. The masticatory edge of the mandible corpus with two strong teeth, posteriorly[2]. Each mandible is furnished with two slender weak masticatory processes.

The setae on the second and third joints of the palp have lancet-like and pointed end-knobs and are furnished with two rows of short sub-branches.

Maxillae. Inner lobe of first maxilla not expanded distally; distal margin narrowly rounded; near the tip there is a short seta.

Outer lappets of the outer lobes of the second maxillae each furnished with two apical setae.

Maxillipeds.[3] The lateral margin of the second joint of the palp is concave, its inner margin is convex and setiferous.

First pair of pereiopods. Distal margin of the carpus devoid of projecting scales; it is provided with two conical composite setae near the lower distal angle, but lacks the non-composite kind. The free distal part of the setal portion is very short in one of the setae and missing in the other.

Lower margin of the propodus with two rows of composite setae of the usual kinds. The leaf-like setae in the caudal row are oblong-oval, narrowing distally. Their distal margin and the distal half of their lateral margins are strongly lobated. The free setal part, which protrudes at the tip of the scale part, is very short, not extending so far distally as the free lobes of the scale part and only differing from these lobes in being traversed by the setal canal which ends in a pore.

The long setae in the rostral row are narrow and, as usual, trilobate distally. The free setal part is somewhat longer and much narrower than the free lappets of the scale part, its distal tip is still narrower, the distal margin narrowly rounded. The free lappets of the scale part are a little flattened and subequal in length. Their lateral margins are slightly convex, their inner margins are straight, their distal ends narrowly rounded.

[1] BEDDARD (1884), p. 70) observes »the upper surface of the third to tenth joints has a row of short blunt tubercles».

[2] See also BEDDARD, 1884, p. 70.

[3] BEDDARD, 1884, p. 71, Pl. VI, Fig. 6.

On the caudal side there is close to the lower margin a submarginal row of distally rounded, projecting scales.

The other pereiopods. Only very few of the setae are provided with sub-branches.

Uropods. The endopodite extends almost to the tip of pleotelson; its distal end is narrowly rounded. The exopodite is shorter than the endopodite; its distal margin is straight and distinctly crenulate.

Localities and Material.

Eugenie Expedition. Port Jackson (off Sydney), the lighthouse. 12 fathoms. Female with embryos, length 16.5 mm. Colour yellowish.

Distribution. Eastern and Southern Australian coast (BEDDARD 1884, WHITELEGGE 1901, CHILTON 1917).

Serolis (*Heteroserolis*) longicaudata BEDDARD, 1884.

Serolis longicaudata. BEDDARD, 1884, p. 72—74, Pl. VII, Figs. 8—10, Pl. VIII, Figs. 1—2; WHITELEGGE, 1901, p. 238; CHILTON, 1917, p. 397, Fig. 11.

Diagnosis. Anterio-lateral angles of the head only slightly prolonged in a lateral direction so that the greatest width of the head is across the middle. Coxal plates marked off by dorsal sutures on the second, third and fourth pereion segments. Posterio-lateral angles of the epimera very slightly produced backwards. Pleotelson long and narrow. Inner lobe of first maxilla not expanded distally, with its distal end narrowly rounded. Outer lappets of outer lobe of second maxillae each with two apical setae. Distal epipodite of the maxilliped marked off from the basipodite by a distinct suture; palp consisting of three joints of which the second has its inner margin convex and outer margin concave. Basipodites of the first three pairs of pleopods with the proximal part of their inner margin slightly convex. Endopodite of fourth pleopod entire (not bifid).

Supplementary Description.

Antennulae and antennae. The flagellum of the antennula consists of eleven joints.

The flagella of the antennae were both broken off at the tip. Ventral surface of the first to the ninth joints of the antennal flagellum provided with a longitudinal row of projecting non-typical pectinate scales. They differ from typical pectinate scales in having their central and most projecting point larger than the others and of a spine-like appearance. On the first joint there are only two such transformed scales, situated distally, the proximal one being small and indistinct, the distal one provided with only two points, both of which are large and spine-like.

Mandibles. Both mandibles are similar; each mandible being furnished with two weak masticatory processes.

The modified setae on the second and third joints of the palp have no distinct end-knobs, but are broadly rounded distally.

Maxillae. Inner lobe of the first maxilla with narrowly rounded end. Outer lappets of outer lobes of the second maxillae each provided with two apical setae.

Maxillipeds. Distal epipodite marked off from the basipodite by a distinct suture. Palp consisting of three joints, the large second joint being about half as long again as it is wide; the proportion between its length and breadth is 20: 14. It is about equally wide throughout, except for an abrupt constriction at its junction with the first joint. Its lateral margin is concave, inner margin convex and furnished with a row of setae.

First pair of pereiopods. Distal margin of the carpus devoid of projecting scales. The two composite setae near the lower-distal angle are conical with a narrow setal part protruding freely at the distal end of the scale part. Non-composite setae at the lower distal angle of the carpus are missing.

The setae on the lower margin of the propodus are characteristic. They are similar to those in *S. pallida* as figured by BEDDARD (1884)[1]. The leaf-like setae in the caudal row are broad distally and lobated marginally. Close to the lower margin, on the caudal side, there is a submarginal row of large distally rounded scales and also a row of sparse non-composite setae.

The other pereiopods. According to BEDDARD (1884), all the setae are branchless. This is, however, not quite correct, as there also occur sparse branched setae of the usual type. The branchless setae are somewhat expanded and blade-like near their pointed distal ends.

Localities and Material.

Eugenie Expedition. Port Jackson (off Sydney), the lighthouse 12 fms. Female with embryos, length 10.8 mm.

Distribution: Eastern and Southern Australian coast. (BEDDARD 1884, WHITELEGGE 1901, CHILTON 1917).

SECTION IV.

Sub-Order Valvifera.

BARNARD (1920), in an analytical table, deduces the principal characters of the four families of this sub-order, viz *Idotheidae, Pseudidotheidae, Amesopodida* and *Arcturidae*. He does not mention the families *Chaetilidae*, proposed by DANA (1852) (embracing the single genus and species *Chaetilia ovata* DANA) or *Holognathidae*, proposed by THOMSON (1904) embracing the single genus and species *Holognathia stewarti* (FILHOL).

Chaetilia ovata is inadequately known. It closely approaches, however, my new sub-family *Macrochiridotheinae* (see p. 104) within the *Idotheidae*.

The genus *Holognathia* THOMSON resembles very close *Cleantis* DANA, agreeing with that genus in all features, except that the mandibles are provided with a distinct, three-jointed palp. In my opinion this characteristic, though very remarkable, is not alone sufficient ground for a separation of *Holognathia* from the *Idotheidae*.

As regards the family *Amesopodidae*, it is still inadequately known and requires further investigation, especially with reference to the penis and first male pleopods. It was proposed by STEBBING (1905) and embraces the single genus and species *Amesopus richardsonae* STEBB. STEBBING (1905) states that the second pereiopod in this species displays only five joints. In his figure of the pereiopod (STEBBING 1905, Pl. XI, gn. 2) a minute

[1] BEDDARD 1884, Pl. VIII, Figs. 14 and 15.

sixth terminal joint is, however, discernable; it is, exactly as in the first pereiopod (STEBBING 1905 Pl. XI gn. 1), though still smaller.

The transformed uropods in the Valvifera afford, as a rule, good indications for the characterizing of the families in regard to the presence or absence of a second ramus (see BARNARD, 1920). The *Arcturidae* are characterized by having two rami on the uropods. Within this family I found an exception in this respect in *Microarcturus digitatus* (described on p. 167—171), which agrees with the *Idotheidae* in having uropods provided with a single ramus.

CALMAN (1909) holds that the small upper ramus of the uropods is the exopodite, on the hypothesis that the present position of the uropods is due to a movement of rotation. TAIT (1918), in his detailed report on *Glyptonotus antarticus*, is of the opinion that CALMAN's assumption does not tally with the detailed structure of the articular foramen of the uropods. His interesting investigations, however, bear out the view that the sternal foramen for the uropods has actually undergone a rotation, presumably whilst moving from its more primitive position on the lateral margin to its present ventral position. Nevertheless this does not settle the problem whether the uropods have been folded below the pleotelson. Both TAIT's and CALMAN's theories are possible explanations.

I. Fam. **Idotheideae.**[1]

A. Subfam. **Idotheinae,** DANA 1849, MIERS 1881.

Genus **Idothea** FABRICIUS, 1798.

For diagnosis see G. O. SARS (1899, p. 79), RICHARDSON (1905, p. 356), COLLINGE (1917, p. 736—737).

Idothea metallica BOSC, 1802.

For synonymy and literature see MIERS (1881, p. 35—36), RICHARDSON (1905, p. 362), COLLINGE (1917, p. 746).

Locality and Material.

Eugenie Expedition. Straits of Magellan, York Bay. Surface of water. One small specimen.

Distribution. Almost universal (see RICHARDSON 1905, THIELEMANN 1914, COLLINGE 1917).

Antarctic and sub-antarctic localities: Patagonia (CUNNINGHAM 1871), Magellanian Region (Eug. Exp.), Near Cape Horn (DOLLFUS 1891), Antarctic Seas south of Australia (DANA 1852), (South Africa, TATTERSALL 1913).

Genus **Edotia** GUÉRIN—MÉNÉVILLE, 1829—1844.

Edotia. GUÉRIN-MÉNÉVILLE, 1829—1844; MIERS, 1881; OHLIN, 1901.
Desmarestia. NICOLET, 1849.
Epelys. DANA, 1852; HARGER 1878.
Edotea. RICHARDSON, 1905.

For diagnosis see RICHARDSON (1905, p. 394). RICHARDSON states in her diagnosis »epimera of all the segments of the thorax firmly and perfectly united with the

[1] COLLINGE (1918 a) divides the Valvitera into the two groups *Idotheinia* and *Astacillinea*, but he does not give any specific characters for his groups.

segments». In some species, however, the pereion is traversed by two lateral and parallel grooves on each side; the most laterally situated of these grooves mark off the epimera. This is the case in *Edotia bilobata* (Pl. I Fig. 6, Text figs. 24 a and b) and *Edotia oculata*[1]. In *E. bilobata* the grooves demarcating the epimera are deepest and narrowest on the last three segments. These grooves are indistinct in *E. tuberculata*[2], and usually they are entirely absent: *E. lilljeborgi*[3], *acuta*[4], *triloba*[5], *montosa*[6], *magellanica*[7], and *doello-juradoi*[8]. Even the more medially situated grooves on the pereion are lacking in *E. lilljeborgi* and *acuta*.

Edotia tuberculata GUÉRIN—MÉNÉVILLE, 1829—1844.

Text. figs. 22 a—d and 23 a.

For synonymy and literature see OHLIN, 1901, p. 292.
It may be added:
Edotia tuberculata. STEBBING, 1914, p. 353; GIAMBIAGI, 1925, p. 12—13, Pl. III Fig. 1.

Diagnosis. Segments of the pereion each with a dorsal tuberculum in the middle line and with two lateral longitudinal grooves on each side, the most lateral grooves often incomplete or indistinct. Abdomen with all segments coalesced with one another, but with two anterior segments indicated, the first by a transverse groove, the second by a short lateral suture or incision. Uropods[9] slightly hollowed distally with lower part of the sympodite and its ramus not bent upwards so as to form a secondary ventral border; ramus triangular, not even half as long again as it is broad.

Supplementary Description.

Oostegits. The number of oostegits in the full-grown female is four pairs. They are all fused with each other by a thin chitinous tegument. The first three pairs are subrectangular, somewhat broader than long; the anterior margin of the small first pair (belonging to the first pereiopods) is not fused anteriorly with the sternum. The second and third pairs are large, the second being subrectangular and broader than it is long, the third subquadrate. The fourth pair is also subrectangular, narrowing backwards, but about twice as long as it is broad; its posterior margin is fastened to the sternum by a thin chitinous tegument.

Antennulae[10]. Anterior margin of the flagellum, in the male, provided with a large number of sensory filaments and with scattered setae; in the female the filaments are fewer in number and only situated distally.

Mandibles[11] (Figs. 22 a and b). Molar tubercle sometimes furnished with spines. Left mandible with a lacinia. Setal row with only one or two setae.

[1] OHLIN, 1901, Pl. XXIV, Fig. 13.
[2] OHLIN, 1901, Pl. XXIII, Figs 10 and 10 c.
[3] OHLIN, 1901, Pl. XXIV, Fig. 12.
[4] RICHARDSON, 1905, Fig. 439.
[5] RICHARDSON, 1905, Fig. 441.
[6] RICHARDSON, 1905, Fig. 443.
[7] GIAMBIAGI, 1925, Fig. 2.
[8] GIAMBIAGI, 1925, Pl. IV.
[9] As regards the uropods of the Valvifera, I have thought it advisable to describe them in their outbent position. That surface which is directed ventrally when the uropods are bent below the pleotelson is thus denoted as the lateral surface, and so on.
[10] See OHLIN, 1901, p. 293, Pl. XXIII, Fig. 10 a_1.
[11] See OHLIN, 1901, Pl. XXIII, Fig. 10 m.

Second pair of pleopods, male[1]. See Figs 22 c and d.
Uropods[2] (Fig. 23 a). Ramus short, triangular.

Remarks. The species may attain a length of 29—30 mm. (MIERS 1881, OHLIN 1901.) The specimens obtained by the Swedish Antarctic Expedition are much smaller, but nevertheless most of them are mature individuals. There are adult specimens of a length of only 9—10 mm. (female with young 9.1 mm. in length, male with fully developed penial filaments 10 mm. in length).

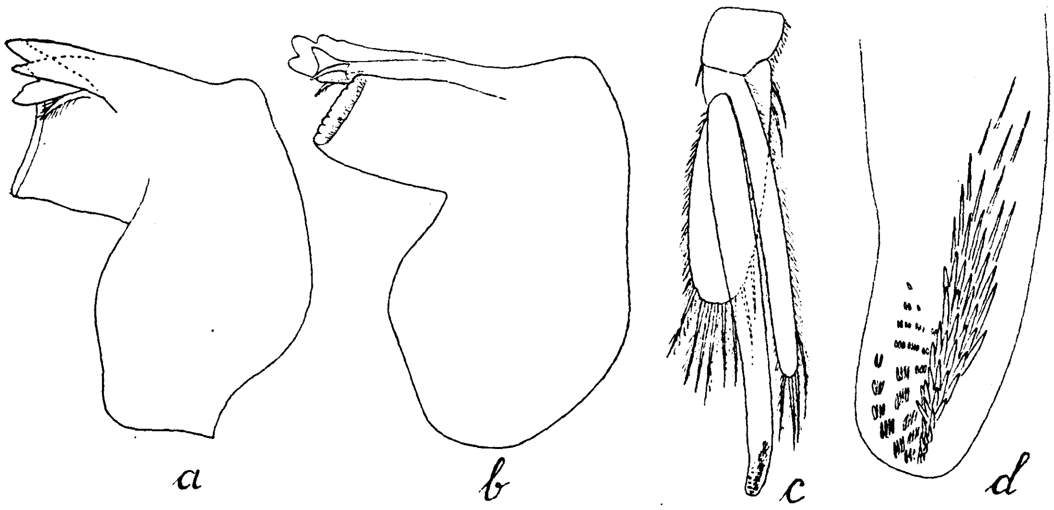

Fig. 22. *Edotia tuberculata*, GUÉR.-MÉN. a. Left mandible, female, 80 ×. b. Right mandible, female, 80 ×. c. Left second pleopod, male 30 ×. d. Distal part of the penial filament of the same pleopod, 235 ×.

OHLIN (1901), who examined a comparatively large amount of material, points out that the individuals vary rather considerably in the configuration of the cephalon and the shape of the abdomen. In the few specimens I have examined I found a less variation in these respects than was indicated by OHLIN. The configuration of the head is illustrated by OHLIN (1901, Pl. XXIII Fig. 10 a). The eyes are placed on large tubercles, the lateral margins of the head are somewhat concave, and the dorsal side of the head has four tubercles, situated approximately in such wise as to form the corners of a square. Usually the front margin of the head is furnished with two small tuberculae. These are not illustrated in OHLIN's figures (1901), but are shown by DOLLFUS[3] (1891) and GIAMBIAGI[4] (1925).

Localities and Material.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. ÷ 1.5°. Clay and also some algae. 14/5 1902. 3 specimens, (2 adult females, 1 immature). Length of largest specimen about 9 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. ÷ 1.45°. Gray clay with a few stones. 5/6 1902. 3 specimens. Length of largest specimen 10 mm. (male). An ovigerous female had a length of 7 mm.

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[1] See OHLIN, 1901, Pl. XXIII, Fig. 10 plp_2.
[2] See OHLIN, 1901, Pl. XXIII, Fig. 10 u.
[3] DOLLFUS, 1891, Pl. VIII a, Fig. 12.
[4] GIAMBIAGI, 1925, Pl. III, Fig. 1.

Distribution. Patagonia (OHLIN 1901), Tierra del Fuego (OHLIN 1901, GIAMBIAGI 1925), Magellan Straits (CUNNINGHAM 1871, OHLIN 1901), Southern Fuegian Archipelago (OHLIN 1901), near Cape Horn (DOLLFUS 1891), Falkland Islands (MIERS 1881, STEBBING 1914), South Georgia (Sw. Ant. Exp.)

The species has not previously been recorded from South Georgia.

Edotia magellanica CUNNINGHAM, 1871.

Text. fig. 23 b.

Edotia magellanica. CUNNINGHAM, 1871, p. 499, Pl. 59, Fig 6; MIERS, 1881, p. 74; OHLIN, 1901, p. 295—297, Pl. XXIV, Fig. 11 and Pl. XXIII, Fig. 11 a.

Edotia cf. *magellanica.* GIAMBIAGI, 1925, p. 13—14, Fig. 2.

Diagnosis. Head and pereion devoid of tuberculae. Pereion segments with a faint laterally situated longitudinal groove on each side. Abdomen with two anterior segments indistinctly marked off by grooves, the second on each side ending in a free lateral tip. Uropods markedly hollowed distally, with the lower part of the sympodite and its ramus bent upwards, so as to form a small ventral secondary border; ramus triangular about twice as long as it is broad.

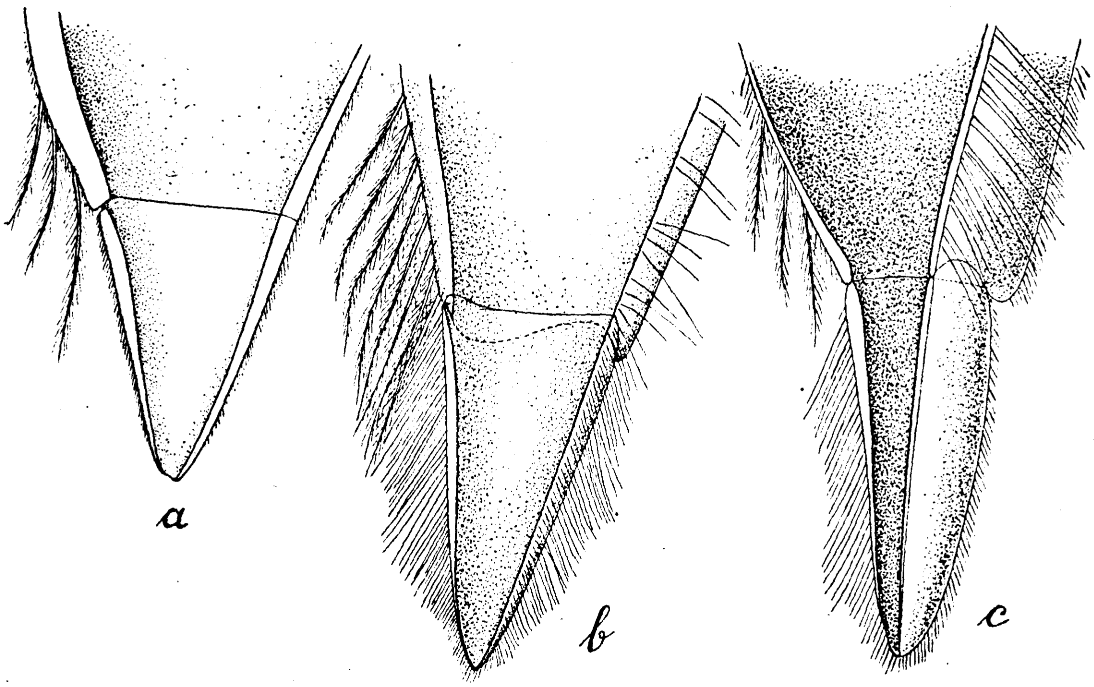

Fig. 23. Uropods in *Edotia*. a. Tip of the left uropod, seen from the inner side, *E. tuberculata*, GUÉR.-MÉN., 80 ×. b. Tip of the left uropod, seen from the inner side, *E. magellanica*, CUNN., 80 ×. c. Tip of the left uropod, seen from the inner side, *E. bilobata* n. sp., 80 ×.

Supplementary Description.

Head. The head is elevated, except at its frontal and lateral margins. The anteriolateral angles are pointed and somewhat triangularly prolonged forwards. The eyes are minute. The elevated part of the head is traversed by two curved grooves with the convexity directed anteriorly.

Pereion. Each segment laterally with a very faint longitudinal groove on each side; these grooves do not demarcate the epimera. Of sutures delimiting the coxal plates there are no vestiges.

Abdomen[1]. Two anterior segments are distinctly marked off by transverse furrows. The lateral tips of the second segment are free and pointed and separated laterally from the posterior part of the abdomen by an incision. Also a third anterior segment is slightly indicated by an incomplete transverse groove, which disappears laterally. The pleotelson is somewhat longer and moreover narrower distally than figured by OHLIN (1901, Fig. 11), its distal end being narrowly rounded. It is almost as in *E. tuberculata;* its highest part is situated anteriorly[2].

Antennae[3]. Of the peduncular joints the first is very small and only visible from below. The other peduncular joints increase in length up to the last, the relation between the length of the joints in the peduncle being 6: 7: 14: 17: 22. The flagellum consists of a long proximal joint and three very small distal ones, decreasing in length to the last, which carries a tuft of long setae.

Uropods (Fig. 23 b). Lower part of the sympodite and its ramus bent upwards, so as to form a small secondary ventral border; ramus about twice as long as it is broad.

Remarks. The description of *E. magellanica* given by MIERS (1881) makes it obvious that the specimen described above is identical with that species. It differs from the description and figures of the species by OHLIN (1901) in having a somewhat divergent shape of the abdomen. It is probable that *E. magellanica* in that respect exhibits variations in a similar way as *E. tuberculata* (see OHLIN 1901).

Localities and Material.

Eugenie Expedition. Magellan Straits, off Cape Virgines. 32 fms. Immature specimen 8.4 mm. in length. Colour yellowish to whitish.

Distribution. Patagonia (OHLIN 1901), Tierra del Fuego (GIAMBIAGI 1925), Magellan Straits (CUNNINGHAM 1871, MIERS 1881).

Edotia bilobata n. sp.

Pl. I, Fig. 6; Text. figs. 23 c, 24 a—c.

Diagnosis. Frontal margin of the head between the antennae furnished with two large rounded lobes. Head and pereion devoid of tuberculae. Segments of the pereion dorsally with distinct lateral grooves, two on either side. Abdomen with only one small anterior segment indistinctly indicated by a furrow. Uropods with distal part markedly hollowed, almost cornet-like and having, the lower part of the sympodite and its ramus bent upwards, so as to form a secondary ventral fold, being about half as wide as the ramus; the ramus is about three times as long as it is wide.

Description.

Type. Immature specimen (female?) of a length of 7.8 mm., whitish to yellowish in colour (Pl. I, Fig. 6).

[1] MIERS, 1881, p. 74; OHLIN, 1901, Pl. XXIV, Fig. 11, Pl. XXIII, Fig. 11 A, GIAMBIAGI, 1925, Fig. 2.
[2] In the specimen examined by OHLIN (1901) the highest part of the pleotelson was situated posteriorly.
[3] See OHLIN, 1901, p. 297.

Head (Fig. 24 a). Frontal margin between the antennae with two large rounded lobes; between these there lies anteriorly a deep incision. Anterio-lateral parts of the head situated lower than the rest and formed into triangular plates, which are somewhat prolonged in an anterior direction and slightly pointed anteriorly. Eyes small, black, on lateral lobes. The part between the eye-lobes is elevated and traversed by a transverse curved furrow.

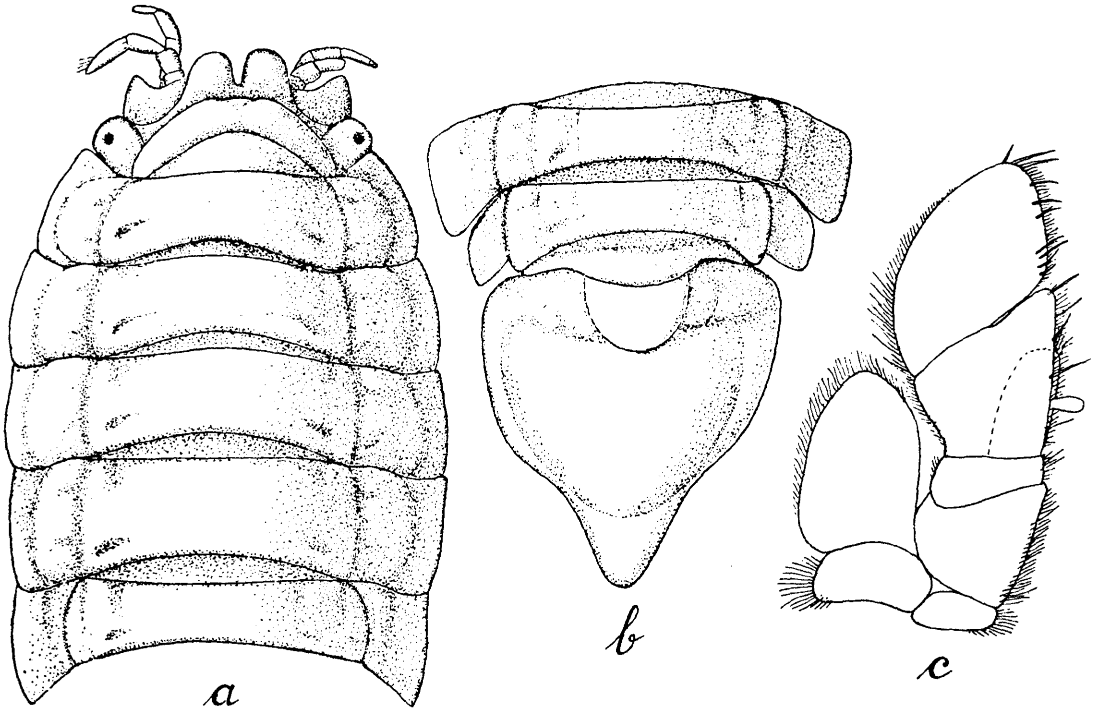

Fig. 24. *Edotia bilobata* n. sp. a. Head and first five segments of the pereion, 17 ×. b. Last two segments of the pereion and the abdomen, 17 ×. c. Right maxilliped, 55 ×.

Pereion (Figs. 24 a and b). The first four segments of the pereion subequal in length, the last three segments decreasing in length from the fifth to the seventh. The pereion traversed by two lateral longitudinal grooves on each side, the more lateral of these demarcating the epimera. The latter grooves are indistinct on the first four segments but distinct and suture-like on the last three segments. The coxal plates of the last three segments are subtriangular and directed somewhat backwards. There is a patch of more glazed pigment on each segment medially from the inner one of the two longitudinal grooves.

Abdomen. About 3 mm. in length and approximately as long as the last four segments of the pereion together. An anterior segment is indicated by a transverse groove. Posteriorly from the first segment there is a distinct semi-circular and superficially rounded elevation in the middle, laterally from which there are two lower, indistinct elevations on each side. Posteriorly from the large elevation in the middle there is a groove, which does not extend to the lateral margins of pleotelson. Remainder part of pleotelson is also elevated, except laterally and at the tip.

Antennulae. Peduncle consisting of three joints slightly increasing in length from the first to the last. The single-jointed flagellum is about as long as the last peduncular joint.

Antennae. Slightly longer than the antennulae and consisting of a five-jointed peduncle and a three-jointed flagelium. The first two joints of the peduncle are very small and subequal in length, the first visible only from below. The third joint is almost as long as the first and second together, the fourth almost as long as the second and the third together, the fifth is a little longer and narrower than the fourth. Flagellum about as long as the last peduncular joint, consisting of one large proximal joint and two very minute distal ones.

First and second pairs of maxillae. Inner lobe of the first maxillae provided with two ciliated setae. Outer lappet of outer lobe of the second maxilla with five, inner lappet of the same lobe with six, apical setae; inner lobe with about seven setae; two of them situated at the inner distal angle are stouter and furnished with long irregularly situated hairlike sub-branches, whilst the other setae are of the usual kind, being furnished with two rows of short sub-branches.

Maxillipeds. See Fig. 24 c.

Uropods (Fig. 23 c). Lower part of the sympodite and its ramus bent upwards, so as to form a secondary ventral fold, which is about half as wide as the ramus. The ramus is about three times as long as it is broad; its distal end is narrowly rounded.

Remarks. *Edotia bilobata* differs from other species of the genus in having the coxal plates of the last three pereion segments demarcated by very distinct suture-like grooves. These grooves or sutures are not in a line with those grooves which mark off the coxal plates of the anterior segments[1]; they commence at the anterior margin of the fifth segment medially from the lateral furrow on the fourth segment. The development of the coxal plates of the last three segments thus differs from that of the preceding ones. In this feature *E. bilobata* agrees with the genus *Macrochiridothea* (see p. 106—108).

Localities and Material.

St. 3. Falkland Islands New Year Island, lat. 54° 43′ S., long. 64° 8′ W. 36 m. Shingle and gravel. 6/1 1902. Immature specimen 7.8 mm. in length.

Distribution. Falkland Islands (Swed. Ant. Exped.).

Genus **Cleantis** DANA, 1849.

Cleantis. DANA 1852; OHLIN 1901; TATTERSALL 1921 a, partim.

Diagnosis. Body linear. Coxal plates distinctly marked off on all pereion segments except the first, but only those of the last three segments are large and distinctly visible in a dorsal view. Abdomen composed of more than one segment. The antennal flagellum consists of a large proximal joint, there being sometimes in addition other more or less vestigial distal joints. Mandibles devoid of palp. Palp of maxilliped five-jointed. Fourth pair of pereiopods the smallest; first pair prehensile. Uropods with two branches,

[1] The grooves which mark off the coxal plates of the last three pereion segments in *Edotia tuberculata* are likewise not in a line with those on the anterior segments; on the fifth and the anterior half of the sixth segment they are actually suture-like, though faint.

the small »secondary» ramus being furnished with dense plumose setae; lateral ramus provided with a long plumose seta at its upper proximal angle.

The above limited definition of the genus *Cleantis*, which is based on examination of the genotype *Cleantis linearis* DANA and of the allied species *Cleantis granulosa* HELLER, permits only these two species to be referred to the genus with certainty. The species previously assigned to *Cleantis*, except *strasseni* THIELEMANN (1910) and *annandalei* TATTERSALL (1921 a), are unknown as regards the structure of the uropods. The two latter species, however, differ from *Cleantis* in being devoid of the »secondary» ramus of the uropods. They should presumably be referred to *Zenobiana* STEBBING (1895), but to decide this requires an examination of the uropods in the genotype of *Zenobiana*.

TATTERSALL (1921 a) points out that the species assigned to *Cleantis* or *Zenobiana* should probably be divided into two genera, in view of the different number of joints in the palp of the maxilliped.

The genus *Holognathus* THOMSON (1904), referred by THOMSON to a separate family of the *Valvifera*, agrees with *Cleantis* as diagnosed above, with the exception that the mandibles are furnished with a three-jointed palp.

Cleantis linearis DANA, 1849.

Cleantis linearis. DANA, 1849, p. 427; 1852, p. 708—709, Pl. 46, Figs. 9 a—9 l; MIERS, 1881, p. 81—82.

Specific Characters. Abdomen with four free segments anteriorly from the pleotelson. Distal margin of the pleotelson truncate. Antella flagellum consisting of two joints; ventral surface of the last peduncular joint as well as that of the first joint of the flagellum covered with a dense nap of fine hairs.

Supplementary Description.

Head. Broader than long. Its anterior margin is slightly sinuate in the middle. Its dorsal surface is traversed by a faint transverse groove anteriorly from the eyes. At the posterior margin of the head there is a small oval area marked off anteriorly by a curved groove with its convexity directed forwards.

Pereion. Segments subequal in width. Second to fourth segments with small coxal plates, not visible from above. Last three segments with large triangular and pointed coxal plates, visible in a dorsal view.

Abdomen. Furnished with fine hairs anteriorly on its lateral sides. Four segments are marked off anteriorly from the pleotelson. Of these the first and the fourth segments are the largest and subequal in length. The first segment is about twice as long in the middle as the second; the second is about twice as long in the middle as the very short third segment. The fourth segment is firmly fused with the pleotelson; the suture between the fourth segment and the pleotelson being indistinctly developed in the middle.

The pleotelson has its distal margin truncate.

Antennulae. The small antennulae extend to the distal margin of the third peduncular joint of the antennae. They consist of a three-jointed peduncle and a single-jointed flagellum, the latter being furnished at the tip with a tuft of sensory filaments.

Antennae. The antennae have a five-jointed peduncle; the small first joint is visible only from below. The last two peduncular joints are together slightly longer than the rest of the peduncle. The flagellum is distinctly two-jointed, but the second joint is minute. The lower margins of the last peduncular joint and the first joint of the flagellum are furnished with a dense nap of fine hairs.

First and second pairs of maxillae. Inner lobe of first maxilla provided with three apical setae. Outer lappet of the outer lobe of the second maxilla with seven, inner lappet of the same lobe with six, apical setae.

Maxilliped. Palp five-jointed, the last joint minute; distal epipodite slightly tapering towards the end, its distal margin rounded.

Pereiopods. The fourth is the smallest, the first is prehensile. Dactyli with two claws, the ventral one minute.

Uropods. Lateral ramus provided with a long plumose seta at its upper proximal angle. »Secondary» ramus oblong-oval, furnished with plumose setae on its dorsal and its distal margin.

Locality and Material.

Eugenie Expedition. Valparaiso. Sandy bottom on roots of seaweed. 4 immature specimens of a brownish colour. Length of the largest specimen 12.5 mm.

Distribution. Coast of Central Chile (Eug. Exp.), Northern Patagonia, (DANA 1852).

Previously not recorded from Chile.

Cleantis granulosa HELLER, 1865.

Cleantis granulosa. HELLER, 1865, p. 132—133, Taf. XII, Fig. 2; MIERS, 1881, p. 82—83; OHLIN, 1901, p. 304—306, Pl. XXV, Figs. 15.

Specific Characters. Abdomen with three complete segments anteriorly from the pleotelson and a fourth indicated by lateral sutures. Pleotelson very faintly granulate; its distal margin very faintly concave in the middle. Antennae with a slingle-jointed, ventrally densely setiferous flagellum; ventral surface of the last peduncular joint of the antenna smooth.

Supplementary Description.

Head. Broader than long. Front margin in the middle slightly sinuate. The head has a transverse groove in front of the eyes and a curved groove at the posterior margin as in *Cleantis linearis*, but these grooves are fainter than in the latter species.

Pereion. Segments subequal in width.

Coxal plates on the second to fourth segments, small, subrectangular; on the last three segments triangular, pointed and visible from above.

Abdomen. Lateral sides, except the caudal third, densely setiferous. The segments are marked off anteriorly from the pleotelson by transverse sutures, but in one of the specimens the suture between the third and fourth segment is indistinct in the middle. A fourth segment is indicated by lateral sutures, which in one of the specimens are continued in the middle by a faint groove, thus, as in *Cl. linearis*, marking off a large segment. The first segment is about as long in the middle as the second and third segments together, the second and third are subequal in length. Pleotelson with distal margin very slightly concave in the middle, its posterior part slightly granulate.

Antennulae. Extending to the distal margin of the third peduncular joint of the antennae.

Antennae. As described by HELLER (1865); the second and third peduncular joints are broader than in *Cleantis linearis.* The ventral surface of the last peduncular joint is smooth. Flagellum consisting of a single joint, which is densely provided with »hairs» ventrally.

First and second pairs of maxillae. Inner lobe of the first maxilla provided with three apical setae. Outer lappet of the outer lobe of the second maxilla with five, inner lappet of the same lobe with seven apical setae.

Maxillipeds. Palp five-jointed, with the last joint minute. Epipodite tapering towards the end; distal margin a little more broadly rounded than in *Cleantis linearis.*

Pereiopods. As in *Cleantis linearis.* The fourth pair is the smallest.

Uropods. Exactly as in *Cleantis linearis.* Lateral ramus provided with a long plumose seta at its upper proximal angle. »Secondary» ramus subrectangular furnished with plumose setae on its dorsal and distal margins.

Locality and Material.

Eugenie expedition. South of La Plata, lat. 36° 50′ S., long. 55° 54′ w. Gravel and stones. $^{18}/_{1}$ 1852. 2 females of about equal length, one of them with embryos, the other with the marsupial plates semi-developed. Colour of the specimens white to yellowish. Length of the largest specimen about 15.2 mm.

Distribution. Argentina (Eug. Exp.), Tierra del Fuego (OHLIN 1901), St. Paul (HELLER 1865).

Not previously recorded from Argentina.

B. Subfamily **Glyptonotinae** MIERS.

Diagnosis[1]. Head posteriorly immersed in the first pereion segment, its lateral margins sinuate or straight. Eyes small, situated dorsally but submarginally at the lateral margins, sometimes with a minute ventral portion. Coxal plates marked off by dorsal sutures on the last three pereion segments. Abdomen anteriorly with three or four free segments. First three pairs of pereiopods prehensile, the others ambulatory.

In proposing the subfamily *Mesidoteinae,* RACOVITZA and SEVASTOS (1910) refer to this subfamily the genera *Proidotea* RAC. et SEV., *Mesidotea* RICH. and *Chiridotea* HARGER, thus leaving only the genus *Glyptonotus* EIGHTS and probably *Symnius* RICH[2]. in the subfamily *Glyptonotinae* of MIERS (1881). In its general shape of body and in its maxillipeds *Glyptonotus* agrees with *Mesidotea;* it differs from the *Mesidoteinae* only in the important characteristic of the number of dorsally delimited coxal plates.

The uropods are in *Glyptonotus* characterized by having branches of about equal length. This, however, is also the case in *Proidotea*[3]; in *Chiroditea,* on the other hand, the »secondary» branch is about half as long as the lateral one, and in *Mesidotea* it is still shorter. In *Symnius* RICHARDSON the uropods appear to be devoid of branches; possibly there is a single branch.

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[1] Cf. MIERS, 1881, p. 9.

[2] *Symnius* RICHARDSON (1904) may probably also be referred to the *Glyptonotinae;* it differs from the *Glyptonotinae* in having only the first pair of pereiopods markedly prehensile; the second pair is faintly prehensile; the third pair remains undescribed.

[3] See RACOVITZA and SEVASTOS, 1910, p. 189, Pl. XVIII.

Glyptonotus EIGHTS, 1833.

MIERS 1881 partim, COLLINGE 1918, nec G. O. SARS 1885.

Diagnosis[1]. Lateral margins of the head sinuate. Abdomen with four free segments anteriorly from the pleotelson. Antennulae small, with a single-jointed flagellum. Antennae with flagellum many-jointed. Palp of maxilliped five-jointed. Uropods with two subequally long branches, each approximately one-fourth the length of the sympodite.

Glyptonotus antarcticus EIGHTS, 1833.

Glyptonotus antarcticus. EIGHTS, 1833, p. 331, 2 Pls.; COLLINGE, 1918, p. 65—72, Pl. I and II, Figs 1—12; TATTERSALL, 1921, p. 232—233, Pl. I, Figs 5 and 6; MONOD, 1931, p. 27.

For further literature see COLLINGE 1918, p. 65 and TATTERSALL 1921, p. 232.

The eyes are small and situated dorsally, but, as has been pointed out by PFEFFER (1887), they have also a ventral portion. In immature specimens taken out of the marsupium this ventral portion of the eye is unpigmented and indistinct.

Localities and Material.

Material collected by E. SÖRLING. South Georgia, Cumberland Bay. Found dead a long way up the shore. 3 jan. 1905. Female with young, 64.5 mm. in length.

Distribution. South Georgia (PFEFFER 1887, TATTERSALL 1921, MONOD 1931), South Shetland Islands (EIGHTS 1833), Graham Region (COLLINGE 1918).

Glyptonotus antarcticus EIGHTS var. acutus RICHARDSON, 1906.

Glyptonotus acutus. RICHARDSON, 1906, p. 10—13, Pl. 1, Figs 2—4.

Glyptonotus antarcticus var. *acutus.* TATTERSALL, 1921, p. 233—235, Pl. IX, Figs. 3—4; PESTA 1928, p. 78 and 81.

For further literature see TATTERSALL, 1921, p. 233.

The small ventral portion of the eye is very indistinct in some of the specimens.

Localities and Material.

Eastern shore of Seymour Island (off Graham Land). Found alive on the ebb-shore. 10—13 febr. 1903. 18 specimens, males and females. Length of the largest specimen 112.5 mm. — Cape Seymour. 16 jan. 1902. Thrown up on the shore. 2 specimens, male and female. Length of largest specimen 98.5 mm. (male).

St. 4. Graham Region, off Paulet Island, lat. 63° 36′ S., long. 55° 48′ W. 100—150 m. Gravel with small stones. $^{15}/_{1}$ 1902. 2 immature specimens. Length of the largest specimen 35 mm.

Distribution. South Georgia (PESTA 1928), Graham Region (RICHARDSON 1906, 1913), Victoria Land (HODGSON 1910, TATTERSALL 1921) Gauss Station (VANHÖFFEN 1914).

Macrochiridotheinae n. subfam.

Diagnosis. Head laterally expanded, its posterior part immersed in the first pereion segment. Body arched with lateral margins bent downwards. Eyes dorsal and small or wanting. Antennulae situated dorsally from the antennae and longer than the antennae; they are furnished with a single-jointed flagellum provided with minute incisions on its

[1] Cf. MIERS 1881, p. 9—10 and COLLINGE 1918, p. 64.

anterior margin or with a two-jointed flagellum, there being, in addition, a minute distal joint. Coxal plates marked off by dorsal sutures on the last three segments of pereion, those on the second to fourth segments distinctly delimited from the tergites, but not visible from above. Abdomen with three free segments anteriorly from the pleotelson. Maxillipeds with a three-jointed palp. First pair of pereiopods markedly subchelate (seroliform). Second and third pair of pereiopods weaker than the first pair, being either prehensile, with the dactylus more or less reduced, or non-prehensile with the dactylus absent.

The morphology of the coxal plates in the *Macrochiridotheinae* differs considerably from that of the other subfamilies of the *Idotheidae*. That development of the coxal plates which is characteristic of the subfamily is found in the two genera *Macrochiridothea* OHLIN (1901) and *Chiriscus* RICHARDSON (1911); these genera agree also in other respects in the characteristics given in the diagnosis. In *Macrochiridothea* the head is furnished with lateral incisions, which are wanting in *Chiriscus*, whilst the second and third pereiopods are prehensile, though weaker than the first pair. In *Chiriscus* they are not prehensile and lack the dactylus. A peculiar feature of *Macrochiridothea* is that the first pereion segment also has a small laterally and ventrally developed coxal plate, and that the uropods have a sympodite 2—$2^1/_2$ times as long as the lateral ramus, which is about twice as long as the small »secondary» one. RICHARDSON (1911) did not find any coxal plate on the first pereion segment in *Chiriscus;* the uropods in *Chiriscus* have not been described.

Chaetilia ovata, DANA (1852) should presumably be referred to the new subfamily. It was referred by DANA to a separate family, the *Chaetilidae*. The morphology of the coxal plates in *Chaetilia* is, however, imperfectly known. It agrees with the *Macrochiridotheinae* in having the antennulae situated above the antennae. The uropods of *Chaetilia* are subequal with those of *Macrochiridothea*, but they differ in having a sympodite almost three times as long as the lateral ramus; the »secondary» ramus, on the other hand, is slightly longer than in *Macrochiridothea*. According to DANA[1] the first three pairs of pereiopods in *Chaetilia* are prehensile, and also the fourth is slightly prehensile[2]. The head is only very slightly expanded laterally. If the morphology of the coxae in *Chaetilia* agrees with that of *Macrochiridothea* and *Chiriscus*, the name of the subfamily must be altered to *Chaetilidae* DANA.

Genus **Macrochiridothea** OHLIN, 1901

Diagnosis.[3] Head laterally expanded; each lateral margin with a small incision. First pereion segment with distinctly defined, laterally and ventrally developed coxal plates. Abdomen provided with three free segments anteriorly from the pleotelson, whilst a fourth segment is indicated by a groove. Inner lobe of first maxilla with two apical setae. Second and third pairs of pereiopods prehensile, but with a small and faint dactylus. Uropods with sympodite 2—$2^1/_2$ times as long as the lateral ramus, which is about twice as long as the »secondary» ramus.

[1] DANA, 1852, Pl. 46, Fig. 11 c.
[2] DANA, 1852, Pl. 46, Fig. 11 d.
[3] Cf. OHLIN, 1901, p. 286.

Morphology of the coxae in Macrochiridothea.

RACOVITZA and SEVASTOS (1910) emphasize the importance of the morphology of the coxae in the Idotheidean genera for the systematization, and accordingly base their new subfamily *Mesidoteinae* on characteristics derived from the morphology of the coxal plates. They write (p. 197): »La fusion progressive des épimères avec leur somites respectifs est une transformation orthogénétique qui se manifeste dans tous les groupes d'Isopodes. C'est donc une adaption parallèle dont il faut se méfier. Cependant ce caractère est utilisable pour différencier les *Chiridoteini* à sutures épiméro-tergales visibles sur les péréionites II à VII, des *Glyptonotus* qui n'ont de sutures visibles que sur les péréionites V à VII. Chez *Macrochiridothea* il semble, d'après des mauvaises figures de OHLIN (1907), que chez l'une des espèces les sutures présentent les mêmes caractères que chez *Glyptonotus*, et que chez la seconde espèce elles ont complètement disparu.»

Macrochiridothaea and *Chiriscus* have must been referred to a separate subfamily chiefly because of the peculiar development of their coxae, which agrees neither with that of the *Glyptonotinae* nor with that of the *Mesidoteinae*. I have studied the morphology of the coxae in two species of *Macrochiridothea*, viz. *michaelseni* OHLIN[1] and *stebbingi* OHLIN. In the case of *stebbingi* the new variety *multituberculata* was examined. As regards the morphology of the coxae, both the examined species agree with one another in their main features.

In *Macrochiridothea michaelseni*[2] (Fig. 25 a and b) the coxal plates on the last three segments of the pereion are distinctly delimited dorsally, whilst ventrally, as usual, no suture-lines are visible at all. The coxal plate on the last segment is small, developed only dorsally and rounded posteriorly. It is retroverted and covers the anterior half of the first abdominal segment.

Viewed from above (Fig. 25 a), the coxal plate of the sixth segment is large and subtriangular. Its dorsal suture is curved and has the concave side laterally directed. The posterior angle of the coxal plate is produced into a sharp point, and extends somewhat further back than the posterior angle of the seventh coxal plate. Viewed from the lateral side (Fig. 25 b), it appears that the coxal plate also has a ventrally directed lateral part, forming a right angle with the dorsal surface of the coxal plate. Viewed from above (Fig. 25 a), the lateral margin is very slightly elevated into a ridge; viewed from the lateral side (Fig. 25 b), this ridge forms a very distinct longitudinal carina. The flat ventral side of the coxal plate passes over into the sternite without any suture.

The coxal plate on the fifth segment is developed, as on the sixth, but its posterior angle is more obtuse and its dorsal surface is more vaulted; the ventrally directed lateral side of the coxal plate thus forms a more obtuse angle with the dorsal surface; also the longitudinal carina is consequently weaker.

The pereiopods on the fifth to seventh segments are fixed in sockets on the ventral surface of the coxal plates; the basipodite of the pereiopods has its proximal margin emarginate, and the emargination is provided with a spur originating in the posterior margin of the sockets (see Fig. 25 c).

The coxal plates on the second to fourth segments differ from those on the last three segments. As the lateral parts of the segments are markedly vaulted and the

[1] The specimens of *M. michaelseni* were kindly sent to me from the Museum at Hamburg.
[2] Cf. OHLIN (1901, Pl XXI, Fig. 8).

lateral margins of the segments are directed ventrally, the coxal plates are not visible in a dorsal view. They are distinctly delimited from the tergites; posteriorly they have a vertically directed projection, and their height decreases continuously from their posterior to their anterior ends. Their ventral surfaces are not delimited from the sternites.

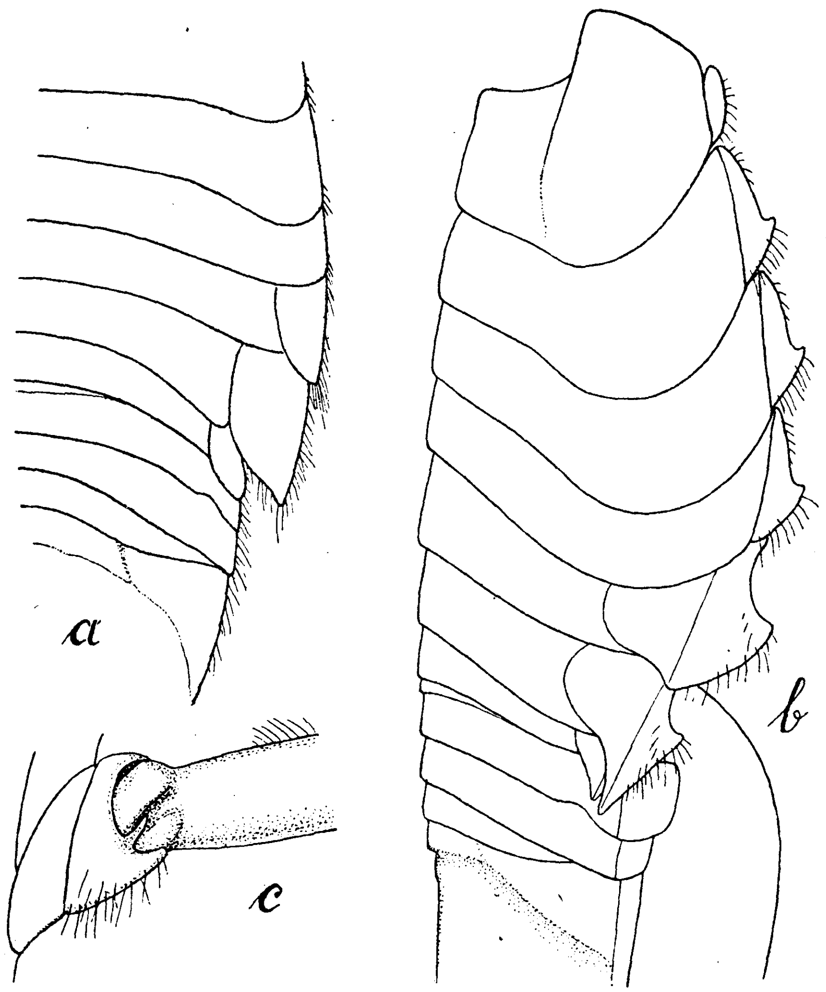

Fig. 25. *Macrochiridothea michaelsenii* OHLIN. a. Right half of the third and following pereion segments and of the anterior part of the abdomen, seen from above, 17 ×. b. Pereion and anterior part of the abdomen in a lateral view, 20 ×. c. Coxal plate of the fourth pereion segment and the proximal part of the basipodite of the right pereiopod, seen from the ventral side, 21 ×.

The pereiopods are attached to the coxal plates much in the same way as on the last three segments, but the spur fitting into the proximal emargination of the basipodite is situated posterio-laterally.

Also on the first segment there is a coxal plate, which is distinctly delimited from the tergite. It is small and sub-rectangular and developed only at the posterior part of the segment. The first pereiopod is attached by the posterior projection of the basipodite to the coxal plate, by its anterior projection to the tergite itself; the small spur fitting into the emargination between the two proximal projections of the basipodite likewise originates from the tergum. Thus the coxal plate on the first segment can be homologous only with the posterior parts of the coxal plates on the other segments, the anterior part of the original coxa having coalesced with the tergum.

It should be noted that the lateral parts of the second and third abdominal segments (not of the third), as also the lateral parts of the pleotelson, are bent downwards in the same way, like the coxal plates of the fifth and sixth pereion segments. Thus, in a lateral view, a sharp ridge is noticeable on the second and third abdominal segments, as well as on the pleotelson.

Macrochiridothea stebbingi var. *multituberculata* has the last three coxal plates distinctly marked off from the tergum by dorsal sutures.[1] They are similar in shape to those in *M. michaelseni*, the lateral and dorsal surfaces of the fifth and sixth pairs thus forming a sharp angle with each other. They differ from the corresponding coxal plates in *M. michaelseni* in having their posterior angles, viewed dorsally, more pointed and posteriorly somewhat upwardly directed, thus presenting the appearance of spiniform projections. The posterior angles of the coxal plates of the sixth segment extend further back than in *M. michaelseni*[2].

The coxal plates on segments 2—4 have the same shape and position as in *M. michaelseni;* this is also the case with the small coxal plate on the first segment. The pereiopods are likewise fastened in the same way as in that species.

In *M. stebbingi*, var. *multituberculata*, the pereion segments 1—4 differ in shape from the corresponding segments of *M. michaelseni*; their posterio-lateral angles are pointed and upwardly directed, so that they present the appearance of spiniform projections. We thus get a lateral row of spiniform projections on the pereion, but, whereas on the first four segments the spines are situated on the actual segments, on the last three segments the spiniform projections emanate from the coxal plates.

The lateral row of spines is continued also on the first and second abdominal segments. The lateral parts of these segments are bent downwards, and the angle between the dorsal surface and the lateral surface is posteriorly elongated into a retroverted spinelike projection. The pleotelson has on either side two longitudinal submarginal ridges.

Affinities of the subfamily Macrochiridotheinae, with special reference to the genus Macrochiridothea.

The characters of the subfamily *Macrochiridotheinae* indicate that it should be assigned a place intermediate between the *Glyptonotinae* and the *Mesidoteinae*. It agrees with the *Glyptonotinae* in having coxal plates marked off dorsally only on the last three segments of the pereion. On the other hand, the subfamily agrees with the *Mesidoteinae* in having coxal plates developed also on the second to fourth segments, though in contradistinction from the *Mesidoteinae*, the coxal plates of these segments are not visible from above. The genus *Macrochiridothea* agrees with the *Mesidoteinae* in having the lateral margins of the head expanded and cleft.

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[1] In the case of *M. stebbingi* these sutures have not been figured by OHLIN (1901). Cf. OHLIN's Pl. XXII, Fig. 9 a.

[2] See OHLIN, 1901, Pl. XXII, Fig. 9.

Features exclusively peculiar to the subfamily are that the coxal plates on segments 2—4 are situated laterally and ventrally; that the sutures which separate them from the tergites are not continuous with those on the last three segments; that the first pereiopods are strongly subchelate and much stronger than the two succeeding, likewise prehensile, pereiopods; and that the dactyli of second and third pereiopods are either more or less vestigial or missing. An important characteristic, which has only been found in *Macrochiridothea*, is that the first pereion segment is provided with a distinct coxal plate, situated laterally and ventrally.

OHLIN (1901) assumed the existence of a close relationship between *Macrochiridothea* and *Chiridotea* in view of the fact that the first three pairs of pereiopods are subchelate and the maxillipeds have a three-jointed palp. RACOVITZA and SEVASTOS (1910), being unable to determine with certainty the morphology of the coxal plates in *Macrochiridothea* from OHLIN's imperfect investigations, contended that *Macrochiridothea* should be assigned to the subfamily *Glyptonotinae*. »*Les Mesidoteini* littoraux septentrionaux sont d'une autre lignée que *Glyptonotus* littoral austral avec lequel ils ont été réunis à tort.»

»C'est également à tort que OHLIN (1907) rapproche son genre subantarctique littoral *Macrochiridothea* de *Chiridotea* littoral subarctique» (RACOVITZA and SEVASTOS, 1910, p. 196).

The morphological type of coxal plates, which is characteristic of the subfamily *Macrochiridotheinae* is not found in the other subfamilies of the *Idotheidae*, but it shows a close affinity to the one characteristic of the family *Arcturidae*. In the Arcturidean genera the coxal plates on segments 2—4 are small and not visible from above; and the sutures which separate them from the tergites are laterally situated, whilst those on the last three segments are large and firmly incorporated with the lateral parts of the tergites. In the spiny species of the genus *Antarcturus*, just as in *Macrochiridothea stebbingi*, the lateral rows of spines on the pereion are situated on the coxal plates of the last three segments, whilst those on the second to fourth segments are mounted on the tergum. In *Antarcturus* the lateral margin of the first pereion segment is always provided with an incision, a feature which may be interpreted as an indication of the coalescence of the coxal plate with the tergite. We thus apparently find a slight trace of at least the posterior part of the coxal plate of the first segment (see Fig. 32 a). In *Antarcturus* the coxal plates on the second to fourth segments are usually provided with an incision, a feature which is common in Isopods and is especially marked in many Parasellids (e. g. *Ianira*).

As pointed out above, the morphology of the coxae in *Macrochiridothea* most closely resembles that which is characteristic of the fam. *Arcturidae*. In both the *Macrochiridotheinae* and the *Arcturidae* the coxae on the second to fourth segments to a great extent form incomplete rings around the proximal ends of the basipodites of the pereiopods. They have thus reached only a comparatively primitive stage of development.[1]

[1] Another explanation of the ventral position of the coxal plates in *Machrochiridothea* is that the pereion is vaulted; the ventral position may thus result from this shape of the pereion. The laterally and ventrally situated coxal plates in *Macrochiridothea* may then be presumed to have arisen from forms with dorsally situated coxal plates, as in *Mesidotea*; that is to say, the vaulting of the pereion, it may be supposed, has given a ventral position to the coxal plates of the second to fourth segments, whilst only the lateral parts of the last three coxal plates have been directed ventrally.

The vestige of a coxal plate found on the first pereion segment in *Macrochiridothea* must likewise be regarded as a primitive feature.

OHLIN'S assumption of a close affinity between *Macrochiridothea* and *Mesidotea* is negatived by the fact that the dorsal sutures of the coxal plates of the last three pereion segments are not in a line with the sutures of the coxal plates of the preceding segments, and that in *Macrochiridothea*, in contradistinction from *Mesidotea*, the posterior part of the coxae remains on the first pereion segment.

The view held by RACOVITZA and SEVASTOS (1910) that *Macrochiridothea* is more closely related to GLYPTONOTUS than to *Mesidotea* is supported by the comparatively primitive development of the coxae on segments 2—4. The coxae on these segments are very small in *Glyptonotus*, though distinctly delimited from the segments. In contradistinction from *Macrochiridothea*, the epimera of segments 2—4 in *Glyptonotus* are mainly formed by the lateral sides of the segments themselves. This feature shows that the transformation of the original coxae of the second to fourth segments in *Macrochiridothea* has preceded along another line of development than in the *Glyptonotinae*. The remnant of a coxal plate on the first segment shows still more clearly that the coxae on this segment have been differently transformed in *Macrochiridothea* and *Glyptonotus*.

Macrochiridothea stebbingi OHLIN var. **multituberculata** n. var.

Pl. I Fig. 7, Text figs. 26 a and b.

Description.

Head. Its general shape agrees with that of the main species, but the head is much shorter, being two and a half to three times as broad as it is long. Posterior part of the head not so deeply immersed intothe first segment of the pereion as is the case in the main species. The dorsal surface of the head is tuberculated, there being about 14 small tuberculae, of which four in the middle are situated in such wise as to form the corners of a square.

Pereion. Lateral margins of the first four segments, as well as those of the coxal plates of the last three segments, provided with short, sparse setae.

The general shape of the pereion agrees with that of the main species. Thus the posterio-lateral angles of the segments are prolonged into hook-like points directed backwards and upwards, which increase in length from the first to the sixth segment; those on the seventh segment being small, with a slightly upward direction and covering the anterior half of the first abdominal segment. The points of the last three segments are situated on the coxal plates. For the coxal plates see p. 108.

The first segment is, measured along the middle line, about as long as the head; it slightly increases in length laterally, so as to be about one-third longer laterally than in the middle. In the main species the segment is about three times longer laterally than in the middle.[1] Second pereion segment about two-thirds as long as the first. The other segments of the pereion are slightly shorter and subequal in length.

The pereion is furnished with a greater number of tuberculae than in the main species, but the larger tuberculae are situated as described by OHLIN in *M. stebbingi*. The first to fourth pereion segments are traversed by nine longitudinal rows of tuberculae, there

[1] See OHLIN, 1901, Pl. XXII, Fig. 9 a.

being nine tuberculae on each of the second to fourth segments; also the large first segment is furnished posteriorly with a transverse row of nine tuberculae. Each segment is furnished in the middle at the posterior margin with a tuberculum, increasing in size up to the seventh segment, where this tuberculum forms a tip directed backwards. On all the segments except the small seventh we find, on either side of the tuberculum in the middle, one dorso-lateral and one lateral tuberculum; on the seventh segment the lateral ones are developed, but the dorso-lateral are missing. On the first to fourth segments we find between the dorsal tuberculum in the middle and the dorso-lateral tuberculae, as also between the latter tuberculae and the lateral ones, yet another tuberculum, thus increasing the number of tuberculae on the segments to nine. The fifth segment, as mentioned above, is furnished only with seven tuberculae, the seventh only with three. On the first segment anteriorly there are three tuberculae in a transverse row, one in the middle and one on either side of the middle line. The first segment is as mentioned above, provided with nine tuberculae in a transverse row along its posterior margin; anteriorly from the lateral ones of these tuberculae there are three more tuberculae in a longitudinal lateral row. There are also other tuberculae on the first segment, but they are more irregularly situated.

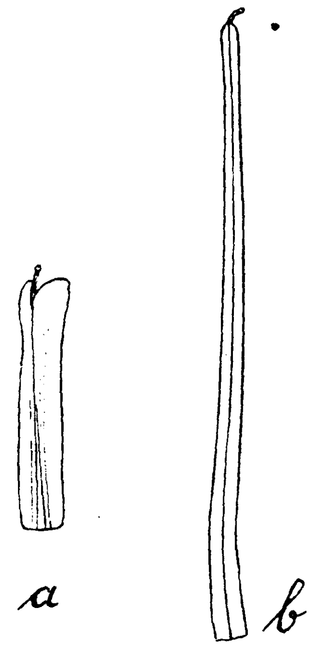

Fig. 26. *Macrochiridothea stebbingi* OHLIN var. *multituberculata* n. var. a. Seta from the lower margin of the propodus of the first pereiopod, 350×. b. Seta from one of the submarginal rows close to the lower margin of the first pereiopod, 350 ×.

Abdomen. The first two segments are bent downwards laterally in a sharp angle to the dorsal surface. Their posterior angles are pointed and directed backwards. The third segment is enclosed by the second and the pleotelson; laterally it is not bent downwards unlike the other two free segments. In the middle it has a small tuberculum.

The anterior part of the pleotelson is elevated and furnished with a conspicuous tuberculum in the middle and two smaller lateral tuberculae on each side, situated close to one another. The pleotelson is furnished with a longitudinal carina along the middle line. The somewhat flattened tip of pleotelson is triangular and terminates in a narrowly rounded, almost pointed end. The lateral margins of the pleotelson, except at the tip, are bent downwards, so that a submarginal ridge is formed, which is only visible in a lateral view. Medially from this ridge there is yet another submarginal ridge, separated from the other by a groove. This latter ridge can be seen when viewed both laterally and from above.

Antennulae. Almost exactly as in the main species, differing only in having the second peduncular joint longer. This joint is longer than the last peduncular joint and the flagellum taken together, and almost twice as long as the third joint; the flagellum has a very minute terminal joint.

Antennae. Almost as the in main species, but the third peduncular joint is slightly longer, being almost as long as the second. The flagellum has seven joints in the right antenna, ten in the left.

Maxillipeds. As the in main species.

First pair of pereiopods. Exactly as in the main species. Lower margin of the propodus covered with irregularly[1] situated short setae. The setae (Fig. 26 a) terminate in three points. On both the caudal and rostral side, close to the lower margin, there is a submarginal row of long setae of the shape illustrated in Fig. 26 b.

The other pereiopods. Most of them broken. Second and sixth pereiopods as in the main species. Dactylus of second pereiopod vestigial.

Uropods. As in the main species. Sympodite about twice as long as the lateral ramus.

Remarks. I have examined only a single specimen, a female with fully developed oostegits (13 mm. in length). As the specimen differs in some features from *Macrochiridothea stebbingi* as described by OHLIN, I have thought it advisable to describe it as a new variety of that species. I am not convinced that the species does not exhibit variation in the characteristics by which the new variety is distinguished.

The variety *multituberculata* differs from the main species in the following characteristics:

1. Eyes totally lacking. In the main species they are small and black.
2. Head measured along the middle line about as long as the first segment. First pereion segment only slightly increasing in length laterally. Of *M. stebbingi* OHLIN says that the head is nearly as long as the first three segments of the pereion; the first pereion segment in the main species is three times as long laterally as in the middle.
3. It is more tuberculated than the main species, the pereion being furnished (on the first four segments) with nine rows of tuberculae.
4. The second peduncular joint of the antennula is longer than the third peduncular joint and the flagellum taken together, whilst in the main species it is only about as long as the third peduncular joint plus half the flagellum.

Macrochiridothea kruimeli (NIERSTRASZ, 1918) comes close to *M. stebbingi* OHLIN. It differs in being less tuberculated, in having the second joint of the antennular peduncle more than twice as long as the third peduncular joint plus the flagellum, and in having a very short antennal flagellum, consisting of two about equally long joints. *M. kruimeli* agrees with *M. stebbingi* var. *multituberculata* in its long first pereion segment. Vestigial eyes are found in this species.

Locality and Material.

Swedish Magellanian Expedition. Falkland Islands. Rocks at Port William. 1907. Female with empty marsupium, 13 mm. in length.

Distribution. Falkland Islands (Sw. Mag. Exp.). Distribution of the main species: Tierra del Fuego (OHLIN 1901) and Falkland Islands (STEBBING 1914).

Fam. **Pseudidotheidae,** OHLIN 1901, STEBBING 1905, BARNARD 1920.

For diagnosis see OHLIN (1901, p. 274) and BARNARD (1920 p. 381). It may be added that the penis is in a single piece, which is distally cleft or bilobate.

[1] Situated approximately in three parallel longitudinal rows.

The family comprises the three genera *Arcturides*[1] STUDER (1884), *Pseudidothea* OHLIN (1901) and *Holidotea* BARNARD (1920). The number of joints in the antennal peduncle is stated by OHLIN (1901), in his diagnosis of the family, to be four. In *Arcturides* there are four joints (STUDER 1884), in *Holidotea*, however, five (BARNARD 1920). In *Pseudidothea* the peduncle also is better described as consisting of five joints, but the short proximal joint is indistinctly marked off on the ventral side from the second (cf. OHLIN, 1901).

The three genera of the family all agree with one another in the structure of the penis, being also in this respect intermediate between the *Idotheidae* and the *Arcturidae*. The penis of *Pseudidothea* is described below. After examining some specimens of *Arcturides cornutus* at the British Museum, I found that the penis is distally cleft also in that genus. In *Holidotea* the penis is distally bilobate.

The uropods of *Arcturides* have not been described. Moreover BARNARD (1920, p. 384) was unable to show whether one or two rami are present in the uropods of. *Holidotea*. In *Pseudidothea*[2] the uropods are characteristic; as in the genus *Neastacilla* (cf. p. 118) the »secondary» ramus is provided with one long seta at the tip. The uropods being unknown in the other genera belonging to the family, it is impossible to say whether this characteristic is common to the whole family.

The fam. *Pseudidotheidae* approaches most closely to the fam. *Amesopodidae*[3], a family containing a single species, likewise intermediate between the *Idotheidae* and the *Arcturidae*.

Genus **Pseudidothea** OHLIN, 1901.

Diagnosis. Head fused with the first segment of the pereion, being separated from the latter only by a faint groove. Eyes small, situated laterally. Coxae developed as incomplete, not very distinct, rings around the proximal ends of the basipodites of the second to seventh pereiopods. All segments of abdomen fused into one piece. Antennae with a two-jointed flagellum. Maxillipeds with a five-jointed palp. First pair of pereiopods prehensile. Penis cleft distally. Second male pleopod with the exopodite transformed and traversed by a diagonal channel. Uropods with two branches, the »secondary» branch being about three-fourths the length of the lateral one and provided with a single large seta at the tip.

OHLIN (1901) points out that the genus may perhaps be congeneric with *Arcturides* STUDER (1884). *Pseudidothea* is, however, clearly distinguished from *Holidotea* (BARNARD, 1920), by having no lateral notches, indicating two anterior segments, on the abdomen, by having the endopodites of the first pair of pleopods well developed, not as in *Holidotea* reduced in size, and by the characteristic shape of the penis. Another characteristic feature of *Pseudidothea* is that the tip of the »secondary» ramus of the uropods is furnished with a long conspicuous seta. Neither *Pseudidothea* nor *Arcturides* have lateral incisions on the abdomen. Whether *Pseudidothea* and *Arcturides* are congeneric cannot be decided without an examination of the uropods and first pair of pleopods in the latter genus.

[1] If the name of the family is to be in conformity with that of the oldest genus within the family it should be *Arcturidoidae* (see OHLIN 1901, p. 276).
[2] See OHLIN, 1901, Pl. XXI, Fig. 6 u^x^.
[3] See STEBBING 1905, p. 43—44 and BARNARD 1920, p. 381.

Pseudidothea bonnieri OHLIN, 1901.

Text fig. 27.

Pseudidothea bonnieri. OHLIN, 1901, p. 276—281, Pl. XX and XXI, Figs. 6.

Supplementary Description.

Mandibles. Cutting edge with three teeth. Lacinia (on the left mandible) with three teeth. Posteriorly from the cutting edge on each mandible there are three setae.

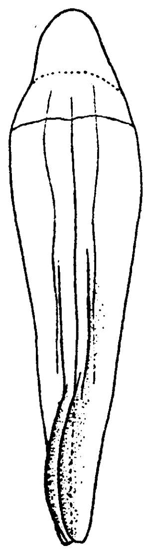

Fig. 27. *Pseudidothea bonnieri,* OHLIN. Penis, 95 ×.

Penis (Fig. 27). Distally cleft, but the two free distal lobes are situated close together. From each of the lobes there projects from the medial margin a thin flap.

Uropods[1]. »Secondary» ramus provided with a long apical seta.

Remarks. According to OHLIN (1901), possibly identical with *Idothea miersi* STUDER[2] (1884).

Localities and Material.

St. 58. South of West Falkland, lat. 52° 29′ S., long. 60° 36′ W. 197 m. Bottom temp. + 4.1°. Sand and gravel. 11/9 1902. 5 specimens (1 male, 4 females). Length of largest specimen 8.2 mm. (female with fully developed marsupium).

Distribution. Patagonia (OHLIN 1901), Falkland Islands (Sw. Ant. Exped.).
Not previously recorded from the Falkland Islands.

[1] See OHLIN, 1901, Pl. XXI, Figs. 6 u and 6 u^x.
[2] See OHLIN, 1901, p. 274.

III. Fam. **Arcturidae.**

Syn. *Astacillidae*, STEBBING, 1905.

For diagnosis see G. O. SARS, 1899, p. 86; RICHARDSON, 1905, p. 323.

This family at present includes the following genera: *Astacilla* CORDINER 1795, *Arcturus* LATREILLE 1829, *Arcturella* G. O. SARS 1899, *Antarcturus* ZUR STRASSEN 1902, *Pleuroprion* ZUR STRASSEN 1903 (= *Antares* ZUR STRASSEN 1902), *Arcturina* KOEHLER 1911, *Arcturopsis* KOEHLER 1911 (= *Arctopsis* BARNARD 1920), *Dolichiscus* RICHARDSON 1913, *Neoarcturus* BARNARD 1914, *Idarcturus* BARNARD 1914, *Neastacilla* TATTERSALL 1921, *Pseudarcturella* TATTERSALL 1921, *Parastacilla*, HALE 1924. To these genera I must add the genus *Microarcturus* (see p. 128).

The genera have been established chiefly on the basis of differences in the following morphological features:

1. Shape of body.

The fourth segment of the pereion in *Astacilla*, *Neastacilla*, *Arcturella*, *Arcturopsis*, *Arcturina* and *Parastacilla* is of a considerably greater length than in the other genera; in *Arcturella*, *Arcturopsis* and *Arcturina* it is, in the female, also much broader than the other segments. As a rule, there is a marked articulation between the fourth and fifth pereion segments; this articulation is lacking in the genera *Pleuroprion*, *Neoarcturus* and *Idarcturus*.

2. The degree of fusion between the head and the first pereion segment.

The first pereion segment has become more or less firmly fused with the head. There is but little information regarding this fusion, and the figures do not always afford reliable guidance in this respect.

As a characteristic feature of the genus *Idarcturus*, BARNARD (1914 a, p. 430) states that the head is fused with the first pereion segment, whilst the sutures are distinct laterally.

In *Pleuroprion* the head and the first pereion segment are separated laterally by a groove, which vanishes on the dorsal side (see ZUR STRASSEN, 1902, p. 687).

In the genus *Arcturus* there is at least usually a distinct suture or furrow between the head and the first pereion segment, as can be seen from figures of the different species. In *A. baffini* (SABINE) I found a very distinct dorsal furrow, passing laterally into a distinct suture; the lateral margin had an incision between the head and the first pereion segment.

In *Antarcturus* there is no suture, but generally a shallow groove. In some species the groove has vanished. This is the case also with *floridanis* RICHARDSON[1], the generic position of which is not settled; according to STEBBING (1908) it probably belongs to *Antarcturus*.

In figures of the species for the genera *Arcturella*, *Arcturopsis*, *Arcturina* and *Neoarcturus* a distinct suture is seen between the head and the first pereion segment (cf. G. O. SARS 1899, KOEHLER 1911, BARNARD 1914). On examining *Arcturella dilatata* G. O. SARS, I found that such a suture exists exactly as figured by SARS (1899).

As regards *Astacilla*, the observations are incomplete. In G. O. SARS' figures (1899) of *A. longicornis*, *arietina*, *affinis* and *pusilla* there is a distinctly marked suture between

[1] RICHARDSON, 1905, Fig. 366.

the head and the first pereion segment. On examining *A. longicornis*, I found that SARS' figure of this species gives a somewhat misleading impression. In reality the first pereion segment is firmly fused with the head, though the segment is separated from the head by a well-marked furrow, which becomes a real suture only quite close to the lateral margin.

TATTERSALL (1921) points out that in his new genus *Neastacilla* the first segment is firmly fused with the head; but as this is the case also in *Astacilla*, the characteristic cannot be taken as the basis of a generic difference between these two genera.

In *Parastacilla* a faint lateral suture is seen between the head and first pereion segment (HALE, 1924, Figs. 1 and 2).

3. Abdomen (number of distinguishable segments and length).

All segments of the abdomen are fused with one another, but generally three anterior segments are indicated, more or less distinctly, by grooves or lateral incisions. Exceptions are:

Pleuroprion with only one anterior segment, and *Idarcturus* without indication of abdominal segmentation.

A very long abdomen is characteristic of the genus *Dolichiscus*, whilst, on the other hand, *Pleuroprion* is characterized by its very short abdomen.

In *Antarcturus* the three anteriorly discernable segments are, as a rule, separated by transverse grooves, but these are sometimes very faint, the three segments thus being indicated almost solely by their transverse spine-rows. In *A. hodgsoni*[1] the usual groove between the third segment and the pleotelson is entirely absent. In *A. brunneus* var. *spinulosus* (Pl. II, Fig. 11) this groove is very faint, sometimes almost entirely missing.

4. Shape of the lateral parts of the head and first pereion segment.

One of the chief differences between *Arcturus* and *Antarcturus* is that in the former genus the lateral margins of the head and first pereion segment are expanded so as to cover the mouth-organs, when viewed laterally. A lateral anteriorly directed lobe from the first pereion segment is characteristic of typical members of the genera *Astacilla*, *Arcturella*, *Arcturopsis* and *Parastacilla*. One important difference between *Neastacilla* and *Astacilla* is that in the former genus the lateral parts of the first pereion segment are not expanded downwards and forwards so as to cover the mouth-organs in a lateral view.

5. Antennulae.

Arcturina, *Arcturopsis* and *Idarcturus* are characterized by having a flagellum provided with very few sensory filaments, all issuing from the tip of the antennular flagellum. In some Arcturidean genera the males have a greater number of sensory filaments than the females. This sexual difference characterizes *Astacilla* (see G. O. SARS, 1899) and *Neastacilla* (see TATTERSALL, 1921), but occurs also in *Antarcturus* and *Microarcturus*, viz. in *A. franklini* and *M. rugosus*.

6. Antennae.

The flagellum of the antennae exhibits two different types in the family *Arcturidae*. In the one type the flagellum is very short and consists normally of three joints, of which

[1] RICHARDSON, 1913, Fig. 1.

the terminal one is furnished with a claw. Such a short, as a rule three-jointed, flagellum is characteristic of the genera *Astacilla, Neastacilla* and *Arcturella,* and also of *Pleuroprion, Arcturopsis, Arcturina* and *Neoarcturus.* It also characterizes the genus *Pseudarcturella,* whose flagellum consists of »two joints terminated by a strong spine» (TATTERSALL, 1921) and *Idarcturus,* of which BARNARD says (1914 a, p. 431) »flagellum a little shorter than 5th joint, 4-jointed in ♂».

A long flagellum consisting of a great many joints occurs in the genera *Arcturus, Antarcturus* and *Dolichiscus.* Some of the species referred to *Antarcturus* differ, however, in having a short, as a rule three-jointed, flagellum (exceptionally two- or four-jointed). I refer these species — which also have other characteristics in common — to the separate genus *Microarcturus* (see p. 128).

In the genus *Dolichiscus* the flagellum attains an uncommonly great length.

7. Pereiopods.

The difference in length of the dactylus of the first pereiopods is an essential difference between *Arcturus* and *Antarcturus* (see ZUR STRASSEN, 1902). The first pereiopod is always shorter and broader than the three following pairs, except in the genus *Arcturina* (KOEHLER, 1911), where the first three pairs are broad and strong, similar to each other and different from the weak fourth pair.

8. First pair of pleopods in male.

The genera *Antarcturus, Dolichiscus* and *Neoarcturus* are characterized by having the posterior surface of the exopodite traversed by a diagonal furrow. In *Pseudarcturella* the exopodite is bifurcate[1].

9. The presence of a characteristic chitinous outgrowth on the ventral surface of the third and fifth pereion segments, in the male.

The presence of such a chitinous outgrowth in the male is the main characteristic of the genus *Arcturopsis*[2] and distinguishes that genus from the allied genus *Arcturella.* BARNARD (1920) points out that a small chitinous process is present on the ventral surface of the third pereion segment in the male in both *Arcturella danmoniensis* and *dilatata* as also in *Astacilla longicornis.* BARNARD therefore cancels the genus *Arcturopsis* and refers its species to *Arcturella,* with one exception: for the single species referred by KOEHLER to *Arcturopsis,* which has the process on the fifth pereion segment instead of the third, he creates a new genus *Arctopsis.* As this species has already been named *Arcturopsis* by KOEHLER there is no need for a new name.

The genus *Arcturopsis* is, however, even with the restricted definition of BARNARD (1920) not satisfactorily etablished as it is founded solely on characters of the male. Not having examined any species of *Arcturopsis* I have retained the genus, but I am of the opinion that it should be identified with *Arcturella,* as I found that the presence of a chitinous process on the fifth segment of the pereion is a common characteristic of *Antarcturus.* In *Antarcturus* this process is spine-like, not bifurcate as in *Arcturopsis*[3]; bifurcate spines, however, occur exceptionally in *Antarcturus* though they are situated only dorsally. In *Antarcturus,* the whole spine-armature (including the spine on the

[1] TATTERSALL, 1921, Pl. X, Fig. 10.
[2] KOEHLER, 1911, p. 8.
[3] KOEHLER, 1911, Figs 20 and 21.

sternite of the fifth pereion segment) undergoes a considerable individual variation in the same species, sometimes to such an extent that the characteristics of spine-armature are not entirely reliable even as distinguishing features of the species.

10. Number of marsupial plates.

The information supplied by various authors as to the number of marsupial plates in the Arcturidean genera differs greatly[1]. Only few species of different genera have hitherto been sufficiently examined in regard to the number of oostegits. Four pairs appear, however, to be the rule.

This was observed by HANSEN (1916) in regard to *Astacilla* and *Arcturella*, by RICHARDSON (1913) in respeat of *Dolichiscus*, by BARNARD (1920) in regard to *Astacilla* and by TATTERSALL (1921) as regards *Antarcturus*. *Arcturus baffini*, on the other hand, has five pairs of oostegits (HANSEN 1916). HANSEN (1916) states that in *Pleuroprion* the number varies in different species from (usually) five to only four. The number of oostegits therefore presumably cannot be employed as a generic characteristic.

A smaller number than four pairs has not been reliably demonstrated in the case of any Arcturidean species. I found four pairs of oostegits in two species of *Neastacilla*, viz. *falclandica* (OHLIN) and *magellanica* (OHLIN), in six species of *Antarcturus* and three species of *Microarcturus*.

Genus **Neastacilla** TATTERSALL, 1921.

Diagnosis. First pereion segment coalesced with the head, but separated from the head by a mere groove, which is sometimes missing dorsally. Lateral parts of the first segment of the pereion not expanded forwards and downwards. Abdomen with three segments indicated by shallow grooves anteriorly from the pleotelson. Dactylus of first pereiopod not expanded, tapering towards the end; claw missing. »Secondary» ramus of uropod furnished with a very long apical seta.

This genus was diagnosed by TATTERSALL (1921, p. 243) as follows: »The second thoracic somite is fused with the head and its lateral parts are not expanded downwards and forwards to cover partially the mouth-organs. The abdomen is unsegmented, all the segments being fused into one piece.» TATTERSALL refers to the genus only the two species *falclandica* and *magellanica* (OHLIN, 1901).

Astacilla differs from *Neastacilla* in having a short lateral suture between the head and first pereion segment (established in *A. longicornis* (see p. 116); but this is only a minute difference and perhaps varies in different species.

Moreover *Astacilla* differs from *Neastacilla* in having the lateral parts of the first pereion segment expanded. In some species of *Astacilla* these expansions — judging by the literature on the subject — appear to be indistinct or quite absent. Thus *A. mediterranea* KOEHLER[2] has no expansion of the lateral margin of first pereion segment, in e. g. *A. deshaisii* STEPHENSEN[3] this expansion is indistinct.

The degree of fusion of the abdominal segments is little known in *Astacilla*. G. O. SARS (1899) says in his diagnosis of *Astacilla:* »Metasome with only a single segment distinctly separated from the terminal one»; but it can be seen from his figures of *A. lon-*

[1] See HANSEN (1916, p. 191—192) and BARNARD (1920, p. 384—385).
[2] KOEHLER, 1911, Figs. 26 and 28.
[3] STEPHENSEN, 1915, Fig. 9.

gicornis that three anterior segments are indicated, the line between the first and second being only indicated by a lateral incision. On examining *A. longicornis,* I found that the lines between the second and third segments and between the third segment and the pleotelson figured by SARS are not sutures but mere grooves. Thus in *Astacilla longicornis,* exactly as in *Neastacilla,* all abdominal segments are fused into one piece. Otherwise the abdomen is characteristic in the four species of *Astacilla* figured by SARS (1899), as they all have a lateral incision between the first two segments, and the lateral parts of the third segment project freely. This configuration of the abdomen is also found in *A. kerguelensis* VANHÖFFEN. Of the two species *A. marionensis* BEDD. and *kerguelensis* VANH. TATTERSALL (1921, p. 243) says »that they are closely allied to *Neastacilla falclandica,* OHLIN, but the composition of the pleon will not allow them to be referred to my new genus». As has been pointed out above, the differences in the degree of fusion between the abdominal segments in *Astacilla* and *Neastacilla* is only a minute one; in my opinion it should not, for the present be taken as a generic character.

The first pereiopods are characteristic in both *N. falclandica* and *magellanica;* the dactylus is not expanded and tapers towards the setiferous end; claw is absent. In both the species above mentioned the uropods too are very characteristic, the »secondary» ramus being furnished with one long apical seta. The two characteristics just mentioned I have included in my diagnosis.

The genus as restricted by my diagnosis will include the species *falclandica* (OHLIN), *magellanica* (OHLIN) and probably *amblyura* (STEBBING). In the latter species both the first pereiopods[1] and the uropods[2] agree with *Neastacilla,* and STEBBING (1905) points out that no transverse dorsal divisions could be discerned on the abdomen.

It will perhaps be possible to refer *A. marionensis* and *kerguelensis* to *Neastacilla* when their first pereiopods and uropods have been examined. Most of the species referred to *Astacilla,* however, are imperfectly known as regards characteristics which are distinctive of the genus *Neastacilla.* It may therefore be asked whether there may not be some species intermediate between *Astacilla* and *Neastacilla,* thus perhaps rendering the genus *Neastacilla* superfluous.

Neastacilla falclandica (OHLIN, 1901).

Text. figs. 28 a—c.

Astacilla falclandica. OHLIN, 1901, p. 266—267, Pl. XX, Fig. 1.
Astacilla falclandicus. STEBBING, 1914, p. 353.
Neastacilla falclandica. TATTERSALL, 1921, p. 244, Pl. X, Figs. 1—3.

Supplementary Description.

Head and pereion. The specimens are covered with dark dots of pigment. A very shallow groove indicates the dividing line between the first segment and the head. Eyes large and black, subtriangular.

Second and third pereion segments subequal in length, each being shorter than the first segment. The lateral parts of the second and third pereion segments, as well

[1] As regards the first pereiopods of *A. amblyura,* STEBBING (1905, p. 47) states »The seventh joint has one conspicuous spine among many that are smaller».

[2] The "secondary" ramus of the uropod appears to have an additional minute seta on its upper margin (STEBBING, 1905, Pl. XI B. urp.).

as the anterio-lateral parts of the fourth pereion segment are traversed by longitudinal grooves, one groove on each side. No dorsal tuberculae on the fourth pereion segment. Seen from above the anterio-lateral angles of the fourth pereion segment are slightly projecting.

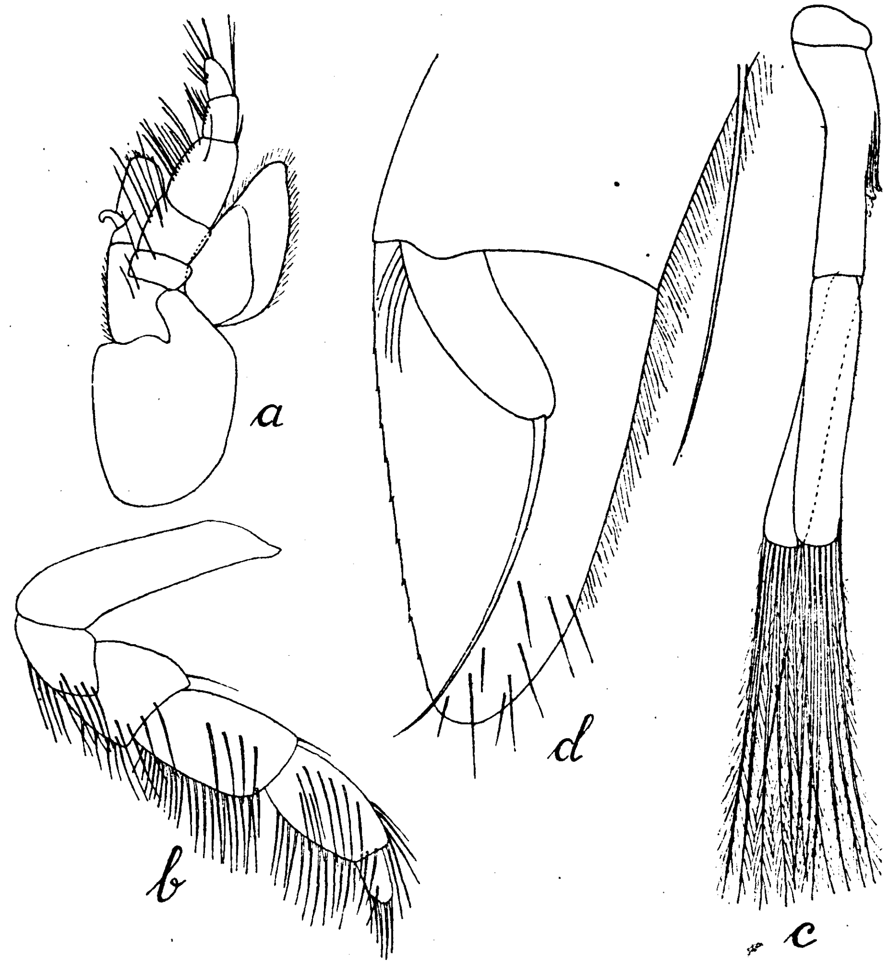

Fig. 28. *Neastacilla falclandica*, (OHLIN). a. Right maxilliped, female with a marsupium, 90 ×. b. Left first pereiopod, female, 90 ×. c. Right first pleopod, female, 90 ×. d. Tip of the right uropod, seen from the inner side, female, 280 ×.

Coxae on the second to fourth pereion segments small and subrectangular, not visible from above; those on the fourth segment almost subquadrate. Coxal plates of last three segments subtriangular.

Antennae. First peduncular joint very short, second about twice as long as the first. Third joint about half as long again as the second, fourth joint twice as long as the third, fifth joint shorter than the fourth and about as long as the second and third joints together. The short flagellum is about two-thirds the length of the last peduncular joint and consists of three joints, which decrease in length. The third and following joints of the peduncle, as well as the flagellum, are furnished with short and sparse setae.

Maxillipeds (Fig. 28 a). Normal. Coxopodite in the mature female expanded into a thin lobe, directed backwards.

First pair of pereiopods (Fig. 28 b). Dactylus characteristic, tapering towards the end and furnished with setae on its distal margin; claw absent.

First pair of pleopods, female (Fig. 28 c). Coxopodite and basipodite together slightly shorter than the exopodite and endopodite, which are subequal in length. Basipodite with five coupling-setae. For further details see the figure.

Uropods (Fig. 28 d). »Secondary» ramus two-fifths as long as the other ramus, its distal margin provided with a single very long seta, which is almost twice as long as the ramus itself.

Remarks. My specimens differ from those described and figured by OHLIN (1901) and TATTERSALL (1921) in the following details:

1. There is a faint groove between the head and the first pereion segment (not figured by OHLIN (1901, Pl. XX, Fig. 1), but observable in the figure given by TATTERSALL (1921, Pl. X, Fig. 1).

2. The first three abdominal segments are faintly indicated by grooves, as figured by TATTERSALL (1921), but not by OHLIN (1901). Just as in *Astacilla longicornis* (cf. p. 116) a furrow between the first and second segments is developed only laterally, and the third segment protrudes when seen from above laterally like a faint tooth.

3. The third peduncular joint of the antennae is somewhat longer than the second peduncular joint. OHLIN (1901, p. 266) says of the antennae: »second and third joints of about the same length»; in the figure by TATTERSALL (1921, Pl. X, Fig. 1) the third joint is somewhat longer than the second.

STEBBING (1914) is of the opinion that *N. falclandica* (OHLIN) is synonymous with *N. magellanica* (OHLIN).

N. falclandica is closely allied to *Astacilla marionensis*[1] BEDDARD, but it differs in 1) having the fourth pereion segment longer (in *marionensis* the length of the fourth segment is only about equal to the length of the head and the first three segments together); 2) in having the third peduncular joint of the antennae shorter (in *marionensis* the third peduncular joint is almost twice as long as the second); 3) and in being devoid of lateral tuberculae on the pleotelson.

Another closely allied species is *Astacilla kerguelensis*[1] VANHÖFFEN, a species which TATTERSALL (1921) assumes to be identical with *Astacilla marionensis*. This is probably not the case, because *Astacilla kerguelensis* differs from the latter species in having the fourth segment of the pereion longer and about as long as in *Neastacilla falclandica*. *Astacilla kerguelensis* differs from *Neastacilla falclandica* in being larger, attaining a size approximately double that of *N. falclandica*, in having a more distinct groove between the head and first pereion segment, in a slightly different configuration of the first three abdominal segments, and in having a lateral tuberculum on each side of the pleotelson.

Localities and Material.

St. 43. Falkland Islands, Port Louis, Greenpatch, near the bridge, lat. 51° 33′ S., long., 58° 9′ W. A few m. Off the inner border of the *Macrocystis*-zone. Stony bottom with algae. 28/7 1902. Female with empty marsupium, length 6 mm.

[1] This species probably belongs to *Neastacilla*.

St. 46. Falkland Islands, Port Louis, Carenage Creek, lat. 51° 32′ S., long. 58° 7′ W. 1 m. Sand bottom with abundant *Codium*. 9/8 1902. Ovigerous female, length 5.5 mm.

Distribution. Falkland Islands (OHLIN 1901, STEBBING 1914) New Zealand (TATTERSALL 1921).

Neastacilla magellanica (OHLIN, 1901).

Astacilla magellanica. OHLIN, 1901, p. 267—268, Pl. XX, Fig. 2.

The two specimens of this species which I have examined agree well with the figure and description by OHLIN (1901). The second and third peduncular joints of the antennae are subequal in length. The first pereiopod agrees with the same appendage in *N. falclandica.* The »secondary» ramus of the uropods, just as in *N. falclandica*, is furnished with a long apical seta.

The colour varies slightly in the species. One of the specimens is of a uniform yellowish colour, just as described by OHLIN, but with sparse brownish dots of pigment. The other specimen has a large brownish spot on the fourth segment and is brownish also on the posterior part of the abdomen, and on the uropods. Moreover the specimen is covered with minute dots of brown pigment.

Localities and Material.

St. 39. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 41′ W. 40 m. Sand and small stones. 4/7 1902. Female specimen devoid of marsupial plates, length 5 mm.

St. 53. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 47′ W. 12 m. Sand and gravel. 3/9 1902. Female specimen devoid of marsupial plates, length 4.1 mm.

Distribution. Magellan Straits (OHLIN 1901), Falkland Islands (Sw. Ant. Exped.).

Not previously recorded from the Falkland Islands.

The Antarcturus group and a revision of the genus Antarcturus zur Strassen.

Diagnosis of the group. First pereion segment completely fused with the head, separated from the head by a mere groove. All abdominal segments fused into one piece, but three segments anteriorly from the pleotelson are, as a rule, indicated by shallow grooves. Lateral parts of the head and the first pereion segment not expanded downwards and forwards to cover partially the mouth-organs. Dactylus of the first pereiopod long, forming with the propodus a strong »chela». Exopodite of the first male pleopod transformed and traversed by a diagonal furrow, which is often partially closed so as to form a canal.

The group corresponds to the genus *Antarcturus* as defined by ZUR STRASSEN (1902). It comprises the genus *Antarcturus* ZUR STRASSEN, *Dolichiscus* RICHARDSON and the new genus *Microarcturus*, which is defined below. Though they differ in some features these three genera agree with each other in many essential characters, so that they may be treated together as a group within the family.[1]

As mentioned above (p. 115), the members of the genus *Arcturus*, in contradistinction from those of the *Antarcturus* group, have a distinct furrow between the head and the first pereion segment, sometimes developing laterally into a suture.

[1] In my opinion it is a matter of taste whether they ought to be regarded as subgenera or genera. But as *Dolichiscus* has already been established as a genus, I prefer to give them generic value.

The third abdominal segment in the *Antarcturus* group is, as a rule, not as distinctly marked as the others. Exceptionally it is not demarcated at all (see p. 116). Often it differs in having its median part situated somewhat more anteriorly and marked off by distinct grooves from the lateral parts of the segment.

The genera of the *Antarcturus* group have the first male pleopod characteristically transformed and traversed by a diagonal furrow. The male pleopods in *Arcturus* have not been much studied, but a transformed exopodite of the first pleopod in the male has never been found in the genus. In *Arcturus baffini* (SABINE) I observed that the exopodite of the first pleopod in the adult male was not transformed in the manner which is characteristic of the *Antarcturus* group, and that it was similarly shaped to the corresponding pleopod exopodite of the female.

The *Antarcturus* group comprises a great many species. Most of them have been referred to the genus *Antarcturus*. To *Dolichiscus* belong two species, or according to TATTERSALL (1921) possibly only one.

I shall now make some observation on the general morphology of the species belonging to the *Antarcturus* group and discuss the characters usually taken as a basis for classification.

The segments of the pereion are approximately semi-cylindrical in transverse section, having their dorsal surfaces vaulted, their ventral surfaces flat. The first four segments are furnished with a posterior transverse ridge, which widens out laterally to embrace the whole segment. Thus anteriorly and dorsally a transverse oval area is formed, which is often traversed by a row of spines, or in non-spinous species, by a more or less distinct ridge. The lateral parts of the second, third and fourth segments are somewhat triangularly prolonged, so as to partially project laterally from the pereiopods. These lateral parts are marked off medially by a longitudinal groove. On the first pereion segment the lateral parts are very slightly, or not at all, prolonged outwardly. The first pereion segment differs frequently from the three following in having its anterior dorsal area traversed by two transverse rows of spines or by two transverse ridges.

The coxal plates on the second to fourth segments are not visible in a dorsal view. Seen from the lateral side they are sub-rectangular; seen from the ventral side they form incomplete rings around the proximal ends of the basipodites of the pereiopods; they are fused medially with the sternum. Often they are incompletely divided into two parts by a ventral incision or incomplete suture. The coxal plates of the fourth pereion segments in the ovigerous female have their posterior portions elongated in a median direction into a long prolongation. The points of these, often spine-like, prolongations meet, or almost meet posteriorly from the marsupium. The coxal plates of the second and third segments also are slightly prolonged posteriorly in the ovigerous female (Figs. 36 a, 37 d and 38 d).

On the first pereion segment the coxae are not marked off by sutures from the tergum. As a rule, there is a slight incision in the epimeral margin of the segment (Fig. 32 a) exactly as on the coxal plates of segments 2—4. This incision I deem homologous with the incisions on the coxal plates of the pereion segments 2—4. In that case the tergal border situated posterior to the incision would be homologous with the posterior portion of the second to fourth coxal plates.

The last three pereion segments are traversed by a transverse ridge across the middle. As in the anterior segments, the ridge widens laterally to comprise the whole segment, leaving anteriorly and, in a slight degree posteriorly, a smooth area in the middle.

The coxal plates of the last three segments are large and subtriangular and are marked off by lateral sutures from the tergites.

The development of coxal plates in the *Antarcturus* group is thus rather similar to that in *Macrochiridothea* (see p. 109); it differs in being devoid of delimited coxal plates on the first segment, and in having the coxal plates of the last three segments marked off from the tergum by lateral sutures (not by dorsal).

The above described morphological features of the body are characteristic of the *Antarcturus* group as a whole. In details there are considerable differences in the different species. The most easily discernable of these differences are those of the spine-armature, though as will be shown below, in this respect also the spinous species agree with one another in their main features.

Only seldom are the two terminal spines situated caudally on the pleotelson lacking (e. g. *Microarcturus digitatus*, see p. 167). These, often very large, spines occur also in species where all other real spines are wanting (e. g. *Antarcturus antarcticus*) and where, instead, the body is granulate. Some species are provided with only a few large tuberculae or spines (e. g. *A. americanus*). In most of the species the body, however, is extremely spinous.

Hodgson (1910) distinguishes on the body (in *A. franklini*) three pairs of spines, one pair of dorsal spines, one dorso-lateral and one lateral pair. This spinearrangement occurs in all spinous or tuberculated species, though they may usually in addition be covered with a number of spines or tuberculae, these being, however, usually smaller than the three main pairs of spines. The typical spinearrangement is the following: dorsally on the head there are four spines, situated so as to form the points at the angles of a square. The posterior pair of these spines is often wanting, but in such cases it is, as a rule, indicated by faint tuberculae. Often there is a small spine at the anterio-lateral angle of the head. The posterior ridge of the first four pereion segments is provided on either side of the middle line with one dorsal, one dorso-lateral, and one lateral spine. The lateral spines are situated on the »pleurae».

The same spines occur on the last three pereion segments, one dorsally, one dorsolaterally, and one laterally, situated on either side of the middle, and on the abdomen the larger spines have the same arrangement. But while the lateral spines of the first four segments are situated on the »pleurae», on the last three segments they are situated on the coxal plates. The same arrangement (of tuberculae) was described in *Macrochiridothea stebbingi* (see p. 108). In the spinous species the body is thus traversed by six longitudinal rows of spines. This arrangement is especially prominent in *Microarcturus digitatus*, in which species all the spines on the first five pereion segments are strongly developed, except the dorsal pair on the fifth segment.

In the classification of the species appertaining to the *Antarcturus* group the differences in spine-armature and other differences in the sculpturing of the body have played a leading part. In the few cases where diagnoses of the species have been given (Ohlin 1901, Hodgson 1910) the distinctive characteristics have, almost exclusively (Hodgson 1910), or at any rate to a large extent (Ohlin 1901), been based on the spine-armature or other external sculpturing.

Differences of spine-armature and sculpturing of the body have, however, a very limited value for purposes of classification. As pointed out above, the arrangement of spines is similar in its main features in all the spinous species. In addition, there is considerable individual variation of the spine-armature within the different species. RICHARDSON (1913, p. 11) states that in one specimen of *A. coppingeri* the terminal spines were wanting and of the species *A. furcatus* var. *polaris* the same writer says (p. 10): »Il y a par conséquent, dans cette espèce, une tendance à la variation dans la taille, la position et le nombre des épines.» As regards the additional spines on the body, RICHARDSON (1913) and TATTERSALL (1921) state with reference to *Antarcturus furcatus* var. *polaris* that the small spines increase in number with age.

In all species, in regard to which I have had access to a large number of specimens. I found a considerable variation in the arrangement, number and size of the small spines or tuberculae, even in individuals subequal in size. The occurrence of a small spine at the anterio-lateral angle of the head (a distinction given by HODGSON (1910) as a specific characteristic of *A. franklini*) is liable to individual variation. Thus in *Microarcturus stebbingi* (p. 159) I found a spine in some specimens, whilst in others there was a tuberculum, which in other cases again was entirely missing. In this species the large spines vary even in specimens subequal in size, there being in some specimens only faint tuberculae, in others distinct spines (see p. 159). A similar variation was recorded by BARNARD (1925) in *Microarcturus similis*. This author states (p. 396): »Thus the development of the granules varies, as may also their shape; in some young ♀♀ all the granules are sharply pointed, in other specimens they are all blunt, so that at first sight one would suspect there to be two species[1].»

A still more noticeable variation in the spine-armature has been mentioned as occurring in *Antarcturus franklini*, a species which was described by HODGSON (1902 and 1910) and has since been recorded by RICHARDSON (1913) and TATTERSALL (1921). HODGSON (1910) and TATTERSALL (1921) state, that the females in *Antarcturus franklini* are markedly spinous, whilst in the male sex all spines on the pereion are lacking. After examining material of *A. franklini* at the British Museum, I came, however, to the conclusion that the males previously described as *franklini* must belong to another species, most probably to *A. adaraneus* (HODGSON) (see p. 149).

The differences in spine-armature in different specimens within the same species is only in a very small degree due to sex. Some slight differences in spine-armature between males and females I found, however, to be constant in *Antarcturus franklini*, *Microarcturus stebbingi* and *rugosus*. In these three species the males always differ from the females in having a smaller number of small additional spines on the pereion.

Another character, which varies in individuals of the same species is the length of the fourth segment of pereion (e. g. in *A. furcatus*, p. 130).

Though it slightly varies in length in different individuals, the fourth segment is sometimes consistently longer in the males than in the females. This I found to be the case in *Antarcturus furcatus*, *franklini* and *granulosus* and in *Microarcturus stebbingi*.

[1] A similar considerable variation in spine-armature was early found in the allied genus *Arcturus*: OHLIN (1895) points out that individuals of *Arcturus baffini* vary as regards their spine armature from being strongly spinous to tuberculated. On the basis of his observations OHLIN merged two previously established species into the single species *Arcturus baffini*.

The antennae differ considerably in different species in the length and number of joints of the flagellum. Either the flagellum is long and consists of a great many joints, or short and consist, as a rule, of only three joints.

The mouth-organs are similar in the different species. The mandibles have not been described or figured in detail. The incisive part of the left mandible (Fig. 32 c) has two teeth, a dorsal and a ventral one, and two other teeth in a row laterally from the dorsal tooth. The lacinia is provided with three brown-coloured proximally fused teeth. Dorsally from the lacinia there is a projecting area of thin membranous skin carrying setae. The molar tubercle is strong and subquadrate in a transverse section and, as a rule, dentated distally. In the right mandible (Fig. 32 d) a lacinia is missing. The projecting area of membranous skin behind the incisive part is large and provided with a number of digitiform processes, of which the first three are the strongest, whilst the others are setiform. Since the ventral part of the chitinous projection with its three non-setiform points is thicker than the dorsal part, this anterior part may perhaps correspond to the lacinia on the left mandible. This view is supported by the fact that the three ventral processes of the right mandible are sometimes brown-coloured, as is occassionally also the ventral margin of the projecting area.

The maxillipeds of the ovigerous female in all the species I examined have the coxopodite posteriorly expanded into a thin lobe directed backwards (see Fig. 32 f). In all specimens examined the marsupial plates were four in number (see p. 118).

As has been pointed out above, differences in spine-armature and sculpturing are of very little value for purposes of classification. On the other hand, distinguishing characteristics other than those based on the spine-armature and sculpturing have seldom been found. This is, however, due to the incompleteness of the descriptions. In *Antarcturus* the pereiopods have been incompletely described; the length of the claws is only rarely to be seen from the figures. The pleopods are still incompletely described, and the uropods have been totally neglected.

An examination of the appendages in *Antarcturus* and *Microarcturus* reveals the existence of more important characteristics, more reliable as bases for classification than the spine-armature and sculpturing. The pereiopods, for example are very dissimilar in different species, there being great differences especially in the length of the dactylus and its claws.

As regards the pleopods, the transformed exopodite of the first male pleopod was for the first time observed by BARNARD[1] (1914) in *A. kladophorus*. TATTERSALL[2] (1921) makes out in detail this transformation in *A. furcatus*. He points out that the exopodite is transformed in a similar way in all species of *Antarcturus*[3] and *Dolichiscus*[4] which he examined. All species of *Antarcturus* and *Microarcturus* examined by me have the exopodites transformed in the adult male. I am therefore of the opinion that the transformation of the first male pleopod in the male sex is a character which probably characterizes both these genera.

In details, however, the exopodite of the first male pleopod is dissimilar in the different species. But also the first pleopods in the female, which agree with those of the

[1] BARNARD, 1914, Pl. XVIII, B. plp. 1.
[2] TATTERSALL, 1921, Pl. VIII, Figs. 1 and 2, Text fig. 1 A.
[3] *Antarcturus furcatus, furcatus* var. *polaris*, (?) *adaraneus* (regarded by TATTERSALL, 1921, as the male of *franklini*), *hiemalis*, *lilliei* and *horridus*.
[4] *Dolichiscus meridionalis*.

male (except that the exopodite has not been transformed), are characters which will be found useful for classification. The basipodite of the first pleopods, for example, differs in regard to the spines on its lateral margin, which differ in size, shape and number in the different species. In the species of *Microarcturus* examined by me, the endopodites of the first pleopods likewise differ, being reduced in size in varying degrees. The first pleopods, especially those of the males, are thus very useful characters for purposes of classification. I observe likewise that the first male pleopod in *Microarcturus stebbingi* was soon typically developed in an immature male, which was lacking in spine-armature and in which the last pereiopod not yet fully out-grown.

The second to fifth pairs of pleopods differ very slightly; as a rule, not at all, in the the different species.

The uropods, on the other hand, serve as a basis for a reliable diagnosis of the species. The size of the exopodite and the number of its apical setae differs in different species. It is a remarkable fact that in one of the species, *Microarcturus digitatus* (p. 171), the "secondary" ramus is absent, a feature which only otherwise occurs in the family *Idotheidae* of the Valvifera.

The penis is, as a rule, similarly shaped in the different species; usually it consists of a chitinous plate which tapers towards the rounded end (Fig. 35 b). In *A. americanus* its shape is divergent (see Fig. 31 e). BARNARD (1925) points out that the penis also in *Microarcturus similis* has a characteristic shape, being distally bilobate (see BARNARD 1925 Fig. 1 pen.).

STEBBING (1908) enumerates the species of *Antarcturus* known up to that date, in a list containing 29 species. To this list he adds with some hesitation the species *floridanus* (RICHARDSON); at the same time he establishes his new species *kladophorus*. Since 1908 the following species have been added: *antarcticus* BOUVIER (1910), *hiemalis* HODGSON (1910), *hodgsoni* RICHARDSON (1913), *gaussianus* and *drygalski* VANHÖFFEN (1914), *lilliei* and *horridus* TATTERSALL (1921), *similis* BARNARD (1925), *belgicae* and *acanthurus* MONOD (1925) and *hirticornis* MONOD (1926).

To the genus *Dolichiscus* only two species have been referred, viz. *pfefferi* RICHARDSON (1913) and *meridionalis* (HODGSON, 1910); TATTERSALL (1921) suspects that these two species are identical.

The genus *Dolichiscus* is characterized by having the antennae provided with a very long flagellum (it being almost twice as long as the last peduncular joint), and by its very long abdomen where the first segment, in particular, is very elongated. In all other characteristics given in the diagnosis of the genus by RICHARDSON (1913) *Dolichiscus* agrees with *Antarcturus*. Thus the characters »Tête unie au premier segment du thorax. Sur la face ventrale du corps se voient de chaque côté un long processus de l'article basal des pattes de la quatrième paire, processus qui se rencontrent presque au centre» (RICHARDSON, 1913, p. 13—14) are likewise characteristic of *Antarcturus* and *Microarcturus*, the last feature being characteristic of the ovigerous female in both genera.

Just as *Dolichiscus* deviates from *Antarcturus* in its long abdomen and long antennal flagellum, so do other species, previously referred to *Antarcturus*, deviate in an exactly the reversal way. These divergent species are provided with short antennae and especially with very short antennal flagellum, consisting, as a rule, of only three joints (exceptionally two or four), a characteristic which is a generic distinction of *Pleuroprion* and *Astacilla* and some other allied genera (see p. 117). The abdomen in these species is short, reminiscent of that in *Pleuroprion*, but differs in having three distinguishable, though fused, segments anterior to the pleotelson. All the species are moreover, like *Pleuroprion*, small forms. One of the species, *simplicissimus* (WHITELEGGE) is still more like *Pleuroprion;* of this species WHITELEGGE (1904, p. 406) says that it is, exactly as *Pleuroprion* »apparently without the usual power of flexure between the fourth and fifth segments of the peraeon».

For the species hitherto referred to *Antarcturus*, which, owing to their short abdomen and short three-jointed flagellum of the antennae, show a distinct resemblance to the genus *Pleuroprion*, I propose the new genus:

Microarcturus.

Diagnosis. Antennae shorter than the body, with a short flagellum consisting of three joints (occasionally two or four). Abdomen short, never longer than the last four pereion segments together, (pleotelson posteriorly pointed or cleft). Small forms.

In accordance with the diagnosis of *Microarcturus*, the genus *Antarcturus* may be confined to comprise forms which have the antennae at least equal in length to the body, the flagellum of the antennae in adult specimens, at least consisting of five joints, and the length of the abdomen not exceeding the length of the last five segments of the pereion together. As a rule, the length of the antennae is greater in *Antarcturus* than the length of the body, and the flagellum consists of a greater number of joints than five. In *Microarcturus*, on the other hand, the abdomen is, as a rule, still shorter than described in the diagnosis. The three species of *Microarcturus* which I have examined agree with one another in yet another respect. They all have the endopodite of the first pleopod in both male and female more or less reduced in size; its distal margin is furnished with sparse setae or is even smooth, whilst its outer and inner margins are always devoid of setae.

To the new genus *Microarcturus* the following species should be referred: *stebbingi* BEDDARD (1886), *oculatus* BEDDARD (1886), *patagonicus* OHLIN (1901), *kophameli* OHLIN (1901), *simplicissimus* WHITELEGGE (1904), *nodosus* WHITELEGGE (1904), *serratulus* WHITELEGGE (1904), *similis* BARNARD (1925), *acanthurus* MONOD (1925), *hirticornis* MONOD (1926), and the new species *rugosus* and *digitatus* which are described below. To this list should probably be added the species *dentatus* and *alcicornis* WHITELEGGE (1904), in regard to which the number of joints in the antennal flagellum is unknown.

The following are the remaining species of the genus *Antarcturus: coppingeri* (MIERS, 1881) *furcatus* (STUDER, 1882) with its variety *polaris* (HODGSON, 1902), *glacialis* (BEDDARD, 1884), *spinosus* (BEDDARD, 1884), *anna* (BEDDARD, 1884), *cornutus* (BEDDARD, 1884), *spinifrons* (BEDDARD, 1884), *purpureus* (BEDDARD, 1884), *abyssicola* (BEDDARD, 1884), *myops* (BEDDARD, 1884), *studeri* (BEDDARD, 1884), *americanus* (BEDDARD, 1884), *tenuispinis* (BENEDICT, 1898), *multispinis* (BENEDICT, 1898), (?) *floridanus* (RICHARDSON, 1900), *caribbaeus* (RICHARDSON, 1901), *adaraneus* (HODGSON, 1902), *franklini* (HODGSON, 1902), *oryx* ZUR STRASSEN (1902), *kladophorus* STEBBING (1908), *antarcticus* BOUVIER (1910), *hiemalis* HODGSON (1910), *hodgsoni* RICHARDSON (1913), *gaussianus* VANHÖFFEN (1914), *drygalski* VANHÖFFEN (1914), *lilliei* TATTERSALL (1921), *horridus* TATTERSALL (1921), *belgicae* MONOD (1925).

To these 28 species the new species *A. granulosus*, described below (p. 153) should be added.

Genus **Antarctures** zur Strassen, 1902.

Diagnosis[1]. First pereion segment coalesced with the head, but separated from it by a shallow groove. Lateral margins of the first pereion segment not prolonged downward and forward; the mouth-organs are visible in a lateral view. Abdomen with three segments anterior to the pleotelson, which are indistincly marked off by shallow grooves. Length of abdomen not exceeding the length of the last five pereion segments together. Antennae at least equal in length to the body; its flagellum in adult specimens consisting of at least five joints. First pereiopods prehensile; carpus small, subtriangular; dactylus long and narrow. Exopodite of the first pleopod in the male provided with a diagonal furrow on its posterior surface.

Antarcturus furcatus (Studer, 1882).

Text. fig. 29.

Arcturus furcatus. Studer, 1884, p. 12—15, Pl. I, Figs. 3 a, b, c, d; Beddard, 1886, p. 85—86, Pl. XXV, Figs. 6, 7.

Antarcturus furcatus. zur Strassen, 1902, p. 686; Vanhöffen, 1914, p. 519; Tattersall, 1921, p. 238—240, Pl. VIII, Figs. 1, 2.

Diagnosis. Body densely covered with spines, most of them small. Dorsal surface of the head with a pair of anterio-laterally directed large spines, situated medially from the eyes; posteriorly from these spines there is a transverse row of small spines. First four pereion segments posteriorly with a pair of large spines on the pleurae and with a pair of dorso-lateral spines, which sometimes are almost as long as the pleural spines. Anteriorly the segments are provided with one or more transverse rows of small spines. Fourth pereion segment subequal in length to the third, but varying in length in different specimens. Ventral surface of seventh pereion segment with a spine or tuberculum in the middle line. Pleotelson coverèd with small spines, of which a pair of terminal spines are always the largest. Tip of pleotelson between the terminal spines slightly rounded, its distal margin provided with spines. Antennae in adult specimens somewhat longer than the body, in young specimens subequal in length to the body. Second to fourth pereiopods always with a spine at the upper distal angle of the basipodite, ischium, merus and carpus and an additional spine on the upper margin of the basipodite; propodus slightly shorter than the carpus; dactylus slightly more than half as long as the carpus; its dorsal claw very short. Last three pereiopods with dactylus a little less than three fourths the length of the propodus, its dorsal claw short. Basipodite of the first pair of pleopods with 7—10 large lateral spines; exopodite in the male subrectangular, of a uniform width, only very slightly curved, with outer margin slightly concave and inner margin slightly convex; diagonal furrow narrowing towards its distal end; latero-distal angle of the exopodite prolonged into a rounded lobe, issuing from the anterior side; distal margin and distal half of the inner margin of the exopodite furnished with long plumose setae; endopodite in both male and female about as large as the exopodite and furnished with long plumose setae. Lateral ramus of the uropods longer than broad, subtriangular and pointed, more than twice as long as the »secondary» ramus, which has its distal margin provided with four setae.

[1] Cf. zur Strassen (1902, p. 683—686), Stebbing (1908, p. 52—53).

Supplementary Description.

Body and spine-armature.

Pereion. Ventral surface of the fifth pereion segment in the middle with a spine directed ventrally. Ventral surface of the seventh pereion segment posteriorly in the middle with a spine directed backwards.

Fourth pair of coxal plates in the ovigerous female posteriorly prolonged into medially directed spine-like projections, each furnished with a spine on its ventral margin. In the male the coxal plates of the fourth segment are fused ventrally with the sternum; the ventral surface of the fourth segment is furnished with two spines, probably corresponding to the spines on the spine-like prolongations of the coxal plates in the ovigerous female.

Abdomen. Ventral surface of the first abdominal segment anteriorly with two transverse parallel rows of small spines.

Variation.

The small additional spines on the body vary greatly in number in different specimens, being —, as was pointed out by RICHARDSON (1913) and TATTERSALL (1921) in regard to the var. *polaris* (HODGSON) — less numerous in smaller specimens. The length of the dorso-lateral pairs of spines on the pereion vary, even in specimens subequal in length and from the same locality. Thus in a female with marsupium, 35 mm. in length, they were scarcely longer than the other small spines covering the surface, whilst in another female specimen likewise with marsupium and 25 mm. in length, they were almost as long as the large pleural spines. As a rule, they are a little longer than the small additional spines. The pleotelson has often a pair of dorso-lateral spines longer than the other spines, except the terminal pair; this variation occurs in specimens subequal in size and from the same locality. The length of the terminal pair of spines on the pleotelson likewise varies, being also from $^1/_6$ to $^1/_9$ the length of the specimen.

The length of the fourth segment varies in different specimens. As a general rule, however, in the adult female, it is subequal in length to the third; in the adult male I found it always longer than the third[1]. In the adult female it varied in length, being sometimes longer, sometimes shorter than the third segment. In immature male specimens the third and fourth segments are subequal in length.[2]

Appendages.

Antennulae. Not quite reaching the distal end of the third peduncular joint of the antennae. Second peduncular joint the shortest. Flagellum about $^1/_5$ longer than the second and third peduncular joints together.

Antennae. In adult specimens somewhat longer than the body; in immature specimens subequal in length to the bodv. Second and third peduncular joints with a row of spines on the caudal (lateral) margin; the spines at the distal angles of the joints being the longest. Flagellum consisting of 9—11 joints (in adult specimens), the first joint long and corresponding to three or four joints.

Maxillipeds. Distal margin of the distal epipodite narrowly rounded. Coxopodite in the ovigerous female in the usual way expanded into a posteriorly directed thin and rounded lobe, which has its inner margin provided with setae.

[1] Cf. STUDER, 1884, Fig. 3.
[2] Cf. TATTERSALL, 1921, Pl. VIII, Figs. 3 and 4.

First pair of pereiopods. Carpus, propodus and dactylus densely covered with long setae, those on the propodus two-pointed and furnished with two rows of short triangular sub-branches. Dactylus approximately two-thirds as long as the propodus. Length of the dorsal claw not quite one-third the length of the dactylus. Ventral claw less than half as long as the dorsal one. Between the claws there is one seta.

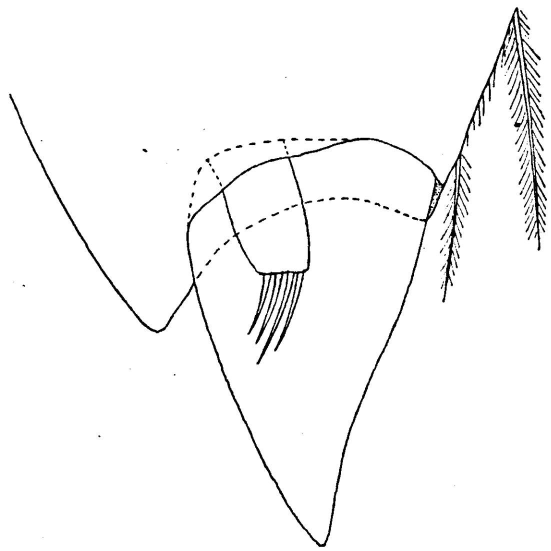

Fig. 29. *Antarcturus furcatus* (STUD.). Tip of the right uropod, seen from the inner side, 95 ×.

Second, third and fourth pairs of pereiopods. Basipodite increasing, but propodus decreasing in length from the second to the fourth pereiopod. Basipodite, ischium, merus and, as a rule, also the propodus, with a spine at its upper distal angle, the basipodite being furnished also with an additional long spine on the upper margin and a few other small spines or tuberculae. Propodus on the second to fourth pereiopods slightly shorter than the carpus, being on the fourth pereiopod about one-third shorter than the carpus. Dactylus slightly more than half the length of the propodus. Length of the dorsal claw (on the second pereiopod) about one-fourth the length of the dactylus; the ventral claw is about one-fourth as long as the dorsal one.

Fifth, sixth and seventh pairs of pereiopods. Basipodite decreasing in length from the fifth to the seventh pereiopod, its upper margin with numerous small spines. Ischium and merus with their upper distal angles prolonged into spines. Dactylus slightly less than three-fourths as long as the propodus. Length of the dorsal claw about one-fifth the length of the dactylus and about five times as long as the minute ventral claw.

First pair of pleopods. Coxopodite about twice as broad as it is long. Basipodite with a lateral row of 5—7 large spines plus 2—5 smaller spines; its inner margin with 11—13 coupling-setae. Exopodite and endopodite in the female large and subequal in length, provided with long plumose setae on the distal, lateral and inner margins.

Exopodite in the adult male subrectangular, of a uniform width, slightly curved, with inner margin slightly convex and outer margin slightly concave, distal margin convex. Inner proximal angle provided with short »hairs». Distal margin and distal part of the inner margin furnished with long plumose setae, lateral margin with long branchless setae. Diagonal furrow narrowing towards its distal end, almost closed at its mouth. At the latero-distal angle of the exopodite anteriorly from the mouth of the diagonal furrow there is a characteristic projecting rounded lobe.[1] Laterally from the proximal end of the furrow there is a shallow cavity on the posterior surface. Endopodite in the male exactly similar to that in the female.

Second pair of pleopods. Coxopodite short; basipodite wider than it is long, its lateral margin lacking spines, but provided with some plumose setae. Exopodite reaching a little further back than the endopodite. Penial filament (in a 32.5 mm. long specimen) reaching the distal margin of the exopodite.

Third pair of pleopods. Exopodite with a small incision in its lateral margin (as in *A. franklini* (HODGSON), cf. Fig. 33 d); the lateral margin is furnished with some short setae (of the plumose type, but only provided with sparse and short sub-branches).

Fourth and fifth pairs of pleopods. Exopodite and endopodite similar to each other, margins with sparse and short setae.

Uropods (Fig. 29). Lateral surface of the sympodite with scattered spines. Lateral ramus longer than it is broad, with a pointed end, and about three times as long as the small, »secondary» ramus, which is furnished with four branchless setae.

Remarks. TATTERSALL (1921, p. 239) states that *A. furcatus* (STUD.) »is very closely related to *A. polaris* (HODGS.), but may be distinguished from that species by the different armature of the body, the longer second antennae and the longer terminal spines on the abdomen». It may be inferred from the descriptions of *A. furcatus* by STUDER (1884) and BEDDARD (1886), compared with the figures of the same species (STUDER 1884), that in *furcatus* the pairs of dorso-lateral spines on the first four pereion segments attain a considerable size, exactly as in *polaris*. I found that this pair of spines on the first four pereion segments was liable to a considerable degree of variation, being in some specimens almost as large as the pleural pair, whilst in other specimens they were scarcely longer than the small surrounding spinules (see p. 130).

Even the lengths of the terminal spines on the pleotelson vary to a degree which makes it impossible to take the length of these spines as basis of distinction between *furcatus* and *polaris*.

As regards the antennae they are always longer than the body in adult specimens of *furcatus*; in young specimens they are, however, subequal in length to the body. TATTERSALL (1921, Pl. VIII, Figs. 3 and 4) figures a young specimen of *polaris* having in one figure the antennae shorter, in the other slightly longer, than the body. Small specimens of *furcatus* of about the same length as the specimen figured by TATTERSALL agree well with one of his figures and differ only from his other figure in having the antennae slightly longer. HODGSON (1902) figures his species *polaris* with the antennae appreciably shorter than the body.

The first pleopods and the uropods are very characteristic in *A. furcatus*. In the structure of these appendages, as well as in the length of the joints of the pereiopods and their claws, both the young and the adult specimens of *furcatus* agree with one another.

[1] TATTERSALL, 1921, Pl. VIII Fig. 2.

On comparing the pereiopods and the first male pleopods in *furcatus* and in specimens of *polaris* from the British Antarctic Expedition, I could find no differences. The uropods also are very similar in *furcatus* and *polaris,* the only difference being that in *polaris* the »secondary» ramus is slightly longer. In the specimen of *polaris* examined

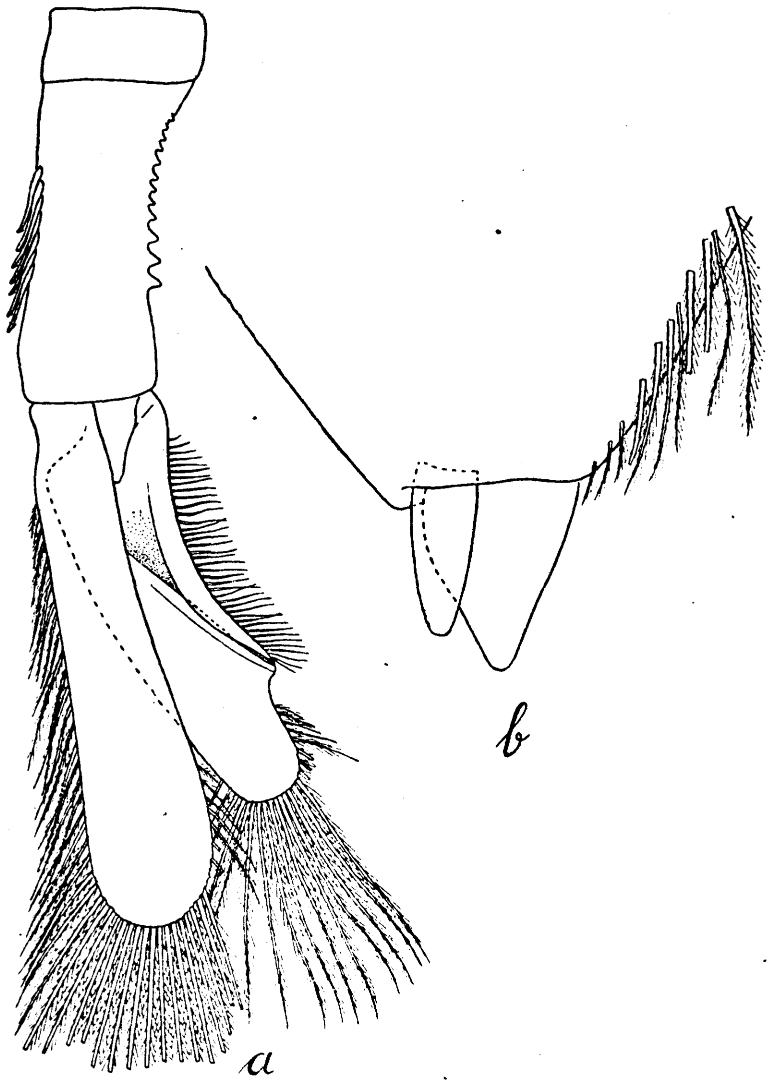

Fig. 30. *Antarcturus spinosus* (BEDD.). a. Right first pleopod of an adult male, from the caudal side (specimen from the »Challenger» Expedition), 15 ×. b. Tip of the right uropod, seen from the inner side (ovigerous female from the »Challenger» Expedition), 35 ×.

it was about half as long as the lateral ramus. The differences between *furcatus* and *polaris* are thus very small, the latter being characterized only by its slightly shorter antennae and by the slightly greater length of the »secondary» ramus of the uropod. In my opinion, therefore, *polaris* should be regarded as a variety of *furcatus.*

I found, on the other hand, that the species *spinosus* (BEDDARD)[1], which is rather similar in its spine-armature to *furcatus*, is easily recognized by its characteristic uropods and first male pleopods (Fig. 30 a and b).

Localities and Material.

St. 6. Graham Region, S. W. of Snow Hill Island, lat. 64° 36′ S., long. 57° 42′ W. 125 m. Stones and gravel. 20/1 1902. 9 specimens, males and females. Fourth pereion segment somewhat longer than the third. Dorso-lateral pair of spines on the first four pereion segments as a rule long, but varying in length, being, in the largest (35 mm. long specimen) not much longer than the surrounding small spines. Terminal pair of spines on the pleotelson short, slightly more than half as long as the pleotelson; in some of the specimens a pair of dorso-laterally situated spines on the pleotelson are longer than other spines on the pleotelson, except the terminal pair. Length of the largest specimen 35 mm (female with a fully developed marsupium).

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. ÷ 2.05°. Gravel and sand. 10/4 1902. 2 specimens, female with fully developed marsupium and immature specimen. The mature female is 37 mm. in length. Its fourth pereion segment is very slightly longer than the third. Dorso-lateral pair of spines on the first four perion segments not much longer than the small surrounding spines. Terminal pair of spines subequal in length to the pleotelson. A pair of dorso-lateral spines on the pleotelson are longer than the other spines, except the terminal pair. The immature specimen is 11 mm. in length. It agrees with the figure by TATTERSALL (1921, Pl. VIII, Fig. 4.) Antennae slightly longer than the body, no small spines in a transverse row posteriorly on the head. Dorso-lateral pair of spines on the first four pereion segments almost as long as the pleural pair of spines. Pleotelson with a pair of dorso-lateral spines longer than the others, except the terminal pair.

St. 20. South Georgia, Antarctic Bay, lat. 54° 12′ S., long. 36° 50′ W. 250 m. Small stones. 6/5 1902. 2 male specimens. Length of largest specimen 32.8 mm. Fourth pereion segment slightly longer than the third. Dorso-lateral pair of spines on the first four pereion segments not very long, but distinctly longer than the surrounding small spines. Terminal spine-pair on the pleotelson not much shorter than the pleotelson. Pleotelson with a pair of dorso-lateral spines very slightly longer than the other small spines.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. ÷ 1.5°. Clay, also some algae. 14/5 1902. 2 immature specimens, the longest 11.5 mm in length. Agreeing with the immature specimen of var. *polaris* figured by TATTERSALL (1921), except that the antennae are distinctly longer than the body, being 14 mm in the specimen of a length of 11 mm. No transverse row of spines posteriorly on the head. Dorso-lateral spines on the first four pereion segments long. A pair of dorso-lateral spines on the pleotelson longer than the other spines, except the terminal pair.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. ÷ 1.45°. Gray clay with a few stones. 5/6 1902. 5 specimens, males, females and immature specimens. Largest specimen, an adult male, 36 mm in length. It has the fourth pereion segment subequal in length to the third; first four pereion segments provided with about two transverse rows of small spines on the posterior transverse elevation. One sub-adult female 28.5 mm in length has long dorso-lateral spines on the first four pereion segments. A young specimen 21.5 mm in length has the fourth segment slightly longer than the third; the dorso-lateral spines on the first four pereion segments are long.

Distribution. Shag Rock Bank (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.), Kerguelen (STUDER 1884, BEDDARD 1886, ZUR STRASSEN 1902, VANHÖFFEN 1914), Heard Island (BEDDARD 1886), Antarctic Ocean SSE of Kerguelen lat. 65° 42′ S. long. 79° 49′ E. (BEDDARD 1886), Victoria Land (TATTERSALL 1921), Graham Region (Sw. Ant. Exped.).

The species is here recorded for the first time from Shag Rock Bank, South Georgia and Graham Region.

Distribution of the var. *polaris:* Victoria Land (HODGSON 1902, TATTERSALL 1921), Ross Sea (TATTERSALL 1921), Graham Region (RICHARDSON 1913).

Antarcturus furcatus has been found at varying depths, from 10 m (VANHÖFFEN 1914) up to 1675 fathoms (by the Challenger Expedition, BEDDARD 1886).

The var. *polaris* has not been found at a greater depth than about 300 fathoms (TATTERSALL 1921). RICHARDSON (1913) records it from a depth of 200—460 m.

[1] Some specimens of *spinosus* were examined by me at the British Museum.

Antarcturus americanus (BEDDARD, 1886).

Fext. fig. 31 a—g.

Arcturus americanus. BEDDARD, 1886, p. 104—105, Pl. XXIII, Figs. 5—8; BENEDICT, 1898, p. 48; OHLIN, 1901, p. 269—270, Pl. XX, Fig. 3.

Diagnosis. Body very granular, provided with a pair of small spines on the head and two dorsal spines on each pereion segment. Ventral surface of fifth pereion segment with a spine directed downwards. Ventral surface of seventh pereion segment spineless. Dactylus of the second, third and fourth pereiopods about half as long as the propodus, its dorsal claw only about one-third as long as the dactylus. Seventh pereiopod (especially its last two joints) much stronger in the adult male than in the female. Penis basally broad and sub-rectangular, narrowing abruptly at about two-thirds of its length, where the lateral margins make an incision; distal part of the penis, narrow, tapering towards the rounded end. Lateral margin of the basipodite of the first pleopod in the male with a row of seven spines, in the female with ten spines; exopodite with a very narrow furrow, and with its inner proximal angle smooth and irregularly rounded. Lateral ramus of the uropods distally rounded, slightly more than twice as long as the »secondary» ramus, which is distally truncate and furnished with three ciliated setae.

Supplementary Description.

Coxal plates. Those on the second, third and fourth segments markedly granulate; those on the second and third segments are posteriorly produced into a small triangular elongation directed inwards and downwards. The coxal plates of the fourth pereion segment in the ovigerous female are elongated posteriorly into very long and markedly granulate triangular processes, directed inwards and supporting the marsupium. In the male these processes of the fourth coxal plates are missing and the coxal plates are posteriorly fused with the sternum.

Antennulae. Reaching approximately to the third peduncular joint of the antennae. First joint broad and dorsally granulate, ventrally flat and smooth. Second and third joints smooth and narrower than the first, together about as long as the first joint and subequal in length to the flagellum.

Antennae. First peduncular joint short and not visible from above. Second joint short, broader than the first, markedly granulate, ventrally with one rostral and one caudal triangular distal projection. Third joint about twice as long as the second, dorsally and laterally granulate. Fourth joint about two and a half times as long as the third. Fifth joint very slightly shorter than the fourth. The flagellum is only about one-third the length of the last peduncular joint (in a female having a length of 21.8 mm.).

First pair of pereiopods. Dactylus apart from the claw, not quite two-thirds the length of propodus, and provided with dense and long two-pointed setae, most of the setae furnished with two rows of short triangular sub-branches. Tip of dactylus with one long dorsal and one short ventral claw, the dorsal claw being only about one-fifth longer than the dactylus. Between the claws there are two short setae.

Second pair of pereiopods. Basipodite dorsally and caudally with small spines; ischium, merus and carpus with a dorsal row of small spines. Carpus and propodus subequal in length. Dactylus about half as long as the propodus. Tip of dactylus with three claws, a long dorsal and two short ventral ones; between the claws there are two setae. The dactylus is about three and a half times as long as the dorsal claw.

Third pair of pereiopods (Fig. 31 a). Dorsal surface of the basipodite, ischium, merus and carpus (usually also of the propodus) provided with small spines, varying, however, greatly in different specimens. Propodal joint slightly shorter than the carpus. Dactylus

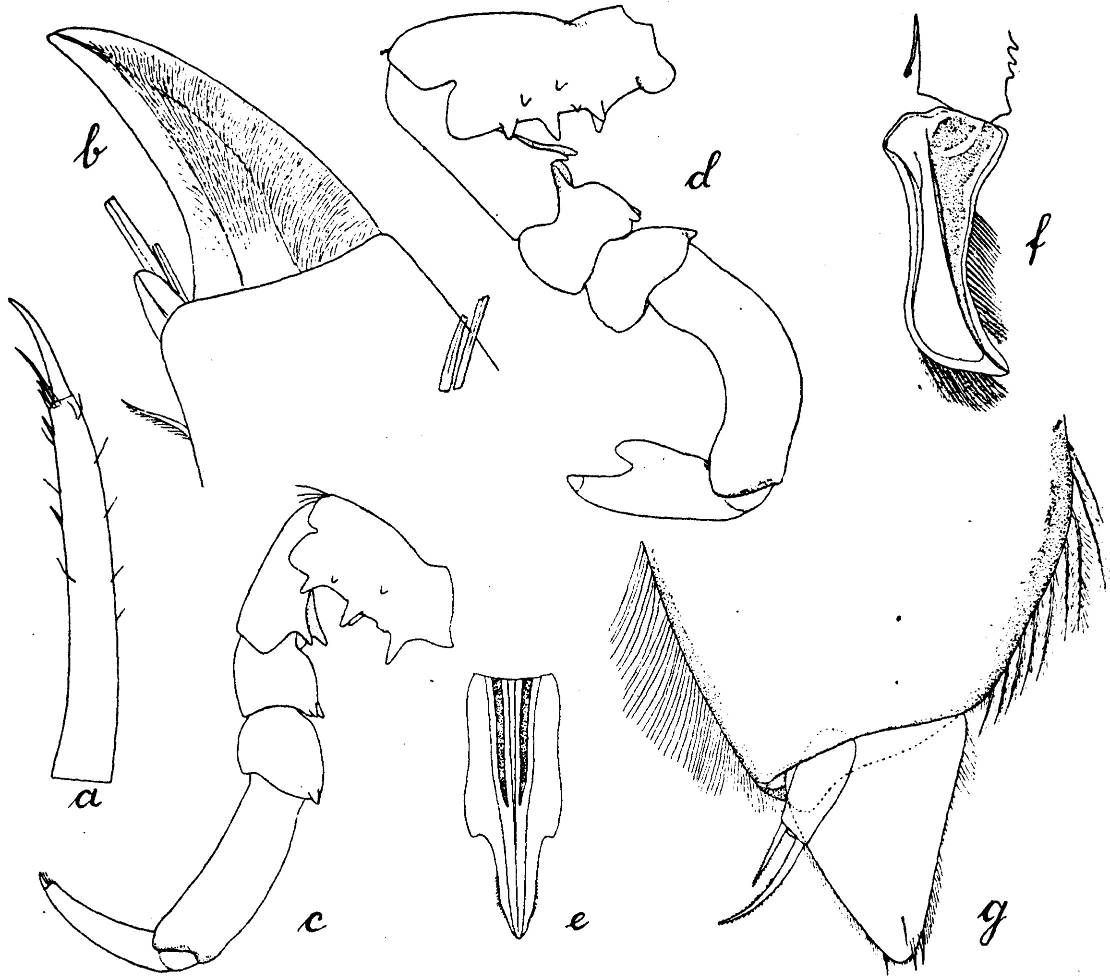

Fig. 31. *Antarcturus americanus* (BEDD.). a. Dactylus of the third periopod, female with a marsupium, 45 ×. b. Tip of the dactylus of the fifth pereiopod, immature female, 240 ×. c. Left seventh pereiopod, seen from the rostral side, in a female (the basipodite figured in a somewhat oblique position), 17 ×. d. Left seventh pereiopod, seen from the rostral side, in an adult male, 17 ×. e. Penis, 17 ×. f. Exopodite and distal part of the basipodite of the first pleopod in an adult male; seen from the caudal side, 17 ×. g. Tip of the right uropod, seen from the inner side (female), 80 ×.

about half as long as propodus. Tip of dactylus with four claws (Fig. 31 a), one long dorsal, two short ventral ones on the distal margin, and an additional claw on the ventral margin at a short distance from the distal margin. Length of the dorsal claw not quite one-third as long as the dactylus. One seta distally.

Fourth pair of pereiopods. Basipodite, ischium, merus and carpus with spines dorsally. In the ovigerous female the basipodite is somewhat curved, closely following the marsupium. Propodus somewhat shorter than carpus. Dactylus, apart from the claw, slightly more than half the length of propodus. Distal margin of dactylus provided with one long dorsal claw and three small ventral ones. A row of four small claws, of the same kind as those on the distal margin, extends along the distal part of the ventral margin. Length of the dorsal claw about one-fourth the length of the dactylus.

Fifth and sixth pairs of pereiopods. Basipodite with a large number of small spines. Dactylus slightly shorter than the propodus. Tip of dactylus (Fig. 31 b) provided with two claws, a short and strong dorsal one and a minute ventral claw. Between the claws there are two setae. The dorsal claw is not quite one-third as long as the dactylus.

Seventh pair of pereiopods. (Figs. 31 c and d). In the *female* (Fig. 31 c) the seventh pereiopod is similar to the fifth and sixth.

In the *adult male* (Fig. 31 d) it is stronger than in the female, the merus and carpus being broader, and the propodus curved, having its lower margin concave and upper margin convex. The dactylus is broad and flattened and distally bilobate. It is probable that this transformation of the seventh pair of pereiopods in the adult male is due to their being employed for clasping the female during copulation. The curved propodus, especially, indicates that the seventh male pereiopods are used for this purpose.

Penis (Fig. 31 e). Differs from the usual type in the genus. Proximally it is broad. The distal third of the organ narrows abruptly and tapers towards the narrowly rounded end. The vasa deferentia are broad.

First pair of pleopods (Fig. 31 f). Basipodite in the male with a lateral row of seven spines, in the female ten spines. Coupling setae on the inner margin of the basipodite in the male 13, in the female 11. Exopodite of the male (Fig. 31 f) with lateral margin concave, inner margin proximally concave, and distally convex, inner proximal angle irregularly rounded and lacking »hairs». Distal margin furnished with plumose setae; lateral margin also setiferous, but only a few distally situated setae being plumose. The diagonal furrow on the exopodite is very narrow; its mouth is not surrounded by projecting lappets. The exopodite resembles the one found in *Pseudidothea bonnieri* OHLIN[1], but its outer distal angle is not so elongated and more obtuse.

The endopodite is of the usual shape in the genus; in the male it is somewhat longer than the exopodite.

Uropods (Fig. 31 g). Sympodite laterally granulate; distal part of the upper margin setiferous; distal part of the lower margin provided with plumose setae. Lateral ramus subtriangular, distally rounded; margins provided with fine »hairs» and a few short setae proper distally. »Secondary» ramus subrectangular, half as long as the lateral ramus; its distal margin straight and provided with three ciliated setae.

Remarks. The male of the species was first described by OHLIN (1901), who states that the male is smaller than the female and differs from it in having the dorsal rows of spines on the pereion much longer. The male specimen examined by OHLIN (l. c.), which was 12.5 mm in length, was probably not adult, since the material from the Swedish Antarctic Expedition contains an adult male specimen 25.5 mm long. This

[1] OHLIN, 1901, Pl. XXI, Fig. 6 pl 1 and 6 pl. 12.

large male specimen, however, had no longer spines than the adult female and much shorter ones than in the male specimen examined and figured by OHLIN (1901). This shows that in the species there is noticeable variation in the length of the spines.

BEDDARD (1886) points out that the species comes close to *A. coppingeri* (MIERS), from which species it differs in having two rows of dorsal spines on the pereion. These spines are, however, insignificant in *A. americanus*.

Localities and Material.

St. 39. Falkland Islands, Port William, lat. 51°, 40′ S., long. 57° 41′ W. 40 m. Sand and small stones with algae. 4/7 1902. 3 specimens: adult male, length 25.5 mm.; ovigerous female, length 25 mm; sub-adult female length 21.8 mm.

Distribution. S. Patagonia (BENEDICT 1898), Eastern part of Magellan Straits (OHLIN 1901), East of Magellan Straits (BEDDARD 1886), Falkland Islands (Sw. Ant. Exped.).

Not previously recorded from the Falkland Islands. Found at depths from 40 m—100 fathoms and known only from a comparatively restricted area. The supposition of OHLIN (1901), that a restricted distribution is characteristic of all species of *Antarcturus* has, however, not proved to be correct.

Antarcturus brunneus (BEDDARD) var. **spinulosus** n. var.

Pl. II, Fig. 11; Text. figs. 32 a—h.

Diagnosis. Body very spinous. Four spines on the dorsal surface of the head are situated in such wise as to form the points at the angles of a square. First four segments of the pereion posteriorly with a dorsal, a dorso-lateral and a lateral pair of spines and with other additional spines; first, second, and third segments with a single spine in the middle line between the dorsal spine-pair. Fourth segment with two spines between the dorsal spine-pair. Second, third and fourth segments with two spines anteriorly on the dorsal area; in addition a number of other spines laterally on the four anterior segments. Last three segments of the pereion posteriorly with a transverse row of eight spines, the most lateral ones situated on the coxal plates. The anterior three segments of abdomen each with a transverse row of about eight spines, the pleotelson covered with spines rather irregularly situated, but always with two short terminal spurs. Fifth pereion segment ventrally with a tuberculum, seventh pereion segment ventrally with a spine, directed backwards. Dactylus of second and third pereiopods rather more than two-thirds the length of the propodus, the dorsal claw about one-fourth the length of the dactylus. Basipodite of the first pleopod with a lateral row of 7 or 8 rather strong spines, those in the middle of the row being strongest. Exopodite of first pleopod in the male slightly tapering towards the broadly rounded end, its inner margin almost straight, its lateral margin concave; diagonal furrow rather broad; a faint rounded lappet on the margin distally from the mouth of the furrow. Lateral ramus of the uropod subtriangular with distal end rounded; »secondary» ramus of the uropod approximately half as long as the lateral ramus and furnished with five setae.

Description.

Types. ♀ with fully developed marsupium, length 16 mm.,
♂ length 11.5 mm.

Body and spine-armature of the female (Pl. I, Fig. 11).

Head. Fused with the first pereion segment but demarcated by a shallow groove, which almost vanishes dorsally. Anterio-lateral angles rounded, furnished with a small spine. Lateral margins straight. Eyes large, black, subtriangular. Dorsal surface of the head with four large spines situated in such wise as to form the points at the angles of a square.

First pereion segment. The posterior transverse elevation is provided with six spines, a dorsal, a dorso-lateral and a lateral (pleural) spine, one on either side of the middle line. The dorsal spines are the largest, the lateral ones the smallest. There is on either side a small spine between the dorso-lateral and the lateral spine, but situated further back. The anterior area is provided with a dorsal spine in the middle. There is, as a rule, no spine in the middle between the dorsal pair of spines on the posterior elevation, but such a spine does occur in one of the specimens. Pleural parts not much projecting, occupying about two-thirds of the segment laterally and anteriorly. Lateral margin with a small ventral incision (Fig. 32 a).

Second pereion segment. With a dorsal, a dorso-lateral and a lateral pair of spines on the posterior elevation, two large spines, on the anterior dorsal area, one on either side of the middle line, and three small spines around the large lateral spines, situated anteriorly, posteriorly and medially of the latter, (the spine situated medially from the lateral spine is likewise situated between the lateral and dorso-lateral spine, but further back). The dorso-lateral spine-pair is larger than that of the first segment. The dorsal pair of spines on the posterior elevation is situated at a greater distance from each other than on the first segment. A large spine is situated in the middle line between the dorsal pair of spines. The triangular pleurae comprise about three-fourths of the length of the segment anteriorly.

Coxal plates with a ventral incision, smooth or with two small submarginal spines.

Third pereion segment. The longest. Spine-armature much as on the third segment, but the posterior dorsal pair of spines, as well as the two spines on the anterior dorsal area, are situated at a greater distance from each other than on the second segment. Around each of the large lateral (pleural) spines there are four small spines, two anteriorly and two posteriorly. Pleurae triangular, comprising anteriorly about two-thirds of the length of the segment.

Coxal plates smooth, divided into an anterior and a posterior part by an incision, which passes into a distinct suture.

Fourth pereion segment. More spinous than the preceding segments. The two spines on the posterior elevation, which on the preceding segments are situated dorsally, are on the fourth segment situated further apart from one another, thus assuming a dorso-lateral position. Between the two spines are two smaller spines close to each other, one on either side of the middle line, instead of the single spine in the middle on the preceding segment. The pair of spines corresponding to the dorso-lateral pair on the preceding segments is represented by two adjacent spines on either side, situated in a longitudinal row. Lateral (or pleural) pair of spines as on the preceding segments. Posteriorly from the lateral spines there are two smaller spines, one of them situated at the posterio-lateral

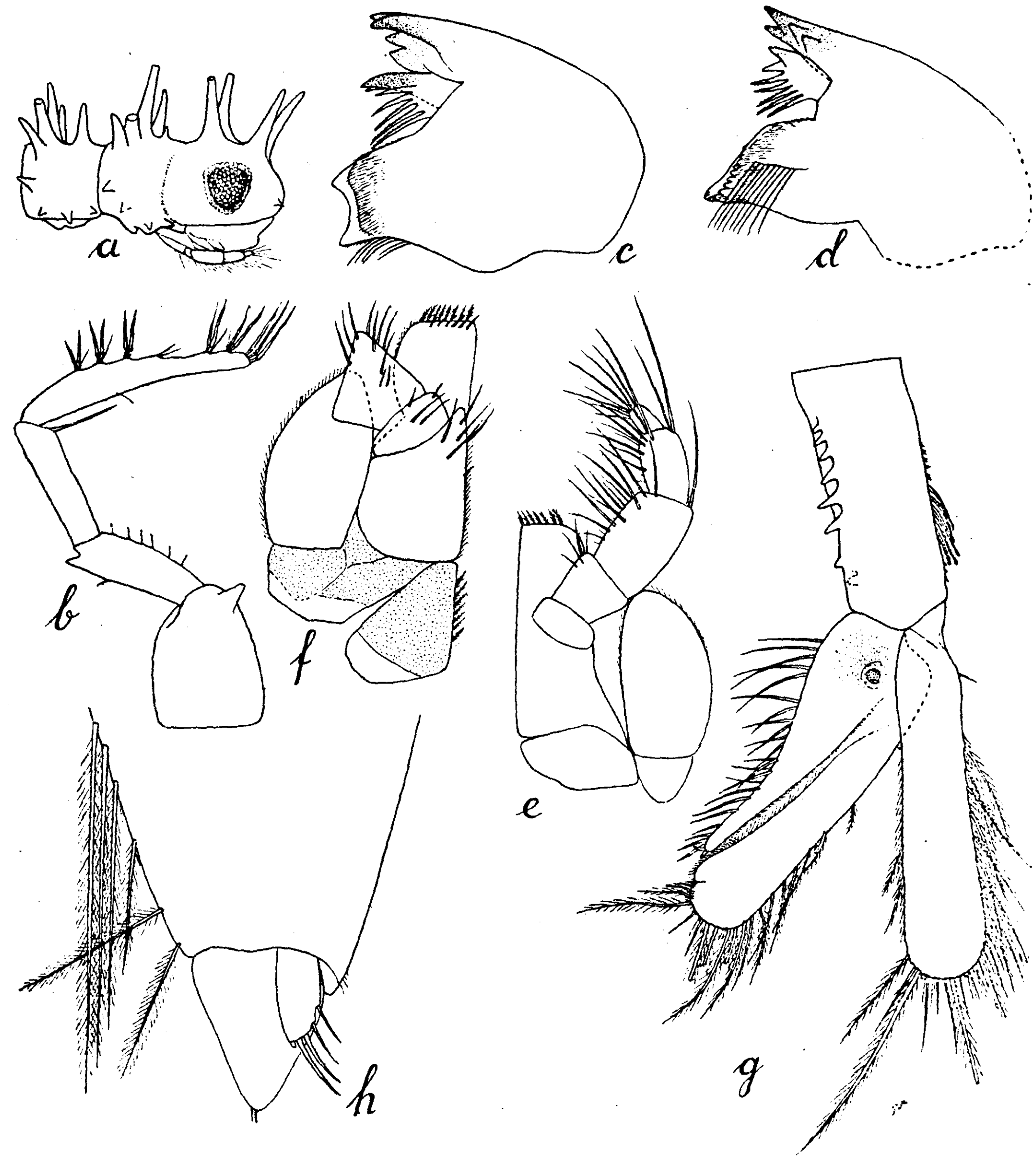

Fig. 32. *Antarcturus brunneus* (BEDD.) var. *spinulosus* n. var. a. Head and first two segments of the pereion, in a lateral view, immature specimen, 8 ×. b. Right antennula, in a female, 30 ×. c. Left mandible, seen from the posterior side, 80 ×. d. Right mandible, seen from the anterior side, 80 ×. e. Left maxilliped, male, 45 ×. f. Right maxilliped (except the last three joints of the palp), female with marsupium, 30 ×. g. First pleopod, (except the coxopodite), in a male; from the caudal side, 35 ×. h. Tip of the left uropod, seen from the inner side, 80 ×.

angle of the segment. The anterior part of the segment is provided with a transverse row of eight spines, of which the two dorsal ones, one on either side of the middle line, are the largest. Two spines of the row on each side are situated anteriorly from the large pleural spines. The pleurae on this segment comprise about half of the lateral sides of the segment.

Coxal plates often spinous, furnished with a small ventral incision. In the female with a marsupium they are prolonged posteriorly into wing-shaped protuberances directed medially. Each projection is provided in the middle of its posterior margin with a small spine directed backwards.

Fifth to seventh pereion segments. Each segment with a transverse row of large spines, consisting of six on the tergum (dorsally, dorso-laterally and laterally situated), and of a large spine on each of the subrectangular coxal plates. Additional small spines occur laterally on the segments and on the coxal plates.

Abdomen. Its length is subequal to that of the four preceding segments together. Three anterior segments are indicated by grooves, these segments taken together being somewhat shorter than the pleotelson. The groove between the third segment and the pleotelson is faint and almost absent dorsally. The three anterior segments are provided each with a transverse row of eight spines, there being in addition some small irregularly situated spines laterally. One lateral spine on each side at the junction of the third segment with the pleotelson is larger than the others.

The pleotelson is covered with spines, somewhat irregularly situated but approximately corresponding to eight longitudinal rows. There are two larger apical spines directed backwards and upwards on each side of the tip. The small tip of the pleotelson is situated somewhat lower than the rest of pleotelson; it is subtriangular, has its distal margin rounded, and is devoid of spines.

Body and spine-armature ot the male.

The males differ from the females in having a smaller number of small spines and in having the fourth pereion segment, as a rule, longer than the third. They also differ in being devoid of the wing-shaped protuberances of the fourth pair of coxal plates, which in the ovigerous female support the marsupium. As a rule, the spinules around the large pleural spines on the second and third pereion segments are absent. The fourth pereion segment has spine-armature similar to that in the female, but some of the small spines found in the female are wanting. Thus anteriorly on the segment there are only four spines, and behind the pleural spines only two, one of them as in the female situated at the posterio-lateral angle.

Variation of the spine-armature.

The small spines laterally on the segments are very variable in number and in situation, but the spines are as a rule, larger and more numerous in large specimens. The four dorsal spines on the head vary in length. In some of the specimens there are, on either side, laterally from the posterior pair of large dorsal spines on the head, two or three additional spines or tuberculae. In one specimen there were two spines, instead of only one between the posterior dorsal spine-pair on the second segment. In another specimen there was a spine in the middle even on the first pereion segment. The spines are sometimes slightly »hairy» distally. The coxal plates are smooth in some specimens, in others provided with small spines.

Apppendages.

Antennulae (Fig. 32 b). Reach approximately two-thirds the length of the third peduncular joint of the antennae. The first three joints are subequal in length. The first peduncular joint is, as usual in the genus, broad and three-sided, having an upper, an inner and outer ventral surface; dorsally near the inner distal angle it is usually provided with a spine. Flagellum (in female) not quite as long as the last two peduncular joints together and furnished with eight groups of sensory filaments and setae.

Antennae. Somewhat longer than the body. First peduncular joint very short and devoid of spines. Second peduncular joint three-sided, having a dorsal and slightly caudal, a caudal-ventral and a rostral-ventral surface; dorsal surface provided with two spines; there is a spine at each of the distal-rostral and the distal-caudal angles. Third peduncular joint caudally (laterally) with a row of about five spines, and ventrally with three or four; distal end of the fourth peduncular joint provided with a spine; fifth peduncular joint devoid of spines. The proportion between the lengths of the peduncular joints was in a female (16.5 mm in length): 0.4: 2.3 : 5 : 6.7 : 5.7. Flagellum about as long as two-thirds of the last peduncular joint, consisting in adult specimens of about 10 joints.

Mandibles (Fig. 32 c and d). Normal.

First pair of maxillae. Normal.

Second pair of maxillae. Normal. The two lappets of the outer lobe are proximally together subequal in width to the inner lobe; each of the lappets is provided with three apical setae. The apical setae on the inner lobe are situated in three rows, one marginal row on the distal margin and one submarginal row on either side. Two setae at the inner distal angle are the largest.

Maxillipeds (Figs. 32 e and f). Normal. In the female with a marsupium (Fig. 32 f) the coxopodite and the proximal epipodite are expanded and the inner margin of the coxopodite is furnished with a row of plumose setae.

First pair of pereiopods. Normal. Propodus and dactylus provided with dense, two-pointed setae, those on the propodus furnished with two rows of short triangular sub-branches. Dactylus with two claws and between the claws a claw-like seta. The dorsal claw is about twice as long as the ventral one and not quite one-third as long as the dactylus.

Second pair of pereiopods. Dorsal side of the basipodite provided with a large proximal spine and two additional spines more distally. Ischium and merus each with a spine distally on the dorsal side. Carpal joint with three spines on the dorsal side at about equal distances from each other; one of the spines is situated at the distal end. Propodus with two spines dorsally. Length of dactylus rather more than two-thirds the length of the propodus. Dactylus provided with two claws and a slender seta between the claws. The length of the dorsal claw is about one-fourth of the length of the dactylus (the proportion being 7.5: 32). The ventral claw is very short being only one-fifth the length of the dorsal one.

Third pair of pereiopods. Basipodite with four dorsal spines, ischium and merus with one, carpus with four, propodus with two, dorsal spines. Length of the dactylus rather more than two-thirds the lenght of the propodus. Dactylus with two claws, the dorsal one being about three times as long as the ventral. Between the claws there are three slender setae.

Fourth pair of pereiopods. Basipodite with two spines on the anterior side and five dorsally. Carpus with three dorsal spines, one of them situated at the distal end. Dactylus subequal in length to the propodus, furnished with two claws and between the claws two slender setae, the dorsal claw being about four times as long as the ventral one.

Fifth to seventh pairs of pereiopods. Basipodite with three or four spines and some tuberculae on the upper margin. Dactylus with two claws, the ventral one very short. Between the claws are two setae.

First pair of pleopods (Fig. 32 g). Coxopodite[1] rectangular, about three times as long as broad. Lateral margin of the basipodite provided with 7 or 8 rather strong spines, those in the middle being the strongest. Inner margin of the basipodite with 6—8 coupling-setae. Exopodite in the male very slightly decreasing in width towards the distal end; inner margin very slightly convex, almost straight; outer margin concave; diagonal furrow rather broad and wide at its mouth. Distally from the furrow there is a faintly marked rounded lobe at the lateral margin. Laterally from the proximal end of the furrow there is a distinct cavity. Distal margin and distal part of the inner margin of the exopodite furnished with plumose setae; lateral margin with branchless setae.

Uropods (Fig. 32 h). Lateral surface of the sympodite provided with small dense spines directed backwards. Lateral ramus subtriangular, distally rounded, not fully twice as long as the »secondary» ramus. »Secondary» ramus distally and somewhat ventrally rounded, but with five distinct incisions; in each incision there is a branchless seta. For further details see the figure.

Remarks. The variety *spinulosus* differs from the main species only in being still more spinous. The third pereion segment is furnished dorsally in the middle with one or two spines and on the fourth pereion segment there are 2 or 4 additional spines in the middle, which are missing in the main species. The dorso-lateral spine-pair on the fourth segment is represented by two spines on either side. The pereiopods are more spinous, the carpus having a large distal spine and 2—3 additional dorsal spines. In BEDDARD's[2] figure of one of the anterior pereiopods in the main species the carpus is provided with a single distal spine. The abundance of small spines in the variety *spinulosus*, compared with the main species, is found in all specimens up to a length of 12 mm., though, as has been shown above, there is a considerable individual variation in their size and number.

In other respects the variety *spinulosus* quite well agrees with BEDDARD's description and figures of *A. brunneus* (1886). It is of the same size as *A. brunneus* and has a slightly brownish colour, from which the name *brunneus* is derived.

A species which stands very near to *Antarcturus brunneus* var. *spinulosus* is *A. hodgsoni* RICHARDSON (1913), which is provided with a still larger number of small spines in addition to the three usual large pair of spines. The difference in spine-armature between *brunneus* var. *spinulosus* and *hodgsoni* is in itself scarcely marked enough to justify a separation of species, but *A. hodgsoni* differs also in having its body covered with long »hairs»[3]. Moreover *A. hodgsoni* is a somewhat larger species, attaining a length of 27 mm.; the greatest length in *brunneus* var. *spinulosus* is 17.5 mm.; in the main species 19 mm. (BEDDARD, 1886).

Localities and Material.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. ÷ 2,05°. Gravel and sand. 19/4 1902. 3 specimens (male and 2 females). Length of the two largest specimens 14 mm. (a male, and a female with semi-developed oostegits).

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. ÷ 1.5°. Clay and some algae. 14/5 1902. 5 specimens, males and females. Length of largest specimen 17.5 mm. (ovigerous female).

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. 6 specimens, males and females. Length of the largest specimens (types): male 14 mm, female with fully developed marsupium 16 mm.

[1] Not shown in Fig. 32 g.
[2] BEDDARD, 1886, Pl. XXII, Fig. 3.
[3] In *brunneus* var. *spinulosus* the spines are sometimes short-haired (see p. 141).

Distribution. Shag Rock Bank (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.).

The var. *spinulosus* was obtained at depths of 75—310 m. The main species is known only from a considerably greater depth, having been collected by the Challenger Expedition at a depth of 1,600 fathoms, off Prince Edwards Islands.

Antarcturus franklini (HODGSON, 1902).

Pl. I, Fig. 8; Text. figs. 33 a—e.

Arcturus franklini. HODGSON, 1902, p. 250—251.

Antarcturus franklini. HODGSON, 1910, ♀, nec. ♂, p. 38—40, Pl. V, Fig. 3; RICHARDSON, 1913, p. 10—11; TATTERSALL, 1921 ♀, nec. ♂, p. 240—241.

Diagnosis. Head with a pair of dorsal spines anteriorly and with a small spine at the anterio-lateral angle. First four pereion segments each with six large spines, situated dorsally, dorso-laterally and laterally. Last three pereion segments, as well as abdomen, granulate; pleotelson with a pair of terminal spines. Fifth pereion segment, as a rule, with a spine ventrally (sometimes wanting in the male). Seventh pereion segment, ventrally with a spine directed backwards. Dactylus of the second, third and fourth pairs of pereiopods subequal in length to the propodus (about $^1/_{12}$ shorter); dorsal claw on the same pairs of pereiopods short, being one-fourth to one-fifth times as long as the dactylus. Lateral margin of the basipodite of the first pleopod with a row of nine short spines; exopodite of first pleopod in the male tapering towards the rounded end; its outer margin concave, and inner margin convex; diagonal furrow narrowing towards the end; lateral margin of the male exopodite distally from the mouth of the furrow with a rather indistinct lobe. Lateral ramus of the uropod subtriangular, with distal margin rounded; »secondary» ramus of the uropod more than half as long as the lateral ramus, suboval, slightly tapering towards the end and furnished with six setae on its distal and lateral margins.

Supplementary Description.

Body and spine-armature of the adult female.

Head. Somewhat broader than long. Front margin sinuate. Anterio-lateral angles of the head rounded and furnished with a small spine. Lateral margins straight. Eyes large and protruding, subtriangular with rounded angles. Between the eyes there are two stout spines, directed upwards and slightly outwards and forwards.

Pereion. The segments increase in length and width up to the third, which is the largest, afterwards decreasing to the seventh segment. The first four segments are provided with six large spines, situated dorsally, dorso-laterally and laterally. The segments, with the exception of the first, are laterally protracted into subtriangular »pleurae».

First segment with a small spine anteriorly from the large lateral spine. Lateral margin posteriorly from the pleural spine with a small incision. Anterior dorsal area usually smooth.

Second segment with a small spine anterior to the large pleural spine. Between the dorso-lateral and the lateral spines there is a small spine, but it is situated further back. Anterior dorsal area often provided with a pair of small dorsal tuberculae. Coxal plates with a deep ventral incision. They are furnished with small spines and protracted anteriorly into a spine-like triangular prolongation.

Spine-armature of *the third segment* subequal to that of the second. Anterior dorsal area usually with two, sometimes with four, tuberculae.

On the *fourth segment* the projecting triangular pleurae comprise about four-fifths of the lateral part, anteriorly. Posteriorly from the pleurae the segment is constricted and narrowed. The two large dorsal spines are situated more laterally than on the third segment, and between them there are often two small tuberculae, one on either side of the middle line. One distinct but small spine, in contradistinction from the other segments, is situated at the posterio-lateral angle of the segment. Coxal plates spinous; their anterior parts are spine-like and prolonged. In the ovigerous female the coxal plates are posteriorly elongated into broad processes directed medially, which support the marsupium. Each process carries a small spine directed backwards.

The last three pereion segments have large subtriangular spinous and tuberculated coxal plates with their posterio-lateral ends broadly rounded. All three segments dorsally provided with a transverse row of spines and tuberculae, whilst laterally they are irregularly tuberculated. In many specimens one of the dorsal and dorso-lateral spines on either side are somewhat larger than the others.

Fifth segment ventrally with a tuberculum[1]. Seventh segment ventrally with a tuberculum directed backwards[1].

Abdomen. Three anterior segments are indicated by shallow grooves. The first three segments are anteriorly smooth, posteriorly they are provided with a transverse row of small spines. A dorsal portion anteriorly in the middle of the third segment is separated by longitudinal grooves from the lateral parts. There is a rather large spine laterally on each side of the third segment at its junction with the pleotelson.

The pleotelson is longer than the first three anterior segments together. Its tip between the terminal spurs is situated lower than the rest of the pleotelson. The pleotelson, except for the tip, is covered with small spines directed backwards; as a rule, there is one row of such spines along each of the lateral margins; otherwise they are more irregularly situated. A pair of dorso-lateral spines, at a distance from the distal end of one-third the length of pleotelson, are sometimes much larger than the others.

Body and spine-armature of the male (Pl. I, Fig. 8).

The males are very similar to the females. They differ in having the fourth segment longer than the third; on the fourth segment the pleurae occupy only somewhat more than half of the lateral parts, anteriorly. The spine-armature is similar to that in the female, but there are fewer small spines and tuberculae. Thus the spines between the dorso-lateral and lateral pair and the spines anterior to the lateral spines on segments 2—4 are lacking in the male, as is also the spine at the posterio-lateral angle of the fourth pereion segment. A pair of small tuberculae between the dorsal spine-pair on the fourth segment is often found. The anterior dorsal areas of the second, third and fourth segments, as in the female, are frequently furnished with two more or less distinct tuberculae.

The coxal plates on the second, third and fourth segments have no spines and are not protracted anteriorly into spine-like prolongations.

[1] Sometimes absent in immature specimens and in the males.

Appendages.

Antennulae (Fig. 33 a). Extend approximately to half the length of the third peduncular joint of the antennae. First peduncular joint, as is usual in the genus, broad, being triangular in a transverse section. In the female, the flagellum is slightly shorter than the second and third peduncular joints together; in the male, it is subequal in length to these

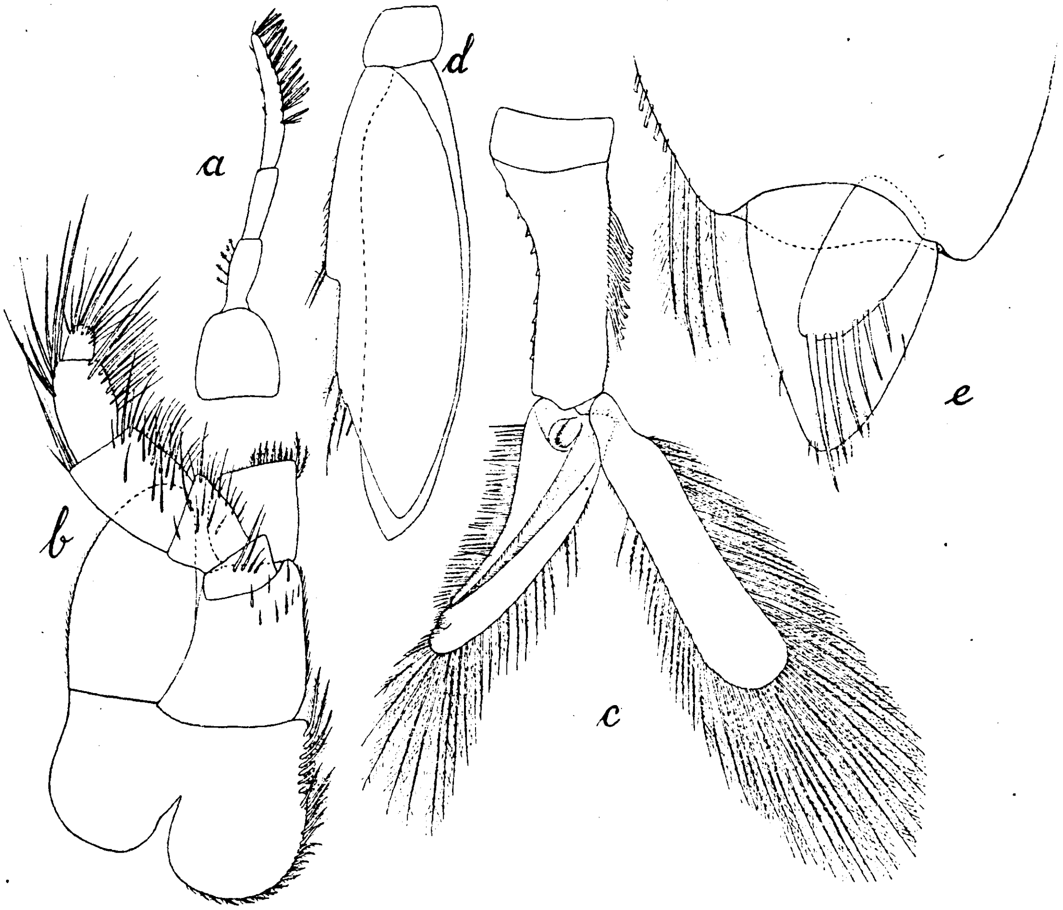

Fig. 33. *Antarcturus franklini* (Hodgs.). a. Left antennula, female, 17 ×. b. Right maxilliped of a female with a marsupium, 25 ×. c. Left first pleopod in an adult male, from the caudal side, 17 ×. d. Right third pleopod, female, 17 ×. e. Tip of the left uropod seen from the inner side (female), 80 ×.

joints together. It is provided in the adult female with 10 or 11 groups of pedunculated sensory filaments and ordinary setae, in the male with 17 or 18 groups.

Antennae. Third peduncular joint furnished on its caudal margin with a varying number of small spines and tuberculae. Flagellum slightly shorter than the last peduncular joint, consisting in adult females of about 10 joints, in adult males of about 12 joints, the first joint very long, being equivalent to two or three joints.

Mandibles. Normal.

First pair of maxillae. Outer lobe with about eleven apical »spines», in two rows. Inner lobe with three apical penicillated setae.

Second pair of maxillae. Outer lappet of outer lobe with five or six apical setae, inner lappet of the same lobe with three apical setae. The two lappets of the outer lobe vary greatly in different specimens; sometimes the outer, sometimes the inner lobe is the largest.

Maxillipeds (Fig. 33 b). Distal epipodite reaching to about the middle of the third joint of the palp. Coxopodite as well as proximal epipodite in the ovigerous female expanded, the coxopodite furnished with plumose setae on its inner and distal margins. Endopodite with two plumose setae on the inner margin near the distal margin.

Pereiopods. Dactylus of the first pair provided with a long dorsal and a short ventral claw, and between them a claw-like seta. Propodus and dactylus densely fringed with setae; most of the setae on the propodus, and a few on the carpus, are furnished with two rows of short triangular sub-branches and terminate in two points.

On the second, third and fourth pereiopods the dactylus is subequal in length to the propodus (approximately $^1/_{12}$ shorter), and the dorsal claw is one-fourth to one-fifth as long as the dactylus. Between the claws are one long and one short seta.

On the fifth, sixth and seventh pereiopods the dorsal claw is about one-fifth the length of the dactylus.

First pair of pleopods (Fig. 33 c). Anterior surface of the basipodite vaulted, posterior, surface flattened, its lateral margin with nine small spines, inner margin with about 11 coupling-setae.

Exopodite in the male decreasing in width towards the rounded end; lateral margin concave, inner margin convex; diagonal furrow on the exopodite narrowing towards the end, its distal half provided with dense, short »hairs». Inner proximal angle of the exopodite rounded and furnished with »hairs». Laterally from the proximal end of the furrow there is a distinct cavity. Distally from the mouth of the furrow there is a faint lobe on the lateral margin. Lateral and distal margins of the exopodite with plumose setae, inner margin with branchless setae.

Endopodite in the male slightly longer than the exopodite. In the female both the rami are similar and subequal in length.

Second pair of pleopods. Coxopodite very short, forming a border proximally from the basipodite. Basipodite shorter than in the first pair of pleopods, subquadrate, somewhat broader than it is long; its lateral margin furnished with four plumose setae, inner margin with 6 or 7 coupling-setae. Penial filament in the male extending beyond the distal margin of the exopodite by almost one-third of its length.

Third pair of pleopods (Fig. 33 d). Coxopodite not distinguishable; endopodite oval, somewhat pointed, its margins without setae. Exopodite subequal to the endopodite, its lateral margin provided with a varying number of plumose setae and with an incision near the middle.

Fourth pair of pleopods. Basipodite short. Exopodite and endopodite thin, subequal, the exopodite on the inner margin near the distal end provided with a few setae equipped with sparse sub-branches; the lateral margin with about four short non-typical plumose setae almost lacking sub-branches.

Fifth pair of pleopods. Much as the fourth.

Uropods (Fig. 33 e). Lateral surface of the sympodite with scattered small spines. »Secondary» ramus more than half as long as the lateral branch; the proportion between the lengths of the rami being about 5: 3. Inner ramus suboval, tapering towards the broadly rounded end, distally and laterally with six conspicuous setae, the three more distally situated provided with short sub-branches.

Remarks. The females of this species agree in detail, even as regards the spine-armature, with the figure by HODGSON (1910, Pl. V, Fig. 3). I have also compared the

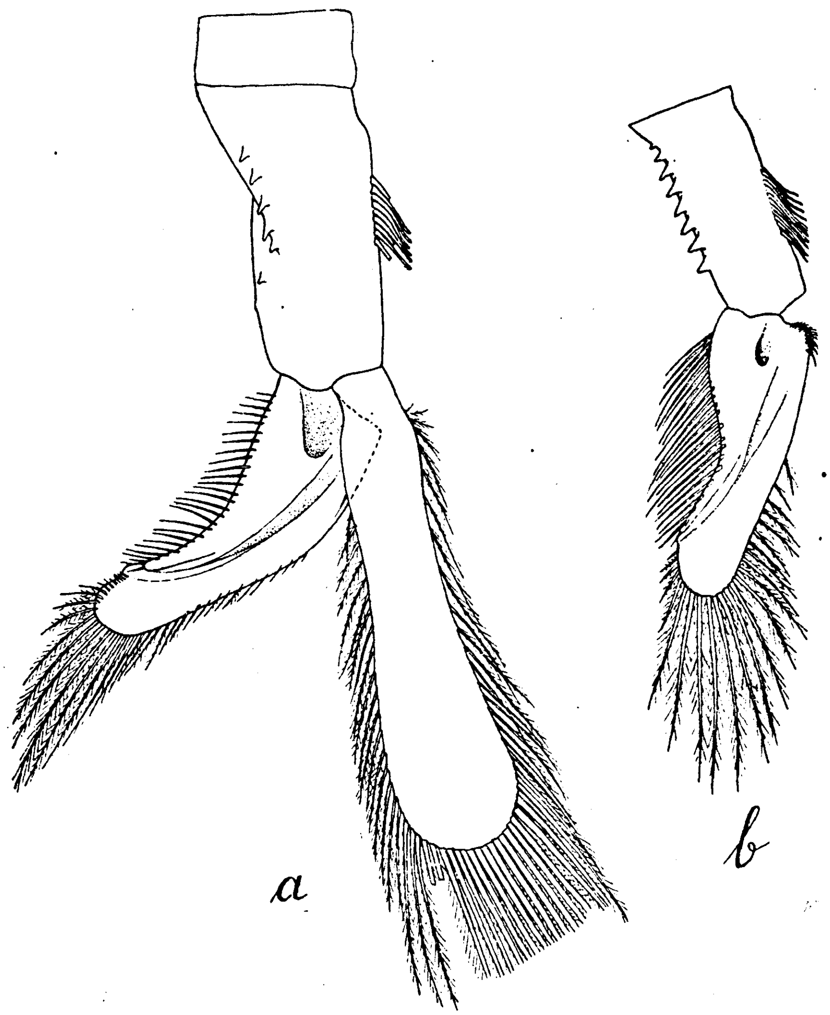

Fig. 34. *Antarcturus adaraneus* (HODGS.) a. Left pleopod of an adult male, from the caudal side, 20 ×. b. First pleopod of an adult male from the caudal side, specimen assigned by HODGSON (1910) to *Antarcturus franklini*, 20 ×.

species with a female specimen from the Museum in Paris, determined by RICHARDSON, and sent to me for investigation, but I found only the usual minor differences in the size and number of the small spines. Both HODGSON (1910) and TATTERSALL (1921) state that the males differ considerably from the females in being devoid of spines on the pereion. Finding that the males of *Antarcturus franklini* collected by the Swedish Ant-

.r the Expedition had almost exactly the same spine-armature as that of the females, I first surmised that there were two distinct races of the species differing in the ..ne-armature of the male sex (cf. p. 125). But after examining[1] material collected by .. National Antarctic (Discovery) Expedition 1901—1904 and by the British Antarctic I.rra Nova) Expedition 1910, determined as *Antarcturus franklini* by HODGSON (1910) ..l TATTERSALL (1921), I came to the conclusion that the males previously referred to (*franklini* are another closely allied species. Though their uropods and pereiopods .arcely differ, the first male pleopods are very dissimilar to those characteristic of *A. ..anklini*. The first male pleopod in the supposed *A. franklini* (see Fig. 34 b)[2] agrees with ..at which I found to characterize *A. adaraneus* (HODGSON) (see Fig. 34 a), a species of .hich I was able to study a few specimens at the British Museum. The males previously ..ferred to *A. franklini* belong therefore in all likelihood to *A. adaraneus*. The spine-.rmature also bears out the correctness of this supposition (cf. HODGSON 1910, Pl. V, I..s. 1 and 2 and HODGSON 1902, Pl. XXXIII, Fig. 1).

Localities and Material.

St. 16. Between Falkland Islands and South Georgia (near Falkland Islands), lat. 51° 40′ S., long. 57° .′ W. 150 m. Sand. 11/4 1902. Immature specimen, length 12.2 mm.

St. 58. South of West Falkland, lat. 52° 29′ S., long. 60° 36′ W. 197 m. Bottom temp. + 4.1°. Sand and ..vel. 11/. 1902. 31 specimens, males and females (10 specimens collected on hydroids). Length of the two lar-..st specimens, a male and a female, about 25 mm.

Distribution. Falkland Islands (Sw. Ant. Exped.), Graham Region (RICHARDSON 1913), Victoria Land (HODGSON 1902 and 1910, TATTERSALL 1921).

The species is not previously known from the Falkland Islands or from any other .ubantarctic locality.

Antarcturus antarcticus BOUVIER, 1910.

Text. figs. 35 a—e.

For synonymy and literature see MONOD, 1931, p. 27.

Diagnosis. Body granulate. Head devoid of spines except, a small one at the anterio-.ateral angle. Dorsal area on the first four pereion segments anteriorly elevated and ..dge-like, leaving a distinct furrow between the anterior ridge-like part and the posterior ..dge. Abdomen with two short terminal spines. Seventh pereion segment with a small .ine ventrally. Dactylus of the first pereiopods about two-thirds the length of propodus; ..tylus of the second, third and fourth pairs about half as long as propodus. Dorsal .aw of the second pereiopod slightly less than one-third as long as the propodus; dorsal .aw of the third and fourth pereiopods about one-third as long as that joint. Lateral .argin of the basipodite of the first pleopod with four conspicuous spines. Exopodite . first pleopod in the male narrowest in the middle, and thence slightly increasing . width towards the broadly rounded end; inner margin slightly convex, lateral ..gin slightly concave; diagonal furrow proximally wide, but distally narrowing to . tube; distally from the mouth of the furrow there is a distinct rounded lobe on the ..eral margin, marked off by a distinct incision. Lateral ramus of the uropod sub-

[1] At the British Museum.
[2] The figure illustrates the first male pleopod of a specimen determined by HODGSON (1910) as *Antarcturus* ..anklini.

triangular with distal end broadly rounded; »secondary» ramus one-fifth longer than half of the lateral ramus; its distal margin obliquely truncate and furnished with six ciliated setae.

Supplementary Description.

Head. Dorsally with a distinct transverse groove and an indistinct longitudinal groove. Eyes large, black, protruding, subtriangular with rounded angles. At the anterio-lateral angles of the head there is a small spine.

Pereion. Segments both anteriorly and posteriorly with a faint ridge-like elevation, dorsally with a distinct groove between the anterior and the posterior ridge. This groove bifurcates laterally, thus demarcating on each side a triangular area. Pleurae subtriangular, faintly marked off medially by longitudinal grooves, which traverse the triangular lateral elevated areas.

The *first segment* differs from the others in having the anterior dorsal ridge divided into two ridges by a transverse groove. Pleurae on the first segment subtriangular, but indistinct; furnished with a small spine. Posteriorly from the pleurae there is a lateral incision.

Pleurae of the *second, third and fourth segments* distinct, with broadly rounded lateral margins. On the first segment they occupy about half the length of the segment, anteriorly: on the second segment the whole lateral side, on the third segment about two-thirds, on the fourth only about half of the lateral sides anteriorly.

Coxal plates on the second and third segment in the ovigerous female posteriorly somewhat produced into short subtriangular prolongations[1], following the outline of the marsupium. Posterior parts of the fourth coxal plates in the ovigerous female prolonged into broad wing-shaped processes, the ends of which almost meet behind the marsupium. In the male these broad processes are missing and the coxal plates are posteriorly coalesced with the sternite, leaving no trace of any suture.

Coxal plates of the *last three segments* large, subrectangular, not visible from above.

Abdomen. The last of the three anteriorly indicated segments is faintly divided by longitudinal grooves into a more anteriorly situated middle area, provided with about four small spines, and two larger lateral areas. The tip of pleotelson between the terminal pair of spines is situated lower than the rest of pleotelson; its distal end is somewhat concave.

Antennulae. Flagellum about as long as the second, third and half of the first peduncular joints together, furnished with 14 or 15 groups of sensory filaments and setae. The proportion between the lengths of the joints is, in both male and female, about 20 : 11 : 13 : 37.

Antennae. First joint very short. The second joint is also short, being about as long as it is broad. The third peduncular joint is about twice as long as the second, having on its caudal margin a varying number of small spine-like tuberculae. Fourth peduncular joint more than twice as long as the third, the fifth subequal in length to the fourth, but narrower.

Flagellum about one-fourth shorter than the last peduncular joint, consisting of 10 or 11 joints, the first being the longest and corresponding to three of the other joints.

Mandibles and maxillae. Normal.

[1] These small prolongations are missing in the male.

Maxillipeds (Fig. 35 a). Normal. Palp densely setiferous, some of the setae provided with short hair-like sub-branches. Coxopodite in the ovigerous female expanded backwards into a thin, rounded lobe.

First pair of pereiopods. Densely setiferous; many of the setae provided with two rows of short triangular sub-branches. Dactylus about two-thirds as long as the propodus, furnished with two claws; the dorsal claw is about twice as long as the short ventral one, the lower margin of which is dentated. Between the claws there is a claw-like seta. The length of the dorsal claw is about two-fifths the length of the dactylus.

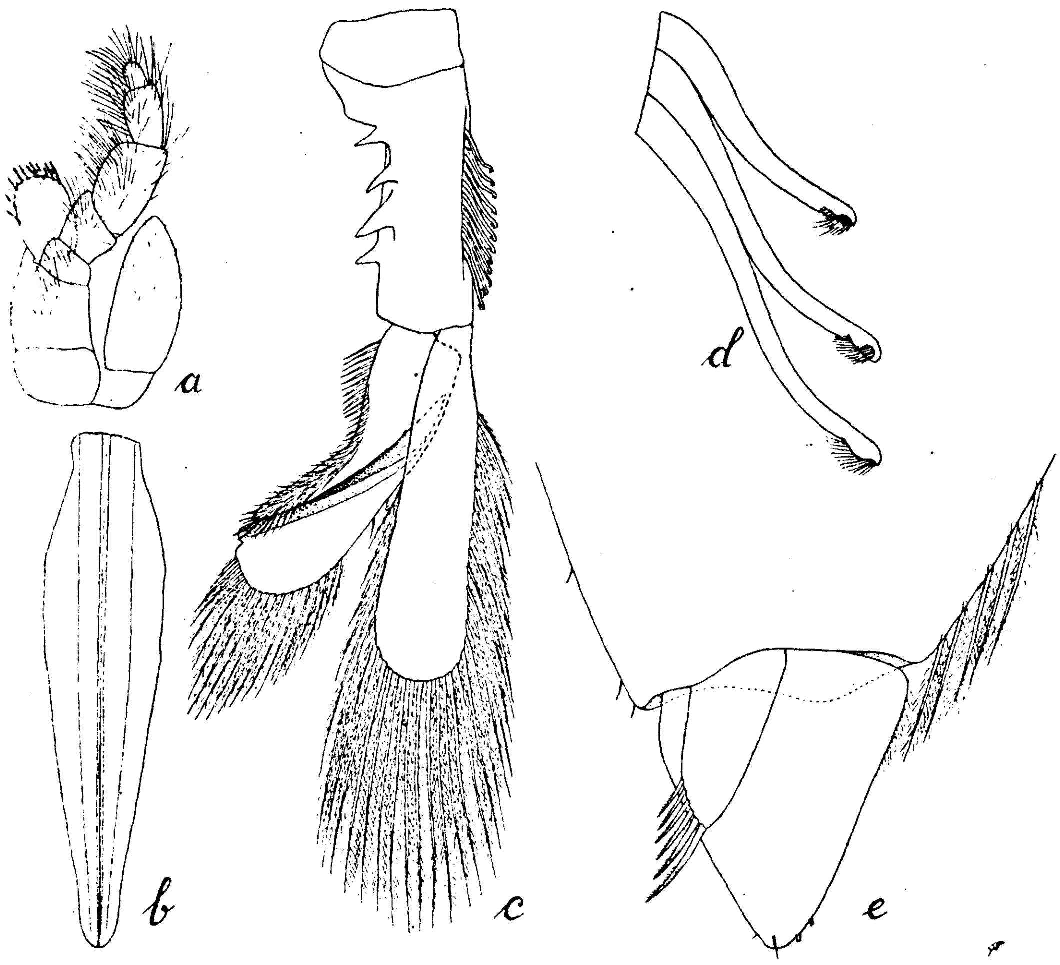

Fig. 35. ***Antarcturus antarcticus***, **Bouv. a. Left maxilliped in a male, 17 ×. b. Penis, 30 ×. c. Left first pleopod in an adult male, from the caudal side, 17 ×. d. Coupling-setae from the inner margin of the basipodite of the first pleopod, 140 ×. e. Tip of the right uropod, seen from the inner side (female), 80 ×.**

Second pair of pereiopods. Dactylus about half as long as the propodus, furnished with two claws and a seta between the claws; the long dorsal claw is not quite one-third as long as the dactylus.

Third and fourth pairs of pereiopods. Similar to the second. Length of the dorsal claw about one-third the length of the dactylus. In one specimen the dactylus of the fourth pereiopod was furnished with four claws, two long dorsal and two short ventral ones, the most dorsally situated one being about one-fifth longer than the other dorsal claw.

Fifth to seventh pairs of pereiopods. On the last three pereiopods the dactylus is about two-thirds the length of the propodus. It is furnished with a long dorsal and a very short ventral claw, the dorsal claw being not quite one-third as long as the propodus and four and a half times as long as the ventral claw.

Penis (Fig. 35 b). Normal.

First pair of pleopods. (Fig. 35 c). Coxopodite subrectangular. Lateral margin of the basipodite provided with four large spines; inner margin with about 13 coupling-setae (cf. Fig. 35 d).

Exopodite in the male narrowest in the middle and thence slightly increasing in width towards the broadly rounded end; inner margin slightly convex; lateral margin markedly concave, and provided with short branchless setae. The same kind of setae also cover the caudal surface, distally, close to the lateral margin. Inner proximal angle of the exopodite provided with short »hairs»; distal margin and distal part of the inner margin furnished with plumose setae; diagonal furrow wide proximally, but narrowing distally to a tube; distally from the mouth of the furrow there is a distinct incision, so that a rounded lobe is formed on the lateral margin; laterally from the proximal end of the furrow the caudal surface of the exopodite is slightly hollowed.

Endopodite of the usual shape.

Second pair of pleopods. Lateral margin of the basipodite provided with plumose setae, inner margin with about six coupling-setae. Endopodite slightly longer than the exopodite. Penial filament in the male somewhat longer than the endopodite; its distal end hook-like.

Uropods (Fig. 35 e). Lateral surface of the sympodite provided with small pointed tuberculae. »Secondary» ramus one-fifth longer than half the length of the lateral ramus, slightly tapering towards the end, distally obliquely truncate and furnished with six ciliated setae.

Remarks. The species somewhat resembles *A. coppingeri* (MIERS, 1881), *adaraneus* (HODGSON, 1910), and *lilliei* TATTERSALL (1921).

The first two species differ from *antarcticus* in their sculpuring on the pereion, the dorsal area of the first four pereion segments not being elevated into a ridge; *adaraneus* is moreover furnished with spines on the head. In the latter species the first male pleopods (Fig. 34 a) have an exopodite which differs from that in *A. antarcticus* in being shorter, more strongly curved and tapering towards the end; *A. adaraneus* differs also in having the dactylus of the second, third and fourth pereiopods subequal in length to the propodus.

A. lilliei TATTERSALL is closely allied to *A. antarcticus*; it is similarly sculptured on the first four pereion segments; the length of the dactylus of the second, third and fourth pereiopods is subequal to that in *A. antarcticus*, but it differs especially in having two cephalic horns anteriorly on the head as well as in its smaller size.

Localities and Material.

St. 5. Graham Region, S. E. of Seymour Island, lat. 64° 20′ S., long. 56° 38′ W. 150 m. Sand and gravel. 1902. 7 specimens, males and females. Length of the largest specimen, about 25.7 mm. (male).

St. 6. Graham Region, Admirality Sound, lat. 64° 36′ S., long. 57° 42′ W. 125 m. Stones and gravel. $^{20}/_{1}$ 1902. 7 specimens, one adult male, females and immature specimens. Length of the largest specimen, 23.1 mm. (female with marsupium).

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 3′ W. 160 m. Bottom temp. + 2.05°. Gravel and sand. $^{19}/_{4}$ 1902. Immature specimen, length about 9 mm.

Distribution. Shag Rock Bank (Sw. Ant. Exped.), South Georgia (MONOD 1931), South Sandwich Islands (BOUVIER 1910, 1911), Graham Region (Sw. Ant. Exped.).

The species has not previously been recorded from Shag Rock Bank or Graham Region.

Antarcturus granulosus n. sp.

Pl. I, Figs. 9, 10; Text. figs. 36 a—c.

Diagnosis. Body granulate; two dorsal spines anteriorly on the head. The first four pereion segments, each with a pair of dorsal and a pair of dorso-lateral small tuberculae. Ventral surface of the pereion, as a rule, smooth. Pleotelson with a pair of short and obtuse terminal spines. Antennae about half as long again as the body, the flagella about two-thirds as long as the last peduncular joint. Length of dactylus of second, third and fourth pereiopod about half the length of the propodus; length of their dorsal claw about two-thirds the length of dactylus. Basipodite of the first pleopod with about six small spines on its lateral margin. Exopodite of the first male pleopod subrectangular, slightly tapering towards the broadly rounded end; both the lateral and inner margins slightly convex; diagonal furrow rather broad, narrowing towards the end; a small but distinct triangular lobe at the lateral margin distally from the mouth of the furrow. Lateral ramus of the uropods subtriangular, with distal margin rounded. »Secondary» ramus of the uropods somewhat more than half as long as the lateral ramus, subrectangular, slightly tapering towards the end and furnished with three apical setae.

Description.

Types. Mature female with young about 11 mm. in length and male about 14.2 mm in length.

B o d y a n d s c u l p t u r i n g o f t h e f e m a l e.

Body (Pl. I Figs. 9, 10), granulate. First three pereion segments in the mature female slightly increasing in length and width, the third being the largest.

Head. Broader than it is long; front margin sinuate; anterio-lateral angles rounded; lateral margins straight. Eyes dark, protruding, almost rounded, about one-third as long as the lateral side of the head. Between the eyes there is a pair of short curved spines with their front margins strongly concave.

Pereion. The perion segments are furnished with a posterior transverse elevation which widens out laterally to comprise the whole of the segments; the pleurae are subtriangular and distinct on the second, third and fourth segments, being distinctly marked off from the medial parts by longitudinal grooves. The anterior dorsal area is elevated in the middle into a low and broad ridge, which on the first segment is indistinctly divided into two parts by a transverse groove. The four anterior segments have their posterior ridge provided with four small tuberculae, two of them dorsally situated and two dorso-laterally. Elsewhere the segments are granulate, especially on the posterior ridge and on the anterior ridge-like elevation, which traverses the anterior dorsal area.

On the *first segment* the four tuberculae on the posterior elevation are very indistinct. The lateral margins are bent down, whence »pleurae» are lacking. Ventral margin of the tergum with a minute spine-like tip, posteriorly from which there is a small incision.

The pleurae of the *second, third and fourth segments* occupy anteriorly about two-thirds of the lengths of their segments; the coxal plates on these segments are provided with a faint ventral incision; they are in the mature female prolonged posteriorly into short triangular lobes, following the outline of the marsupium. On the fourth segment the anterior dorsal area is only very slightly elevated in the middle; its elevated part is often provided with a pair of minute dorsal tuberculae, one on either side of the middle line. The segment is sharply constricted by a lateral incision (behind the pleurae). The coxal plates are provided with a distinct ventral incision; they are posteriorly prolonged into triangular pointed elongations, the points of which meet behind the marsupium.

Last three segments decreasing in length and width from the first to the last. Posterior transverse elevation distinct and granulate. Anterio-lateral angles of fifth segment somewhat projecting triangularly and pointed. Coxal plates subrectangular, broadly rounded posteriorly.

Abdomen. Three anterior segments are distinctly indicated by transverse grooves. The three segments together are shorter than the pleotelson. Laterally they are markedly granulate, dorsally almost smooth. The third segment has its posterio-lateral angles somewhat triangularly prolonged. Its dorsal part in the middle is separated by slight grooves from the more laterally situated parts.

The pleotelson is markedly granulate, and is provided with a pair of short and obtuse terminal spines. The small tip of the pleotelson between the two terminal spines is situated lower than the rest and is almost devoid of granules; its posterior margin is truncate.

Body and sculpturing of the male.

The adult male differs from the female in having the four anterior pereion segments subequal in width, and in having much fainter sculpturing. The posterior and anterior transverse elevations on the first four pereion segments in the male are very faint and the tuberculae on the posterior elevations are almost indistinguishable.

Moreover the male differs from the female in having the fourth segment of the pereion longest, about one-fourth longer than the third[1].

The pleurae of the second, third and fourth segments are smaller than in the female and comprise on the fourth segment only about half the length of the segment, anteriorly. The fourth segment in the male is only indistinctly constricted posteriorly from the pleurae.

On the coxal plates of the second, third and fourth segments the posterior projecting triangular lobes are wanting.

As in the female, the body is covered with granules, most distinctly on the pleotelson.

[1] The length of the third and fourth segments was in a male specimen 2 mm. and 1.5 mm. respectively.

Appendages.

Antennulae. Reaching the middle of the third joint of the antennae. The first peduncular joint is broader than the others and, seen from above, subrectangular. The flagellum is longer than the last two peduncular joints together and is provided with about ten groups of sensory filaments and setae. The proportion between the lengths of the peduncular joints and the flagellum is (in a female) 10 : 9 : 7.5 : 19.2.

Antennae. About half as long again as the body. First peduncular joint small and not visible from above. Second peduncular joint with a spine at its posterio-distal angle.

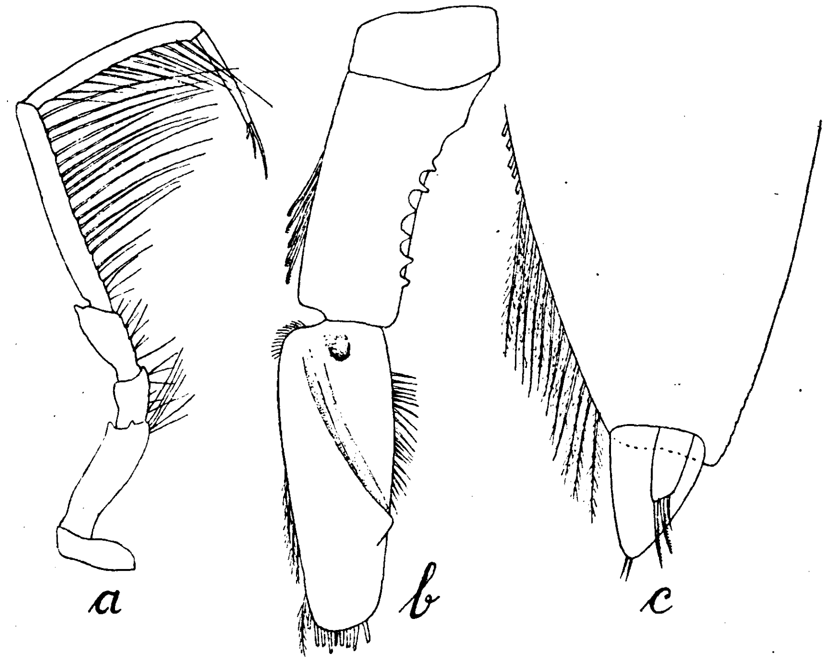

Fig. 36. *Antarcturus granulosus* n. sp. a. Second pereiopod of a female, from the rostral side, 20 ×. b. Right first pleopod (except the endopodite) in the adult male, seen from the caudal side, 35 ×. c. Tip of the left uropod, seen from the inner side, 90 ×.

Third peduncular joint about twice as long as the second and provided with a row of small spines or tuberculae along its caudal margin. Fourth peduncular joint slightly more than twice as long as the third. The fifth is about one-fifth longer than the fourth. The flagellum is about two-thirds the length of the last peduncular joint and consists (in a young specimen about 8.5 mm. in length) of six joints. The long first joint of the flagellum is longer than the two following together, but shorter than the three following joints together. In the adult male the flagellum consists of eight or nine joints.

Mandibles and maxillae. Normal.

Maxillipeds. Distal epipodite with distal margin broadly rounded. Coxopodite in females possessing a marsupium, expanded and prolonged into a thin lobe of the same shape as in *A. brunneus* var. *spinulosus*[1]; inner margin of the coxopodite furnished with ten

[1] Cf. Fig. 32 f.

plumose setae, distal margin provided with »hairs» devoid of a setal canal, and with short setae.

First pair of pereiopods. As usual in the genus, very setiferous. The setae are long, as a rule two-pointed, and often (especially those on the propodus and carpus) provided with two rows of short triangular sub-branches. The dactylus is about one-third shorter than the propodus (the proportion being 14 : 10), and is provided with two very short claws, the ventral claw being about two-thirds the length of the dorsal one. The length of the dorsal claw is only about one-seventh of the length of the dactylus.

Second pair of pereiopods (Fig. 36 a). Dactylus about half as long as propodus, furnished with two claws and a strong seta between the claws. Length of the dorsal claw approximately five times larger than that of the ventral one and about two-thirds the length of the dactylus. The proportion between the lengths of the joints and the dorsal claw is 20: 9.5: 12: 39: 35: 18.5: 11.

Third and fourth pairs of pereiopods. Similar to the second pair, but the basipodite increases in length, being longest on the fourth pair. On the fourth pair the posterior margin of the basipodite is granulate.

Fifth, sixth and seventh pairs of pereiopods. Upper margin of the basipodite provided with small spines and tuberculae. Propodus almost twice as long as the dactylus, which is provided with two claws, and between the claws two setae. Length of the dorsal claw about one-fourth the length of the dactylus. The ventral claw is minute.

First pair of pleopods (Fig. 36 b). Coxopodite short, subrectangular. Lateral margin of the basipodite with a row of six small spines; inner margin with eight coupling-setae. Exopodite and endopodite subequal in length. Exopodite in the male subrectangular, slightly tapering towards the broadly rounded end; outer and inner margins almost straight; inner proximal angle rounded and furnished with short »hairs»; lateral margin proximally from the mouth of the diagonal furrow with branchless setae; distal margin and distal half of the inner margin with plumose setae; diagonal furrow rather broad proximally, but narrowing towards the end; posterior surface laterally from the proximal end of the furrow slightly hollowed; distally from the mouth of the furrow there is a projecting triangular lobe at the lateral margin of the exopodite.

Penis. Normal.

Uropods (Fig. 36 c). Lateral surface of the sympodite granulate, with a longitudinal row of somewhat larger granules along the middle line. »Secondary» ramus slightly more than half as long as the lateral ramus, slightly tapering towards the end and provided with three apical setae. For other details see the figure.

Remarks. The species is very similar to *Antarcturus spinifrons*[1], (BEDDARD), from which species it differs in having a pair of terminal spines on the pleotelson, one on either side of the tip, instead of only one terminal spine in the middle, as in *A. spinifrons*; in having the pleotelson more markedly granulated; and in having the fourth pereion segment in the male longer than the third. These differences, which mainly relate to the sculpturing are not quite reliable. The uropods and first male pleopods, which are characteristically shaped in *A. granulosus* have, however, not been investigated in *Antarcturus spinifrons*. *A. granulosus* was found at South Georgia, whilst *spinifrons* was obtained from Kandavu

[1] Cf. BEDDARD, 1886, Pl. XXV, Figs. 9—12.

Islands (off Fidji Islands). It is therefore most probable that a more thorough examination of *spinifrons* will disclose differences in the uropods and the first male pleopods; otherwise *granulosus* in my opinion should be regarded merely as a variety of *spinifrons*.

From *A. lilliei* TATTERSALL (1921) *granulosus* differs expecially in its much longer antennae.

Localities and Material.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. + 2.05°. Gravel and sand. 19/4 1902. Immature specimen, 6 mm. in length, having the tuberculae on the pereion segments more distinct than in the specimens from st. 34 (South Georgia); in the specimen there is also a pair of minute tuberculae behind the frontal spines on the head.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. 6 specimens, males and females. Length of the largest specimen 14.5 mm. (adult male, type); its antennae are about 20 mm. in length. Female with young (type), length about 11 mm.

Distribution. Shag Rock Bank (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.).

Genus **Microarcturus** n. gen.

For diagnosis see p. 128.

Microarcturus stebbingi (BEDDARD, 1886).

Pl. II, Figs. 12, 13; Text. figs. 37 a—g.

Arcturus stebbingi. BEDDARD, 1886, p. 105—106, Pl. XXIV, Figs. 1—4; ZUR STRASSEN, 1902, p. 686.

Diagnosis. Dorsal surface of the head with four tuberculae or spines, situated in such wise as to form the points at the angles of a square. The first four pereion segments posteriorly with six tuberculae or spines, two dorsally, two dorso-laterally and two laterally situated. Fourth segment in the female shorter, in the male longer than the third. Last three pereion segments and abdomen tuberculated. Pleotelson about as long as the three anterior abdominal segments together. Tip of pleotelson triangular and obtusely pointed, with lateral margins straight. Second and third pereiopods with dactylus about half as long as propodus, the dorsal claw one-third as long again as the joint itself; dorsal claw of the fourth pereiopod about half as long as the dactylus. First pair of pleopods much narrower and slightly shorter than the others, lateral margin of the basipodite with 6—9 spines, increasing in size towards the distal end; endopodite in both male and female small, suboval, one-third to two-thirds as long as the exopodite and lacking plumose setae; exopodite in the male, distally from the mouth of the diagonal furrow, tapering towards the rounded end and having its distal margin furnished with a few plumose setae; diagonal furrow proximally broad but distally narrowing almost to a tube, its mouth surrounded by two slightly projecting lobes, the rostral one with convex margin, the caudal one subtriangular and pointed. Lateral ramus of the uropods subtriangular with distal end rounded; »secondary» ramus of the uropods about two-thirds as long as the endopodite, tapering towards the end, distally truncate and provided with three apical setae (exceptionally two).

Supplementary Description.

Body and spine-armature of the female (Pl. II, Fig. 12).

Head. Frontal margin sinuate, anterio-lateral angles rounded and often furnished with a small submarginal tuberculum or spine. Lateral margins straight. Eyes protruding, rounded, of brownish colour, of a length about one-third of that of the lateral side of the head. Dorsal surface with four tuberculae or spines, situated in such wise as to form the points at the angles of a square.

Pereion. In the female the third segment is the longest; in females with marsupium it is also the broadest. The first four segments are sculptured in the usual way by a posterior transverse elevation, which widens out laterally to comprise the whole segment. The pleurae are triangular; on the first segment they are small and indistinct. The posterior transverse elevation on the first four segments is always provided with three pairs of spines or tuberculae, situated dorsally, dorso-laterally and laterally. There are also additional spinules or tuberculae on these segments. The spines or tuberculae are in varying degrees covered with short hairs.

On the *first segment* the dorsal pair of spines or tuberculae on the posterior elevation are the largest. Often there is a tuberculum between the dorso-lateral and the pleural process, but situated further back. The anterior dorsal area is often provided with a pair of dorsal tuberculae. The lateral side of the tergite is provided with a faint ventral incision. Coxal plates not distinguishable.

On the *second segment* the triangular pleurae are distinct and occupy almost the whole lateral side of the segment. The sculpturing of the segment is much the same as that of the first segment, but on either side there is a small spine at the anterior margin of the pleurae. These small spines are directed anteriorly and project beyond the posterior margin of the first segment. Coxal plates with a slight ventral incision. They are elongated posteriorly into small triangular pointed lobes following, in the mature female, the outline of the marsupium.

On *the third segment* the pleurae occupy about three-fourths of the lateral side of the segment. Sculpturing and coxal plates as on the second segment.

On *the fourth segment* the pleurae occupy about two-thirds of the lateral side of the segment. On either side there is a deep and broad furrow posteriorly from the pleurae. The anterior dorsal area is often smooth. The tuberculae between the dorso-lateral and the pleural processes are usually missing. The small spines at the anterior margin of the pleurae are directed anterio-laterally. Otherwise the sculpturing corresponds with that of the second and third segments. The coxal plates are prolonged posteriorly into broad protuberances directed medially, having a rounded distal end and being more or less tuberculated.

The last three segments decrease in length and width from the fifth to the seventh; the posterior elevation is distinctly tuberculated. On the fifth segment there is a pair of small spines, directed laterally, and situated dorso-laterally close to the anterior margin. Dorsal area on the fifth, sixth and seventh segments smooth. Ventral surface of the fifth segment tuberculated, of the sixth and seventh almost smooth.

Abdomen. Short, not longer than the last three segments of the pereion together. Three anterior tuberculated segments are indicated by transverse grooves; the third segment and the pleotelson are broader than the first two segments, and the third segment is also slightly longer than each first or second segment.

Pleotelson subequal in length to the three anterior segments together, dorsally, except on the tip, it is tuberculated. Tip of pleotelson smooth, subtriangular with lateral margins straight and meeting at the apex in a right or obtuse angle. In some specimens a pair of tuberculae anteriorly from the tip are the largest.

Body and spine-armature of the male (Pl. II, Fig. 13).

The body of the male differs from that of the ovigerous female in having the first four pereion segments much narrower (the second and third are subequal in width, the fourth is slightly narrower than the third). It also differs in the fourth pereion segment being distinctly the longest. The pleurae are somewhat smaller and occupy a smaller part of the segments, anteriorly; on the fourth segment they only comprise approximately the anterior half of the lateral side of the segment. The lateral grooves behind the pleurae on this segment are broader and shallower than in the female. The small spines at the anterior margin of the pleurae, which occur in the female on the second, third and fourth segments, are missing in the male.

Variation of the spine-armature.

In their spine-armature the different specimens vary to a large extent. On examining a large amount of material, slightly tuberculated individuals can be found, on the other hand there are individuals which are very spinous. *Microarcturus stebbingi* affords a good example of the great individual variation in spine-armature occurring in the genus, as also in ***Antarcturus*** and *Arcturus* (see p. 125). As regards these genera an equally great variation in spine-armature has previously been found only in *Microarcturus similis* by BARNARD (1925) and in *Arcturus baffini* by OHLIN (1895).

The four dorsal processes on the head are either spines or mere tuberculae. Sometimes the anterior pair are the largest[1], sometimes the posterior pair, or they are subequal in length. The small process at the anterio-lateral angle of the head occurs as a spine or tuberculum and in some cases is entirely wanting. The processes on the posterior elevation of the first four perion segments are either spines or mere tuberculae. The small processes which are situated between the dorso-lateral and pleural processes, but further back, on these segments are spine-like, tuberculiform or entirely missing. In other specimens, however, these processes are distinct and spine-like.[2]

Though the spine-armature in *Microarcturus stebbingi* varies greatly in both males and females, most male specimens are only tuberculated, whilst spinous specimens are commonly found in the females. Most of the female specimens are at any rate furnished with a pair of dorsal spines on the posterior elevation of the first four pereion segments, often also with a pair of dorso-lateral spines on this elevation, whilst the large pleural processes as well as the other processes on the pereion are generally tuberculiform.

Appendages.

Antennulae (Fig. 37 a). Reaching to the distal margin of the second joint of the antennal peduncle. Third peduncular joint one-half to one-third as long as the second. Flagellum about one-fifth as long again as the second and third peduncular joints together.

Antennae (Figs. 37 b and c). Shorter than the body. First peduncular joint short, only visible from below, second and third increasing in length, the third being about one-third longer than the second. The second joint is triangular in transverse section,

[1] This is the case in the specimen figured by BEDDARD (1886, Pl. XXIV, Figs. 1 and 2).

[2] These processes occur more often as spines in female specimens. In male specimens I never found a spine-like process between the dorso-lateral and pleural processes on the first four pereion segments, but often there are distinct tuberculae on this spot in the males.

with the posterio-distal, the upper distal and the lower anterior distal angles produced and pointed; distal margin between the points somewhat concave. Third peduncular joint about one third longer than the second, often provided with two tuberculae on its caudal margin (one tuberculum at about the middle of the joint and one near the distal margin). Fourth joint about twice as long as the third and somewhat increasing in width distally. Fifth pecundular joint one-fourth to one-fifth as long again as the fourth.

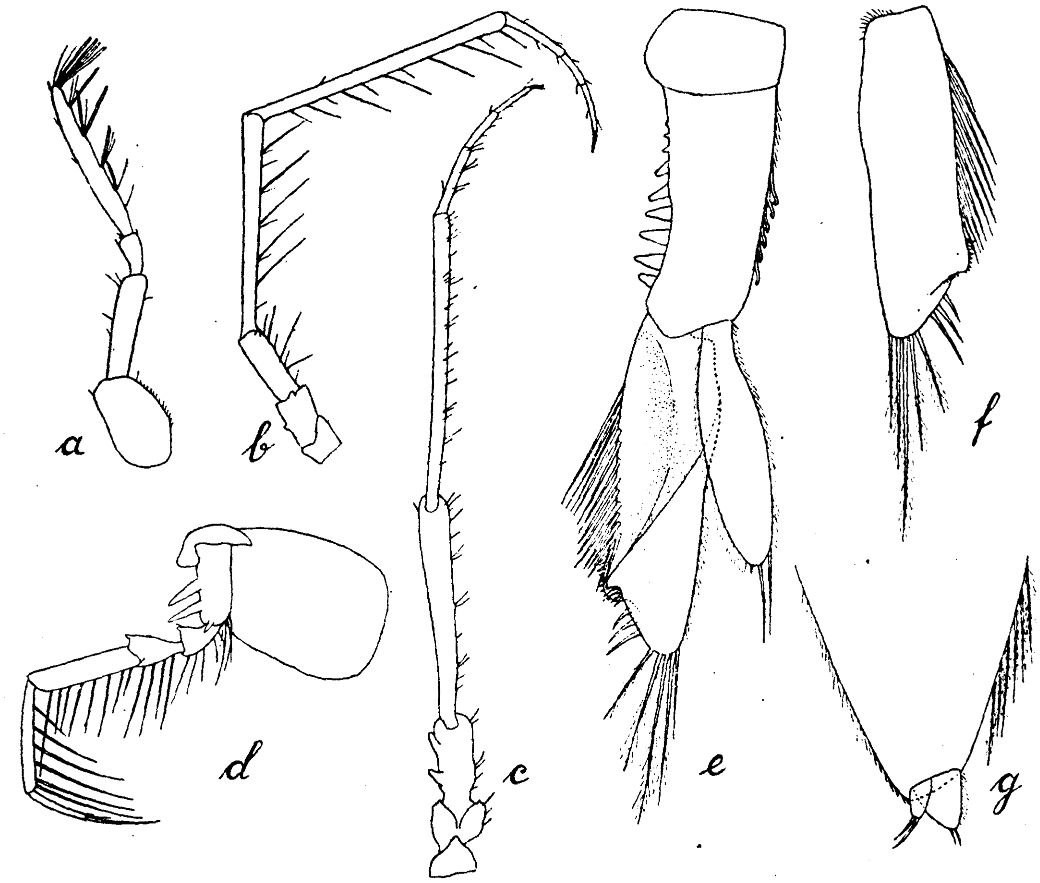

Fig. 37. *Microarcturus stebbingi* (BEDD.). a. Right antennula of a male, 140 ×. b. Right antenna, from above (female), 17 ×. c. Antenna of a male, from below, 17 ×. d. Left second pereiopod of a female with marsupium, 17 ×. e. Left first pleopod of an adult male; from the caudal side, 80 ×. f. Exopodite of the first pleopod in an adult male; from the rostral side, 80 ×. g. Tip of the right uropod, seen from the inner side, (male), 80 ×.

The three-jointed flagellum is slightly more than half as long as the last peduncular joint, its terminal joint is provided with a short »claw», traversed by a setal canal.

Mandibles and maxillae. Normal.

Maxillipeds. Distal epipodite with distal margin broadly rounded in the female, narrowly rounded in the adult male. In the male the epipodite is sometimes undivided. Coxopodite in the female with a marsupium elongated into a thin and rounded lobe directed backwards and having its inner margin furnished with plumose setae.

First pair of pereiopods. Setae on the propodus and dactylus two-pointed and provided with two rows of short triangular sub-branches. Dactylus about two-thirds as long as the propodus, furnished with a long dorsal and a short ventral claw, and between the claws a claw-like seta. Dorsal claw about one-third as long as the dactylus and about twice as long as the ventral claw.

The carpus is about half as long again as it is broad, the proportion being, in an adult male 30: 21, in a female 32: 19; it is thus slightly broader in the adult male than in the female.

Second to fourth pairs of pereiopods. Basipodite, as is usual, increasing in length from the second to the fourth pereiopod, its upper margin on the second pereiopod, as a rule with two, on the third with three, on the fourth with four spines or tuberculae. Upper distal angles of the ischium and the merus often prolonged into short spines. On the second pereiopod (Fig. 37 d) the carpus and propodus are subequal in length, on the third the propodus is slightly shorter, on the fourth about one-third shorter than the carpus (24: 17). The dactylus is about half as long as the propodus and is furnished with a very long dorsal claw and a minute ventral one. On the second and third pereiopods the dorsal claw is about one-third as long again as the dactylus, the proportion being 30: 23; on the fourth it is only about half as long as the dactylus. The minute ventral claw on the second pereiopod is not quite one-tenth as long as the dorsal one.

Fifth to seventh pairs of pereiopods. Basipodite more or less tuberculated. Dactylus about two-thirds as long as the propodus (the proportion being 10: 18), furnished with a dorsal claw about two-fifths the length of the dactylus and a very minute ventral claw; between the claws there are two setae.

First pair of pleopods (Fig. 37 e). Smaller than the other pleopods. Lateral margin of the basipodite provided with 6—9 spines, increasing in length towards the distal end of the basipodite; inner margin with 5—7 coupling setae.

Exopodite, in the female of the usual shape; its distal margin is provided with some short branchless setae. The exopodite in the male (Figs. 37 e and f) is straight and of a uniform width, except that it narrows at the distal end. Its outer and inner margins are almost straight, except distally from the mouth of the diagonal furrow, whence the exopodite tapers towards the broadly rounded end. The lateral margin of the exopodite is furnished with strong branchless setae, three setae of this kind being situated distally from the mouth of the diagonal furrow. The distal margin of the exopodite is furnished with five short-branched setae. The inner proximal angle of the exopodite is rounded and »hairy». The diagonal furrow is very wide proximally but contracts distally almost to a tube. Its mouth is surrounded by two projecting lobes, the posterior lobe (Fig. 37 e) being triangular and pointed, the anterior one (Figs. 37 e and f) rounded. The margins of the anterior lobe, and to a slight extend those of the posterior lobe, are provided with minute spines.

The endopodite is reduced in size, being in the female about half as broad and one-third to two-thirds as long as the exopodite; greatly varying in size in different specimens. Its distal margin is smooth in the female. In the male the endopodite is subequal in shape to that in the female; its length varies from a half to two-thirds the length of the exopodite, its distal margin is provided with a few, as a rule, branchless setae.

Second pair of pleopods. Exopodite and endopodite of ebout equal size, their distal margins provided with long plumose setae, their lateral margins with shorter plumose setae. Penial filament in the adult male somewhat longer than the exopodite.

Third and fourth pairs of pleopods. Basipodite small. The endopodite is somewhat longer than the exopodite. The margins of the branches are devoid of setae, except one short, branchless seta on the lateral margin of the exopodite near the distal margin.

Fifth pair of pleopods. Exopodite and endopodite similar in shape and size, their margins devoid of setae.

Uropods (Fig. 37 g). Lateral surface of the sympodite spinous, tuberculated or almost smooth. "Secondary" ramus from one-half to two-thirds as long as the lateral ramus, tapering towards the end; distal margin with three (exceptionally two) setae.

Remarks. The species has been described by BEDDARD (1886) from a single female specimen[1], (13 mm. in length), obtained off Kerguelen by the Challenger Expedition. It has since been collected likewise off Kerguelen by the German Deep-Sea Expedition 1898—99 (see ZUR STRASSEN, 1902, p. 686). The specimens obtained by the Swedish Antarctic Expedition are from South Georgia and Shag Rock Bank. Though I have examined a large amount of material, I found no specimen of a greater length than 9 mm., whereas BEDDARD (1886) states that the length of his examined specimen was 13 mm. In all other features than this slight difference in length my specimens agree exactly with *stebbingi* as described and figured by BEDDARD (1886). In the figure by BEDDARD (1886, Pl. XXIV, Fig. 1) the antennae of the species have been given a greater length than the body. In his description BEDDARD, however, states that the lengths of the antennae in his 13 mm. long specimen are only 9 mm.

Microarcturus stebbingi approaches most closely to *Microarcturus patagonicus* (OHLIN), *hirticornis* (MONOD) and *rugosus* n. sp. It differs from *patagonicus* in having smaller eyes, in being less spinous on the pereion, and in having the dorsal claw of the first three pereiopods of much greater length. It differs from the two allied species *hirticornis* and *rugosus* in the absence of hair-like small spines on the body and in a different shape of pleotelson. It differs distinctly from *rugosus* in that the first pleopods both in the male and the female have a different shape and have a different length of the dorsal claw of the fourth pereiopods.

Localities and Material.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. + 2.05°. Gravel and sand. $^{19}/_{4}$ 1902. 14 specimens, males and females, all specimens spinous. Length of the largest specimen 8 mm. (female with marsupium). The specimens were obtained together with *Microarcturus rugosus.*

St. 21. South Georgia, mouth of Possession Bay, lat. 54° 8′ S., long. 37° 3′ W. 200 m. Bottom temp. + 1.5° Clay. $^{9}/_{5}$ 1902. 6 specimens. Length of the largest specimen about 8 mm.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. + 1.5° Clay and also some algae. $^{14}/_{5}$ 1902. A large spinous male specimen, length about 9 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. $^{5}/_{6}$ 1902. About 125 specimens, males and females. Length of largest specimens, males about 9 mm., females 8.5 mm.

[1] The type specimen of *Microarcturus stebbingi* is preserved at the British Museum. When visiting the British Museum I asked for the specimen, but it could not be found and has perhaps been lost. I have thus been unable to compare the characteristic pleopods and uropods of my specimens with those of the type specimen of *Microarcturus stebbingi*.

Distribution. Shag Rock Bank (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.), Kerguelen (BEDDARD 1886, ZUR STRASSEN 1902).

The species has previously been found only at Kerguelen.

Microarcturus rugosus n. sp.

Pl. II, Fig. 14; Text figs 38 a—e.

Diagnosis. Body densely covered with short-haired spines and »hairs», the largest spines being: four on the dorsal surface of the head, six (a dorsal, a dorso-lateral and a lateral pair) on the posterior transverse elevation of the first four pereion segments and a pair, one on either side of the tip of the pleotelson. Pleotelson with lateral margins slightly convex, converging towards the tip, where they meet in an acute angle. Fourth pereion segment in the male subequal in length to the third. First two peduncular joints of the antennulae, as well as the peduncle of the antennae (except the distal part of the last peduncular joint), dorsally more or less covered with small spines, varying from the usual type down to needle-like points. Length of the dactylus of the second pereiopod two-fifths the length of the propodus, length of the dactylus of the third pereiopod about half that of the propodus; dactylus of fourth pereiopod three-fourths the length of the propodal joint. Dorsal claw of the second and third pereiopods about one-third as long again as the dactylus, of the fourth subequal in length to this joint. Basipodite of first pair of pleopods with a lateral row of 11—16 small and obtuse spines. Exopodite and endopodite in the female linguiform, of uniform width and furnished with one or two long plumose setae on the broadly convex distal margins; the endopodite is slightly shorter than the exopodite, but only about half as broad. Exopodite of the first pleopod in the male sub-rectangular and of a uniform width; distal margin almost straight, provided with a few rather short plumose setae; diagonal furrow proximally broad, but narrowing towards the distal end; mouth of the furrow forming a deep incision in the lateral margin of the exopodite. Lateral ramus of the uropod subtriangular, with a convex distal margin; "secondary" ramus of the uropod about two-thirds as long as the lateral ramus, tapering towards the end and provided with three setae on its distal margin.

Discription.

Types. Male about 7 mm. in length, female with marsupium about 8.5 mm. in length.

Body (Pl. II, Fig. 14). Covered, dorsally and laterally, with spines of varying size and »hairs». The large spines are, as a rule, covered with short »hairs», the small spines are often distally divided into a number of acute points (Fig. 38 b). Ventral surface of the pereion devoid of spines.

Head. Frontal margin concave; anterio-lateral angles rounded; lateral margins straight. Eyes small, dark and rounded, with a length subequal to one-fourth of the length of the lateral side of the head. Dorsal surface of the head with four spines, situated in such wise as to form the points at the angles of a square. The anterior pair of spines are directed slightly forwards and are somewhat longer than the posterior pair. At the anterio-lateral angle of the head there is a long spine. The head is, moreover, covered with small spinules of varying size.

First pereion segment. Fused with the head but separated by a transverse groove. Lateral parts of the segment not projecting, directed ventrally. Lateral margin of the tergite with a small ventral incision. Posterior transverse elevation, as a rule, with a pair of large dorsal and another of large dorso-lateral spines; sometimes also a pair of laterally situated spines are longer than the others. In some of the adult specimens the segment is covered with numerous small spines of uniform length, situated approximately in four transverse rows, two of these rows being on the transverse elevation.

Second, third and fourth pereion segments. In the female the third segment is the longest, in the male the third and fourth segments are subequal in length. Lateral parts of the segments subtriangular and forming horisontally situated »pleurae», those on the fourth segment occupying about the anterior three-fourths of the lateral side of the segment. Posteriorly from the pleurae of the fourth segment as in *Microarcturus stebbingi,* there is, a deep transverse furrow on the lateral side. In small specimens, a dorsal, a dorso-lateral and a pleural pair of spines are always the largest. In some adult females the pleural pair of spines only are longer than the others, the posterior elevation being densely covered with small spines, practically uniform in length, forming, though indistinctly, two dorsal transverse rows and three or four lateral rows; the anterior dorsal area is moreover furnished with a transverse row of spines. In most of the adult specimens, the dorsal, dorso-lateral and pleural pairs of spines on the posterior elevation are larger than the others, and the anterior dorsal area is provided with only one pair of dorsally situated spines. In very small specimens the anterior dorsal area is smooth.

Coxal plates devoid of incisions; those of the second and third segments in the female with marsupium posteriorly prolonged into short triangular projections closely following the outline of the marsupium. Coxal plates of the fourth segment in females with marsupium prolonged into long triangular obtusely pointed processes, directed inwards, the points of which almost meet behind the marsupium. Posterior margins of the processes provided with a small spine.

Fifth, sixth and seventh pereion segments. Decrease in length and width, from the fifth to the seventh. Anterior dorsal area smooth. Posterior elevation covered with spines, dorsally forming two indistinct transverse rows. Coxal plates spinous.

Abdomen. About as long as the last three pereion segments together. Three anterior segments are indicated by very faint transverse grooves; each segment with a transverse row of spines; as a rule, one lateral spine on each side of the third segment is the largest.

Pleotelson about as long as the anterior part of the abdomen covered with spines, of which one pair of terminal spines — one spine on either side anterior to the tip of pleotelson — are always longer than the others. Lateral margins of pleotelson slightly convex meeting at the tip at an acute angle. The part of the pleotelson which is situated posteriorly from the terminal pair of spines is shorter than in *Microarcturus stebbingi.*

Antennulae (Fig. 38 a). Reaching the distal margin of the third peduncular joint of the antennae. First and second peduncular joints with a sparse covering of small spines and setae. Flagellum in the male, as a rule, with six groups of sensory filaments and setae, in the female with only two groups, situated distally.

Antennae (Figs. 38 b and c). Much shorter than the body. Second, third, fourth and, in a minor degree, the proximal part of the fifth joint covered with short and slender spines and »hairs». Third peduncular joint somewhat less than twice as long as the second, as a rule, with one spine larger than the rest at its anterio-distal angle. Fourth peduncular joint about twice as long as the third, increasing in width towards the distal end and provided with a large spine at the anterio-distal angle. Fifth peduncular joint about one-sixth longer and somewhat narrower than the fourth, increasing in width towards the distal end. Flagellum about one-third shorter than the last peduncular joint, consisting, as a rule, of three joints, the last joint being furnished with a terminal claw. Exceptionally there are four joints in the flagellum.

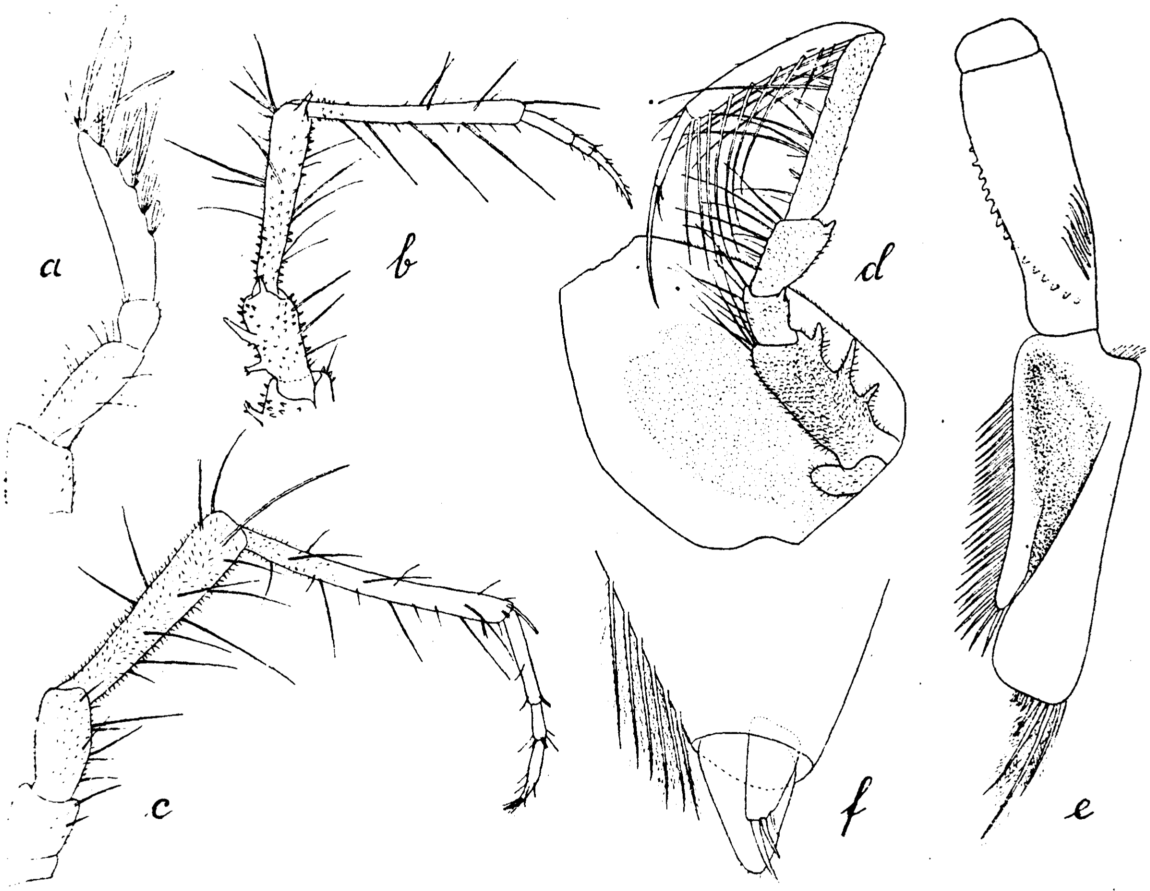

Fig. 38. *Microarcturus rugosus* n. sp. a. Left antennula, in a male, 50 ×. b. Right antenna, from above, 17 ×. c. Left antenna, from below, 30 ×. d. Second pereiopod of a female with marsupium, 25 ×. e. Left first pleopod (except the endopodite) of an adult male; from the caudal side, 80 ×. f. Tip of the right uropod, seen from the inner side, (adult female), 140 ×.

Mouth-organs. Normal. In the maxillipeds the distal margin of the distal epipodite is broadly rounded. The ovigerous female has the coxopodite expanded into a lobe directed backwards; the inner margin of this lobe is furnished with plumose setae.

First pair of pereiopods. Setae on the propodus and dactylus of the usual type, long, two-pointed and furnished with two rows of short triangular sub-branches. Propodal joint about half as long as the dactylus. Dorsal claw about half as long as the dactylus and more than three times as long as the short ventral claw.

Second pair of pereiopods (Fig. 38 d). Upper margin of the basipodite spinous, often with three spines longer than the rest; ischium and merus with a spine at their upper distal angles (frequently larger than in the figured specimen), propodus slightly shorter than the carpus and about two and a half as long as the dactylus; dorsal claw about one-third as long again as the dactylus, ventral claw extremely minute and setiform; between the claws there is a seta.

Third pair of pereiopods. Similar to the second, except that the basipodite is longer and the propodus shorter. Propodus not fully twice as long as the dactylus. Length of the dorsal claw about one-third as long again as the dactylus.

Fourth pair of pereiopods. Basipodite longer than that of the third pereiopod, with upper margin spinous; ischium and merus with a spine at its upper distal angle. Propodus only about half as long as the carpus. Dactylus about one-fourth shorter than the propodus; dorsal claw subequal in length to the dactylus.

Fifth, sixth and seventh pairs of pereiopods. Upper margin of the basipodite more or less spinous. Propodus about two-thirds as long as the dactylus, which is furnished with two claws, and a seta between the claws. Length of the dorsal claw about two-fifths that of the dactylus. Ventral claw minute.

First pair of pleopods, female. Lateral margin of the basipodite with about 10 small obtuse spines. Exopodite and endopodite linguiform, slightly tapering towards the end and furnished with setae only on their distal margins. Distal margin of the exopodite provided with two long plumose[1] setae. Endopodite slightly shorter and only about half as broad as the exopodite; its distal margin provided with one or two plumose[1] setae.

First pair of pleopods, male (Fig. 38 e). Basipodite with a lateral row of 11—16 small obtuse spines; inner margin with 5 coupling-setae. Exopodite broad, not curved, of uniform width; its outer and inner margins almost straight, distal margin almost truncate and provided with about eight short plumose setae, three of them longer than the rest; outer margin with a row of stout branchless setae; inner margin devoid of setae proper but with some short »hairs» at the inner proximal angle; diagonal furrow proximally broad but narrowing considerably towards the end; the mouth of the furrow forms a deep incision in the lateral margin.

Uropods. Lateral surface of the sympodite short-haired. "Secondary" ramus about two-thirds as long as the lateral ramus, tapering towards the end, its distal margin furnished with three branchless setae.

Remarks. It is possible that the species is identical with *Microarcturus hirticornis*[2], a species of which a single, probably non-adult, specimen was obtained by the Belgian Antarctic Expedition (1897—99). The specimen was figured, but not described, and provisionally given the name of *hirticornis* by MONOD (1926). From the figure by MONOD (1926, Fig. 30) it will be seen, however, that *hirticornis* differs in having the distal end of the pleotelson cleft, owing to the pair of terminal spines being situated near each other on the distal margin of the pleotelson; the triangular and pointed tip of the pleotelson between the two terminal spines, which is characteristic of *rugosus*, is thus entirely lacking in *hirticornis*. This difference may perhaps be due to variation within the same species.

[1] The setae have only sparse sub-branches.
[2] MONOD, 1926, p. 33, Fig. 30.

Localities and Material.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° W. 160 m. Bottom temp. + 2.05°. Gravel and sand. 19/4 1902. 32 specimens, males, females, and immature. Length of the largest specimen 9 mm. (female with young); colour whitish. Length of the type specimens, male about 7, female about 8.5 mm.

St. 94. Graham Region, north of Joinville Island, lat. 62° 55′ S., long. 55° 57′ W. 104 m. Gravel mingled with stones. 31/12 1902. One male specimen, length about 5.5 mm. (Pl. II, Fig. 14); colour grayish-brown.

Distribution. Shag Rock Bank (Sw. Ant. Exped.), Graham Region (Sw. Ant. Exped.).

Microarcturus digitatus n. sp.

Pl. II, Figs. 15, 16; Text figs. 39 a—e.

Diagnosis. Head with four large dorsal spines, situated in such wise as to form the points at the angles of a square. First four pereion segments each with a transverse row of six large spines, one dorsal, one dorso-lateral and one lateral on either side of the middle. Last three pereion segments each with a pair of large dorso-lateral and a pair of large lateral spines, the lateral spines being situated on the coxal plates (fifth segment with a pair of dorsal tuberculae). Pleotelson pointed, lacking the usual pair of terminal spines. Second, third and fourth pairs of pereiopods with dactylus slightly longer than the propodus, its dorsal claw on second and third pereiopods being about $^1/_8$, on the fourth $^1/_{12}$—$^1/_{13}$ as long as the dactylus. Last three pairs of pereiopods with dactylus about two-thirds as long as the propodus. Basipodite of the first pair of pleopods with 7—10 small spines on its lateral margin; exopodite and endopodite subequal in length, but the endopodite narrower than the exopodite; endopodite furnished with sparse plumose setae only on its distal margin. Exopodite in the male of a uniform width, slightly curved, with inner margin convex and lateral margin concave; diagonal furrow of the male exopodite contracted into a tube, except at its proximal end. Uropod provided with a subtriangular, distally rounded lateral ramus, but with no trace of a "secondary" ramus.

Description.

Types: Female with marsupium, length 9 mm., length of its antennae 8 mm.; male, length 12.5 mm., length of the antennae 11.5 mm.

Body and spine-armature of the female.

Head. Frontal margin sinuate. Anterio-lateral angles pointed. Lateral margins, when viewed laterally, straight, showing a small point behind the eyes when seen from above. Eyes protruding and circular, about one-third the length of the head. In the middle they are dark-brown in colour but colourless peripherally. Dorsal surface of the head with four large spines, situated in such wise as to form the points at the angles of a square.

Pereion. Segments of the pereion sculptured in the usual way in a posterior transverse elevation, which widens out laterally to comprise the whole segment. The second, third and fourth segments are protracted laterally into subtriangular pleurae, occupying anteriorly on the second and third segments about three-fourths, on the fourth segment about two-thirds of the length of the segment. Pereion traversed by six longitudinal rows of large spines, situated dorsally, dorso-laterally and laterally on the posterior transverse elevation of the segments, and forming on each of the first four segments a dorsal, a dorso-lateral and a lateral pair of spines; the lateral spines on segments 2—4 are formed by the prolonged tips of the pleurae. A similar spine arrangement occurs on the other segments, too, though some of the spines are small or missing. The large lateral spines of the last three segments are formed by the tips of the coxal plates.

The first segment is fused with the head, but separated by a groove. The lateral parts of the segment are not protracted into pleurae, but are furnished with a small but distinct spine, directed laterally and corresponding to the pleurae on the second, third, and fourth segments. Posteriorly from the lateral spine there is a small ventral incision in the lateral margin. Posterior transverse elevation provided with a pair of dorsal and a pair of dorso-lateral spines. The dorso-lateral spines are the largest. Coxal plates absent.

The second segment is longer than the first and is furnished with six large spines, increasing in size from the dorsally situated spines to the pleural ones. There is a small spine on each side between the dorso-lateral and the lateral (pleural) spine, but situated further back, and a small spine anteriorly on the pleurae.

Coxal plates in female with a marsupium posteriorly prolonged into slight triangular projections.

The third segment is subequal in length to the second but broader. It is sculptured in the same way as the second.

Coxal plates as on the second segment.

The fourth segment is narrower than the third and about as broad as the second. It is shorter than both the third and second segments and about as long as the first segment. Its sculpturing is similar to that of the other anterior segments.

Coxal plates in female with a marsupium prolonged into posterior processes directed medially, the points of which almost meet behind the marsupium. The posterior margin of these processes, approximately on the middle, is furnished with a small spine directed downwards and outwards.

The last three segments decrease in length and width from the fifth to the seventh. Each segment is provided with a pair of dorso-lateral and a pair of lateral spines, the latter, situated on the coxal plates (see p. 124), being the longest. Fifth segment furnished with a pair of dorsal tuberculae. It has on each side a small spine, which is situated between the dorso-lateral and the lateral spine but further back, and a small spine anteriorly on each coxal plate; there is also a small spine anterio-laterally on the segment (this spine perhaps corresponding to the large lateral [pleural] spine on the anterior segments). Sixth and seventh segments similar to the fifth, but the small additional processes — except the one anterior on each coxal plate — are mere tuberculae. Ventral surface of seventh segment with a small tuberculum in the middle.

Abdomen. Slightly longer than the last four pereion segments together. First three segments distinctly indicated by transverse grooves. First segment posteriorly with a pair of dorso-lateral and a pair of somewhat larger lateral spines; its ventral surface furnished anteriorly in the middle with a small spine. Second segment with two small dorsal and two larger dorso-lateral spines. Third segment with two small dorsal and two somewhat longer lateral spines.

Pleotelson about one-third longer than the three anterior segments together, with lateral margins slightly convex. Tip of pleotelson ending in an acute point. The pleotelson, with the exception of the tip, is sparsely covered with short tooth-like spines; there are two parallel rows of these spines on either side along the lateral margin, each row consisting of three spines. In the more lateral row the spines are small and tuberculiform.

Body and spine-armature of the male.

The male differs from the mature female in its body being somewhat less broad anteriorly, owing to the absence of marsupium. The lengths of the segments are the same

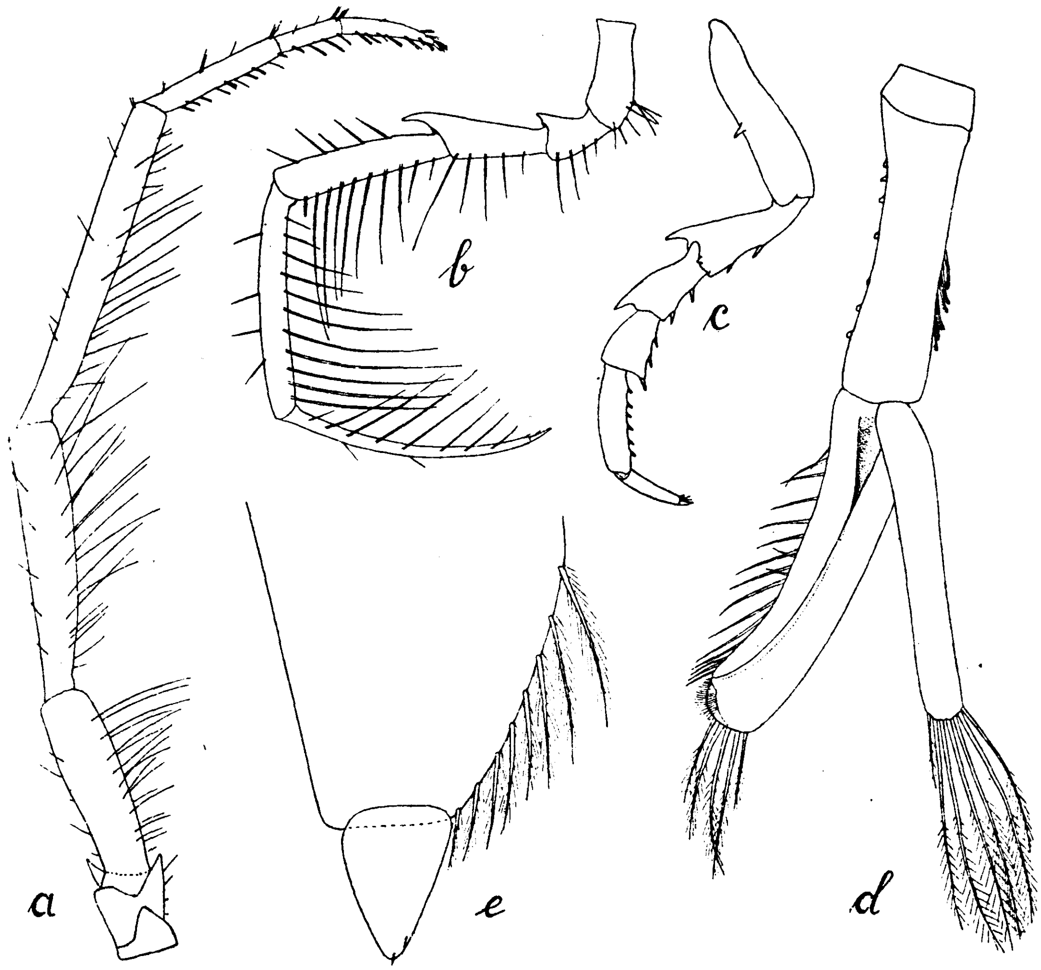

Fig. 39. *Microarcturus digitatus* n. sp. a. Antenna from above, 17 ×. b. Right second pereiopod, 17 ×. c. Right sixth pereiopod, 17 ×. d. Left first pleopod of an adult male; from the caudal side, 45 ×. e. Tip of the right uropod, seen from the inner side, (female), 80 ×.

as in the female, the fourth segment in the male being likewise shorter than the third. As in the female, the fourth pair of coxal plates are prolonged into processes, directed inwards, which in the middle are provided with a spine, but these processes are firmly fused with the sternum. The characteristic spine-armature dorsally and laterally on the body is the same in both males and females. In its spine-armature the adult male differs from the female only in having the ventral surface of the fifth pereion segment provided with a spine situated anteriorly in the middle.

Appendages.

Antennulae. Reaching approximately the distal margin of the third peduncular joint of the antennae. The proportion between the lengths of the three peduncular joints and the flagellum is 7.9: 5: 3.5: 18 (in a female). The flagellum is thus slightly longer than the peduncle. Its length varies slightly in different specimens.

Antennae (Fig. 39 a). Shorter than the body. Second peduncular joint provided with a spine at its lower-distal and anterio-distal angles. The last peduncular joint is the longest.

The flagellum is about four-fifths as long as the last peduncular joint and consists, as a rule of three joints, the last joint provided with a claw, in which a distinct setal canal can be seen. In one large female with marsupium the flagellum consisted of four joints, the first two joints corresponding to the usual first joint.

Mandibles and maxillae. Normal.

Maxillipeds. Epipodite ovate with distal margin broadly rounded. The suture between the proximal and the distal epipodite is faint in males. In females with a marsupium this suture is distinct, and the coxopodite extends backwards into a thin subrectangular lobe in the usual way, the lobe being furnished on its inner margin with plumose setae.

First pair of pereiopods. Dactylus subequal in length to the propodus, furnished with two very short claws near each other, the claws being almost equal in size. All setae on the pereiopod are single-pointed, without sub-branches.

Second, third and fourth pairs of pereiopods (Fig. 39 b). Basipodite of the second pereiopod, as a rule, with a small spine[1] on its upper margin; on the third pereiopod the upper margin of the basipodite, as a rule, has two, on the fourth pereiopod, three spines. Ischium and merus with their upper distal angles prolonged into spine-like projections. The propodus and dactylus are extremely long, the dactylus being somewhat longer than the propodus. On the second and third pereiopod the dactylus is furnished with a dorsal claw, which is about one eighth as long as the dactylus, and a minute slender ventral claw. Between the claws there is one seta. The dactylus of the fourth pereiopod is provided with two claws, both strong, but the ventral one is about two-thirds the length of the dorsal; between the claws there is one slender seta; the dorsal claw is about $^1/_{12}$—$^1/_{13}$ as long as the dactylus.

Fifth, sixth and seventh pairs of pereiopods (Fig. 39 c). Upper margin of the basipodite provided with a small spine. Upper distal angle of the ischium and merus prolonged into a spine. Lower margin of the ischium, merus, carpus, and propodus, with small spines. Dactylus about two-thirds as long as propodus, furnished with two claws, a small dorsal claw about one-seventh the length of the dactylus, and a minute ventral one, about one-third as long as the dorsal claw.

Penis. Normal.

First pair of pleopods (Fig. 39 d). Basipodite with 7—10 minute tooth-like spines along its lateral margin; inner margin with about seven coupling-setae. Exopodite in the male almost of uniform width, slightly curved; outer margin concave and provided with branchless setae, inner margin slightly convex; distal margin convex and furnished with five plumose setae; inner proximal angle rounded, smooth. The diagonal furrow

[1] The spine is missing in the specimen figured.

of the male exopodite is broad proximally, but for the greater part of its length it is contracted into a tube; the posterio-distal angle of the mouth of the tube is pointed. For further details see the figure. Endopodite in the male always narrower than the exopodite, its width in some specimens being two-thirds the width of the exopodite; in other specimens it is broader.

The exopodite and endopodite in the female are long and narrow, the endopodite being very slightly shorter and narrower than the exopodite. Both are furnished with plumose setae on their distal margins; the exopodite is provided with four such setae, the endopodite with five. In one female with marsupium the exopodite was transformed in exactly the same manner as in the adult male.

Uropods (Fig. 39 e). Lateral surface of the sympodite with a longitudinal ridge along the middle bearing about six small tooth-like spines. Lateral ramus subtriangular and broadly rounded distally. "Secondary" ramus completely absent in all specimens.

Remarks. *Microarcturus digitatus* is allied to *M. acanthurus* (MONOD, 1926). The spine-armature of the head and the pereion resembles that of *acanthurus*. The length of the joints of the pereiopods and the antennae is similar in both species, but *digitatus* differs in having the pleotelson pointed, not as in *acanthurus* elongated into a cleft prolongation, as well as in many other details. Whether or not the "secondary" ramus of the uropod is lacking in *acanthurus*, as is the case in *digitatus*, was not indicated by MONOD (1926).

The spine-armature in *Microarcturus digitatus* is very similar to that in *Arcturus parvus* RICHARDSON (1910) from the Phillipine Islands (see RICHARDSON, 1910 a).

Localities and Material.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. + 2.05°. Gravel and sand. 19/4 1902. Immature specimen, found on a sponge. Flagellum of one of the antennae consisting of only two joints. Seventh pair of pereiopods only semi-developed. Spine-armature in its main features as in adult specimens. Thus there is a transverse row of six spines posteriorly on the first four pereion segments, but the small additional spines are absent or minute. Length of the specimen about 3.2 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. 11 specimens, males and females, found on a sponge. Length of largest specimens (types), male 12.5 mm, female possessing a marsupium 9 mm.

Distribution. Shag Rock Bank (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.).

SECTION V.

Sub-Order Asellota.

I. Fam. **Parasellidae.**

A. Group **Ianirini** HANSEN, 1916.

Genus **Ianira** LEACH, 1813.

HANSEN 1916, TATTERSALL 1921.

Subgenus **Iathrippa** BOVALLIUS, 1886.

Syn. *Notasellus.* PFEFFER, 1887.
Jorina. NIERSTRASZ, 1918.

Diagnosis. Eyes protruding, situated laterally. Uropods broad and flattened, the width of the peduncle increasing towards the distal end. First pair of pleopods (in the male) with the latero-distal angles of the sympodite triangular and protruding freely, rami triangular distinctly marked off from the sympodites. Exopodite of third pleopod two-jointed, differently shaped in male and female, being large in the male and widening towards the end, in the female small and narrow and tapering towards the end. Endopodite of third pleopod oblong-ovate furnished with three plumose setae on its distal margin. Otherwise as in *Ianira.*

In 1886, BOVALLIUS referred the species *Ianira longicauda* CHILTON to a new genus *Iathrippa,* characterized by having lamellar uropods. As will be shown below, *Ianira* (*Iathrippa*) *longicauda* CHILTON is identical with *Notasellus trilobatus* RICHARDSON (1910). Consequently, the name *Notasellus* PFEFFER must be abandoned and replaced by the older name *Iathrippa.*

BOTH HODGSON (1902), and TATTERSALL (1921) point out that *Ianira* (*Iathrippa*) *sarsi* (PFEFFER) comes very close to a typical species of *Ianira.* Still more is this the case with the second species *Iànira* (*Iathrippa*) *longicauda.* But as there still remain some features characteristic of both species, as shown in the diagnosis, I prefer to retain *Iathrippa* as a separate subgenus. The value of the subgenerical characters cannot be shown without a revision of *Ianira* and allied genera.

The shape of the first pleopods in the male is characteristic and exactly similar in both the known species. This characteristic thus applies to the subgenus, but it is however, to be remarked that the shape of the first male pleopods within the group *Ianirini* sometimes varies rather considerably in different species of the same genus. (e. g. the closely allied species *Jaera albifrons* LEACH and *Jaera nordmanni* RATHKE).

According to HANSEN (1905, p. 329—330) and STEBBING (1905, p. 49) *Stenetrium inerme* HASWELL (1881) should probably be referred to *Ianira.* In its laterally situated eyes and broad uropods it agrees with the subgenus *Iathrippa* (see HASWELL, 1881, Pl. 19, Figs. 2 and 2 x).

Ianira (*Iathrippa*) **longicauda** CHILTON, 1884.

Text. figs 40 a—h.

Janira longicauda. CHILTON, 1884, p. 250, Pl. 18, Fig. 2 a; TATTERSALL, 1921, p. 200, Pl. I, Fig. 6.
Iathrippa longicauda. BOVALLIUS 1886, p. 32—33.
Notasellus trilobatus. RICHARDSON, 1910, p. 649—650, Figs. 1 a, b, and c; GIAMBIAGI, 1925, p. 16—17, Pl. V.
Jorina chilensis. NIERSTRASZ, 1918, p. 134—137, Figs. 74—85.
For additional literature see TATTERSALL (1921).

Supplementary Description.

Colour. Whitish to slightly yellow or brownish; some specimens with brownish dots of pigment on the dorsal surface.

Head. Sub-rectangular, anterio-lateral angles rounded. Rostrum extending to about the distal end of the third peduncular joint of the antennae, its dorsal surface concave. Eyes laterally situated, protruding, semi-spherical. Lateral margins with short spine-like setae which, in large specimens, are found, as a rule also on the dorsal surface, mingled with longer ones.

Pereion. In large specimens more or less covered with setae. Coxal plates as described and figured by RICHARDSON (1910).

Abdomen (Fig. 40 a). With one short free segment anteriorly. Pleotelson semi-circular, more or less covered with short and long setae, most thickly on the margins.

Antennulae (Fig. 40 b). Most of the setae on the peduncular joints are two-pointed and of the appearance shown in Fig. 40 c. Flagellum consisting of about 28 joints.

Antennae. Slightly longer than the body. In most of the specimens they are broken between the fourth and fifth peduncular joints. Peduncle furnished with the same kind of setae as the peduncle of the antennulae. First, second and third joints short, subequal in length. Third peduncular joint about twice as long as the first, with well developed and articulated squama, which is furnished with apical setae. The sixth peduncular joint (in a free antenna lacking the first four joints of the peduncle) is longer than the fifth. The long flagellum consists of about 90 (91) joints, the first very long and corresponding to several joints.

Mandibles. Of typical Ianiridian structure, almost as in *Ianira maculosa*[1] LEACH. Incisive part in both mandibles five-pointed. Lacinia (on the left mandible) with five points. Row of setae consisting of 14—16 large setae; they are furnished with a row of spinelike sub-branches, except 1—3 of the posterior setae. Between the large setae occur some hair-like additional ones.

First and second pairs of maxillae, upper and lower lips. Almost as in *Ianira maculosa*[1] LEACH. Each lappet of the outer lobe of the second pair of maxillae is provided with three apical setae.

Maxillipeds (Fig. 40 d). Same in males and females. Third palp joint narrow. Some of the setae on the distal margin of the endite are illustrated in Fig. 40 e.

First pair of pereiopods, female. See Fig. 40 h.

First pair of pereiopods, male[2]. See Figs 40 f and g. Meral joint with six two-pointed distal setae. Carpal joint strong, with lower surface very broad and somewhat hol-

[1] Cf. G. O. SARS, 1899, Pl. 40.
[2] Cf. RICHARDSON (1910, Fig. 1 b) and GIAMBIAGI (1925, Pl. V, p_1 and $p_1{}^x$).

lowed. On both the rostral and the caudal margin of the lower surface there is a row of densely situated setae, having between them a longitudinal furrow in the middle. Most of the setae are slender and hair-like, but in the caudal row they are mingled with stout

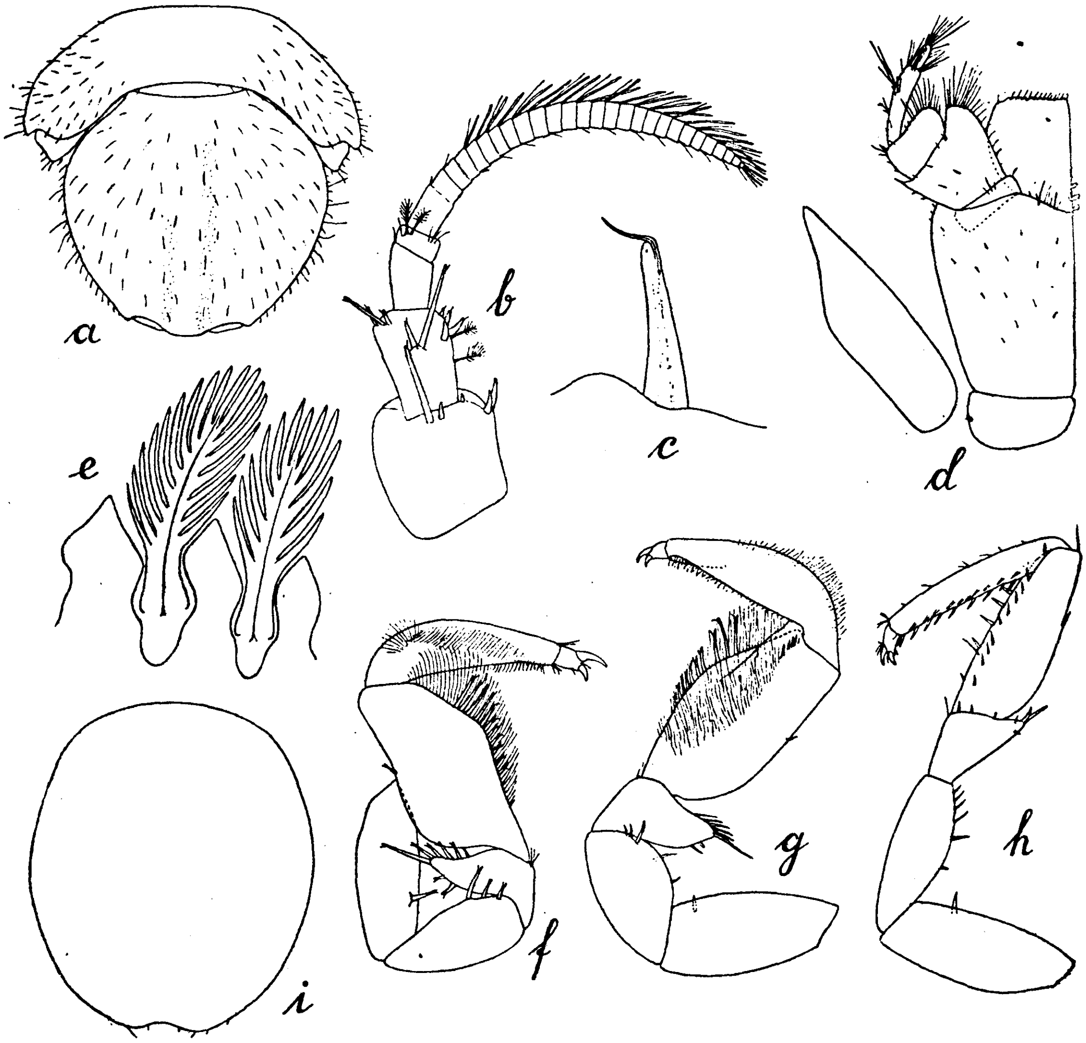

Fig. 40. ***Ianira (Iathrippa) longicauda*** **CHILT. a. Last pereion segment and abdomen, 13 ×. b. Right antennula, male, 35 ×. c. Seta from the second penduncular joint of the antennula, 240 ×. d. Right maxilliped, (non-ovigerous female), 30 ×. e. Setae from the distal margin of the endite of the maxilliped, 670 ×. f. Right first pereiopod of an adult male; seen from the caudal side, 17 ×. g. Right first pereiopod of an adult male; seen from the rostral side, 20 ×. h. Right first pereiopod, in a female, 25 ×. i. Female operculum, 25 ×.**

two-pointed ones. The propodus is ventrally hollowed and carries one longitudinal row of hair-like setae on both the rostral and caudal margins of its lower surface.

The figures by GIAMBIAGI (1925, Pl. V, p_1 and p_1^x) illustrate the first pereiopod of an immature male specimen, in which this appendage resembles the first pereiopod of the female.

The other pereiopods. Dactylus provided with three claws.

First pairs of pleopods, male. First pleopods much broader proximally than figured by RICHARDSON[1] (1910) and agreeing with the same appendages in *Ianira* (*Iathrippa*) *sarsi.*

Operculum, female. With distal margin somewhat concave in the middle.

Third pair of pleopods. In the female the exopodite is sligtly longer than the endopodite' narrow, two-jointed, its second joint small; lateral margin of the exopodite exhibiting an incision between its first and second joint. Endopodite oblong-ovate; its distal margin provided with three plumose setae, two of which are situated close to each other near the outer distal angle.

In the male[2] the two-jointed exopodite is much larger and longer than in the female. The endopodite is similar to that in the female.

Uropods, Broad and flattened; exopodite about half as long as the endopodite.

Remarks. With the above described species, previously known only from New Zealand, the Patagonian form *Notasellus trilobatus* described by RICHARDSON (1910) must be identical. I have compared some sub-adult and immature specimens from the Campbell Islands with specimens subequal in size from the Falkland Islands and could find no differences. The rostrum of *Ianira* (*Iathrippa*) *longicauda* is somewhat longer than as figured by TATTERSALL (1921). The anterio-lateral angles of the head are slightly more rounded than shown in the figures by RICHARDSON (1910) and GIAMBIAGI (1925), but not so much rounded as figured by TATTERSALL (1921). The pleotelson (Fig. 40 a) is almost circular in outline (as it is figured by TATTERSALL, 1921), though occasionally it is somewhat trilobate distally, as shown in the figure by GIAMBIAGI (1925), but not so much trilobate as it is figured by RICHARDSON (1910). The lateral margins and the dorsal surface of the body are covered with setae, but sometimes nearly all the setae are missing.

The species described by NIERSTRASZ (1918) under the name of *Jorina chilensis* is certainly identical with *Ianira* (*Iathrippa*) *longicauda* CHILTON. The figures by NIERSTRASZ show that it agrees in detail with the latter species. His description is, however, incomplete in some points which certainly is due to his defective material, consisting of a single female specimen. The characteristic five-pointed incisive part, as well as the lacinia, of the left mandible is illustrated by NIERSTRASZ in his Fig. 77, but it is stated to be that of the right mandible. On all the pereiopods, except the first, I found three claws; NIERSTRASZ (1918) states that the fifth pereiopod is provided with three claws.

Localities and Material.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. Male specimen of a length of about 9 mm.

St. 40. Falkland Islands, Berkeley Sound, lat. 51° 33′ S., long. 58° 0′ W. 16 m. Bottom temp. + 2.75°. Gravel and shells with algae. 19/7 1902. 2 immature specimens male and female.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. 6 specimens, males and females; length of the two largest specimens about 9.5 mm. (males).

St. 52. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 44′ W. 17 m. Sand. 3/9 1902. Female broken into two parts.

[1] See RICHARDSON, 1910, Fig. 1 b.
[2] See RICHARDSON, 1910 Fig. 1 c.

St. 55. Falkland Islands, Port Albemarle, lat. 52° 11′ S., long. 60° 26′ W. 40 m. Sand with algae. $^{6}/_{9}$ 1902. In a rotten root of kelp. Female with marsupium; the specimen covered with dots of brown pigment dorsally; length about 7 mm.

St. 58. South of West Falkland, lat. 52° 29′ S., long. 60° 36′ W. 197 m. Bottom temp. + 4.1°. Sand and gravel. $^{11}/_{9}$ 1902. 4 specimens (3 males with lengths of about 4.7. 4.7 and 7.9 mm.; ovigerous female, length about 6.5 mm.).

St. 59. South of West Falkland, on the Burdwood Bank, lat. 53° 45′ S., long. 61° 10′ W. 137—150 m. Broken shells with stones. $^{12}/_{9}$ 1902. 2 male specimens; length of the largest specimen about 9.5 mm.

St. 60. Fuegian Archipelago, eastern mouth of the Beagle Channel, lat. 55° 10′ S., long. 66° 15′ W. 100 m. Bottom temp. + 5.0°. Broken shells. $^{15}/_{9}$ 1902. 5 specimens, male and 4 females, one of the females with about 16 eggs in the marsupium. Largest specimen, female with small oostegits, about 8 mm. in length.

Swedish Magellanian Expedition. Tierra del Fuego, Fitzroy Channel, between Otway and Skyring. 13—14 m. Strong current. Gravel. Female with marsupium; dorsal surface with dots of pigment; length about 6.8 mm.

Swedish Expedition to Tierra del Fuego. Magellan Straits, Cape Valentyn. 150 fms. Shells. $^{12}/_{3}$ 1896. Male specimen, with a few scattered dots of pigment dorsally; length about 7.2 mm.

Magellan Straits, Martha Bank, 100 fms. Pebbles and gravel. $^{16}/_{3}$ 1896. Male, damaged; with dots of pigment; length about 6.9 mm.

Distribution. West Chile (NIERSTRASZ 1918), Patagonia (RICHARDSON 1910), Tierra del Fuego (GIAMBIAGI 1925), Magellan Straits (Sw. Mag. Exped., Sw. Exped. to Tierra del Fuego), Fuegian Archipelago (Sw. Ant. Exped.), Burdwood Bank (Sw. Ant. Exped.), Falkland Islands (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.), Campbell Islands (S. WALLIN legit 1924), New Zealand (CHILTON 1884, TATTERSALL 1921).

Not previously recorded from Falkland Islands, Burdwood Bank, South Georgia or Campbell Islands.

Ianira (*Iathrippa*) sarsi (PFEFFER, 1887).

Notasellus Sarsii. PFEFFER, 1887, p. 125—134, Pl. VII, Figs. 5—28; TATTERSALL, 1921, p. 201—202. For further synonymy and literature, see TATTERSALL, 1921, p. 201.

As this species has been described in detail by PFEFFER (1887), I merely add a few supplementary notes. The mandibles are of typical Ianiridian structure and resemble those in *Ianira* (*Iathrippa*) *longicauda*. The maxillipeds have their epipodites somewhat broader than figured by PFEFFER (1887), and their distal margins broadly convex. The third joint of the palp decreases in width distally; interio-distally this joint is somewhat concave, as also figured by PFEFFER. The first pereiopods, as stated by PFEFFER, are alike in males and females. First and second pairs of pleopods in male as in *Ianira* (*Iathrippa*) *longicauda*. The exopodite of the third pleopod in the female is subequal in length to the endopodite and has no lateral incision between its first and second joints; exopodite in the male (PFEFFER, 1887, Taf. VII, Fig. 2) smaller than in *Ianira* (*Iathrippa*) *longicauda*, subequal in width to, and slightly longer than, the endopodite. Endopodite of third pleopod in both male and female as in *Ianira* (*Iathrippa*) *longicauda*.

Localities and Material.

South Georgia, Grytviken. From roots of *Macrocystis* taken on the shore at low tide, 9 specimens; from roots of *Macrocystis* taken at a depth of three to four fathoms by net, 11 specimens. 22, 23 and 24 May 1902. Length of the largest specimen 8.4 mm. (female with young). Colour of the specimens grayish yellowish to brownish.

South Georgia, Cumberland Bay, May Bay. Haul at 1—2 m. among algae on a stony bottom. $^{8}/_{5}$ 1902. 2 females, one of them small of a length of only about 2.6 mm. The anterio-lateral angles of the head in this specimen are somewhat pointed but not projecting as in the adult specimen; rostrum in the young specimen very short.

St. 5. Graham Region, S. E. of Seymour Island, lat. 64° 20′ S., long. 56° 38′ W. 150 m. Sand and gravel. $^{16}/_{1}$ 1902. Fragment of a female specimen.

St. 17. Between Falkland Islands and South Georgia, on the Shag Rock Bank, lat. 53° 34′ S., long. 43° 23′ W. 160 m. Bottom temp. + 2.05°. Gravel and sand. 19/4 1902. Female with small oostegits, colour slightly yellowish. Length about 6.4 mm.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. + 1.5°. Clay with some algae. 14/5 1902. 4 specimens (male and 3 females). Length of the largest specimen, a female, about 8 mm. Colour of specimens slightly yellowish.

St. 32. South Georgia, Sydfjord, off the Nordenskjöldglacier, lat. 54° 24′ S., long. 36° 22′ W. 195 m. Bottom temp. + 1.45°. Clay with stones. 29/5 1902. Immature male specimen of a yellowish-brownish colour and of a length of about 3.8 mm.

St. 34 b. Atlantic Ocean, east of Patagonia and north of Falkland Islands, lat. 44° 49′ S., long. 57° 34′ W. 700—500 m. 27/12 1901. 2 specimens, male and female, of a grayish-brown colour. Largest specimen, a male, about 6.5 mm. in length.

St. 94. Graham Region, north of Joinville Island, lat. 62° 55′ S., long. 55° 57′ W. 104 m. Gravel and stones mingled with clay. 21/12 1902. Male specimen of a slightly yellowish colour. Length, about 6.7 mm.

Distribution. South Atlantic Ocean E. of Patagonia N. of Falkland Islands (Sw. Ant. Exped.), Shag Rock Bank (Sw. Ant. Exped.), South Georgia (PFEFFER 1887, TATTERSALL 1921), Kerguelen (VANHÖFFEN 1914), South Shetland Islands (RICHARDSON 1913), Graham Region (RICHARDSON 1906, 1908, 1913), Victoria Land (HODGSON 1902 and 1910, TATTERSALL 1921).

New localities for the species are Shag Rock Bank and South Atlantic Ocean (St. 34 b, Swedish Antarctic Expedition). In contradistinction from *Ianira* (*Iathrippa*) *longicauda*, it is not only distributed in the subantarctic but also widely in the Antarctic Region. It has been found at different depths, varying from shallow water up to 700—500[1] m.

Genus **Iais** BOVALLIUS, 1886.

STEBBING, 1900.

Diagnosis. Coxae visible from above and marked off by dorsal sutures on the last three pereion segments. Eyes small, situated dorsally. Antennulae short, consisting of one broad peduncular joint and a five-jointed flagellum. Antennae about half as long as the body, with very small but distinct squama and a six-jointed peduncle. Mandibles as in *Ianira.* Maxillipeds with first and second joints of the palp expanded and about as broad as the endite; third joint of the palp about half as broad as the second. Pereiopods all about equal, each with four claws. First pleopods of male with the branches subtriangular; endopodites distally rounded; exopodites[2] somewhat diverging from the endopodites, but with only their distal parts protruding freely. Female operculum broadly rounded with a small apical tip. Third pleopod with exopodite two-jointed, tapering towards the end. Fourth pleopod with exopodite narrow, about half as long as the endopodite and furnished with one conspicuous apical seta. Uropods short, one-third to one-fourth as long as the pleotelson; the endopodite about as long as the peduncle.

The two genera *Ianthopsis* BEDDARD and *Iolella* RICHARDSON were cancelled by HANSEN (1916) and referred to the genus *Ianira* LEACH. In a tabular view however, he divided the genus *Ianira* into three groups according to the development of the epimeral plates. TATTERSALL (1921) is of the opinion that these three groups correspond to *Ianira*, *Ianthopsis* and *Iolella* and that the last two genera should be retained. It should be noted, however, that if *Iolella* RICHARDSON is regarded as a separate genus with the definition given by HANSEN (1916), some of the species referred to *Iolella*

[1] St. 34 b, Swedish Antarctic Expedition.
[2] See p. 179.

by RICHARDSON (1905) must instead, to judge from the figures, be assigned to *Ianira*. The development of the coxae in *Iais* is exactly as in the group C. of *Ianira* HANSEN (1916), or as in *Iolella* according to TATTERSALL (1921); but, as compared with *Iolella*, *Iais* is especially characterized by its short uropods, the narrow third joint of the palp of the maxilliped, and the four claws on the pereiopods. The fourth pleopod in *Iais* is very characteristic (see diagnosis). In *Iolella* this appendage has not been described.

Iais pubescens (DANA, 1852).

Text figs. 41 a—c.

Jaera pubescens. DANA. 1852, p. 744, Pl. 49, Fig. 9 a—9 d; BEDDARD, 1886, p. 19—20, Pl. II, Fig. 6—10.
Iais pubescens. STEBBING, 1900, p. 549—551, Pl. XXXVIII; TATTERSALL, 1913, p. 890; BARNARD, 1914 a, p. 435—436, Pl. XXXVII C; GIAMBIAGI, 1925, p. 17, Pl. III, Fig. 2; MONOD, 1926, p. 13—14; STEPHENSEN, 1927, p. 356; MONOD, 1931, p. 11; 1931 a, p. 1.
This list is by no means complete, but the complete synonymy can be obtained by comparing the synonymous lists of the above-named authors and their discussion of the synonymy.

Supplementary Description.

Coxae. Visible from above and marked off by dorsal sutures on the last three pereion segments.

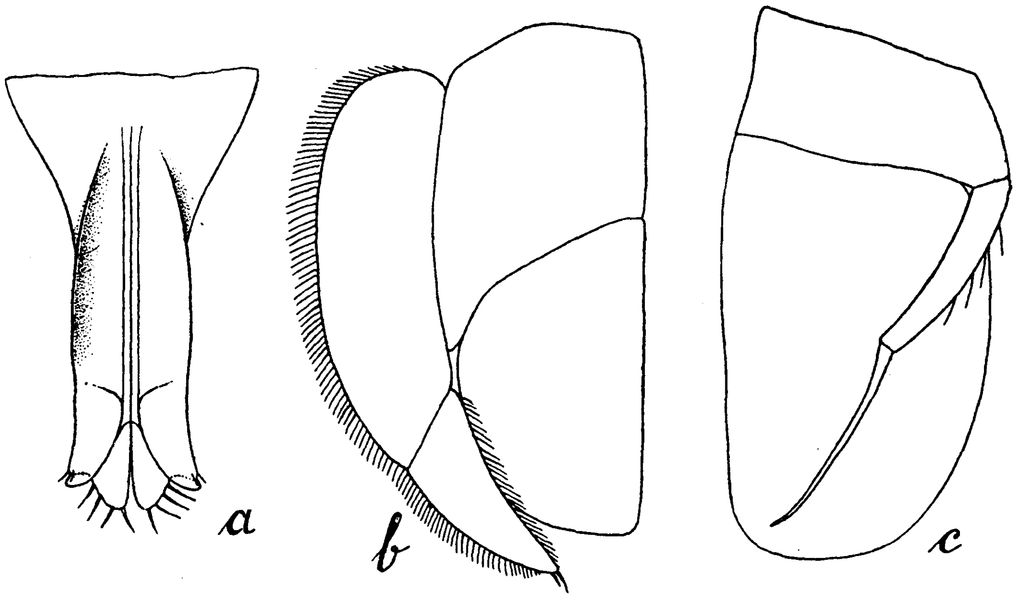

Fig. 41. *Iais pubescens* (DANA). a. First pleopods, male, 225 ×. b. Third pleopod, 225 ×. c. Fourth pleopod, 300 ×.

Mouth-organs. As figured by STEBBING (1900)[1]. The figures of the mandible and maxilliped by BARNARD (1914 a)[2] differ considerably from the corresponding figures by STEBBING. Thus in BARNARD's figure of the mandible the palp is only about half as long as figured by STEBBING (1900). As BARNARD's figures of the first male pleopods and the female operculum tally perfectly with my observations on *Iais pubescens*, it seems probable, that also the specimens examined by him were from the same species.

[1] STEBBING, 1900, Pl. XXXVIII.
[2] BARNARD, 1914 a, Pl. XXXVII C, mand. and mxp.

First pair of pleopods, male (Fig. 41 a). See also BARNARD[1] (1914 a). The latero-distal parts of the sympodites are marked off by incomplete sutures. It may thus be assumed that these parts correspond to the exopodites, whilst the medially situated rami are the endopodites.

Second pair of pleopods, male. See BARNARD (1914 a).[2] I did not find any setae on the distal margin of the sympodite.

Operculum, female[3]. With a characteristic distal tip.

Third pair of pleopods (Fig. 41 b). Both branches subequal in length. Exopodite tapering towards the end, two-jointed. Endopodite broadly oval, distally non-setiferous.

Fourth pair of pleopods (Fig. 41 c). Exopodite narrow, almost of uniform width, about half as long as the endopodite and provided with one long and stout apical seta, the proximal part of which is almost as broad as the distal part of exopodite. Endopodite broadly oval.

Fifth pair of pleopods. Exopodite missing. Endopodite oblong-ovate, non-setiferous.

Remarks. It is supposed by MONOD (1926) that *Janiropsis californica* RICHARDSON is identical with this species. This supposition seems probable enough, but must be verified by an examination of the Californian specimens, especially of their maxillipeds.

Localities and Material.

Falkland Islands, Hookus Point. Pools, at low water between rocks of quartz. $^{26}/_{2}$ 1902. About 45 specimens, males and females, of whitish colour. Collected together with *Exosphaeroma gigas* (LEACH).

Falkland Islands, on the north beach of Port Louis, in the ebb-region below stones. $^{6}/_{8}$ 1902. 26 specimens, mostly females. Collected together with three specimens of *Exosphaeroma gigas* (LEACH).

Staten Island, (New Year Island). Below stones on the beach at low tide. 9 whitish specimens, collected together with 5 specimens of *Exosphaeroma gigas* (LEACH).

Fuegian Archipelago, Ushuaia. March 1902. In the forest 10 female specimens of a brownish-yellow colour, many of them with embryos. Largest specimen 2.2 mm. in length. A damaged specimen of a terrestrial Isopod was collected at the same time and place.

Swedish Expedition to Tierra del Fuego. Magellan Straits, Punta Arenas. On the shore at low tide. Sand and large stones. $^{25}/_{11}$ and $^{1}/_{12}$ 1895. Plenty of specimens, males and females, of a whitish colour, collected together with *Exosphaeroma gigas* (LEACH).

Fuegian Archipelago, Ushuaia Bay. On the rocky shore at low tide. $^{22}/_{5}$ 1896. 2 specimens, collected together with *Exosphaeroma gigas* (LEACH).

Fuegian Archipelago, Lennox Cove. $^{5}/_{2}$ 1896, 10—20 fms. Red algae. 2 specimens, collected together with *Exosphaeroma gigas* (LEACH).

Eugenie Expedition. Magellan Straits, York Bay, $^{15}/_{2}$ 1852. On the shore at low tide. A great many specimens of a whitish colour. Some few specimens of a dark-brown colour were collected below stones at the surface, in 1852, presumably in Febr. or March. Length of the largest female specimen 2.8 mm.; largest male 1.7 mm. Most of the specimens were collected together with *Exosphaeroma gigas* (LEACH), a few together with *Dynamenella eatoni* (MIERS); some others were collected alone at the surface.

Magellan Straits, St. Nicholas Bay, $^{5}/_{2}$ 1852. Some specimens collected together with *Exosphaeroma gigas* (LEACH).

Distribution. Staten Island (Sw. Ant. Exped.), Fuegian Archipelago (Sw. Ant. Exped., Sw. Exped. to Tierra del Fuego), Tierra del Fuego (DANA 1852), Magellan Straits (BOVALLIUS (1886, GIAMBIAGI 1925), Falkland Islands (STEBBING 1900), Tristan d'Acunha (BARNARD 1914 a), South Africa (BARNARD 1914 a), Kerguelen (SMITH 1876, BEDDARD 1886), Auckland Islands (CHILTON 1909, STEPHENSEN 1927), Campbell Islands (CHILTON 1909, MONOD 1931), New Zealand (CHILTON, fide STEPHENSEN 1927), Chatham Islands (CHILTON 1906), Tasmania (CHILTON, fide STEPHENSEN 1927), Ceylon (STEBBING 1904), Cameroon (MONOD 1931 a), (?) California (MONOD 1926).

[1] BARNARD, 1914 a, Pl. XXXVII C, plp. 1.
[2] BARNARD, 1914 a, Pl. XXXVII C, plp. 2.
[3] BARNARD, 1914 a, Pl. XXXVII C, operc. ♀.

Genus **Ianthopsis** BEDDARD, 1886.

Ianthe. BOVALLIUS, 1885, part., nec 1881' STUDER, 1884. *Iolanthe.* BEDDARD, 1886; HANSEN, 1895; VANHÖFFEN, 1914.

Diagnosis[1]. Head usually with a long rostrum. Eyes situated dorsally, minute or missing. Antennulae with a flagellum consisting of comparatively few joints. Antennae with a six-jointed peduncle, a distinct squama and a many-jointed flagellum. Mandibles as in *Ianira*. Thoracic segments without coxal plates, with lateral margins often cleft and produced into lappets. Palp of maxilliped with second and third joints about half as broad as the endite. First pereiopods not subchelate, equal in males and females. Dactylus of the pereiopods furnished with two subequal claws. First pleopods in male tapering towards the distal end. Female operculum elongated into a distal tip. Uropods long (usually subequal in length to the pleotelson) and provided with two branches.

The most characteristic feature of the genus *Ianthopsis* is that coxal plates are missing on all thoracic segments[2] (cf. TATTERSALL 1921, p. 199). This feature distinguishes the genus from the allied genera *Ianira* LEACH, *Iolella* RICHARDSON, *Acanthaspidea* STEBBING, and *Iais* BOVALLIUS. HANSEN (1916) considers that *Ianthopsis* BEDDARD and probably also *Iolanthe* BEDDARD should be cancelled as genera and united with *Acanthaspidea* STEBBING. I do not share his opinion, as these genera differ from *Acanthaspidea* in such an essential character as the absence of coxal plates. *Ianthopsis* moreover differs from *Acanthaspidea* in the pereiopods, which are furnished with two subequal claws. The close connection of *Acanthaspidea* with *Ianthopsis* is shown especially by the similarity of the maxillipeds, which, in both genera, have the second joint of the palp narrow and only about half as wide as the endite. The two species previously referred to *Iolanthe* have their maxillipeds exactly shaped as in *Ianthopsis* and *Acanthaspidea*. In the figures of »*Iolanthe acanthonotus*» by BEDDARD[3] (1886) and VANHÖFFEN[4] (1914) no coxal plates are to be seen. HANSEN (1895) states that »*Iolanthe decorata* is devoid of coxal plates. Thus the distinction between *Iolanthe* and *Ianthopsis* is reduced to a slight difference in the shape of the head and the spine-armature of the pereion. These minor dissimilarities cannot be regarded as generic distinctions.

In the two species of *Ianthopsis* examined by me, *I. bovallii* (STUDER) and *nasicornis* VANHÖFFEN, the third pairs of pleopods (Figs. 42 d and 43 j) are similarly shaped, the exopodite being two-jointed, increasing in width distally, its distal margin being furnished with seven to nine penicillated or plumose setae. Having examined only two species of *Ianthopsis* I have not included these characters in the diagnosis, but it seems fairly probable that the peculiar shape of the third pleopod in *Ianthopsis bovalli* and *nasicornis* is characteristic of the whole genus.

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[1] Cf. BEDDARD, 1886, p. 15.
[2] The coxae are developed as basal rings fused with the sternum and surrounding the proximal ends of the basipodites of the pereiopods.
[3] BEDDARD, 1886, Pl. IV, Fig. 9.
[4] VANHÖFFEN, 1914 Fig. 65 a.

Ianthopsis bovallii (STUDER, 1884).

Text. figs. 42 a—d.

Janthe Bovallii. STUDER, 1884, p. 10—12, Pl. I, Figs. 2 a, b, c, d.
Ianthe bovallii. BOVALLIUS, 1886, p. 36.
Ianthopsis Bovallii. BEDDARD, 1886, p. 14—15.
Janthopsis sp. VANHÖFFEN, 1914, p. 544—545, Fig. 70; TATTERSALL 1921, p. 200—201, Pl. I, Figs. 7—10.

Supplementary Description.

Eyes. Colourless, minute, in small specimens difficult to detect.

Pereion. In adult specimens with three longitudinal rows of tuberculae, of which the two lateral rows are faint and indistinct; in young specimens only the row along the middle line is distinct.

Antennulae[1]. The flagellum in an ovigerous female, about 7.3 mm. in length, consists of six joints, the first of which is very long. STUDER (1884) assigns this joint to the peduncle.

Antennae[1]. First four joints of the peduncle short; first and second together about as long as the third, which is furnished with a distinct squama; the fourth joint is about half as long as the third; fifth and sixth joints long, somewhat widening towards their distal ends. The flagellum consists of sixteen joints, the first of which is very long, being almost as long as the remaining joints together. STUDER (1884) does not figure the suture between the first and second peduncular joints or that between the third and fourth joint but assigns the long first joint of the flagellum to the peduncle.

Mandibles[2]. Molar tubercle slightly tapering towards the distal denticulated end. Incisive part with four points. Lacinia (on the left mandible) with three points. Setal row on the left mandible with eleven setae, on the right with twelve.

Second pair of maxillae. Lappets of outer lobe each with four apical setae.

Maxillipeds (Fig. 42 a). Second joint of the palp only about half as broad as the endite.

Pereiopods. All similar and with a row of setae (most of them two-pointed) along the lower margin of the carpus and propodus. The two-pointed setae are of the usual shape; they terminate in one stout and one hair-like point. The dactylus of all pereiopods is furnished with two subequal claws.

First pair of pleopods. See BEDDARD[3] (1886). One female or perhaps hermaphroditic specimen was furnished with a minute first pleopod (Fig. 42 b); in the specimen the fused second pleopods were quite normal and had the usual form of the female operculum. As seen in the figure the first pleopods in this specimen are fused into an operculum which is cleft distally. They differ rather considerably in shape from the first pleopods in the male[3] and all setae are missing.

Operculum female (Fig. 42 c). Distally triangularly elongated.

Third pair of pleopods (Fig. 42 d). Exopodite increasing somewhat in width towards the distal end, two-jointed; its distal margin provided with nine setae, some of them plumose, others penicillated, having irregularly situated sub-branches. Endopodite broadly oval, its distal margin furnished with plumose setae.

[1] Cf. STUDER, 1884, Pl. I, Fig. 2 b.
[2] STUDER, 1884, Pl. I, Fig. 2 c.
[3] BEDDARD, 1886, Pl. V, Fig. 6.

Fourth pair of pleopods. Exopodite subtriangular, much smaller than endopodite, provided with some short hair-like setae distally. Endopodite broadly oval; its margins devoid of setae.

Fifth pair of pleopods. Exopodite missing. Endopodite oval, without setae.

Uropods[1]. In a small specimen, about two mm. in length, the peduncle was about twice as long as the endopodite, which was about twice as long as the exopodite.

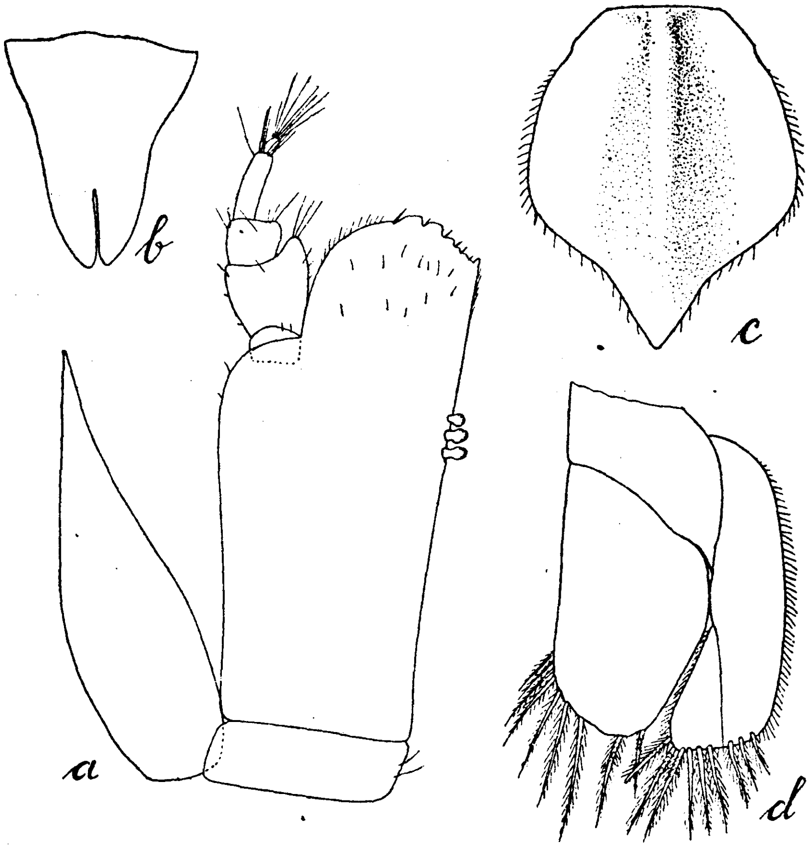

Fig. 42. *Ianthopsis bovalli* (STUD.). a. Right maxilliped, male, 55 ×. b. Vestigial first pleopods from a female specimen, 55 ×. c. Operculum, female, 23 ×. d. Right third pleopod, female, 45 ×.

Remarks. A large specimen, 10 mm. long, of this characteristic species was figured by STUDER (1884). TATTERSALL (1921) figures a small specimen of *Ianthopsis*, of which he says (p. 200) that »it is very closely allied to if not identical with, *I. bovalii*, STUDER». He supposes that his figured specimen belongs to the same species as an unnamed small *Ianthopsis* figured by VANHÖFFEN (1914). The material from the Swedish Antarctic Expedition, which contains an ovigerous female and numbers of young specimens, shows that the latter exactly resemble the unnamed *Ianthopsis* figured by TATTERSALL (1921). Young specimens, about 2.5 mm. in length, differ from adult ones in the following characters: —

[1] See BEDDARD, 1886, Pl. V, Fig. 8.

1. The projections in front of the eyes on the anterior margin of the head are only slightly indicated, the frontal margin being only slightly convex anteriorly from the eyes.

2. The pleotelson is narrower.

3. The projections on the posterior margin of the pleotelson laterally from its apical tip are short or indistinct.

In the fully grown specimen (about 7.3 mm. in length) the projections of the anterior margin of the head in front of the eyes are somewhat shorter and broader than figured by STUDER (1884), but otherwise it corresponds exactly with his figure.

Localities and Material.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 12—15 m. Sand and algae. $^{24}/_{5}$ 1902. 5 immature specimens; length of the largest specimen about 4.2 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. $^{5}/_{6}$ 1902. Female specimen about 5 mm. in length.

St. 58. South of West Falkland, lat. 52° 29′ S., long. 60° 36′ W. 197 m. Bottom temp. ÷ 4.1°. Sand and gravel. $^{11}/_{9}$ 1902. 2 females; length of largest specimen about 7.3 mm. (ovigerous female).

Distribution. Patagonia (BOVALLIUS 1886), Falkland Islands (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.), Kerguelen (STUDER 1884, BEDDARD 1886), Gauss Station (VANHÖFFEN 1914), Victoria Land (TATTERSALL 1921).

The species is here recorded for the first time from South Georgia and Falkland Islands.

Ianthopsis nasicornis VANHÖFFEN, 1914.

Text. figs. 43 a—j.

Ianthopsis nasicornis. VANHÖFFEN, 1914, p. 539—541, Figs. 66 a—g; nec MONOD, 1926.

Supplementary Description:

Head. Lateral margins straight or slightly concave. Eyes vestigial, colourless.

Pereion. First segment with lateral margins straight. Second, third and fourth segments laterally divided into two short lappets of about equal length; the lateral margins of the lappets are almost straight. On the second segment the posterior lappet is slightly larger than the anterior one, on the third the two lappets are subequal, on the fourth the anterior lappet is the largest. Last three segments with lateral margins slightly convex.

Antennulae and antennae (Figs. 43 a and b). Much as in *Ianthopsis bovalli* (STUDER). The antennae are furnished with distinct squamae.

Upper and lower lips (Figs. 43 c and d). Normal.

Mandibles[1]. Left: Molar tubercle sub-cylindrical, of a uniform width; its distal margin approximately straight, but furnished with some teeth. Incisive part and lacinia each provided with four points. Setal row with twelve setae. Second joint of the palp with a row of about seven setae on the distal part of its lower margin. Third joint with setae on the distal part of its lower margin and distally.

Right: Incisive part with five points. Lacinia absent. Setal row with thirteen setae. Otherwise as in the left mandible.

[1] VANHÖFFEN, 1914, Fig. 66 f.

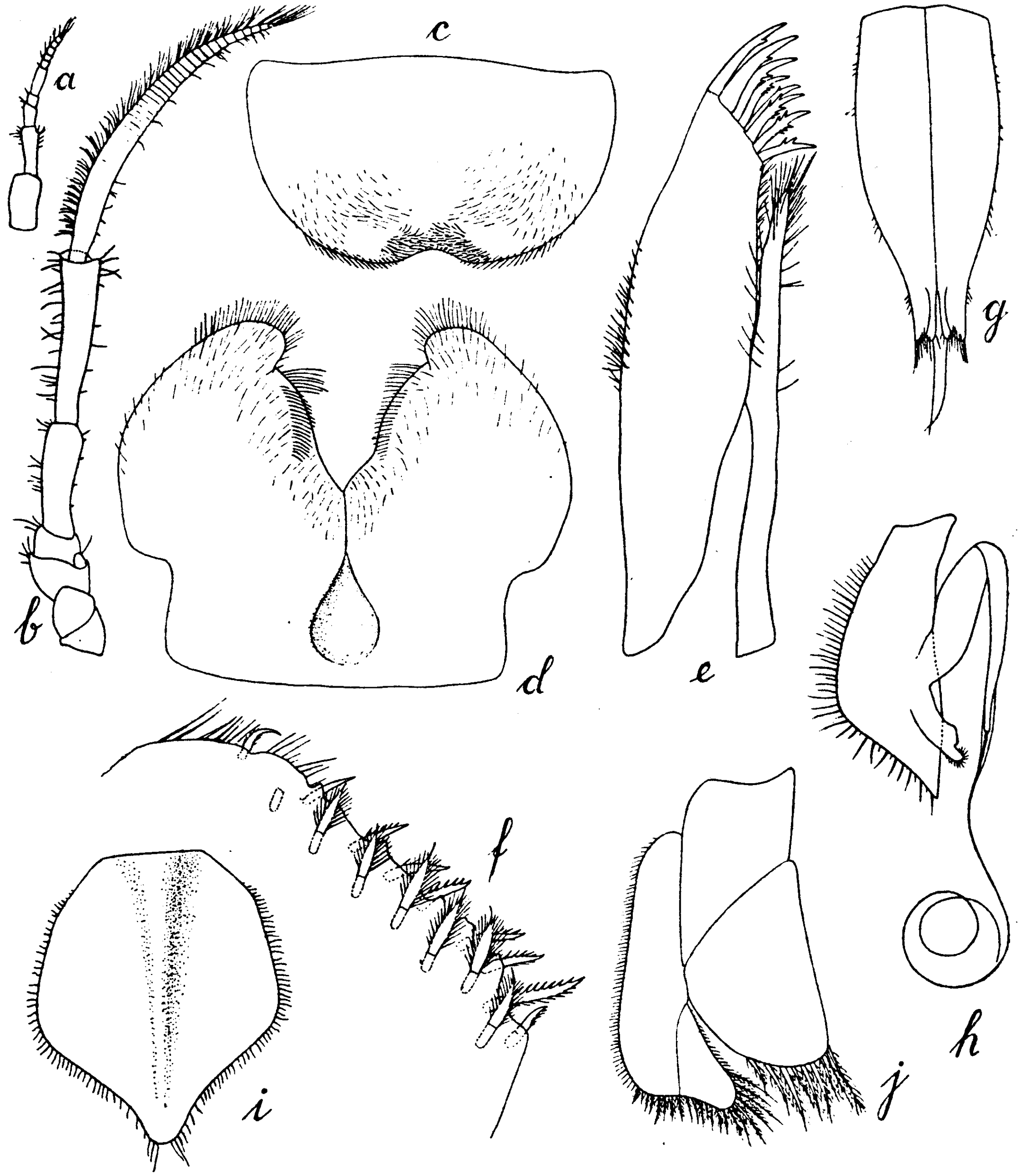

Fig. 43. *Ianthopsis nasicornis* VANHÖFF. a. Antennula, 17 ×. b. Antenna, 17 ×. c. Upper lip, 80 ×. d. Lower lip, 80 ×. e. Right first maxilla, female, 95 ×. f. Distal part of the endite of the maxilliped, seen from below, 240 ×. g. First pleopods, male; seen from the rostral side, 17 ×. h. Left second male pleopod, seen from the caudal side, 17 ×. i. Female operculum, 17 ×. j. Right third pleopod, male, 30 ×.

First and second pairs of maxillae. Inner lobe of the first maxilla (Fig. 43 e) very narrow, somewhat tapering towards the end. Each lappet of the outer lobe of the second maxilla is provided with four apical setae.

Maxillipeds[1]. Endite with five coupling-hooks. The distal part of the endite is illustrated in Fig. 43 f. Close to the distal margin are two rows of submarginal setae, one row on either side; those in the ventral row are somewhat thicker and have more slender sub-branches than the setae in the dorsal row. Dorsally, near the distal margin, there are a large number of fine »hairs[2]», lacking a setal canal.

Pereiopods. All alike and carrying a row of setae along the lower margin of the carpus and propodus, some of them of the usual two-pointed shape (cf. Fig. 40 c). The dactylus has two claws of which the upper is the longest.

First pair of pleopods, male[3] (Fig. 43 g). Exopodite[4] slightly broader than endopodite. Distal margin of endopodite not concave as figured by VANHÖFFEN (1914). The posterior chitinous folds, illustrated in VANHÖFFEN's Fig. 66 d, are not seen in my figure, which shows the pleopods in an anterior view.

Second pair of pleopods, male[5] (Fig. 43 h). Exopodite small, cleft distally. Endopodite distally elongated into a spiral thread.

Operculum, female (Fig. 43 i). As in *Ianthopsis bovalli* with an apical tip but more obtuse than in the latter species.

Third pair of pleopods (Fig. 43 j). Much as in *Ianthopsis bovalli*; the exopodite however, is slightly different in shape.

Fourth pair of pleopods. Exopodite narrowly oval, more than twice as narrow and about three-fourths as long as the endopodite. Endopodite broadly oval. Margins of the branches without setae.

Fifth pair of pleopods. Exopodite absent. Endopodite oval, lacking setae.

Uropods. Narrow. Exopodite about two-thirds the length of the endopodite.

Remarks. A great many specimens of this species were obtained by the Swedish Antarctic Expedition, at South Georgia. They agree well with the figures by VANHÖFFEN (1914, Figs. 66 a—g).

MONOD (1926) figures a species of *Ianthopsis*, which, though it differs in some respects from *I. nasicornis* he refers to this species of VANHÖFFEN, regarding the differences from the figure[6] of *I. nasicornis* by VANHÖFFEN (1914) as due to immaturity of Vanhöffen's specimens. My material shows that differences of this kind between young and adult specimens do not exist in the species. Full-grown specimens, about 10 mm. in length, agree with immature specimens in all characters, except that in very young examples the last segment of the pereion is narrower[6], i. e. the usual difference between young and adult individuals. The species described and figured by MONOD (1926)[7],

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[1] See VANHÖFFEN, 1914 Fig. 66 g.

[2] In Fig. 43 f, which illustrates the distal part of the endite in a ventral view, only a few of these hairs are seen.

[3] VANHÖFFEN, 1914, Fig. 66 d.

[4] I consider that the latero-distal parts of the sympodites correspond to the exopodites, exactly as is the case in *Iais pubescens*. See p. 179.

[5] VANHÖFFEN, 1914, Fig. 66 e.

[6] Cf. VANHÖFFEN, 1914, Fig. 66 a.

[7] MONOD, 1926, p. 14, Figs. 3, 4 and 5.

consequently, is not *Ianthopsis nasicornis* VANHÖFFEN. As will be seen from MONOD's figure of this species (MONOD 1926, Fig. 3), it differs from *Ianthopsis nasicornis* VANH. especially in the following characters: —1. The rostrum and the anterio-lateral projections of the head are longer and more pointed. 2. The first, fifth, sixth and seventh pereion segments are prolonged into lateral spine-like projections. (In *Ianthopsis nasicornis* VANH. the lateral margins of the first segments are straight or almost straight and the lateral margins of the sixth and seventh segments slightly convex). 3. The pleotelson is posteriorly broader than in *Ianthopsis nasicornis* VANH.

For MONOD's species I propose the name of *Ianthopsis Monodi*.

Localities and Material.

St. 22. South Georgia, off May Bay. lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. + 1.5°. Clay and some algae. $^{14}/_{5}$ 1902. Male specimen about 7.5 mm. in length.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. $^{5}/_{6}$ 1902. 9 specimens, males and females. Length of largest specimen about 10 mm. (ovigerous female).

Distribution. South Georgia (Sw. Ant. Exped.), Gauss Station (VANHÖFFEN 1914). Not previously recorded from South Georgia.

Genus **Ectias** RICHARDSON, 1906.

For diagnosis see RICHARDSON (1906, p. 13—14). To the diagnosis may be added that the coxae are visible from above and are marked off by dorsal sutures on the last three thoracic segments, and that the third pleopod has an oblong-ovate endopodite and a narrow two-jointed exopodite, tapering towards the end and subequal in length to the endopodite.

In the genus the mandibles are of the typical Ianiridean structure. As the coxae are visible from above and are delimited by dorsal sutures on the last three thoracic segments, the genus comes close to *Iolella* RICHARDSON and *Iais* BOVALLIUS. It differs from these genera especially in its very long and narrow body, in its characteristically built first pereiopods in the male (the female is unknown), and in its long and narrow first male pleopods. The last three pleopods are characteristic; the third is similar to that in *Iolella laciniata*[1] (G. O. SARS), except that the exopodite is two-jointed.

Ectias turqueti RICHARDSON, 1906.

Ectias Turqueti. RICHARDSON, 1906, p. 14—15, Pl. 1, Fig. 5, Text figs. 14—19; RICHARDSON, 1913, p. 18; TATTERSALL, 1921, p. 202.

Supplementary Description.

As there is only one specimen in my material, a male of a length of about 3.9 mm., I shall only give a few brief notes.

Coxae. On the last three thoracic segments they are situated at the posterio-lateral angles of the segments. They are small but visible from above and marked off from the segments by dorsal sutures.

[1] Cf. G. O. SARS, 1899, Pl. 41, plp².

Mandible (*right*). Of typical Ianiridian type. Incisive part with five points. Setal row with ten setae. Molar tubercle sub-cylindrical, widening towards the distal end, directed somewhat forwardly. Palp long and slender with the last two joints somewhat expanded.

First pair of maxillae. Normal.

Second pair of maxillae. Lappets of outer lobe narrow, about as long as the inner lobe, each provided with three apical setae.

Maxillipeds. First, second and third joints of the palp broad and expanded, somewhat broader than the endite, second joint broadest. Endite with two coupling-hooks. Epipodite reaching approximately to the middle of second joint of the palp, obtusely pointed distally and with outer margin angular.

Third pair of pleopods. Exopodite about as long as, but narrower than, the endopodite, two-jointed, tapering towards the end. Its inner margin is almost straight, its outer margin convex. The second joint of the exopodite is subtriangular and about half as long as the first; the distal part of its outer margin is provided with plumose setae. Outer margin of first joint, proximal part of outer margin of second joint as well as inner margin of second joint furnished with fine »hairs». Endopodite oval, its distal margin with three plumose setae, of which two are situated near each other at the outer distal and one at the inner distal angle.

Fourth pair of pleopods. Exopodite about half as long as the endopodite, subtriangular, its distal end provided with a seta. Endopodite oval, tapering towards the end, with inner margin almost straight, and outer margin markedly convex.

Fifth pair of peopods. Exopodite missing. Endopodite subtriangular with inner margin straight and outer margin convex.

Locality and Material.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 12—15 m. Sand and algae. $^{24}/_{5}$ 1902. Male about 3.9 mm. in length.

Distribution. South Georgia (Sw. Ant. Exped.), Booth Wandel and Petermann Islands off Graham Land (Richardson 1906, 1913), Victoria Land (Tattersall 1921).

Not previously found at South Georgia.

Genus **Neojaera** n. gen.

Diagnosis. Body oblong, at least three and a half times as long as it is broad. Thoracic segments without coxal plates. Eyes small, situated dorsally. Antennulae very short, consisting of one very broad peduncular joint and a five-jointed flagellum. Antennae not quite one-third the length of the body; peduncle six-jointed; squama small but distinct. Maxilliped with second and third joints about as broad as the endite, epipodite very long with lateral margin angular. Pereiopods all similar, generally with two subequal claws. First male pleopods with very broad endopodite and narrow styliform exopodite. Third pair of pleopods with exopodite two-jointed and somewhat tapering towards the end. Uropods very short, fitted in incisions of the pleotelson.

The genus is closely allied to *Jaera* LEACH. As pointed out by BARNARD (1914, a, p. 434), the distinct squama on the antennae, the shape of the maxillipeds and first pleopods of male justify the generic separation of his species *serrata* from *Jaera*. Having found that *N. antarctica* (PFEFFER) likewise differs in all these characters from *Jaera* in the same manner as *N. serrata* (BARNARD), I consider that these two species should be referred to a separate genus.

Neojaera antarctica PFEFFER, 1887.

Text. figs. 44 a and b.

Jaera antarctica. PFEFFER, 1887, p. 134—136, Pl. VII, Figs. 1—3; VANHÖFFEN, 1914, p. 529—530, Fig. 58; NORDENSTAM 1930, p. 550, Fig. 12.

Supplementary Description.

Abdomen. With a short free segment anterior to the pleotelson; pleotelson with a slightly marked longitudinal elevation along the middle line.[1]

Mandibles. Molar tubercle subcylindrical and of uniform width.

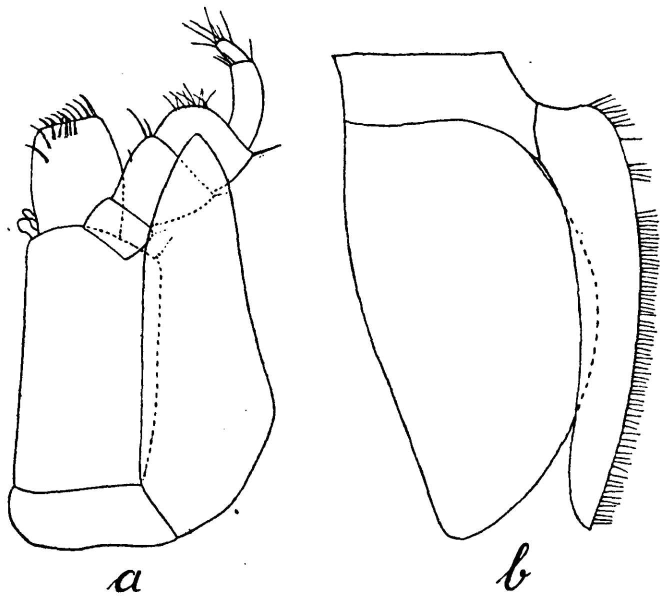

Fig. 44. *Neojaera antarctica* (PFEFF.). a. Right maxilliped, 160 ×. b. Fourth pleopod, 180 ×.

Maxillipeds (Fig. 44 a). Epipodite long, distally pointed, reaching to the middle of the third joint of the palp; lateral margin of the epipodite angular. Endite with two coupling-hooks.

Pereiopods. All similar. Dactylus with two subequal claws. Carpus and propodus with a longitudinal row of setae on the lower margin, most of them two-pointed.

First pair of pleopods, male[2]. Exopodites and endopodites of about equal length. Posterior surface of the endopodites more or less concave.

[1] Not with a furrow as was stated by PFEFFER (1887).
[2] See NORDENSTAM, 1930, Fig. 12.

Second pair of pleopods, male. Much as in *Neojaera serrata* (BARNARD), see BARNARD (1914 a, Pl. XXXVIII A, plp. 2).

Operculum, female[1]. Almost circular, distal margin provided with setae.

Third pair of pleopods. Much as in *Neojaera serrata* (BARNARD)[2]. Exopodite two-jointed, tapering towards the end, with a lateral incision between the first and the second joint; the second joint is slightly longer, and broader proximally than in *Neojaera serrata*; lateral margin of second joint furnished with hair-like setae. Distal margin of the endopodite provided with three plumose setae, one at the inner distal angle, one at the outer distal angle, and one seta on the distal margin; the latter seta is situated closer to the outer distal angle than to the inner distal angle.

Fourth pair of pleopods (Fig. 44 b). Branches subequal in length. Exopodite single-jointed, tapering towards the end, about one-fourth as broad as the broadly oval endopodite.

Fifth pair of pleopods. Exopodite missing. Endopodite oblong-ovate.

Remarks. *Neojaera antarctica* (PFEFFER) is closely allied to *Neojaera serrata* (BARNARD), from which species it is distinguished by lacking the tip on the distal margin of the pleotelson between the uropods, by having the first male pleopods broader, with shorter exopodites, and by having the exopodites of the fourth pleopods longer (about as long as the endopodites).

Localities and Material.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S., long. 36° 28′ W. 75 m. Bottom temp. + 1.5°. Clay with some algae. 14/5 1902. 2 specimens, female with young, about 3.5 mm. in length, and male about 3.1 mm. in length.

St. 23. South Georgia, off the mouth of Morain Bay, lat. 54° 23′ S., long. 36° 26′ W. 64—74 m. Bottom temp. + 1.65°. Gray clay with gravel and stones. 16/5 1902. 2 females, washed out from algae. Length of the largest specimen about 2.5 mm.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 12—15 m. Sand and algae. 24/5 1902. 2 specimens. Length of largest specimen, a male, about 3.5 mm.

St. 34 b. Atlantic Ocean, east of Patagonia and north of Falkland Islands, lat. 44° 49′ S., long. 57° 34′ W. 700—500 m. 27/12 1901. Female with embryos; length about 3.8 mm.

St. 47. Falkland Islands, Port Louis, mouth of the Carenage Creek, lat. 51° 32′ S., long. 58° 7′ W. 3—4 m. Shells and stones. 9/8 1902. 2 female specimens. Length of the largest specimen about 3.3 mm.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. 3 specimens, (male and two females); length of the largest specimen about 2.3 mm. (male).

St. 60. Fuegian Archipelago, eastern mouth of the Beagle Channel, lat. 55° 10′ S., long. 66° 15′ W. 100 m. Bottom temp. + 5.0°. Broken shells. 15/9 1902. 2 males; length of the largest specimen about 2 mm.

Distribution. Juan Fernandez (NORDENSTAM 1930), South Atlantic Ocean E. of Patagonia N. of Falkland Islands (Sw. Ant. Exped.), Fuegian Archipelago (Sw. Ant. Exped.), Falkland Islands (Sw. Ant. Exped.), South Georgia (PFEFFER 1887), Kerguelen (VANHÖFFEN 1914).

In spite of its name *antarctica*, the species has not been found in the Antarctic Region but is widely distributed in subantarctic waters. It was collected by the Swedish Antarctic Expedition at the following new localities: South Atlantic Ocean (st. 34 b), Fuegian Archipelago, and Falkland Islands. The species occurs from shallow water up to a depth of 700—500 m.

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[1] See PFEFFER, 1887, Pl. VII, Fig. 2.

[2] See BARNARD, 1914 a, Pl. XXXVIII A, plp. 3.

B. **Group Jaeropsini**, new group.

Diagnosis. Mandible with the incisive part widening towards the end, divided distally into five points; molar process long and slender, tapering towards the obtuse end, directed somewhat backwards; lacinia missing. Thoracic segments without coxal plates and with their lateral margins not continuous. Antennulae situated above the antennae, very short and consisting of few joints. Antennae with a six-jointed peduncle; squama lacking; first joint of the flagellum longer than the other joints of the flagellum together, which are small and few. First maxillae with the inner lobe short. Second maxillae with the inner lobe much shorter than both lappets of the outer lobe. Maxilliped with the palp at its broadest part about half as wide as the endite; epipodite short, pointed, not reaching the proximal margin of the first joint of the palp. Pereiopods all similar. Uropods inserted in incisions of the distal margin of the pleotelson and provided with two very short branches.

Jaeropsis was referred by HANSEN (1916) to the group *Ianirini*. It differs, however, in some important features from the *Ianirini* as defined by HANSEN, so that I find it necessary to establish a new group for the genus. The most striking character in *Jaeropsis* is the structure of the mandibles, which have a narrow molar process tapering towards the end and directed slightly backwards; thus the mandibles in *Jaeropsis* have almost the type peculiar to the group *Nannoniscini* HANSEN, which, according to HANSEN (1916), comprises creatures »in general aspect somewhat similar to species of *Ianira*, but they differ from all Ianirini in several important features, above all in the mandibles» (HANSEN 1916, p. 84). In the group *Ianirini*, the mandibles are especially characterized by having the »molar process well developed, directed a little forwards, with the end cut off» (HANSEN 1916, p. 12), whilst in the *Nannoniscini* the mandibles have a molar process which »tapers strongly to the narrow, obtuse setiferous end, and is directed somewhat backwards» (HANSEN 1916, p. 83). In *Jaeropsis*, the molar process most resembles the one in the *Nannoniscini*, but it is considerably longer and it is only slightly directed backwards. Another similarity between the *Jaeropsini* and the *Nannoniscini* is seen in the front part of the head, which has the appearance of a small posteriorly delimited lobe, thus forming a »front area», just as in the *Nannoniscini*. Both the groups have small uropods.

In other features, however, *Jaeropsis* differs from the *Nannoniscini*. Thus the antennae have no trace of squama, and the maxillipeds have a narrow palp, with the second joint only about half as broad as the endite. In *Jaeropsis* the eyes are small but distinct; in the *Nannoniscini*, which are related to the *Desmosomatini*, eyes are absent. In view of the above-mentioned differences from the *Nannoniscini*, *Jaeropsis* cannot be referred to that group.

As shown above, the *Jaeropsini* display some important features, which give the group a place between the *Ianirini* and the *Nannoniscini*. This intermediate stage of *Jaeropsis* is noticeable especially in the mandibles, which limbs have been shown by HANSEN (1916) to be of a very essential value for the classification of all Parassellids. The transformation and reduction of the molar process is more advanced in the Nannoniscidean genera than in the *Jaeropsini*.

Genus **Jaeropsis** KOEHLER, 1885.

STEBBING 1905, RICHARDSON 1905, VANHÖFFEN 1914.

For diagnosis see RICHARDSON (1905, p. 476—477). In regard to the antennae RICHARDSON's diagnosis must be amended. They consist of a six-jointed peduncle and a well-developed flagellum with a large proximal joint and a small number of minute additional distal joints. See Fig. 45 c. The proximal joint of the flagellum has previously been referred to the peduncle. This would, however, result in the aberrant number of seven peduncular joints. The arrangement of the setae in groups along the rostral margin on the proximal joint of the flagellum, as well as the fact that the small joints are sometimes marked off by incomplete sutures at the distal end of the large first joint, make it evident that this joint is a part of the flagellum.

Jaeropsis patagoniensis RICHARDSON, 1909.

Text. figs. 45 a—f.

Jaeropsis patagoniensis. RICHARDSON, 1909, p. 421—422, one fig.

Diagnosis. Front area trapezoidal with a small tip in the middle of the distal margin. Lateral margins of the head and the pereion almost smooth. Pleotelson with a small lateral incision on each side anterior to the uropods. Eyes dorsal, at a distance from the lateral margin equal to one eye's width. First joint of antennulae with the inner distal angle projecting, but rounded. Inner distal angle of the second peduncular joint of the antennae prolonged into a forward-directed projection. Endite of the maxilliped with the inner part of the distal margin only slightly concave, the inner distal angle of the second joint of the palp very little produced. Peduncle of uropods almost ovate, longer than broad, inner distal angle with a short hook-like projection. Female operculum obtusely pointed.

Supplementary Description.

Colour. The colour is laterally slightly yellowish; generally there is a broad brownish streak along the middle of the pereion and abdomen. On the dorsal side of the head there is, as a rule, a more or less markedly brown-coloured spot of the same form as in *Jaeropsis brevicornis*[1] KOEHLER and *paulensis*[2] VANHÖFFEN. The colouring is somewhat different in different specimens. One of the examined specimens, a female 2.9 mm. in length, differed in having the short fifth pereion segment uncoloured. Another specimen, a female 4.2 mm. in length, had the pereion and abdomen of a uniformly slight-yellowish colour; the head had a faint brownish spot of the usual form. My largest specimen, a male 6.5 mm. in length, has the same slightly yellowish colour, but the brownish spot on the head in that specimen is more distinct.

Head, pereion, abdomen. As in all other species of *Jaeropsis*, the head, thoracic segments, and abdomen, have their lateral margins not continuous, and there is a broad rounded longitudinal elevation along the middle line. Lateral margins of the head smooth. Lateral margins of the pereion segments smooth and convex. On the first and second and, in a minor degree, also on the third pereion segment, the anterio-lateral angles of the segments are somewhat projecting; the same is the case with the posterio-

[1] KOEHLER, 1885, Pl. 1, Fig. 1.
[2] VANHÖFFEN, 1914, p. 532.

lateral angles of the fifth, sixth and seventh segments. All the abdominal segments are coalesced, but a rather long anterior segment is faintly marked off by a narrow groove. The lateral margins of the pleotelson are smooth, with the exception of the two marked incisions, one on each lateral margin, which are characteristic of the species.

Antennae. As in *Jaeropsis intermedius* (cf. Fig. 46 c) the anterio-distal (inner distal) angle of third peduncular joint is produced into a long forward-pointing projection reaching to about the distal end of the third joint. The number of joints in the flagellum is seven, including the very large first joint (in a female 2.9 mm. in length). In a male 3.8 mm. in length the number of small joints in the flagellum was 10; the large first joint of the flagellum had three incomplete distal sutures, distinct in the middle of the joint only, but not developed marginally.

Mandibles. Incisive part of the right mandible divided into five points, that of the left mandible likewise with five strong points, but, in addition, with two minute points on the rostral margin. Setal row on the left mandible with eleven, on the right with ten setae.

First pair of maxillae. Typical of the genus. Inner lobe with three stout and a few slender apical setae.

Second pair of maxillae. Typical of the genus. Inner lobe with four apical setae; each lappet of outer lobe with four apical setae.

Maxillipeds (Fig. 45 a). Inner part of the distal margin of the endite only slightly concave, denticulated. The second joint of the palp is the broadest, about half as wide as the endite and having its inner distal angle very little produced. Number of coupling-hooks three or four.

Pereiopods. Dactylus of the first pair provided with two strong claws of about equal size; on the other pereiopods there are three claws of which the intermediate one is smallest. Lower margin of propodus with a row of two-pointed setae of the usual type. On the lower margin of the carpus there is a row of single-pointed setae.

First pair of pleopods, male (Fig. 45 b). Outer distal angles of the sympodites (exopodites) triangular, about as long as the endopodites. Distal margin of the endopodites convex and setiferous.

Second pair of pleopods, male. See Fig. 45 c.

Operculum, female (Fig. 45 e). Distal end obtusely pointed.

Third pair of pleopods (Fig. 45 d). Exopodite two-jointed, longer than the endopodite; second joint tapering towards the obtusely pointed end. Endopodite oval; distal margin provided with three plumose setae, one at the inner distal angle and two near each other close to the outer distal angle.

Uropods (Fig. 45 f). The peduncular joint is approximately semi-cylindrical, tapering towards the end, the dorsal surface being vaulted, the ventral almost flat; the lateral margin is convex, the inner margin almost straight (slightly convex). The inner distal angle is prolonged into a hook-like projection. The branches are minute; the endopodite is a little larger than the exopodite.

Remarks. RICHARDSON (1909) points out that the species has an anteriorly broadly rounded, almost straight, front area (rostrum) with a small apical tip anteriorly in the middle, and that there are two incisions, one on each lateral margin of the pleotelson, anterior to the uropods. In 1912 CHILTON stated that in adult specimens of *Jaeropsis curvicornis* (NICOLET), just as in *Jaeropsis patagoniensis* RICHARDSON, there is only one incision on each lateral margin of the pleotelson, whilst young specimens have the lateral margins of the pleotelson denticulated throughout. Moreover, the front area in *Jaeropsis curvicornis* (NICOLET) has been differently figured by NICOLET (1849) and STEBBING (1905). CHILTON (1912) is therefore of the opinion that *Jaeropsis patagoniensis* RICHARD-

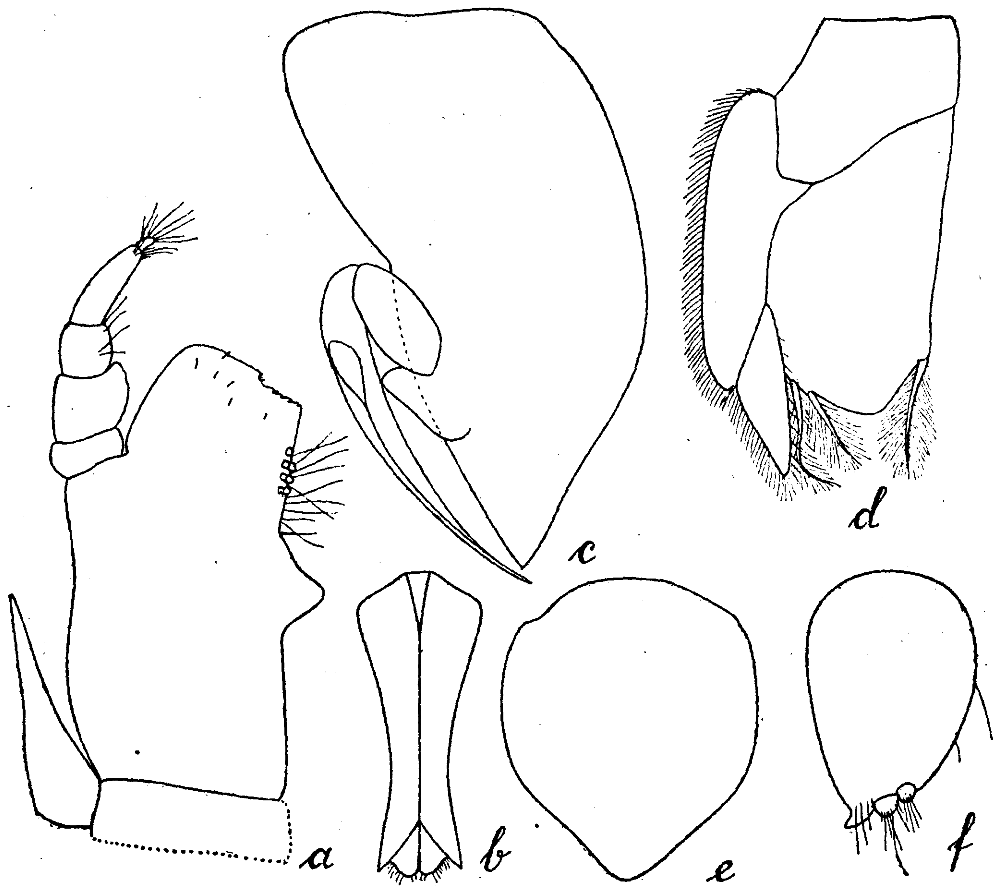

Fig. 45. *Jaeropsis patagoniensis* RICH. a. Right maxilliped, male, 95 ×. b. First pleopods, male, 30 ×. c. Right second male pleopod, seen from the caudal side, 155 ×. d. Right third pleopod, male, 115 ×. e. Female operculum, 45 ×. f. Right uropod, seen from above, (male), 65 ×.

SON is identical with *Jaeropsis curvicornis* (NICOLET). This, I could state to be incorrect. I found even in immature specimens of *Jaeropsis patagoniensis* RICHARDSON always the two incisions on the pleotelson and the small tip on the front area exactly as figured by RICHARDSON (1909)[1]. Besides, there are other characteristic differences in the uropods, and especially in the maxillipeds, which, in contrast to *Jaeropsis curvicornis* (NICOLET)[2]

[1] In a large male, 5.8 mm. in length the small tip on the front area was indistinct.
[2] Cf. STEBBING, 1905, Pl. IX C, mxp.

and *Jaeropsis intermedius* n. sp. (cf. p. 196), have not the inner distal angle of the second joint of the palp elongated into a forward-pointed projection. *Jaeropsis patagoniensis* is a comparatively large species, larger than the two above mentioned species. There are no females with a marsupium in my material, but the largest specimen, a male, attains a length of 6.5 mm. The smallest specimen of this species in the collection has a length of only 2.9 mm., but the characteristic small tip on the front area and the incisions on the lateral margins of the pleotelson can be seen quite clearly.

Jaeropsis patagoniensis RICHARDSON is closely allied to *Jaeropsis paulensis* VANHÖFFEN, but there are differences in the maxillipeds, the uropods and the shape of the distal part of the pleotelson. The lateral margins of the pleotelson in *Jaeropsis paulensis* VANHÖFFEN are quite smooth and have no incisions anterior to the uropods. The shape of the front area has not been described in this species.

A revision of the southern species of *Jaeropsis* is very much needed. It cannot for example be considered quite certain that the Chilean species *Jaeropsis curvicornis* (NICOLET) is identical with the species from the Gulf of Manaar described by STEBBING (1905) under the same name. The trapezoidal form and anteriorly almost truncate front area and the brownish colour in *Jaeropsis curvicornis*, as figured by NICOLET (1849), render it possible that the species of NICOLET is the same as *Jaeropsis patagoniensis* RICHARDSON.

Localities and Material.

St. 53. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 47′ W. 12 m. Sand and gravel. $^{3}/_{9}$ 1902. Male about 3.8 mm. in length. Colour, brownish in the middle, slightly yellowish at the margins.

St. 55. Falkland Islands, Port Albemarle, lat. 52° 11′ S., long. 60° 26′ W. 40 m. Sand with algae. $^{6}/_{9}$ 1902. Female without oostegits, length about 2.9 mm. Colour, brownish in the middle, at the margins and on the whole fifth pereion segment; elsewhere slightly yellowish.

St. 59. South of West Falkland, on the Burdwood Bank, lat. 53° 45′ S., long. 61° 10′ W. 137—150 m. Broken shells with stones. $^{12}/_{9}$ 1902. Female without oostegits, of slightly yellowish colour, and lacking brownish spot on the head; length about 4.2 mm.

St. 60. Fuegian Archipelago (off Tierra del Fuego), eastern mouth of the Beagle Channel, lat. 55° 10′ S., long. 66° 15′ W. 100 m. Bottom temp. + 5.0°. Broken shells. $^{15}/_{9}$ 1902. Male specimen of a slightly yellowish colour but with a faint brownish spot on the head; length about 6.5 mm.

Eugenie Expedition. Straits of Magellan, York Bay. 4—6 fathoms; on Echinids. Male specimen; length about 5.8 mm. Colour yellowish. The specimen differs in having the tip of the anterior margin of the front area indistinct.

Distribution. Patagonia (RICHARDSON 1909), Magellan Straits (Eug. Exp.), Fuegian Archipelago (Sw. Ant. Exped.), Burdwood Bank (Sw. Ant. Exped.), Falkland Islands (Sw. Ant. Exped.).

The species has been previously recorded only from Patagonia.

Jaeropsis intermedius n. sp.

Text. figs. 46 a—g.

Diagnosis. Front area pointed. Lateral margins of head and abdomen generally serrate, those of pereion smooth. Eyes dorsal, at a distance from the lateral margin of the head equal to he width of one eye. First joint of antennulae with the inner distal angle somewhat projecting, and pointed. Inner distal angle of the second joint of the antennal peduncle produced into a long forward-pointing projection. Maxilliped with the inner part of the distal margin of the endite deeply concave; second joint of the palp elongated into a projection directed forwards, which reaches to the distal margin of the third joint of the palp. Peduncles of uropods deeply inserted in the distal margin of pleotelson, increasing in width towards the distal end and with its inner distal angle elongated into a hook-like point. Operculum in female apically pointed.

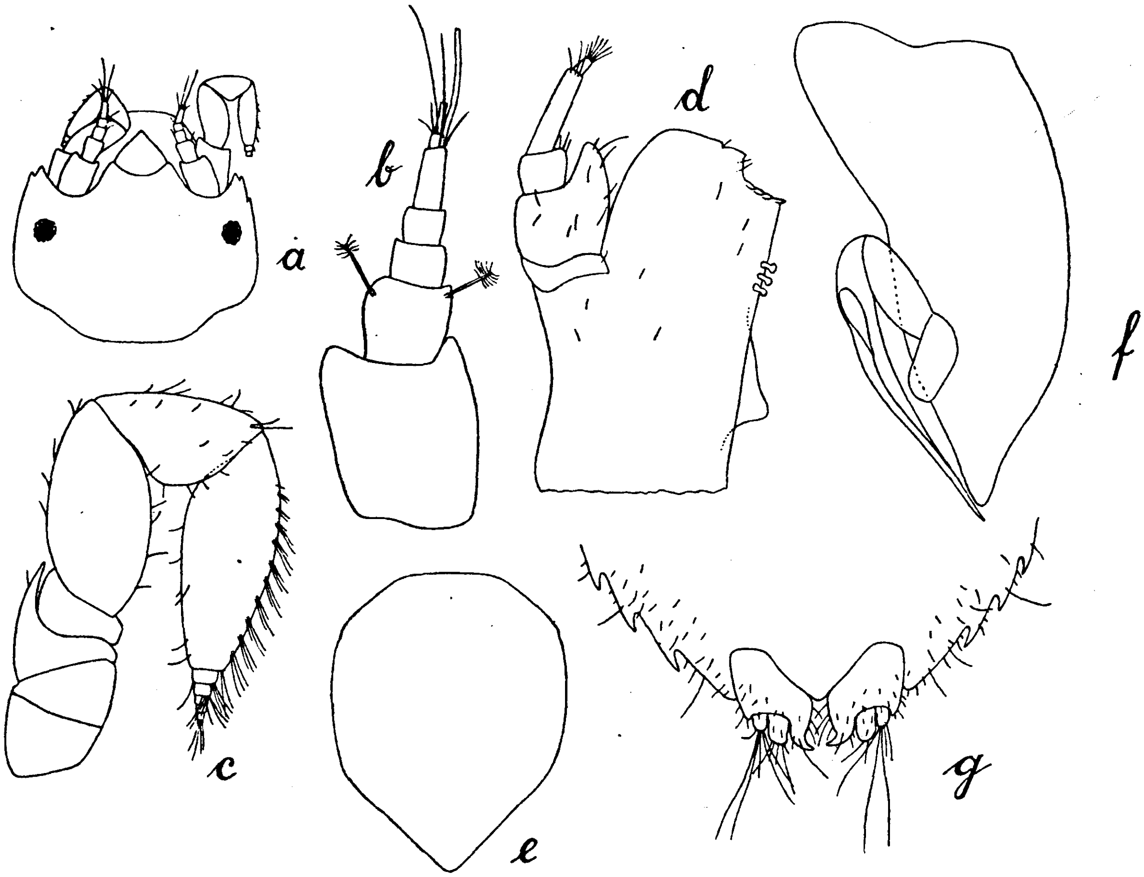

Fig. 46. *Jaeropsis intermedius* n. sp. a. Head, female, 45 ×. b. Left antennula, female, 160 ×. c. Right antenna, female, 115 ×. d. Distal part of the maxilliped, 115 ×. e. Female operculum, 65 ×. f. Right second male pleopod, from the caudal side, 115 ×. g. Tip of pleotelson with the uropods, 115 ×.

Description.

Types. Male, about 2 mm. in length; female, about 3 mm.

Colour. Light yellowish, in some specimens slightly brownish; some of the specimens with indication of a faint brownish-marbled spot on the head.

Head (Fig. 46 a). Front area (rostrum) triangular and pointed, fitting into an emargination of the anterior margin of the head. Lateral margins of the head slightly serrate, anteriorly.

Pereion. Lateral margins of the pereion segments smooth. The fifth pereion segment is the shortest, but only a little shorter than the fourth.

Abdomen. Subtriangular, lateral margins with about eight denticulations and with short setae.

Antennulae (Fig. 46 b). First peduncular joint very large, its inner distal angle is elongated and pointed. Second joint only about half as long and about twice as narrow as the first joint. The third and fourth joints are short, together slightly longer than the second. The flagellum consists of two joints each carrying one sensory filament. The second joint of the flagellum is only about one-third as long as the first.

Antennae (Fig. 46 c). Inner distal angle of the second joint prolonged into a forward-pointing projection reaching to the distal margin of the third joint. Flagellum in specimens with a length of 3 to 3.5 mm. consisting of 5—7 small joints in addition to the very large proximal joint.

Mandibles. Typical of the genus. On the left mandible the incisive part is divided into five teeth, but on the rostral margin there is a row of three additional very small teeth. Setal row on the left mandible with nine setae.

First pair of maxillae. Typical of the genus. Inner lobe with four stout and some slender apical setae.

Second pair of maxillae. Typical of the genus. Outer lappet of outer lobe with three or four apical setae; the inner lappet of the same lobe is furnished with three apical setae, and the inner lobe with four.

Maxillipeds (Fig. 46 d). Inner part of the distal margin of the endite markedly concave and furnished with a row of teeth. Second joint of the palp about half as broad as the endite, its inner distal angle is elongated and reaches to the distal margin of the third joint. The number of coupling hooks is three (in a specimen about 3.5 mm. in length).

Pereiopods. As in *J. patagoniensis*.

First pair of pleopods, male. As in *J. patagoniensis* (cf. Fig. 45 b).

Second pair of pleopods, male (Fig. 46 f). The short branch slightly tapering towards the end.

Operculum, female (Fig. 46 e). More pointed than in *J. patagoniensis*.

Third pair of pleopods. As in *J. patagoniensis* (cf. Fig. 45 d). Exopodite two-jointed.

Fourth and fifth pairs of pleopods. Normal. Fourth pleopod with oblong-ovate endopodite and a small exopodite of about the same shape; fifth pleopod with oblong-ovate endopodite and exopodite missing.

Uropods (Fig. 46 g). Almost as broad as they are long. Peduncles inserted in deep incisions in the margins of pleotelson; only their distal parts project freely. The inner distal angle of the peduncle is prolonged into a hook-like projection, much longer than in *J. patagoniensis*. The free lateral margin of the peduncle is sometimes denticulated. Rami small; exopodite about half as large as the endopodite.

Remarks. Though it is not impossible that this species is identical with one of the previously described species, either *J. marionis* BEDDARD or. *J. curvicornis* (NICOLET), there remain differences, which make it necessary to describe it as a new species. It differs from *J. marionis* BEDDARD in having a more pointed front area, in having broader antennae with another shape of the second and third peduncular joints, in having the lateral margins of the pereion segments smooth and the seventh pereiopods furnished with three claws. It is very similar to *Jaeropsis curvicornis* (NICOLET) as described by STEBBING (1905); especially there is a marked similarity in the maxillipeds; the front area, however, is not rounded anteriorly, but triangular and pointed. *Jaeropsis paulensis* VANHÖFFEN, in which the second joint of the palp of the maxilliped is not produced into a forward-pointing projection, approaches more closely to *Jaeropsis patagoniensis* (cf. p. 194). *Jaeropsis intermedius* is a smaller species than *patagoniensis.* It attains a length of up to 3.5 mm. (see below), but even at the length of 3 mm. we find females with embryos.

Localities and Material.

St. 2. Coast of North Argentina, lat. 37° 50′ S., long. 56° 11′ W. 100 m. Gravel mixed with sand. 23/12 1901. 2 specimens, male and female (types), of a slightly yellowish colour; length of the largest specimen about 3 mm. (female), length of the male 2 mm.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. Small male specimen, about 1.6 mm. in length and almost colourless.

St. 55. Falkland Islands, Port Albemarle, lat. 52° 11′ S., long. 60° 26′ W. 40 m. Sand with algae. 8/9 1902. Female with embryos, colour slightly yellowish, length about 3.5 mm.

St. 59. South of West Falkland, on the Burdwood Bank, lat. 53° 45′ S., long. 61° 10′ W. 137—150 m. Broken shells and stones. 12/9 1902. A small male specimen of a slightly yellowish colour, but with a touch of brownish; length about 2.8 mm.

St. 60. Fuegian Archipelago, Eastern mouth of the Beagle Channel, lat. 55° 10′ S., long. 66° 15′ W. 100 m. Bottom temp. + 5.0°. Broken shells. 15/9 1902. 6 specimens of a very slightly yellowish colour; length of the largest specimen about 3.2 mm.

Distribution. Argentina (Sw. Ant. Exped.), Fuegian Archipelago (Sw. Ant. Exped.), Burdwood Bank (Sw. Ant. Exped.), Falkland Islands (Sw. Ant. Exped.).

Group **Munnini** HANSEN, 1916.

Fam. *Munnidae* G. O. SARS, 1899.

For diagnosis see HANSEN (1916, p. 33—34). The family *Munnidae* of G. O. SARS was divided by VANHÖFFEN (1914) into three families, *Munnidae, Paramunnidae* and *Dendrotionidae.* VANHÖFFEN founded this division on characters based on the shape of the body and the length of the uropods. HANSEN (1916) united the families of VANHÖFFEN into his group *Munnini,* but he points out that »in reality some of the genera, as *Munna* and *Dendrotium,* differ much from each other in a number of features» (p. 33), and expresses the opinion that the group may be divided satisfactorily, when the southern, not very well-known, genera have been more closely investigated. As regards the classification of the family *Parasellidae* it has been shown by HANSEN (1916) that the mandibles are of essential importance. Having been able to examine these appendages in a number of southern genera, such as *Austrosignum* HODGSON, *Antias* RICHARDSON, *Pleurosignum* VANHÖFFEN, *Antennulosignum* n. gen. and *Coulmannia* HODGSON I came to the conclusion that the mandibles are essentially of two different types, the one characterized by its broad, anteriorly cut-off molar tubercle, which widens out towards its distal end, the other by its very narrow molar tubercle distally obliquely truncate or rounded. The generally very marked difference between these two types of mandibles can be seen by comparing the two figures 65 c and 68 b showing the mandible of *Paramunna dentata* n. sp. and *Pleurosignum magnum* VANHÖFFEN. To these two types of mandibles may be added a third, not so well marked as the two others, which is characterized by having a strong molar tubercle tapering towards the end and distally truncate. This type of mandible, which, however, most resembles the one characteristic of *Munna* and *Paramunna*, is found for instance in *Dendrotium*[1] G. O. SARS and *Antias* (Fig. 49 b). Taking into consideration also other marked differences which are found in the antennulae, the antennae, the maxillipeds, and the uropods, the group *Munnini* HANSEN may be divided into four sub-groups. The two genera *Neasellus* BEDDARD, 1885, and *Acanthomunna* BEDDARD, 1886, cannot be arranged under the following division, since their mouth-organs are unknown.

1. *Antiasini*, new sub-group.
(comprises the genus *Antias*.)

Diagnosis. Mandibles with molar tubercle strong and broad, distally truncate but somewhat tapering towards the end. Antennulae consisting of a four-jointed peduncle, of which the first two joints are stout, and a short flagellum composed of one or two joints, only the last joint furnished with sensory filaments. Antennae not provided with squama. Maxilliped with a narrow palp, the palp being $^1/_3$—$^1/_2$ as wide as the endite; epipodite with distal end pointed. Uropods of medium length, being from a-fourth of the length of to subequal in length to the pleotelson.

Antias RICHARDSON, 1906, has previously been referred to the group *Ianirini*. Its shape of body, which is sometimes very similar to that characteristic of the genus *Munna*[2], its broad eye-peduncles and the composition of the antennulae, indicates, that the genus comes close to *Munna* and *Paramunna*.

2. *Munnini*, new sub-group.
(comprises *Munnidae* VANHÖFFEN and *Paramunnidae* VANHÖFFEN p. p.)

Diagnosis. Mandibles with a broad molar tubercle directed somewhat forward, increasing in width towards the distal end and anteriorly abruptly truncated. Antennulae with the peduncle and the flagellum of about equal length; peduncle consisting of four joints, the first two stout, the following two very small; flagellum consisting of few joints (1—4), the last two joints (exceptionally only the last) provided with a long sensory filament. Antennae without squama. Maxillipeds with first three joints of the palp broad, second joint of the palp $^1/_3$—$^1/_4$ narrower than the endite; epipodite with distal margin broadly rounded. Uropods very small, with peduncle minute or missing.

Comprises the genera: *Munna* KROEYER 1839, *Paramunna* G. O. SARS 1866, *Coulmannia* HODGSON 1910, *Notoxenus* HODGSON 1910, *Austrosignum* HODGSON 1910, *Echinomunna* VANHÖFFEN, 1914.

The genus *Astrurus* BEDDARD, 1885, whose shape of body somewhat resembles that of *Coulmannia*, may perhaps be referred to this sub-group. It differs, however, in having a narrow palp of maxilliped. As its mandibles are unknown, its systematical position is doubtful.

3. *Dendrotiini*, new sub-group.
(= Fam. *Dendrotionidae* VANHÖFFEN.)

Diagnosis. Mandibles with molar tubercle broad and strong, similar to the molar in subgroup *Munnini*, but tapering towards the end. Antennulae with flagellum longer than

[1] See G. O. SARS, 1899, Pl. 49, M. sin.
[2] Cf. *Antias marmoratus*, Pl. II Fig. 17 and VANHÖFFEN (1914, Fig. 61 a).

the peduncle, its last three — as a rule more than three — joints, furnished with short sensory filaments. Antennae with squama missing or small. Palp of maxilliped narrow, with second joint about half as wide as the endite; epipodite pointed. Uropods very long, always longer than the pleotelson; peduncle of uropods long.

Comprises the genera: *Dendrotium* G. O. SARS 1871, *Mormomunna* VANHÖFFEN 1914, and *Pseudomunna* HANSEN 1916.

4. *Pleurogoniini*, new sub-group.
(comprises *Paramunnidae* VANHÖFFEN p. p.)

Diagnosis. Mandibles with a long and narrow molar tubercle, slightly forward-directed, very slightly widening or tapering towards the end, which is obliquely truncated or rounded. Antennulae as in sub-group *Munnini*, except that the penultimate joint of the flagellum is never provided with a sensory filament. Maxillipeds as in sub-group *Munnini*. Uropods very short with peduncle minute or missing.

Comprises the genera: *Pleurogonium* G. O. SARS 1899, *Pleurosignum* VANHÖFFEN 1914, and *Antennulosignum* n. gen.

Synopsis of the genera.

I. Mandibles with a broad subcylindrical molar tubercle widening towards the distal end and distally cut off. (Uropods minute.)

Sub-group *Munnini*.

1. Eye-peduncles broad.
    a. Pleotelson bulbous, coxae visible from above and marked off by dorsal sutures on the second to seventh pereion segments.
        α. Body smooth. — *Munna* KROEYER.
        β. Body strongly spinous. — *Echinomunna* VANHÖFFEN.
    b. Pleotelson flattened, coxae not visible from above. — *Paramunna* G. O. SARS.
2. Eye-peduncles slender.
    a. Pereion flattened, coxae visible from above and marked off by dorsal sutures on the last three pereion segments. — *Austrosignum* HODGSON.
    b. Pereion vaulted, coxae not visible from above.
        α. Mandibles with palp. — *Notoxenus* HODGSON.
        β. Mandibles without palp. — *Coulmannia* HODGSON.

II. Mandibles with molar tubercle stout, but tapering towards the truncate end. (Uropods long to mediumly long).

A. Antennulae with a very short flagellum composed of only a few joints. Uropods of medium length not exceeding that of the pleotelson.

Sub-group *Antiasini*.

Antias RICHARDSON.

B. Antennulae with a very long flagellum consisting of many joints. Uropods very long.

Sub-group *Dendrotiini.*

1. Coxal plates spine-like. *Dendrotium* G. O. SARS.
2. Coxal plates rounded.
   a. Each of the first male pleopods distally cleft. *Pseudomunna* HANSEN.
   b. First male pleopods uncleft, distally rounded. *Mormomunna* VANHÖFFEN.

III. Mandibles with a narrow molar tubercle with obliquely truncate or rounded end.

Sub-group *Pleurogoniini.*

1. Eyes on long eye-peduncles.
   a. Second peduncular joint of the antennula distally prolonged into a spine-like projection longer than the flagellum. *Antennulosignum* n. gen.
   b. Second peduncular joint of the antennula not prolonged distally. *Pleurosignum* VANHÖFFEN.
2. No eyes, no eye-peduncles. *Pleurogonium* G. O. SARS.

Sub-group **Antiasini**, new sub-group.

For diagnosis see p. 198.

Genus **Antias** RICHARDSON, 1906.

RICHARDSON, 1913; VANHÖFFEN, 1914.

Diagnosis.[1] Body short, sometimes with the four first pereion segments sligthly marked off from the last three segments. Eye-peduncles broad furnished with a tooth in front of the eyes. Abdomen narrower than the pereion, with dorsal surface vaulted and sometimes slightly swollen. Antennulae consisting of a four-jointed peduncle having the first two joints stout, the last two small, and an 1—3-jointed flagellum; last joint of flagellum furnished with one or more long sensory filaments. Mandible with a strong subcylindrical molar tubercle with the end cut off and directed forwards. Maxilliped with a narrow palp, the joints not differing much in width; second joint of the palp only one-third to one-half as wide as the endite. Pereiopods with first pair in both sexes slightly subchelate, all with two claws. Uropods never exceeding the length of the abdomen.

This genus was referred by RICHARDSON (1906) and VANHÖFFEN (1914) to the *Ianiridae* G. O. SARS. Its affinity to *Munna* and *Paramunna* is indicated especially by its distinct eyepeduncles, its comparatively narrow, sometimes slightly swollen, abdomen, its antennulae, which consist of very few joints and have the last joint furnished with one or more sensory filaments, its mandibles and its occasionally very short uropods (cf. *Antias marmoratus* VANHÖFFEN). The general shape of body is similar to that of *Paramunna* G. O. SARS. The eye-peduncles resemble those in the genus *Munna.* Owing to its comparatively flattened body and, as a rule, rather long uropods, the genus comes closest to the *Ianirini* of all the genera of the group *Munnini.* In the three species of *Antias* examined by me, the small coxae are visible from above and separated by dorsal sutures from the tergum on the last three pereion segments.

[1] Cf. RICHARDSSON (1906, p. 16—17).

Antias hispidus VANHÖFFEN, 1914.

Text figs 47 a—g.

Antias hispidus. VANHÖFFEN, 1914, p. 533—534, Fig. 60; STEPHENSEN, 1927, p. 356—357, Fig. 24 (1, 2, 3).

Supplementary Description.

General shape of body. Flattened, oval; body about two and a third times as long as its greatest width.

Head. About as long as the first and second pereion segments together. Rostral part projecting, with rostral margin strongly convex, reaching about to the middle of the penultimate joint of the antennal peduncle. Eyes of a reddish-brown colour and consisting of twenty ocelli. In the anterio-lateral angle of the head, there is a forward-directed tooth-like projection in front of the eyes.

Pereion. Segments approximately equal in length. First four segments approximately equal in width; the fourth segment very slightly broader than the others. Lateral margins of the first four segments almost straight, of the last three convex. Dorsally and laterally the segments are furnished with sparse setae.

Coxae visible from above and marked off from the tergites by faint dorsal sutures on the last three pereion segments.

Abdomen. Narrower than pereion. Anteriorly is one free segment. Pleotelson with lateral margins very slightly convex (almost straight), laterally with two marked incisions for the uropods. Distal margin between the uropods convex.

Antennulae (Fig. 47 a). Short, about two-thirds the length of the head. Peduncle composed of four joints; the first two joints are stout, the second and third joints much smaller. Flagellum single-jointed, about as long as the third and fourth peduncular joints together; it is furnished apically with one long sensory filament and some setae.

Antennae (Fig. 47 b). Short, but about twice as long as the antennulae, lateral margin of the third joint provided with a large seta. The flagellum consists of about eleven joints.

Mandibles. Incisive part with five points. Molar tubercle subcylindrical and forward-directed, very slightly tapering towards the truncate denticulated end. Lacinia (on the left mandible) with three points. Setal row (on the left mandible) with four setae, (on the right) with five.

First pair of maxillae (Fig. 47 c). Outer lobe about twice as broad and one-fourth again as long as the inner lobe; distal margin straight furnished with about ten stout setae; inner margin provided distally with a row of slender setae. Inner lobe distally decreasing in width, with four apical setae.

Second pair of maxillae (Fig. 47 d). Inner lobe provided with setae on the inner margin and at the tip. Lappets of outer lobe with three apical setae each.

Maxillipeds (Fig. 47 e). Palp narrow, its second joint being not fully half as wide as the endite; distal margin of the endite furnished with a row of setae; near the same margin there is also a submarginal row of setae. There are two coupling-hooks. The epipodite is distally pointed, its outer margin is markedly convex, its inner margin almost straight.

First pair of pereiopods (Fig. 47 f). Slightly subchelate and shorter than the other pereiopods. The basipodite is slightly longer than the ischium and merus together. The ischium is slightly longer than the propodus. Merus and carpus are subequal in length. The setal armature is illustrated in the figure. Some of the setae are stout and two-pointed. Dactylus with one long and one short claw.

The other pereiopods. All with one long and one short claw.

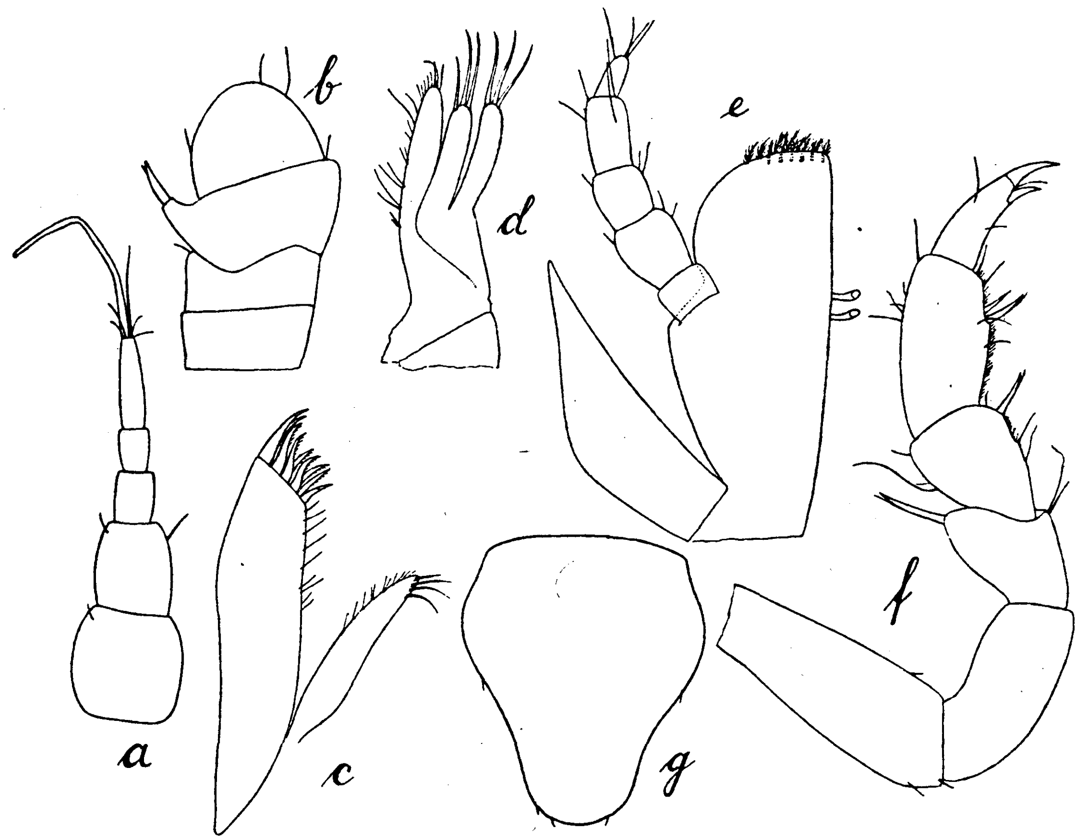

Fig. 47. *Antias hispidus* VANHÖFF. a. Right antennula, female, 235 ×. b. Proximal joints of the right antenna, female, 315 ×. c. Right first maxilla, female, 235 ×. d. Right second maxilla, 235 ×. e. Right maxilliped, female, 235 ×. f. Right first pereiopod, female, 200 ×. g. Female operculum, 200 ×.

Operculum, female (Fig. 47 g). Slightly tapering towards the broadly rounded end, being distally not quite one-third as broad as its greatest width. Lateral margins proximally convex, distally somewhat concave. Distal margin convex.

Uropods. About as long as the pleotelson. Peduncle about half as long as and somewhat broader than the rami. The rami are of about equal length, half as long again to twice as long as the peduncle. Each of the rami with two strong spine-like apical setae, forming an angle of about 60 ° with each other.

Localities and Material.

St. 49. Falkland Islands, Berkeley Sound, lat. 51° 35′ S., long. 57° 56′ W. 25—30 m. Shells and stones. 10/8 1902. 2 specimens 1.4 and 1.2 mm. long respectively.

St. 95. Graham Region, North of Astrolabe Island, lat. 63° 9′ S., long. 58° 17′ W. 95 m. Bottom temp. — 1.0°. Sand mixed with clay, algae, and stones. 28/12 1902. Female specimen with empty marsupium; length about 1.5 mm.

Distribution. Falkland Islands (Sw. Ant. Exped.), St. Paul (VANHÖFFEN 1914), Auckland Islands (STEPHENSEN 1927), Graham Region (Sw. Ant. Exped.).

The species thus has a wide distribution. It has not previously been found at the Falkland Islands or the Graham Region.

Antias marmoratus VANHÖFFEN, 1914.

Pl. II Fig. 17; Text figs. 48 a—g.

Antias marmoratus. VANHÖFFEN, 1914, p. 534—535, Figs. 61 a—d.

Supplementary Description.

General shape of body. In the fully grown female (Pl. II, Fig. 17) oval, in males and immature females, oblong, narrowing backwards[1]. The greatest width in adult females is across the third pereion segment; in males and young specimens the anterior five pereion segments are subequal in width; the last two pereion segments decrease in width.

Colour. Varying between grayish and brownish. The first four pereion segments are often brownish-marbled, whilst the last three pereion segments and the abdomen have a marbled grayish-brown colour, which is generally of a lighter tinge of gray in the middle of the last three pereion segments. The head is either marbled grayish or brownish. In some specimens the body is marbled brown throughout, except for a lighter tinge in the middle of the last three pereion segments.

Head. Frontal margin straight. Eyes small, often without pigment.

Pereion. First four segments subequal in length, but the third slightly longer than the others Last three segments curved backwards; elevated and of a paler tinge in the middle. Lateral margins of all the pereion segments rounded.

Coxae visible from above and marked off by dorsal sutures on the last three segments.

Abdomen. About as long as the last four pereion segments together, anteriorly with a distinct free segment. The pleotelson is somewhat swollen, having the dorsal surface vaulted, but it is more depressed in a dorso-ventral direction than in the genus *Munna*. The greatest width of the pleotelson is near the anterior margin, whence it tapers towards the distal end. Its lateral margins are convex, its distal margin between the uropods is broadly rounded and often setiferous. The dorsal surface of the pleotelson, in the middle, exhibits a faint longitudinal elevation.

Antennulae (Fig. 48 a). Reaching approximately to the distal margin of the penultimate joint of the peduncle of the antennae. First and second peduncular joints are large and subequal in size. Second and third joints small, approximately equal in length and together about as long as the second joint. Flagellum single-jointed, about as long as the second and third peduncular joints together.

Antennae. From one-half to one-third as long as the body. The first four joints

[1] See VANHÖFFEN, 1914, Fig. 61 a.

of the peduncle are short, of about equal length and together slightly longer than the fifth joint, which is about as long as the sixth. Squama missing. The flagellum is somewhat shorter than the peduncle and consists (in a female 1.7 mm. long) of eleven joints, of which the first is as long as the two following joints together.

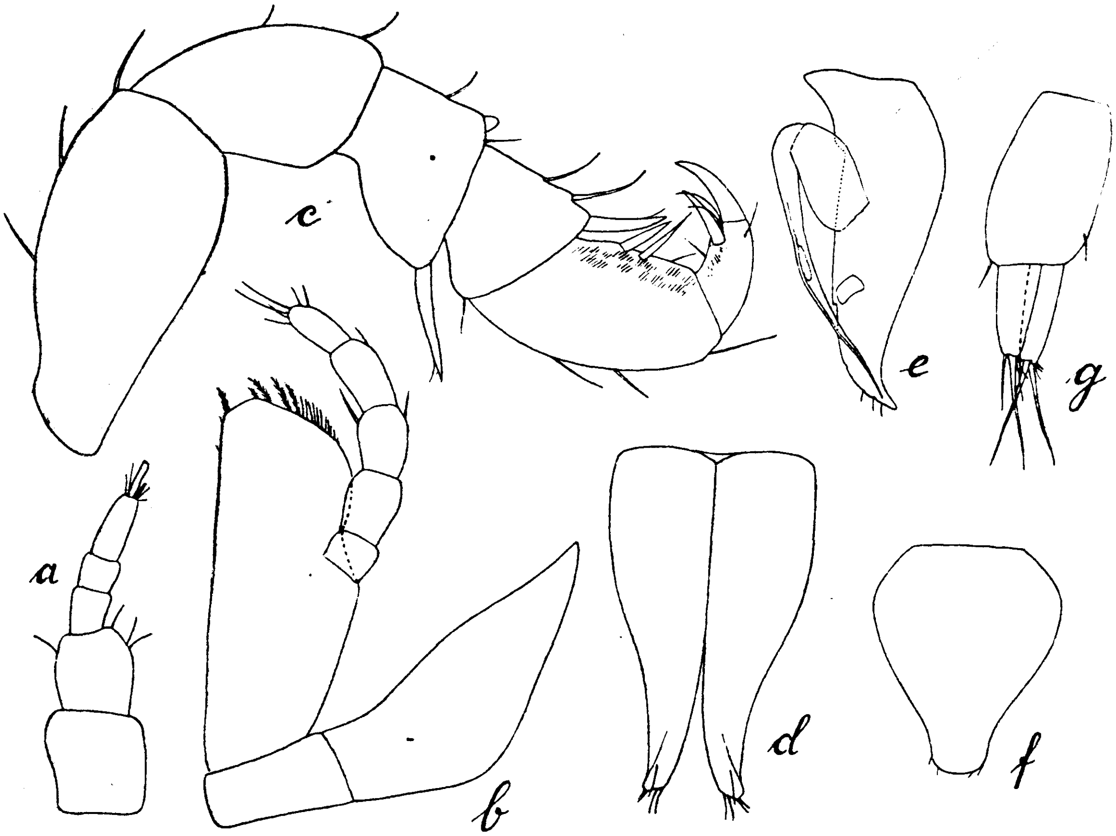

Fig. 48. *Antias marmoratus* VANHÖFF. a. Right antennula, female, 160 ×. b. Left maxilliped, 200 ×. c. Right first pereiopod, male, 200 ×. d. First male pleopods, 160 ×. e. Right second male pleopod, seen from the caudal side, 160 ×. f. Female operculum, 65 ×. g. Right uropod, female, 235 ×.

Mandibles. Incisive part with five points. Lacinia (on the left mandible) with three points. Setal row (on the left mandible) with three or four setae, (on the right) with five setae. Molar tubercle very slightly tapering towards the truncate and denticulated end. Palp short, three-jointed.

First pair of maxillae. Much as in *Antias hispidus.* Inner lobe weak, shorter than the outer lobe and furnished with four setae at the tip (situated somewhat towards the inner margin.

Second pair of maxillae. Lappets of outer lobe about as long as inner lobe, each with four apical setae. Inner lobe not much broader than each of the lappets of outer lobe, provided with setae distally.

Maxillipeds[1] (Fig. 48 b). The epipodite is apically pointed; outer margin strongly

[1] See also VANHÖFFEN, 1914, Fig. 61 b.

convex, inner margin almost straight. The palp is narrow; its joints are approximately equal in width, the second joint being approximately two-fifths the width of the endite. Each maxilliped is provided with three coupling-hooks.

Pereiopods. Increasing somewhat in length from the first to the seventh. First pereiopod (Fig. 48 c) alike in male and female. Meral joint with a strong seta at its upper distal angle. Carpal joint with three setae on its lower margin, of which the largest is situated at the lower distal angle. Propodal joint with two setae near each other on its lower margin. For other details see the figure.

First and second pleopods in the male. See Figs. 48 d and e and cf. VANHÖFFEN (1914, Figs. 61 c and d).

Operculum, female (Fig. 48 f). Approximately cordate; distally not quite one-third as broad as its greatest width; lateral margins near the distal end somewhat concave; distal margin sub-truncate.

Uropods (Fig. 48 g). Situated in incisions on the margin of the pleotelson. They are only one-third to one-fourth as long as the pleotelson. The short rami are fairly equal in length.

Remarks. My specimens of this species correspond in essentials with the figures and description by VANHÖFFEN (1914). VANHÖFFEN figures, in his Fig. 61 a, a female specimen, apparently an immature female. The ovigerous female (Pl. II, Fig. 17) is more oval in outline. The specimens described above differ slightly in colour from those described by VANHÖFFEN. The colour of the species appears, however, to vary considerably in different specimens.

The general aspect of *Antias marmoratus* VANHÖFFEN is fairly similar to that of a *Munna*.

Localities and Material.

South Georgia, Cumberland Bay, May Bay. Haul among algae above a stony bottom. 1—2 m. 6/5 1902. About 29 specimens, males and females. Length of the largest specimen. 2.2 mm. (female).

South Georgia, Cumberland Bay, May Bay. Haul among algae in and below the low-tide region. 26 specimens, males and females, collected together with *Antias Hofsteni.* 5/5 1902. Largest specimen, a female, about 2 mm. in length.

South Georgia, Cumberland Bay, May Bay. 8/5 1902. In a rock-hollow in the low-tide region. Washed off from a colony of Bryozoa. One small male specimen.

Distribution. St. Paul, (VANHÖFFEN 1914), South Georgia (Sw. Ant. Exped.), Kerguelen (VANHÖFFEN 1914).

Not previously recorded from South Georgia.

Antias Hofsteni n. sp.

Pl. II, Fig. 18; Text figs. 49 a—i.

Diagnosis. Head with broad eye-peduncles furnished at its anterio-lateral angles with an acute point directed anteriorly. Pleotelson of fairly uniform width, but broadest slightly anterior to the middle; its distal margin with well-marked incisions for the uropods; distal tip between the uropods short and with a convex margin. Antennulae consisting of a four-jointed peduncle and a two-jointed flagellum. First pereiopods very slightly subchelate. Distal half of the fused first male pleopods of a uniform width, subrectangular and not tapering towards the end. Female operculum distally about two-fifths as wide as its width across the middle; distal margin subtruncate.

Description.

Types. Male 1.5 mm. in length and female with an empty marsupium 2 mm. long.

General shape of body. In the male (Pl. II, Fig. 18) the body is oblong, the pereion segments being almost of equal width. In the female with a marsupium it is more oval in outline, being broadest across the third pereion segment. Laterally and dorsally there are short scattered setae.

Colour. Yellowish, slightly marbled with brown, especially on the head and the abdomen.

Head. About three-fourths as long as it is broad, and about as long as the first and second pereion segments together. Front part between the antennulae projecting, divided by two faint parallel and transverse lines into one proximal trapezoidal part and one anterior lobe with distal margin convex. Eyes small without pigment. Anteriolateral angles of the head forward-directed and pointed.

Pereion. The first four segments are subequal in length. The last three segments are short and somewhat curved backwards.

Coxae small, visible from above and marked off by dorsal sutures on the last three pereion segments.

Abdomen. Short, approximately as long as the last three pereion segments together, anteriorly with a free segment. The pleotelson is somewhat swollen, with dorsal surface slightly vaulted; lateral sides slightly convex. The greatest width of the pleotelson is somewhat anteriorly to the middle. The incisions for the uropods are distinct. The posterior part of the pleotelson between the uropods is somewhat triangularly prolonged; its distal margin is convex. The dorsal surface of the pleotelson is furnished with a slight light-coloured longitudinal elevation along the middle line.

Antennulae (Fig. 49 a). The four-jointed peduncle has stout first and second joints; the third and fourth joints are small. The flagellum consists of two joints.

Antennae. Short, about as long as the head and the first pereion segment together. The first four peduncular joints are short and of about equal length; together they are about as long as the fifth joint, which is subequal in length to the sixth. The latter joint differs from the others in being narrow proximally and increasing in width towards the distal end. The flagellum is about as long as the last two joints of the peduncle together and consists of eight joints, which decrease in length and width from the first to the last.

Left mandible (Fig. 49 b). As in *Antias marmoratus*. Incisive part with five teeth. Lacinia with three teeth. Setal row with four setae. Molar tubercle slightly tapering towards the truncate, denticulated end. Palp short, three-jointed.

First pair of maxillae (Fig. 49 c). Of the usual type in the genus. Inner lobe weak, provided with five slender setae at the tip.

Second pair of maxillae (Fig. 49 d). The two lappets of the outer lobe are each provided with four apical setae.

Maxillipeds (Fig. 49 e). Typical of the genus. Second joint of the palp about half as wide as the endite. There are two coupling-hooks.

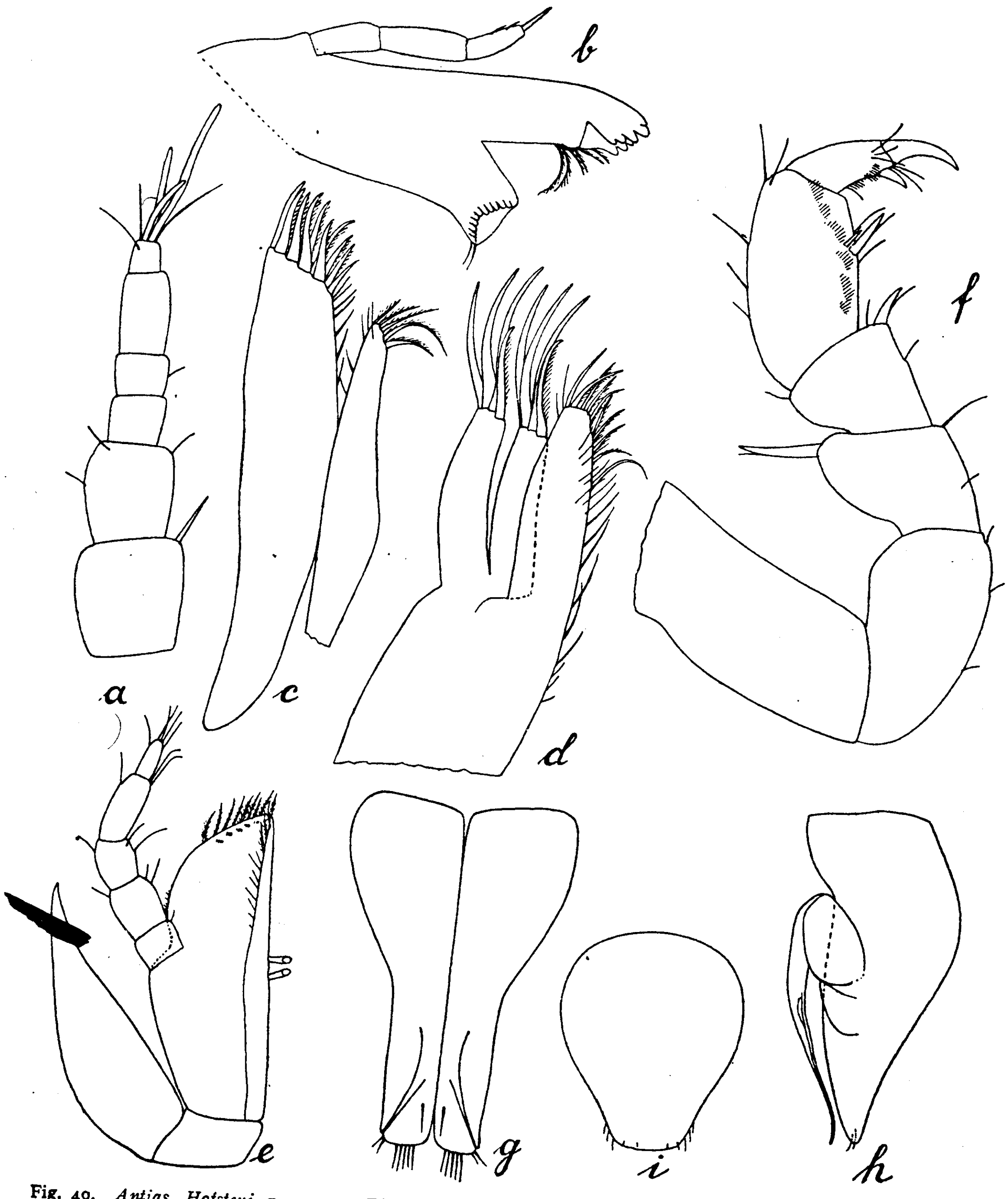

Fig. 49. *Antias Hofsteni* n. sp. a. Right antennula, female, 200 ×. b. Left mandible, female, 200 ×. c. First maxilla, 315 ×. d. Second maxilla, 315 ×. e. Left maxilliped, in a female with embryos, 160 ×. f. Left first pereiopod, female, 235 ×. g. First pleopods, male 160 ×. h. Second male pleopod, seen from the caudal side, 160 ×. i. Female operculum, 95 ×.

First pair of pereiopods (Fig. 49 f). Very similar to those in *Antias marmoratus*.

The other pereiopods. Much as in *Antias marmoratus*.

First and second pleopods male (Fig. 49 g and h). They differ from the same appendages in *Antias marmoratus* in the way shown in the figures. The fused first pleopods are thus much broader distally than in *Antias marmoratus*.

Operculum, female (Fig. 49 i). It is much broader distally than in *Antias marmoratus*, being about two-fifths as wide at the distal margin as across the middle. The distal margin is subtruncate.

Uropods. Broken in all the specimens.

Remarks. In its general aspect the species somewhat resembles *Antias marmoratus*, from which species it is easily distinguished by a different shape of the pleotelson, the female operculum and the first male pleopods.

The species in named after Professor N. v. HOFSTEN of Upsala.

Localities and Material.

South Georgia, Cumberland Bay, May Bay. Haul among algae in and below the low-tide region. $^5/_5$ 1902. 4 specimens (2 males, 2 females), collected together with *Antias marmoratus*. Length of the specimens: Female with empty marsupium (type) 2 mm.; female with embryos, 2 mm.; male (type), 1.5 mm.; male, 1.2 mm.

Distribution. South Georgia (Sw. Ant. Exped.).

Sub-group **Munnini** new sub-group.

For diagnosis see p. 198.

Genus **Munna** KROEYER, 1839.

For diagnosis see G. O. SARS (1899, p. 106—107) and HANSEN (1916, p. 34).

Munna maculata BEDDARD, 1885.

Text fig. 50.

Munna maculata. BEDDARD, 1886, p. 25—26, Pl. XI, Fig. 14; VANHÖFFEN, 1914, p. 563—564, Figs. 92 a and b; MONOD, 1931, p. 18 and 20, Figs. 7 a and b.

The Swedish Antarctic Expedition collected only a single specimen of this species, viz. an ovigerous female about 2.6 mm. long, found off the Falkland Islands. I have compared it with a female specimen from the German Antarctic Expedition, determined by VANHÖFFEN as *Munna maculata* BEDDARD and sent to me for examination from the Berlin Museum. These two specimens are similar in almost every detail, the only difference being in the colour. The Falkland Islands specimen was paler in colour; the pigment spots on the pereion were sparse and entirely absent on the abdomen. The specimen has no setae on the pereion, but the pleotelson is furnished laterally with some small spines. The body is ovoid in shape, and the first pereion segment is the shortest of the anterior four segments.

Coxal plates subrectangular, with lateral margins convex in a dorsal view. Uropods (Fig. 50)with outer margin slightly convex and inner margin almost straight; distal margin provided with three small triangular lobes.

Localities and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. Female with an empty marsupium; length about 2.6 mm.; collected together with *Munna pallida* BEDDARD.

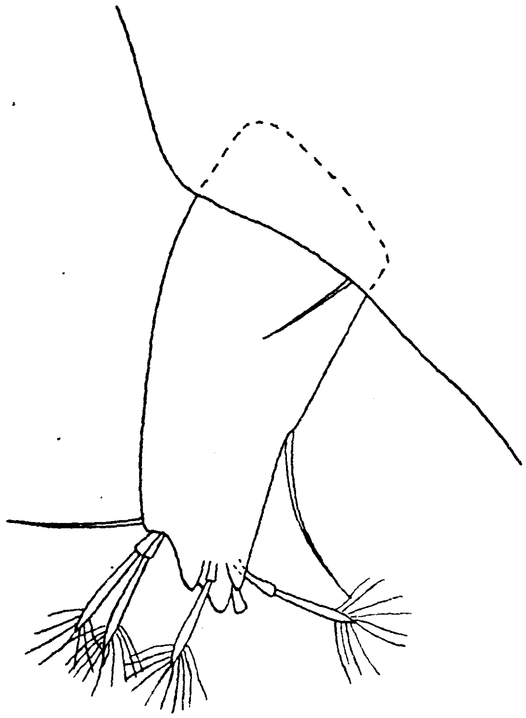

Fig. 50. *Munna maculata* BEDD. Left uropod (of an ovigerous female), 340 ×.

Distribution. Falkland Islands (Sw. Ant. Exped.), Kerguelen (BEDDARD 1886, VANHÖFFEN 1914, MONOD 1931).

The species has not previously been recorded from the Falkland Islands.

Munna pallida BEDDARD, 1886.

Text figs. 51 a—g.

Munna pallida. BEDDARD, 1886, p. 26—27, Pl. XI, Fig. 15; MONOD, 1931, p. 22.

Supplementary Description.

General shape of body (Fig. 51 a). Body very oblong, about three times as long as it is broad.

Colour. Whitish to slightly yellowish.

Head (Fig. 51 a). Almost as long as the first two pereion segments together. Frontal margin straight. Eye-peduncles broad, of uniform width, with a small anteriorly directed tooth in front of the eyes. The eyes are not very large and of a dark colour.

Pereion (Fig. 51 a). Sublinear, with the pereion segments only slightly differing in width. The first four segments are subequal in length and somewhat longer than the last three segments, which are likewise about equal in length. Lateral margins of all the pereion segments rounded.

Coxal plates subrectangular, with their lateral margins rounded.

Abdomen (Fig. 51 a). About as long as the last four pereion segments plus half the fifth segment, anteriorly with a distinct free segment.

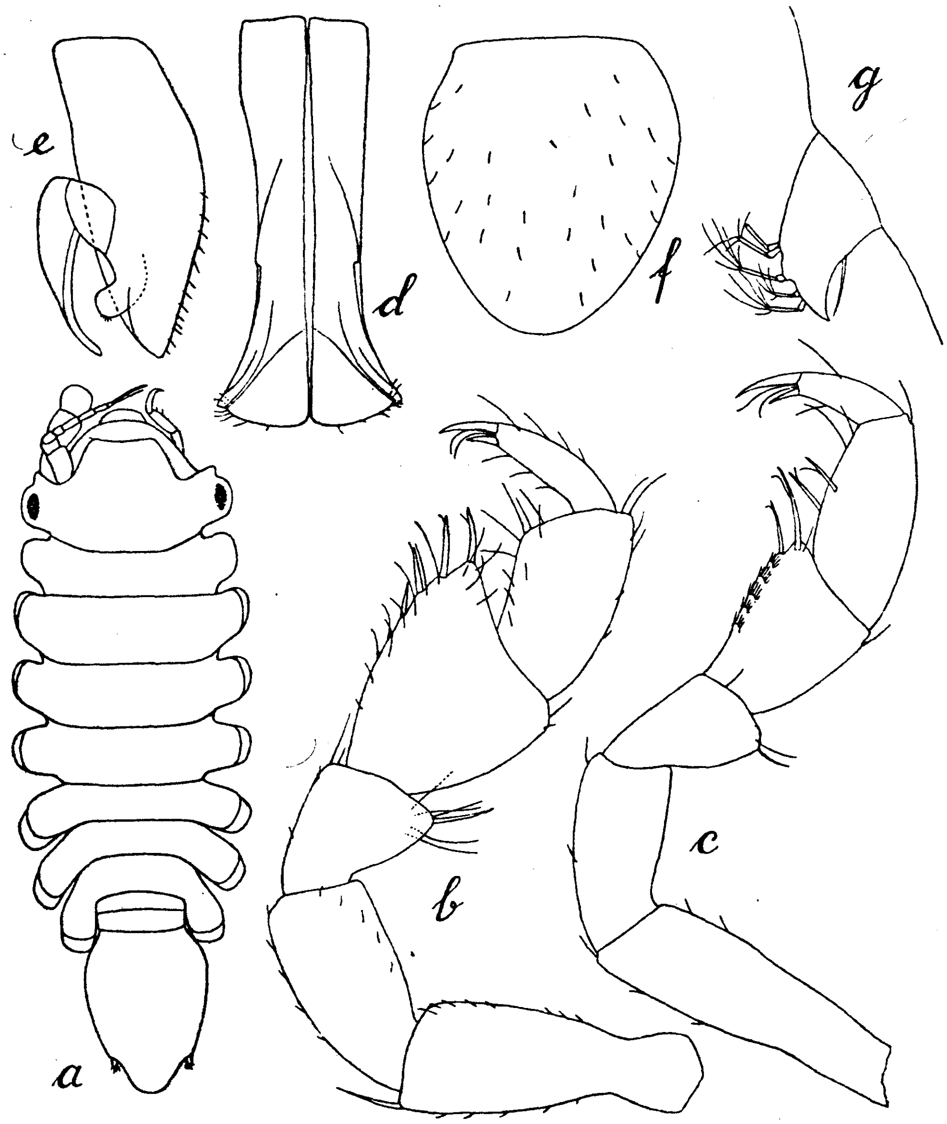

Fig. 51. *Munna pallida* BEDD. a. Male, 27 ×. b. First pereiopod, male, 100 ×. c. First pereiopod, female, 235 ×. d. First male pleopods, seen from the caudal side, 115 ×. e. Right second pleopod, from the caudal side, male, 115 ×. e. Right second pleopod, male, 115 ×. f. Female operculum from the rostral side, 135 ×. g. Left uropod, female, 320 ×.

Pleotelson not very swollen, greatest width near its base. Lateral sides slightly convex. Insertions for the uropods large and distinct. The tip between the uropods with its margin almost semicircularly rounded. Longitudinal elevation along the middle line slightly indicated. Dorsally and laterally the pleotelson has a few minute scattered setae.

Antennulae. Of the usual shape in the genus *Munna*, with third and fourth joints of the peduncle very short. The flagellum consists of four joints, of which the last is small. The last two joints of the flagellum are each provided with a long sensory filament.

Antennae. Broken. The four proximal joints are small.

Maxillipeds. Typical of the genus, having the second and third joints of the palp expanded and broader than the others. Distal margin of the epipodite broadly rounded. Coupling-hooks, three.

First pair of pereiopods, male (Fig. 51 b). Carpal joint broad, subtriangular, widening considerably towards its distal end; lower margin provided with four stout two-pointed setae and a number of more slender bristles. Propodal joint subrectangular, about as long as the carpus, but much narrower. Dactylus narrow, furnished with one long and one short claw.

First pair of pereiopods, female (Fig. 51 c). Much more slender than those of the male (especially the carpus and propodus), but otherwise similar. Carpal joint with only two double-pointed setae on its lower margin. Propodus close to its lower margin with two double-pointed setae. The propodus is somewhat longer than the carpus.

The other pereiopods. In most of the specimens examined not preserved. They are not quite so long as is generally the case in the genus *Munna*. The fifth pereiopod is somewhat shorter than the body.

First pair of pleopods, male (Fig. 51 d). Widening towards their distal ends. Distal margins convex.

Second pair of pleopods, male. See Fig. 51 e.

Operculum, female (Fig. 51 f). Its anterior surface provided with short scattered setae.

Uropods (Fig. 51 g). Somewhat hook-like. For details see the figure. They differ from the description by MONOD (1931) in lacking the »3—4 petites protubérances apicales».

Localities and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. 7 specimens, of which four are very small. Of the three large specimens one is a male, the two others are indeterminable as to sex, having lost their operculums and first pereiopods; one specimen of slightly more ovoid shape of body than the others is probably a female. Of the four young specimens three are females; one of them has no operculum. Almost colourless. Length of largest specimen, a male, about 3 mm. The specimens were found together with one specimen of *Munna maculata*.

Falkland Islands, Port Louis, Greenpatch. From algae and roots of kelp thrown up on the shore by storm. Male specimen about 2.4 mm. in length. It differs slightly from the above-mentioned specimens in having the pleotelson not quite so tapering towards its distal end and in its slightly brownish colour, the body being faintly marbled with brown pigment.

Distribution. Falkland Islands (Sw. Ant. Exped.), Kerguelen (BEDDARD 1886, MONOD 1931).

Previously found only at Kerguelen.

Munna antarctica (PFEFFER, 1887).

Text figs. 52 a, b.

Haliacris antarctica. PFEFFER, 1887, p. 137—143, Pl. VI, Figs. 28—46; HODGSON, 1910, p. 58—61; TATTERSALL, 1921, p. 203—205, Pl. I, Figs. 15, 16, Pl. II, Figs. 1—3.

(?) *Munna antarctica*. VANHÖFFEN, 1914, partim., p. 562—563.

Diagnosis[1]. Anterior margin of the head with a distinct spine-like projection in front of the eyes. First, second and third segments of the pereion laterally pointed, fourth trun-

[1] Cf. MONOD, 1931, p. 15.

cate, fifth, sixth and seventh with lateral margins convex. Coxal plates (on the second to seventh segments) all pointed. First male pereiopod with ischium longer than merus; in the adult male with the free distal edge of carpus furnished with a tooth, lower distal angle of the propodus tooth-like, projecting, and lower margin of propodus crenulate. Uropods sub-conical, tapering towards the broadly rounded and setiferous end.

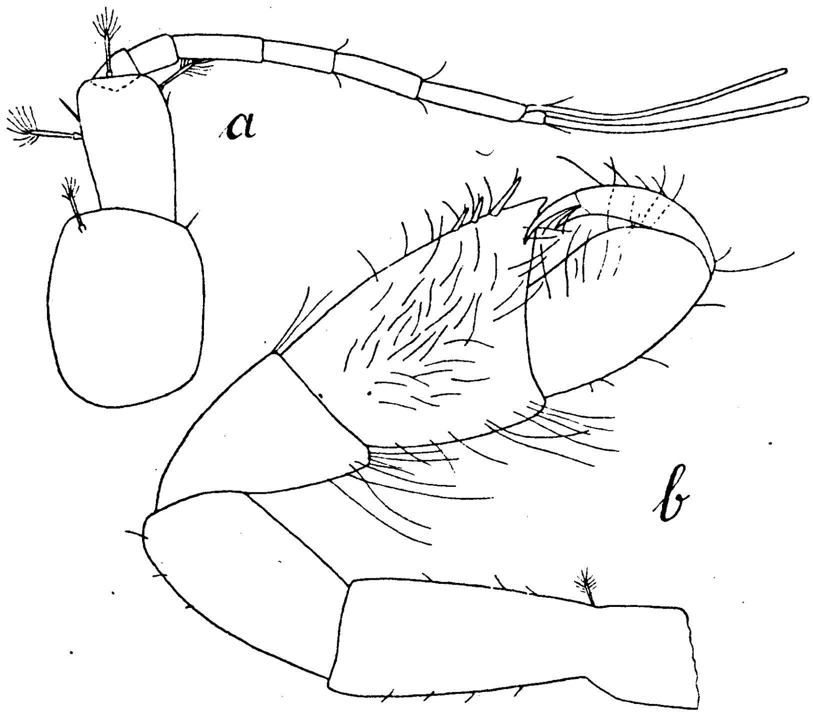

Fig. 52. *Munna antarctica* (PFEFF.). a. Antennula, female, 100 ×. b. Right first pereiopod of a sub-adult male 3.1 mm. in length, 75 ×.

Supplementary Description.

Antennulae (Fig. 52 a). First and second joints of the peduncle very stout, third and fourth very small. The flagellum consists of five joints, of which the last is small; each of the last two joints of the flagellum — as is usual in the genus *Munna* — are furnished with one large sensory filament.

Mandibles. Incisive part with five teeth, of which two are situated on the frontal and three on the inner margin. Lacinia (on the left mandible) with four teeth. Setal row on the left mandible with four setae, on the right with five. Second joint of the palp provided at its distal end with two long setae, each seta furnished with two rows of sub-branches; third joint distally with three setae of the same kind.

First and second pairs of maxillae[1]. Normal. Inner lobe of first maxilla provided distally with four stout and about five slender setae. Lappets of outer lobe of the second maxilla each provided with three long apical setae.

[1] Cf. HODGSON, 1902, Pl. XXXIV, Figs. 1 a and 1 b.

Maxillipeds[1]. Epipodite with distal margin broadly rounded. Coupling-hooks, about six.

First pair of pereiopods, young male[2] (Fig. 52 b). Ischium, somewhat longer than merus. Carpal joint on the lower margin near its distal end with three setae. The free distal margin of the carpus and the lower margin of the propodus are not denticulated.

First pair of pleopods, male Cf. TATTERSALL (1921)[3]. Distal margin almost straight.

Uropods[4]. Sub-conical. Outer margin slightly convex; inner margin almost straight; distal margin broadly rounded and setiferous, not concave as figured by TATTERSALL[5] (1921).

Remarks. The names *Munna antarctica* (PFEFFER) and *Haliacris antarctica* PFEFFER are often met with in the literature and used by several authors. But, as has been pointed out by TATTERSALL (1921), it is doubtful how far their statements actually refer to the true species. TATTERSALL (1921) examined the first male pereiopod of *Munna antarctica* (PFEFFER) in specimens of different ages from the type locality (South Georgia), and found that this leg in all his specimens examined differed from that figured by RICHARDSON (1906) under the name of *Haliacris australis* HODGSON. He accordingly presumes that *Munna australis* (HODGSON) perhaps is a species distinct from *Munna antarctica* (PFEFFER). He points out, however, that this »matter cannot be cleared up until fully adult males from Antarctic waters are available». According to TATTERSALL (1921), the first male pereiopods in *Munna antarctica* (PFEFFER) are characterized by having the ischium longer than the merus, the lower margin of the propodus smooth and the free distal margin of the carpus furnished with a single tooth, distinct in adult but faint in sub-adult specimens, whereas the figure by RICHARDSON (1906, Fig. 20, illustrating one of the first male pereiopods in »*Haliacris australis*» HODGSON) shows a pereiopod with the meral joint longer than the ischium and with the lower margin of the propodus and the distal edge of the carpus denticulated throughout.

The material of the species from the Swedish Antarctic Expedition was collected at South Georgia and agrees very well with the figures and description of the true *Munna antarctica* given by PFEFFER (1887). It consists only of three specimens, but contains one sub-adult male (length 3.1 mm.) with its first pereiopods preserved. The first pereiopod in that specimen, which is illustrated in Fig. 52 a, agrees almost completely with the same appendage in a young male specimen, 3.5 mm. long, figured by TATTERSALL[6] (1921). The only difference is that the free distal margin of the carpus is quite smooth. This difference is perhaps due to the somewhat smaller size of my specimen. The differences from the first pereiopod of »*Munna australis*» as illustrated by RICHARDSON (1906, Fig. 20) are more marked (see above). This different structure of the first male pereiopods is, however, the single difference of any importance between *Munna australis* (HODGSON) and *Munna antarctica* (PFEFFER). I therefore consider »*Munna australis*» to be merely a variety of *Munna antarctica* (PFEFFER).

In 1910 HODGSON referred his *Haliacris australis*, which in 1902 he regarded as

[1] Cf. HODGSON, 1902, Pl. XXXIV. Fig. 1 d.
[2] See also TATTERSALL, 1921, Pl. I, Fig. 15.
[3] TATTERSALL, 1921, Pl. II, Fig. 3.
[4] See PFEFFER, 1887, Pl. VI, Fig. 46.
[5] TATTERSALL, 1921, Pl. II, Fig. 2.
[6] TATTERSALL, 1921, Pl. I, Fig. 15.

distinct from *Munna antarctica*, to the synonymous list of *Munna antarctica* (PFEFFER). In describing the first male pereiopod, HODGSON states that the ischium is longer than the merus, which agrees with TATTERSALL's and my own observations on *Munna antarctica*. The statement indicates that his specimens were probably the true *Munna antarctica* (PFEFFER).

The specimens from the German Antarctic Expedition, which have been referred to *Munna antarctica* (PFEFFER) by VANHÖFFEN (1914), are dubious. VANHÖFFEN (1914) says of his *Munna antarctica* that it is »gekennzeichnet durch spitze Epimeren». But in his Fig. 90 the epimera are drawn with rounded lateral margins. I have had the opportunity of re-examining two small specimens from the German Antarctic Expedition, sent to me for investigation from the Zoological Museum in Berlin, and have found that their coxal plates have the lateral margins rounded and are quite different from the pointed coxal plates in *Munna antarctica* (PFEFFER). These two specimens, at any rate, do not belong to *Munna antarctica* (PFEFFER).

STEBBING (1919) describes a *Munna* from the Falkland Islands, which he names *Munna antarcticus*. In his figure of the species the coxal plates are rounded, and there is no trace of the projecting spines in front of the eyes which are characteristic of *Munna antarctica* (PFEFFER). The first male pereiopod, however, is similar to that of *Munna antarctica* (PFEFFER) as figured by TATTERSALL (1921). STEBBING's specimens was referred by MONOD in 1931 to his new species *Munna neglecta*. MONOD presumes that the specimens assigned by TATTERSALL to *Munna antarctica* also was in fact *Munna neglecta*. This, however, is not correct, as my specimens of *Munna antarctica* (PFEFFER) from the type locality agree with *Munna antarctica* as described both by PFEFFER (1887) and TATTERSALL (1921). MONOD's figure of the first male pereiopod in *Munna antarctica* (MONOD 1931, Fig. 11 b) agrees with *Munna antarctica* var. *australis*, as figured by RICHARDSON (1906, Fig. 20). Accordingly his specimens which were found in the Antarctic, have presumably been this variety of *Munna antarctica* (PFEFFER). There are no specimens of *Munna antarctica* var. *australis* in the collections of the Swedish Antarctic Expedition. The synonymy of the variety *australis* should apparently be as follows:

(?)*Haliacris australis* HODGSON, 1902.
Haliacris australis RICHARDSON, 1906, 1908.
Munna antarctica MONOD, 1931.

The rather large species *Munna antarctica* (PFEFFER) is recognizable by its characteristic pointed coxal plates. The figures of the species by PFEFFER, HODGSON and MONOD give a good idea of its general structure. HODGSON (1910, p. 58) points out that the shape of the pleotelson varies with the age in the male sex, being modified in very large male specimens (see also MONOD, 1931, Figs. 6 a and b, Fig. 10 b). In all my specimens the shape of pleotelson is the same, in complete correspondance with PFEFFER's[1] illustration. The pleotelson has a broad, flattened, longitudinal, white-coloured elevation along the middle line. This ribbon-like elevation is often traversed by a transversal white streak, thus forming a distinctly marked white cross on the dorsal surface of the pleotelson[2]. The colour of the head and the pereion is yellowish to brownish. Colour of the eyes brown to black.

[1] PFEFFER, 1887, Pl. VI Fig. 46.
[2] See MONOD, 1931, Figs. 6 a, 6 b and 10 b.

Localities and Material.

South Georgia, Grytviken. From kelp thrown up on the shore. $^{22}/_{5}$ 1902. 2 specimens, male 3.1 mm. long and female 4.2 mm. in length. Eyes dark. Pleotelson in both specimens typically coloured.

St. 22. South Georgia, off May Bay, lat. 54°, 17′ S., long. 36°, 28′ W. 75 m. Bottom temp. + 1.5°. Clay with some algae. $^{14}/_{5}$ 1902. One damaged specimen about 5 mm. in length, having dark eyes with a touch of brownish; without the whitish colouring on the pleotelson.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54°, 11′ S., long. 36°, 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. $^{5}/_{6}$ 1902. One damaged male specimen with the head almost missing. The transverse whitish ribbon-like streak on the pleotelson is absent.

Distribution. South Georgia (PFEFFER 1887, TATTERSALL 1921), Victoria Land (HODGSON 1910, TATTERSALL 1921), (?) Kerguelen (VANHÖFFEN 1914).

According to VANHÖFFEN (1914) it occurs at Kerguelen. The material determined by VANHÖFFEN (1914) as *Munna antarctica* consists, however, at least only partly of the actual *Munna antarctica* (PFEFFER). The species has been found at a depth of 2—5 m.,[1] but occurs also at a depth about of 300 m[2]. Its variety *australis* HODGSON is common in the Antarctic, but has never been recorded from South Georgia.

Munna neglecta MONOD, 1931.

Text figs. 53 a, b.

Munna neglecta. MONOD, 1931, p. 14—15, Fig. 3, 4 a and c, 5 a—b, 10 a and c, 11 a, 12 a—c, 13 a—i, 14 a, 16 a—b

(?) *Haliacris antarctica.* RICHARDSON, 1913, p. 19—20.

Munna antarcticus. STEBBING, 1919, p. 336—337, Pl. V.

For diagnosis see MONOD (1931, p. 15).

Supplementary Description.

(Sub-adult male about 3.2 mm. in length, greatest width about 1.2 mm.).

General shape of body. Oblong, narrow, almost three times as long as it is wide. Segments of the pereion only slightly differing in width; greatest width across the fourth pereion segment. Dorsal surface smooth.

Colour. Grayish-yellowish with scattered dots of brown pigment.

Head. About as long as the first and second pereion segments together. Frontal margin slightly concave, almost straight, with a row of stiff setae. Insertions for the antennulae and the antennae deep. Eye-peduncles narrow, widening towards the end, anteriorly with a short tooth. Eyes distinct, black.

Pereion. First four pereion segments very slightly diminishing in length from the first to the fourth, the first being the longest. Last three segments shorter than the others, subequal in length. Lateral margins of the segments rounded.

Coxal plates distinct on all the segments except the first, seen from above, subrectangular with lateral margins almost straight.

Abdomen. About as long as the last five pereion segments together, anteriorly with one distinct free segment.

Pleotelson oviform; greatest width approximately across the middle; distal margin between the uropods broadly rounded.

[1] TATTERSALL (1921).

[2] Swedish Antarctic Expedition, st. 34.

Antennulae. First and second joints of the peduncle stout, second and third very small. The flagellum consists of four joints, of which the last is minute.

Antennae. Broken.

Mandibles. See MONOD (1931, Figs 13 a and b).

Maxillipeds. Normal. Epipodite with distal margin broadly rounded. Coupling-hooks, three.

First pair of pereiopods, sub-adult male[1] (Fig. 53 a). In the examined 3.2 mm. long specimen the left periopod is about as long as the body and is of the same shape as in

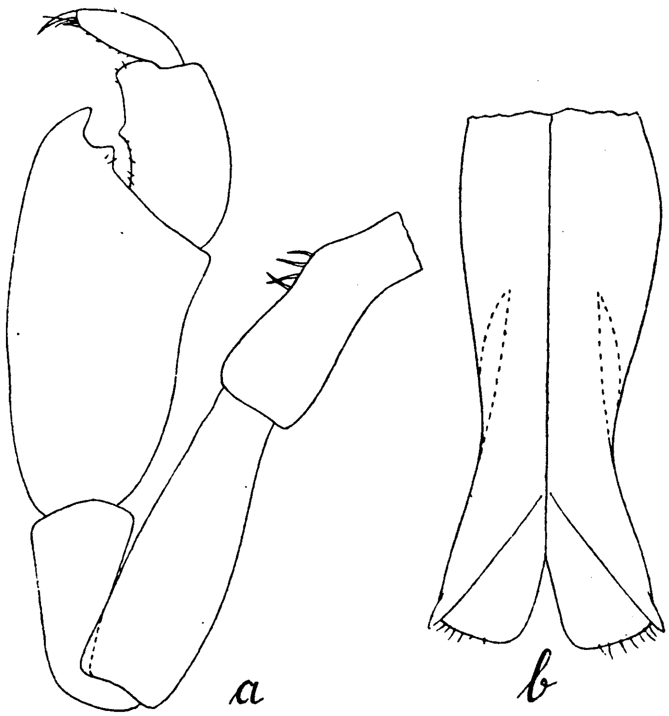

Fig. 53. *Munna neglecta* MONOD. a. Left first pereiopod of a sub-adult male, 50 ×. b. First pleopods, male, 115 ×.

Munna antarctica[2] PFEFFER. There is one tooth on the free distal margin of the carpus and one on the lower margin of the propodus. The proportion between the length of the joints in the left pereiopod is 35: 45: 30: 45: 22: 15. The right pereiopod is very much shorter and smaller than the left. Denticulation on the free distal margin of the carpus and the lower margin of the propodus is missing.

The other pereiopods. Long and moderately »hairly».

First pair of pleopods, male (Fig. 53 b). Distal margins almost straight.

Uropods[3]. Subconical, distally obtusely pointed; outer margin slightly convex, inner margin almost straight.

[1] Cf. also STEBBING (1919, Pl. I, gn. 1 ♂) and MONOD (1931, Figs. 10 a, 11 a and 12 a).
[2] Cf. TATTERSALL (1921 Pl. I, Fig. 15 and 16; Pl II, Fig. 1).
[3] See MONOD, 1931, Fig. 12 c.

Localities and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. Sub-adult male with both the first pereiopods preserved, length about 3.2 mm.

St. 55. Falkland Islands, Port Albemarle, lat. 52° 11′ S., long. 60° 26′ W. 40 m. Sand bottom with algae 8/9 1902. Male, length about 2.6 mm. The specimen is proportionately somewhat shorter than the above-mentioned specimen. The head and the abdomen have the form characteristic of *Munna neglecta* MONOD; the coxal plates have their lateral margins almost straight. The colour is light yellowish, slightly dotted with brown pigment.

Distribution. Falkland Islands (STEBBING 1919), South Orkney Islands (MONOD 1931), Graham Region (MONOD 1931).

Munna affinis n. sp.

Pl. II, Fig. 19; Text figs 54 a—e.

Diagnosis. Anterior margin of the head with short but distinct spine-like projections in front of the eyes. Lateral margins of the pereion segments convex. Last three pereion segments, short medially, increasing in length towards their lateral margins. Coxal plates on the second, third and fourth pereion segments with lateral margins convex, those on the fifth, sixth and seventh segments triangular and pointed. First pereiopods in the male with ischium and merus subequal in length; merus considerably widening towards its distal end, with distal angles somewhat projecting; lower distal angle of the carpus projecting, obtusely pointed; the free distal margin of the carpus and the lower margin of propodus denticulated.

Description.

Types. Male, length about 3.6 mm., with both the first pereiopods preserved; female, length about 3.0 mm.

General shape of body (Pl. II, Fig. 19). Pereion segments only slightly differing in width. Dorsal surface with minute setae.

Colour. Light yellowish.

Head (Pl. II Fig. 19). About as long as the first two pereion segments together. Frontal part between the antennulae about as long as the posterior part of the head, with the front margin very slightly concave and densely fringed with short stiff setae. Insertions for the antennulae and the antennae deep. Eye-peduncles slender, with a short obtuse tooth in front of the eyes. Eyes distinct, black.

Pereion (Pl. II, Fig. 19). First four pereion segments subequal in length. Last three segments very short in the middle, widening towards their lateral sides. Lateral margins of all the segments rounded.

Coxal plates distinct but small on all segments, except the first; on the second, third and fourth segments their lateral margins are convex; on the last three segments they are triangular and obtusely pointed.

Abdomen (Pl. II, Fig. 19). About as long as the pereion, except the first pereion segment. Anterior to the pleotelson there are two short free segments.

Pleotelson bulbous, shortly oval in outline, with its broadest part at a distance from its anterior margin of about one-third of its length. There is a faint broad, slightly light-coloured, elevation along the middle line.

Antennulae (Fig. 54 a)[1]. First and second peduncular joints stout, first joint the longest; third and fourth peduncular joints very small. The flagellum consists of five joints, of which the last is minute. In the male the first joint of the flagellum is somewhat longer than in the female.

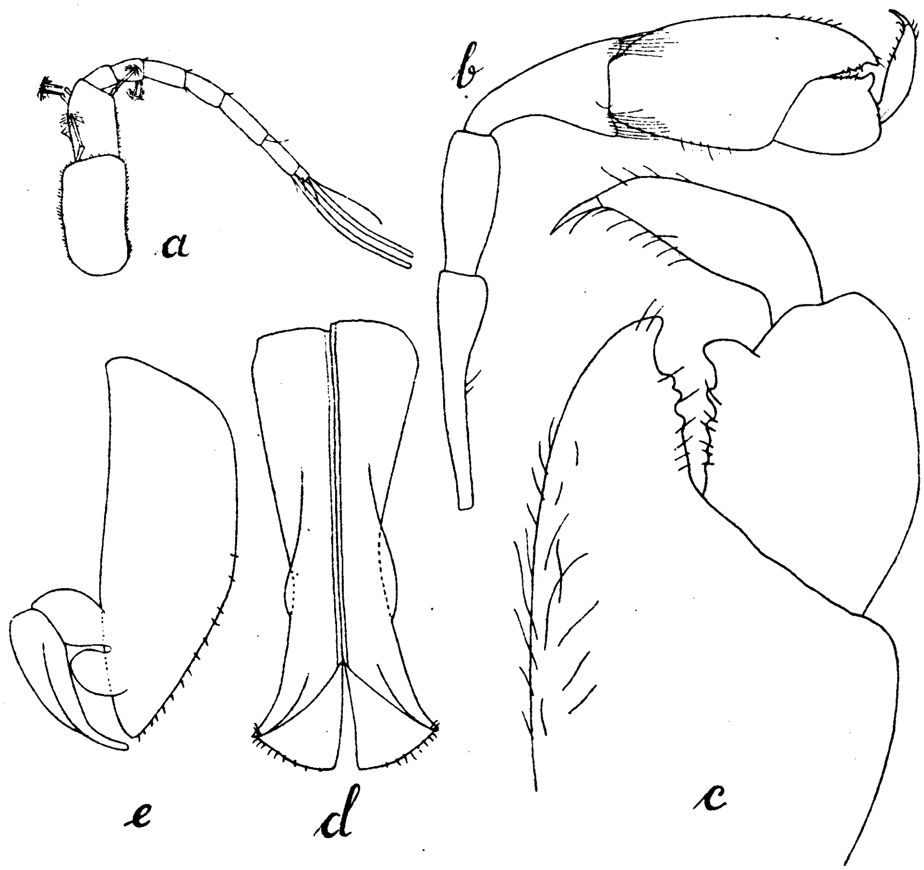

Fig. 54. *Munna affinis* n. sp. a. Right antennula, female, 80 ×. b. First pereiopod, adult male, 28 ×. c. Propodus, dactylus and distal part of the carpus of the same pereiopod, 80 ×. d. First male pleopods, seen from the caudal side, 80 ×. e. Right second male pleopod, seen from the caudal side, 80 ×.

Antennae. Broken.

Left mandible. Normal. Incisive part with five teeth, lacinia with four teeth, molar tubercle denticulated. Second joint of the palp, distally, on the lower margin, with a ciliated seta, third joint with three apical setae of the same kind.

Maxillipeds. Normal. Epipodite with distal margin broadly rounded. Coupling-hooks three.

First pair of pereiopods, male (Figs. 54 b and c). About as long as the body. Basipodite very narrow proximally, but widening towards its distal end. Ischium of approxi-

[1] Of a female.

mately uniform width, subequal in length to the merus, which increases considerably in width distally; its distal angles are somewhat projecting and have tufts of long setae. Carpal joint large and broad, oval, its lower distal angle obtusely pointed and its free distal margin denticulated. Lower margin of the carpus provided with long setae. Propodus short, with lower distal angle pointed, its lower margin denticulated. Dactylus short and narrow, about equal in length to the propodus. The proportion between the lengths of the joints is 57: 39: 40: 53;[1] 23: 23.

First pair of pereiopods, female. Broken.

The other pereiopods. Long and moderately »hairy». Seventh pereiopod with carpus and propodus (in a male specimen) more densely setiferous than in the other pereiopods. The seventh pair of pereiopods in the female are broken.

First and second pleopods, male. See figs. 54 d and e.

Operculum, female. Broken (in the single female specimen of the species).

Uropods. Slightly tapering towards the end, outer margin slightly convex, inner margin almost straight, distal margin broadly rounded.

Remarks. It is surprising to find that the first male pereiopods in this species are similar to those figured by RICHARDSON (1906, Fig. 20) and MONOD (1931, Fig. 11 b) in *Munna antarctica* var. *australis* (PFEFFER). They differ only in having the ischium and merus subequal in length. But the rounded lateral margins of the pereion segments and the rounded coxal plates on the second, third and fourth segments afford evidence that the specimens do not belong to *Munna antarctica* (PFEFFER). It was thus necessary to establish a new species.

Munna affinis is closely allied to *Munna neglecta* MONOD but differs especially from MONOD's species in having the last three pereion segments increasing in length laterally, in having the lateral margins of the second to fourth pereion segments more convex, in having pointed coxal plates on the last three pereion segments, and in having the ischium and merus of the first male pereiopod subequal in length.

Localities and Material.

South Georgia, Grytviken. From roots of kelp taken at a depth of 3—4 fathoms. $^{24}/_{5}$ 1902 Male about 3.6 mm. in length (type). Colour, faint yellowish.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S, long 36° 28′ W. 12—15 m. Sand and algae $^{24}/_{5}$ 1902. 2 specimens, male and female. Length of the male about 3.5 mm.; colour light yellowish strongly marbled with dark-brown. Length of the female (type) about 3 mm.; colour light yellowish to brownish.

Distribution. South Georgia (Sw. Ant. Exped.).

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[1] The number 53 corresponds to the middle length of the carpus; the length of the lower distal projection of the carpal joint has not been included.

Munna bituberculata n. sp.

Pl. II, Fig. 20; Text figs. 55 a—g.

Diagnosis. Frontal margin of the head with two oblong tuberculae, one on each side of the middle line. Eye-peduncles with a tooth in front of the eyes. Coxal plates on second, third and fourth segments of the pereion subtriangular with lateral margins rounded, those on the last three pereion segments triangular and pointed. First pair of pereiopods in the adult male about twice as long as the body; ischium subequal in length to the merus, merus with a rounded prolongation at its lower distal angle; lower distal angle of carpus projecting and pointed, extending about to the distal margin of propodus; lower distal angle of propodus tooth-like, projecting; the free distal margin of carpus and the lower margin of propodus denticulated, dactylus about as long as the width of propodus.

Description.

Types. Male, length about 5 mm., with both the first pereiopods preserved; and female (Pl. II, Fig. 20), length about 3.5 mm., greatest width 1.5 mm.

General shape of body. The first four segments of the pereion are nearly equal in width. Some scattered, very short, setae on the dorsal surface.

Colour. Light brownish.

Head (Pl. II, Fig. 20). About as long as the first two pereion segments together. At the frontal margin there are two distinct oblong tuberculae, one on either side of the middle line, extending somewhat backwards on the dorsal side. Between the tuberculae there is a longitudinal furrow. Frontal margin between the tuberculae somewhat concave, and laterally from the tuberculae straight. Insertions for the antennulae and antennae deep. Eye-peduncles broad and long, distally sub-globular. Eyes large, slightly brown-coloured. There is a distinct tooth-like projection in front of the eyes.

Pereion (Pl. II, Fig. 20). The first four pereion segments are subequal in length and width. In the male the first and second are a little longer than the others. In the female the second is the longest, the first the shortest Last three segments subequal in length, narrow in the middle but increasing in length towards their lateral margins; together they are about as long as the fourth plus half the third segment. Lateral margins of all the pereion segments rounded.

Coxal plates seen from above, on the second to fourth segments subtriangular with lateral margins rounded, on the last three segments triangular and pointed.

Abdomen (Pl. II, Fig. 20). About as long as the last five thoracic segments together, with a large and distinct first free segment.

Pleotelson suboval in outline, with greatest width approximately across the middle, and distal margin rounded. On the dorsal side there is a distinct white-coloured elevation along the middle line, traversed by an indistinct white-coloured transverse ribbon-like streak.

Antennulae (Fig. 55 a). First and second joints of the peduncle very stout, the first somewhat longer than it is broad, the second about two and a half times as long as it is broad. The following two joints are very small and narrow, each only about one-fourth to one-fifth as long as the second joint. The flagellum, which is in length about equal to the peduncle, consists of five joints in the female and six joints in the male specimen.

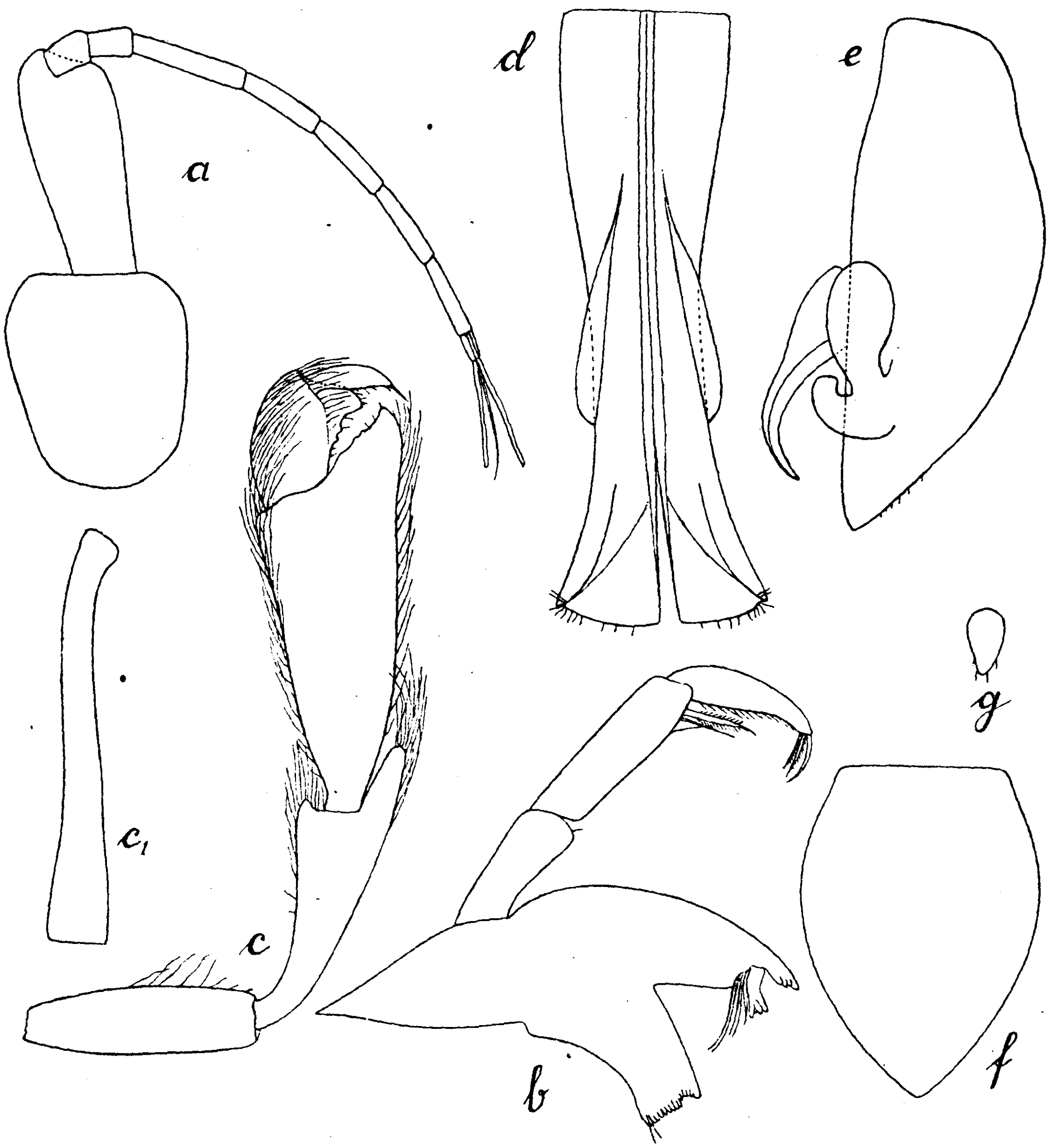

Fig. 55. *Munna bituberculata* n. sp. a. Right antennula, male, 80 ×. b. Left mandible, male, 80 ×. c. Left first pereiopod, (except the basipodite), in an adult male), 26 ×. c_1. Basipodite of the same periopod, 26 ×. d. First male pleopods, seen from the caudal side, 80 ×. e. Right second male pleopod from the caudal side, 80 ×. f. Female operculum, 40 ×. g. Right uropod, 80 ×.

Mandibles (*male*) (Fig. 55 b). Of the usual type in the genus. Incisive part with five teeth. Lacinia (on the left mandible) with four teeth. Second joint of the palp on the lower margin distally with one strong ciliated seta and two slender, hair-like setae. Third joint of the palp with three distal setae. For other details see the figure.

First and second pairs of maxillae. Normal. Each lappet of the outer lobe of the second maxillae provided with three distal setae.

Maxillipeds. As in *Munna antarctica* (PFEFFER). Distal margin of the epipodite broadly rounded. Coupling-hooks three.

First pair of pereiopods, in the adult male (Fig. 55 c and c_1). Very strong. In the five mm. long male specimen their length is about 10 mm. The basipodite is very long, almost as long as the pereion, and widens out towards its distal end. Its length is about equal to the length of the ischium plus two-thirds the length of the merus. The ischium is somewhat broader than the basipodite and almost of uniform width. Meral joint about equal in length to the ischium, very narrow proximally, but widening towards its distal end to a width about three times as great as that proximally; on the lower side, distally, the joint is prolonged into a large forward-directed projection with rounded end; upper distal angle slightly produced. The carpal joint is the largest of all the joints widening out distally to about four times the width proximally. Its lower distal angle projects and extends about as far as to the distal margin of the propodus. The distal edge of the carpus is denticulated. The propodus is short and of almost uniform width; its lower margin is slightly denticulated; its lower distal angle forms a broad unguiform projection. Dactylus short and narrow, about as long as the width of the propodus. The lengths of the joints in the 5-mm-long specimen are — 2.8, 1.8, 1.7, 2.4, 0.7 and 0.6 mm. — commencing with the basipodite. The pereiopod is furnished with long and hair-like setae at the lower and upper angles of the ischium, at the lower and upper margins of the carpus and the upper margin of the propodus. Shorter setae appear on the lower margin of the propodus and elsewhere (see figure).

The other pereiopods. All broken.

First pair of pleopods, male. See Fig. 55 d.

Second pair of pleopods, male (Fig. 55 e). Exopodite strongly curved. Endopodite rather short.

Operculum, female (Fig. 55 f). Cordiform, obtusely pointed.

Uropods (Fig. 55 g). Outer margin slightly convex. Inner margin almost straight, distal margin rounded.

Localities and Material.

St. 22. South Georgia, off May Bay, lat. 54° 17′ S, long. 36° 28′ W. 75 m. Bottom temp. + 1.5°. Clay with a few algae. 11/5 1902. 3 specimens (mutilated female specimen about 3.5 mm in length, [type], 2 other damaged specimens, and a first pereiopod of an adult male.)

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S, long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 14/5 1902. Male about 5 mm. in length, having both the first pereiopods preserved (type).

Distribution. South Georgia (Sw. Ant. Exped.).

Occurring at a depth of 75—300 m.

Munna nana n. sp.

Text fig. 56, Text figs. 57 a—j.

Diagnosis. Eye-peduncles broad with front margin straight (the ordinary tooth in front of the eyes missing). Lateral margins of the pereion segments rounded. Coxal plates small, rounded. Antennular flagellum consisting of two joints, the last being furnished with one sensory filament. First pereiopods shorter than the others, but stronger and prehensile. First male pleopods strongly tapering towards the end, being about four times broader proximally than distally. Sympodite of second male pleopod prolonged distally into an acute point. Female operculum approximately cordate, very broad proximally but strongly tapering towards the narrowly rounded end; near the distal margin it is furnished with two slender setae.

Description.

Types. Ovigerous female with twelve eggs (Fig. 56), length about 1.2 mm.; male, about 1 mm. in length.

General shape of body. Body in the female (Fig. 56) broadly oval in outline, with greatest width across the third pereion segment. In the male the first four pereion segments are subequal in width. No setae on the dorsal surface.

Colour. Whithish to yellowish.

Head (Fig. 56). About as long as the first and second pereion segments plus half the third segment. Frontal part broadly trapezoidal with front margin straight. Insertions for the antennulae and the antennae not very deep. Eye-peduncles broad with very small dark eyes. There is no tooth on the anterior margin of the eye-peduncles.

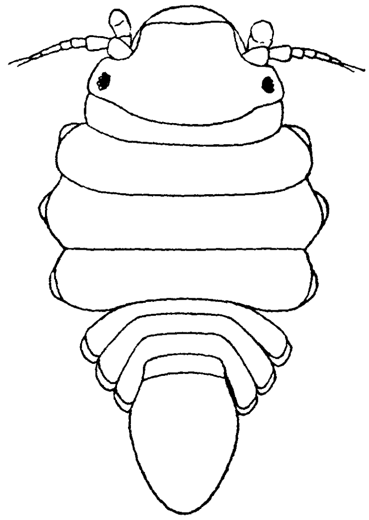

Fig. 56. *Munna nana* n. sp. Ovigerous female, 60 ×.

Pereion (Fig. 56). Segments in the ovigerous female increasing in length and width to the third, which is the largest. First segment in the ovigerous female not fully half as long as the second. In the male the first four segments are subequal in length. The lateral margins of the pereion segments are rounded.

Coxal plates small; seen from above their lateral margins are rounded.

Abdomen (Fig. 56). About as long as the last five thoracic segments together, anteriorly with one free segment.

Pleotelson oviform, with distal margin rounded. Greatest width of pleotelson in the female somewhat proximally from the middle. In the male the pleotelson is slightly narrower than in the female and has its greatest width about across the middle. There is a faint elevation on the dorsal side along the middle line.

Antennulae (Fig. 57 a). The two proximal joints of the peduncle are stout and the two following joints small. The flagellum consists of two joints only, of which the last is furnished with one sensory filament and some setae. The flagellum thus differs from the ordinary Munna-type characterized by having one sensory filament on the last and penultimate joints.

Antennae. Broken in all specimens, except a small male about 0.9 mm. in length. In this specimen they are about as long as the body. The first three joints of the peduncle are short, the fourth and fifth long, the fifth somewhat longer than the fourth. The flagellum is subequal in length to the peduncle and consists of about ten joints.

Right mandible (Fig. 57 b). Palp with the third joint small.

First and second pairs of maxillae (Figs. 57 c and d). Lappets of outer lobe of the second maxillae each with three apical setae.

Lower lip. See Fig. 57 e.

Maxillipeds. Epipodite ovate with distal margin broadly rounded, reaching to about the second joint of the palp.

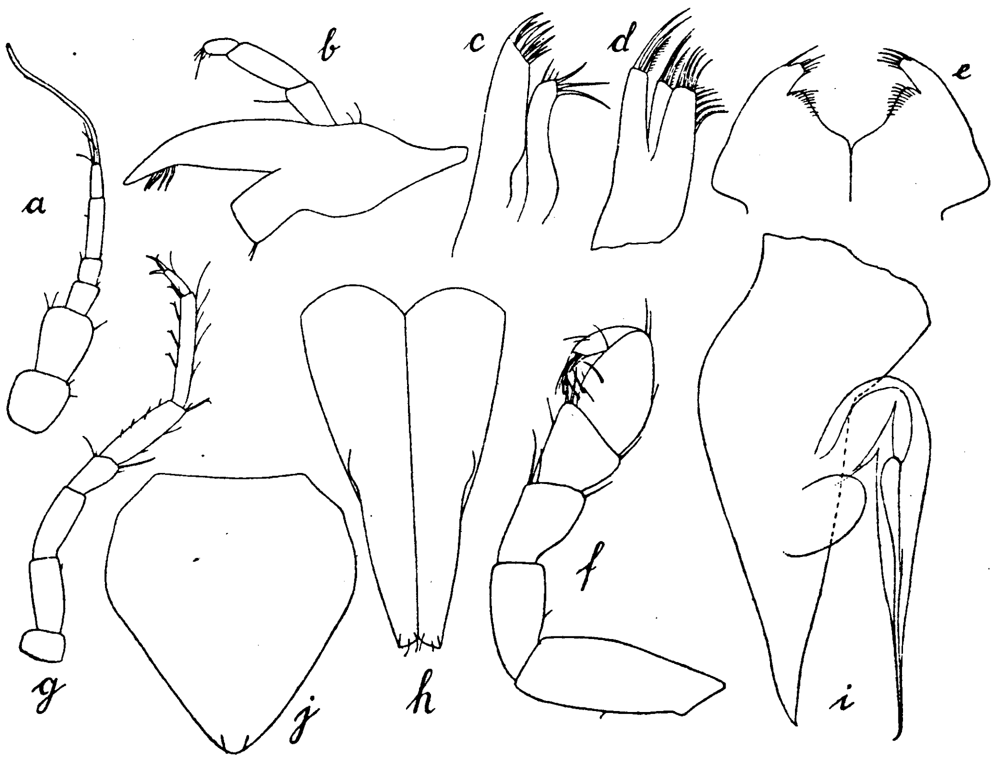

Fig. 57. *Munna nana* n. sp. a. Right antennula, female, 175 ×. b. Right mandible, female, 235 ×. c. First maxilla, 235 ×. d. Second maxilla, 235 ×. e. Lower lip, 235 ×. f. Right first pereiopod of a female, 150 ×. g. Third pereiopod, female, 75 ×. h. First male pleopods, from the caudal side, 240 ×. i. Left second male pleópod, from the caudal side, 325 ×. j. Female operculum, 175 ×.

First pair of pereiopods (Fig. 57 f). Small. Similar in males and females. Carpal joint subtriangular, with one slender seta on the lower margin and two stout setae at the lower distal angle. Propodus ovate, with — as usual in *Munna* — two setae near the lower margin. For other details see the figure.

The other pereiopods (Fig. 57 g). Increase in length from the first to the last, which is about as long as the body. The merus and carpus have each one two-pointed seta at their upper distal angles, and the propodus has a row of setae of the same kind along the lower margin.

First pair of pleopods, male (Fig. 57 h). Elongate, tapering towards the narrow end. They are proximally about four times broader than distally.

Second pair of pereiopods, male (Fig. 57 i). Sympodites ending distally in acute points.

Operculum, female (Fig. 57 j). Approximately cordate. Very broad proximally, triangularly protracted distally. Distal margin narrowly rounded. Near the distal end there are two small setae.

Uropods. Minute, sub-rectangular. Outer and inner margins almost straight; distal margin slightly rounded and provided with a few setae.

Remarks. The species comes very close to *Munna schauinslandi* G. O. Sars. In its general aspect it is very similar to that species, but differs in having the distal margin of the pleotelson slighly more rounded. The first pereiopods are similar to the same limbs in *Munna schauinslandi*.

But it differs distinctly from *M. schauinslandi* in its first and second male pleopods and the female operculum. The first male pleopods taper more strongly towards the end than in *M. schauinslandi*; the sympodites of the second male pleopods are distally more prolonged, each ending in an acute point. The female operculum is proximally much broader than in *M. schauinslandi* and is triangularly protracted distally, having its distal margin narrowly rounded, not concave as in *M. schauinslandi*. The colour, in contradistinction from *M. schauinslandi*, is whitish - to yellowish, only in a few specimens there is a slight trace of brownish marbling. The second male pereiopods, which are characteristic in *Munna schauinslandi*, were broken in all the male specimens of *Munna nana*.

Localities and Material.

St. 40. Falkland Islands, Berkeley Sound, lat. 51° 33′ S, long. 58° 0′ W. 16 m. Bottom temp. + 2.75° Gravel and shells with algae. 19/7 1902. 7 specimens, all females; length of the largest specimen, an ovigerous female, about 1.2 mm.

St. 46. Falkland Islands, Port Louis, Carenage Creek, lat. 51° 32′ S, long. 58° 7′ W. 1 m. Sand bottom with plenty of *Codium*. 9/8 1902. 6 specimens (2 males, 4 females); length of the largest specimen, an ovigerous female (type), 1.2 mm.; largest male (type) length 1 mm.

Distribution. Falkland Islands (Sw. Ant. Exped).

Genus **Coulmannia** Hodgson, 1910.

Diagnosis. Body vaulted, pleotelson bulbous. Eyes small on slender eye-peduncles. No coxal plates, but coxae at the base of the pereiopods. Antennulae short, consisting of a four-jointed peduncle and a single-jointed flagellum, which is about as long as the peduncle; last joint of the flagellum provided with one long sensory filament at the tip. Antennae not much longer than the antennulae, with peduncle six-jointed; squama missing. Mandibles with molar tubercle broad, widening towards its distal end; palp missing. Lower lip with the inner distal prolongations each elongated into four spine-like points. Maxilliped with a broad palp, having its second and third joints almost as wide as the endite; epipodite with distal margin narrowly rounded. First pereiopods equal in males and females, prehensile, but not larger than the others. The first pleopods (in the male) each provided with a lateral triangularly projecting extension. Uropods very small, consisting of two branches.

Hodgson (1910) refers the genus to the fam. *Ianiridae* of G. O. Sars. Its distinct slender eye-peduncles, bulbous pleotelson, its minute uropods, the composition of the antennulae, and its first male pleopods, which are similar to those characteristic of *Paramunna* G. O. Sars, show that it must be assigned to the group *Munnini*.

Coulmannia australis Hodgson, 1910.

Text figs. 58 a—j, text figs. 59 a—h.

Coulmannia australis. Hodgson, 1910, p. 53—54, Pl. IX, Figs. 2, and 2 a.

Supplementary Description.

General shape of body. As illustrated by Hodgson (1910, Pl. IX, Fig. 2). First pereion segment somewhat shorter than the three following segments, which are subequal in length. The first abdominal segment is not so cordiform as figured by Hodgson and much shorter.

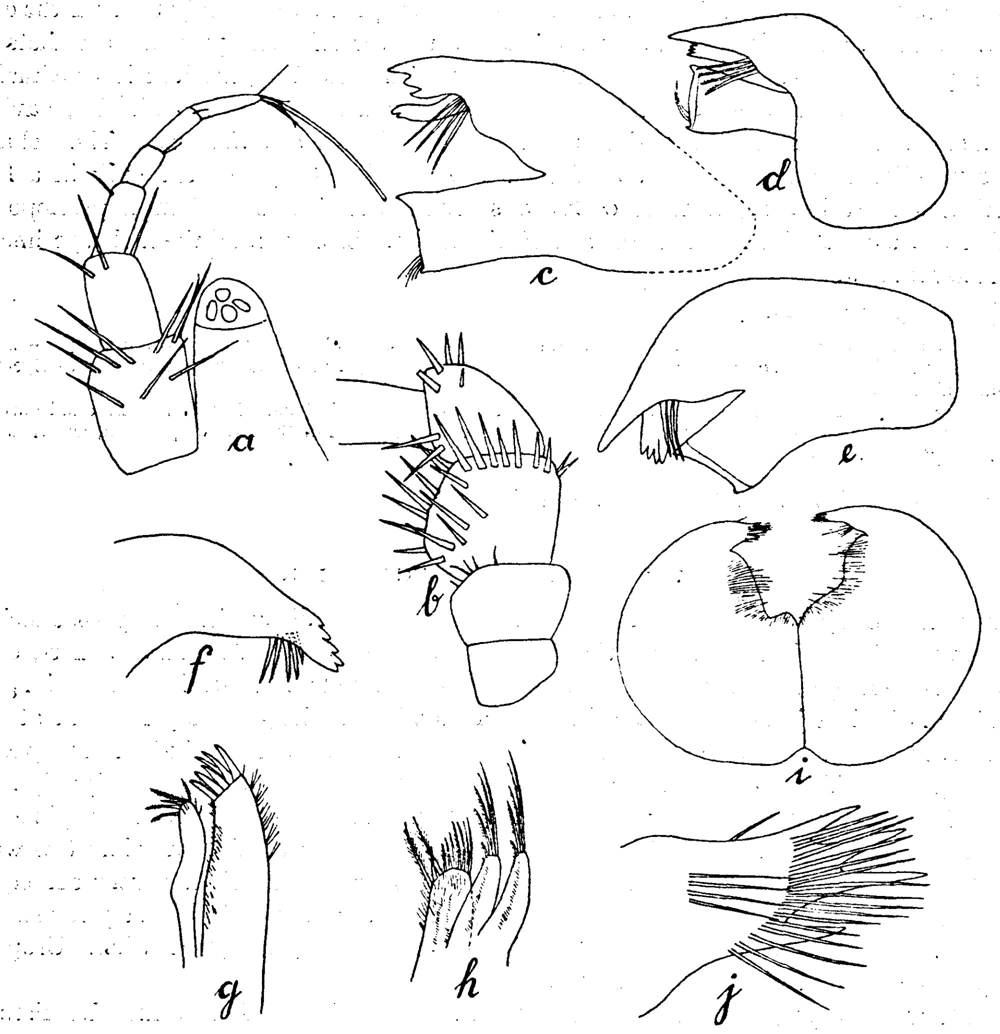

Fig. 58. *Coulmannia australis* Hodgs. a. Right antennula and eye, female, 80 ×. b. Proximal peduncular joints of the antenna, 50 ×. c. d. and e. Left mandible, 80, 80 and 90 ×. f. Incisive part of the right mandible 30 ×. g. Left first maxilla, female, 80 ×. h. Second maxilla, female, 80 ×. i. Lower lip, 80 ×. j. One of its inner distal corners, 535 ×.

Antennulae.[1] See Fig. 58 a. The figure illustrates an antennula from a female specimen about 9 mm. in length. The antennulae are always six-jointed. The first two joints are stout, the first being the largest; both the joints are provided with setae, most of the setae situated dorsally. The last four joints are narrow; the terminal joint is furnished with one long sensory filament and some setae. The antennulae are thus similar to those in the genus *Antias* (cf. p. 200). As in that genus, the first four joints may be reckoned to the peduncle.

Antennae[1] (Fig. 58 b). The peduncle consists of six joints, the first four short. The second joint is about twice as long as the first, the third joint about half as long again as the second. The fourth peduncular joint is somewhat shorter than the third; the fifth is about as long as the first, second and third joints together. Sixth joint somewhat longer and narrower than the fifth. Flagellum about as long as the last three peduncular joints together, consisting of thirteen to fifteen joints (fifteen joints in a female specimen about eight mm. long). The first joint of the flagellum is about as long as the two following joints together.

Mandibles (Figs. 58 c, d, e and f). Corpus mandibulae broad and strong. Incisive part with four teeth on the left mandible, five teeth on the right one. Lacinia (left mandible) with four teeth. Setal row on the left mandible with four setae, on the right with five. Molar tubercle strong, subcylindrical, slightly widening towards its distal end, somewhat forwards-directed. Palp missing.

First pair of maxillae (Fig. 58 g). Normal. For details see the figure.

Second pair of maxillae (Fig. 58 h). Lappets of the outer lobe somewhat longer than the inner lobe, each with five apical setae. Distal margin of inner lobe provided with about ten long setae, of which the two largest are situated near the inner distal angle.

Upper lip. With distal margin convex.

Lower lip (Figs. 58 i and j). Distal angles of a tuft-like appearance, each divided into four points and strongly furnished with setae.

Maxillipeds[2]. Distal margin of the endite with two somewhat submarginal rows of setae, one row each on the dorsal and the ventral side. The somewhat ventrally situated submarginal row consists of four stout flattened setae, which are furnished distally and laterally with long and pointed sub-branches; the length of the sub-branches increases towards the distal end of the setae. The other submarginal, but dorsally situated, row consists of five setae, which are longer than in the ventral row and are furnished with slender, hair-like sub-branches. The coupling-hooks are two or three in number. Epipodite triangular, distally pointed, and extending slightly beyond the distal margin of the second palp joint. Second and third joints of the palp broad, being only slightly narrower than the endite. The fourth and fifth joints of the palp are narrow.

First pair of pereiopods (Fig. 59 a). Similar in males and females. Ischial, meral and carpal joints each with one seta at their upper distal angles. Meral and carpal joints broader than long. Lower margin of carpal joint provided with five stout two-pointed setae. Propodus about half as wide as carpus, its lower margin furnished with five setae. For other detail see the figure.

[1] Cf. HODGSON (1910, p. 53).
[2] See HODGSON (1910, Pl. IX, Fig. 2 a).

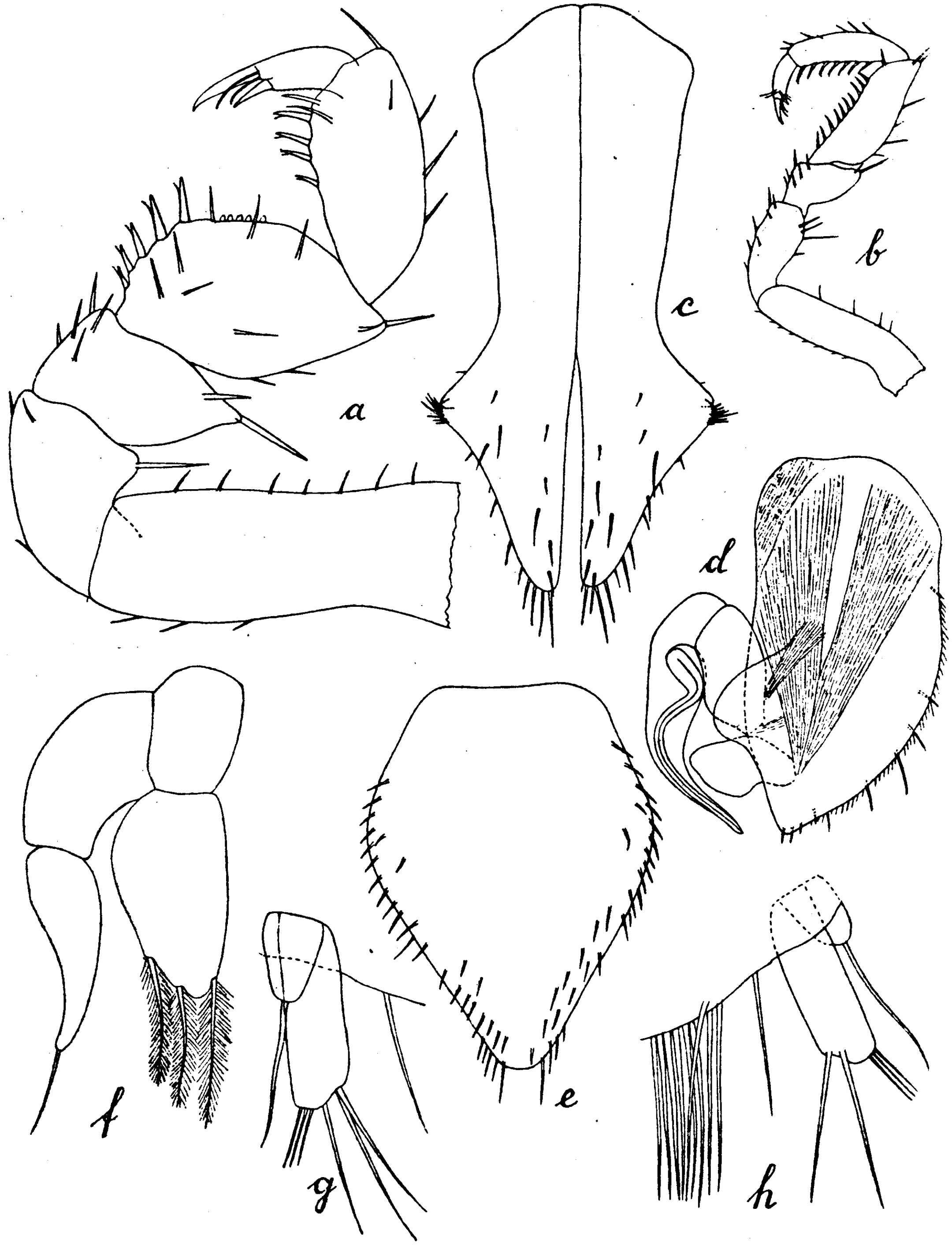

Fig. 59. *Coulmannia australis* HODGS. a. First pereiopod, female, 80 ×. b. Second pereiopod, 30 ×. c. First male pleopods, seen from the rostral side, 80 ×. d. Right second male pleopod, seen from the caudal side, 80 ×. e. Female operculum, seen from the rostral side, 50 ×. f. Third pleopod, male, 80 ×. g. Uropod, in a dorsal view, 160 ×. h. Uropod, in a ventral view, 150 ×.

The other pereiopods (Fig. 59 b). Meral joint with one seta at its upper distal angle. Lower margin of carpus and propodus provided with a row of single-pointed setae (in the second pereiopod, Fig. 59 b, about 10). Dactylus provided with two claws.

First pair of pleopods, male (Fig. 59 c). The distal parts of the sympodites have not coalesced with one another, but their inner margins are in contact. Anterior surface of the pleopods sparsely setose distally.

Second pair of pleopods, male (Fig. 59 d). Caudal surface of the sympodite with a fold issuing from a place a short distance from the inner margin. Both the rami are attached between this fold and the inner margin of the sympodite. The two-jointed endopodite has the usual shape; its second joint is penetrated by a narrow canal, which terminates in a small proximally situated vesicle with very narrow lumen.

Operculum, female (Fig. 59 e). Laterally and distally with single-pointed setae. Two setae, situated one on either side of the tip, are the longest.

Third pair of pleopods (Fig. 59 f). Similar in males and females. Basipodite about half as long again as broad, almost rectangular. Exopodite two-jointed, with second joint slightly longer than the first. First joint strongly curved, with outer margin convex and inner margin concave. Second joint tapering towards the end, which is furnished with one long apical seta; outer margin proximally slightly convex, distally distincly concave; inner margin convex. The endopodite tapers slightly towards the end; its posterior surface is vaulted, its anterior surface hollowed, its outer margin is convex, inner margin only slightly convex, almost straight; its distal margin is provided with three long plumose setae.

Fourth pair of pleopods. Sympodite subquadrate. Exopodite two-fifths as wide as and slightly shorter than the endopodite, curved and tapering towards the pointed end; outer margin markedly convex, inner margin proximally markedly concave, distally almost straight. Endopodite of an ovate shape, having its caudal surface strongly vaulted and its rostral surface concave with the greatest depth of the cavity nearest to the lateral margin.

Fifth pair of pleopods. Basipodite small. Exopodite wanting. Endopodite oval, with outer margin markedly convex and inner margin slightly concave. Dorsal surface strongly vaulted, ventral surface concave, the deepest part of the cavity being closer to the outer than to the inner margin.

Uropods (Fig. 52 g and h). Small. Exopodite about twice as long as the endopodite, distally with two or three long and three short setae. Endopodite provided with one long distal seta. For further details see the figures.

Localities and Material.

St. 8. Graham Region, lat. 64° 3′ S , long. 56° 37′ W. Position of the station as well as depth uncertain. (360 m?). Soft clay. 11/2 1902. Male specimen 7.2 mm. in length.

St. 11. Graham Region, lat. 65° 19′ S., long. 56° 48′ W. 400 m. Clay mingled with gravel. 18/2 1902. 2 females; length of the largest specimen about 9 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. 85 specimens, males and females. Length of the largest specimen, about 7.6 mm (a male).

Distribution. South Georgia (Sw. Ant. Exped.), Graham Region (Sw. Ant. Exped.), Victoria Land (Hodgson 1910).

One specimen only has previously been found, at the Coulman Island (near Victoria Land).

Genus **Paramunna** G. O. SARS, 1866.

Leptaspidia. BATE and WESTWOOD, 1868.
(?) *Metamunna.* TATTERSALL, 1906.
Austrimunna. RICHARDSON, 1906, 1908, 1913; HODGSON, 1910.
Austronanus. HODGSON, 1910; RICHARDSON, 1913.
Paramunna. STEBBING, 1893, 1910; G. O. SARS, 1899; VANHÖFFEN, 1914; BARNARD, 1920.

For diagnosis see G. O. SARS (1899, p. 111) and cf. STEBBING (1910, p. 435). As pointed out by VANHÖFFEN (1914), *Austrimunna* RICHARDSON is synonymous with *Paramunna*. This is presumably the case also with *Metamunna* TATTERSALL (see BARNARD, 1920, p. 408—409). As I cannot find any difference of importance between *Austronanus* HODGSON and *Paramunna*, I am of the opinion that *Austronanus* is congeneric with *Paramunna*. In the diagnosis of *Austronanus* HODGSON says that the pereiopods are all ambulatory and the uropods consist of a single joint. I do not, however, consider that these differences warrant the retention of the genus *Austronanus*. A comparison of the figures by HODGSON (1910, Pl. VIII, Fig. 3, *Austronanus glacialis*) and RICHARDSON (1908, Fig. 6, *Paramunna serrata*) shows such a marked similarity that it may be possible that these two species are identical.

In the material from the Swedish Antarctic Expedition 1901—1903 there are six species of *Paramunna*, of which two must be described as new, thus increasing the known species of *Paramunna* to seventeen. One of the new species, *Paramunna integra*, bears a strong resemblance to the genotype of the genus, *Paramunna bilobata* G. A. SARS, the head being, anteriorly prolonged into two diverging lobes as in that species.

Paramunna integra n. sp.

Pl. II, Fig. 22; Text figs. 60 a—e.

Diagnosis. Rostral part of the head between the antennae anterio-laterally prolonged into two subtriangular diverging lobes; anterior margin of the head between the lobes slightly concave. Hind part of the head immersed in the first pereion segment, which increases in length laterally to about twice the length in the middle. Segments of the pereion with lateral margins continuous, the first segment longest, the others subequal in length. Pleotelson tapering towards its rounded end, with lateral margins convex and serrate. Carpal joint of the first pereiopod about one-third as broad again as the propodus, its lower margin and its free distal margin each provided with a large two-pointed seta; lower margin of propodus attenuate.

Description.

Type. Male, length 1 mm.

Head (Pl. II, Fig. 22; Text fig. 60 a). Posterior part of the head immersed in the first pereion segment. Frontal part between the antennae prolonged into two subtriangular diverging lobes; rostral margin between the lobes slightly concave. Eyepeduncles broad. Eyes small, distinct and dark-coloured.

Pereion (Pl. II, Fig. 22; Text fig. 60 a). First pereion segment the longest, increasing in length laterally to about twice the length in the middle. Measured along the middle line, it is about one-third as long again as the second pereion segment. The other pereion segments are subequal in length, slightly decreasing in width from the first to the last, and have their lateral margins continuous.

Abdomen (Pl. II, Fig. 22; Text fig. 60 a). Somewhat longer than the last four pereion segments together, with a small free segment anteriorly. Pleotelson subtriangular with greatest width in front, tapering towards the rounded end. Lateral margins slightly convex, finely serrate.

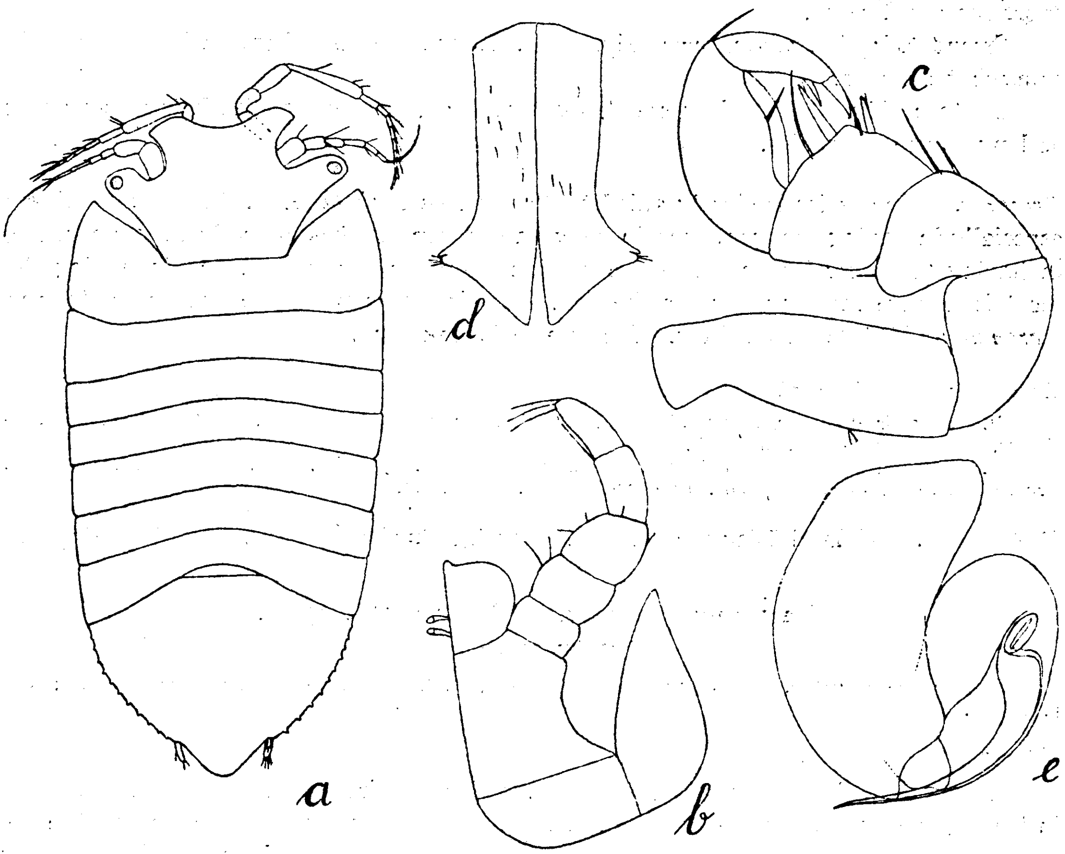

Fig. 60. *Paramunna integra* n. sp. a. A specimen, from above, 80 ×. b. Maxilliped, 315 ×. c. First pereiopod, 240 ×. d. First male pleopods, from the rostral side, 140 ×. e. Second pleopod, male, 240 ×.

Antennulae. About as in *Paramunna bilobata* G. O. SARS, with a four-jointed peduncle and a two-jointed flagellum. SARS refers only the three proximal joints to the peduncle.

Antennae. About as in *Paramunna bilobata* G. O. SARS. Peduncle consisting of six joints, flagellum of seven joints.

Mandibles. Typical of the genus, with molar tubercle strong, widening towards the distal end, somewhat forward-pointing, and with distal margin truncate. Incisive part single-pointed; lacinia (on the left mandible) with three points; setal row of four setae, on the left mandible. Palp very short consisting of three joints.

First and second pairs of maxillae. Normal.

Maxillipeds (Fig. 60 b). Normal.

First pair of pereiopods (Fig. 60 c). Carpus about one-third as broad again as the propodus, its lower margin and its free distal margin each provided with a large two-pointed seta. Propodus with the lower margin attenuate. For other details, see the figure.

The other pereiopods. Normal.

First pair of pleopods, male (Fig. 60 d). Typical of the genus. Anterior surface with short scattered setae.

Second pair of pleopods, male (Fig. 60 e). Exopodite linguiform with distal margin somewhat concave.

Uropods (Fig. 60 a). Very small, two-branched, the endopodite being about half as long as the exopodite.

Remarks. The species is closely allied to *Paramunna bilobata* G. O. SARS, but it differs especially in having the front margin between the frontal lobes of the head less concave, in having the lateral margins of the pereion segments continuous, and in having the pleotelson more tapering towards the end. The first pereiopods are similar to those in *Paramunna bilobata* G. O. SARS. The female is unknown.

Localities and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 122 m. Sand. 3/9 1902. Two specimens, males, about 1 mm. in length.

St. 59. South of West Falkland, on the Burdwood Bank, lat. 53° 45′ S., long. 61° 10′ W. 137—150 m. Broken shells with stones. 12/9 1902. One specimen (Pl. II Fig. 22).

Distribution. Falkland Islands (Sw. Ant. Exped.), Burdwood Bank (Sw. Ant. Exped.).

Paramunna antarctica (RICHARDSON, 1906).

Text figs. 61 a—b.

Austrimunna antarctica. RICHARDSON, 1906, p. 20—21, Pl. I. Fig. 7, Text figs. 24—26; 1908 p. 5; 1913 p. 20—21.

Supplementary Description.

Antennulae. Consisting of six joints, of which the first two are large and subequal in length, the first being the broadest. The third and fourth joints are, as usual in the genus, short; together they are about as long as the second joint; the fourth joint is shorter than the third. The flagellum consists of two fairly equal long joints, each very slightly longer than the last peduncular joint. The last joint of the flagellum is furnished with one sensory filament and a few setae.

Antennae. Of the usual type in the genus. The flagellum in a full-grown female specimen, 2 mm. long, consists of seven joints.

First pair of pereiopods (Fig. 61 a)[1]. The carpus widens considerably towards its distal end; close to its lower margin it has three stout two-pointed submarginal setae (the right pereiopod of a full-grown specimen from the Swedish Antarctic Expedition was without the proximal seta). The broadly oval propodus is about equal in length

[1] The fig. shows the left pereiopod of a full-grown female collected by the Expédition Antarctique Française (1903—1905); some material from the French Expedition was kindly sent to me from the Muséum d'Histoire Naturelle in Paris. The first pereiopod from the full-grown female specimen obtained by the Swedish Antarctic Expedition (1901—1903) agrees well with my figure.

to the carpus. Its lower portion is not attenuate; near the lower margin there are a few setae.

Operculum, female (Fig. 61 b). Prolonged into a long subtriangular tip fitting into the distal part of the pleotelson. The distal margin of the tip of the operculum is narrowly rounded.

Uropods. Small, consisting of two joints, of which the endopodite is extremely small and difficult to detect, being only one-fourth to one-fifth as long as the exopodite.

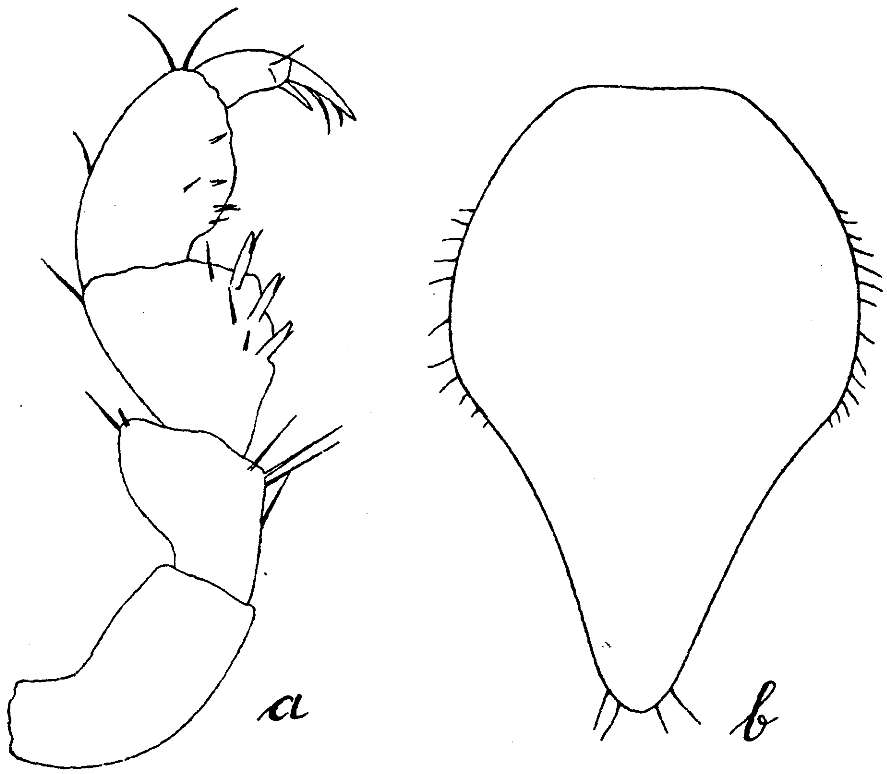

Fig. 61. *Paramunna antarctica* (RICH.). a. Left first pereiopod from the rostral side, (adult female from the Museum of Paris), 215 ×. b. Operculum, female, 180 ×.

Remarks. A full-grown female with empty marsupium was found by the Swedish Antarctic Expedition. It agrees with the description and figures of the species by RICHARDSON (1906), except that the tip of pleotelson is furnished with some setae. A small male specimen, 1 mm. in length, which was collected together with the female specimen, is probably also *Paramunna antarctica*. It differs slightly from the female specimen in having three minute denticulae on each side of the pleotelson in front of the uropods and in having the tip of pleotelson somewhat shorter, the distal margin of pleotelson being almost truncate; the shape of pleotelson almost agrees with RICHARDSON's text figure of *Paramunna antarctica* (RICHARDSON 1906, Fig. 25). In shape as well as in the structure of its antennulae, antennae and first pleopods the specimen agrees with *Paramunna antarctica*. Both its first pereiopods are broken.

Localities and Material.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 12—15 m. Sand and algae. 14/6 1902. Female with an empty marsupium, length about 2 mm. Immature male specimen, about 1 mm. in length, probably belonging to *Paramunna antarctica*.

Distribution. South Georgia (Sw. Ant. Exped.), Graham Region (RICHARDSON 1906, 1908, 1913).

Not previously recorded from South Georgia.

Paramunna serrata (RICHARDSON, 1908).

Text fig. 62.

Austrimunna serrata. RICHARDSON, 1908, p. 5—6, Figs. 6—7.
(?) *Austronanus glacialis*. HODGSON, 1910, p. 50—51, Pl. VIII, Fig. 3.
Austronanus serrata. RICHARDSON, 1913, p. 19.

Supplementary Description.

General shape of body. As figured by RICHARDSON (1908, Fig. 6).

Head, pereion, abdomen. Frontal part of the head decreasing in width anteriorly, front margin evenly convex. Eyes small of reddish-brown colour. First four pereion segments subequal in length and width. There is no distinct waist between the first four and the last three pereion segments; the latter are shorter, however, than the anterior segments and curved backwards. Abdomen somewhat broader than it is long, anteriorly with a small free segment.

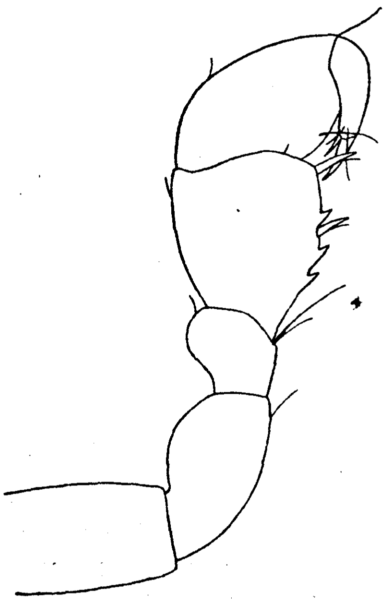

Fig. 62. *Paramunna serrata* (RICH.). Right first pereiopod, female, 270 ×.

Antennulae. About three times as long as the eyepeduncles. First joint large, about as long as the narrower second joint; third and fourth joints small, of about equal length. The flagellum is comparatively long, about as long as the second, third and fourth peduncular joints together, and consists of two joints, of which the last is the longest. The proportion between the lengths of joints in the antennula is 10: 9: 3.5: 3.5: 6: 10.

Antennae. Broken (in both specimens).

First pair of pereiopods (Fig. 62). Carpal joint widening towards the distal end, slightly longer than broad, its lower margin provided with two large two-pointed setae. Lower margin of carpus furnished with some small teeth. The propodus is almost as wide as the carpus, but slightly shorter. Its lower margin is thin and is furnished with at least one long slender seta.

First pair of pleopods, male. Extended laterally into long triangular lobes, as shown by RICHARDSON (1908, Fig. 7).

Operculum, female. About as long as it is broad. Lateral margins convex. It is broadest across the middle and thence tapers towards the distal end. Distal margin broadly rounded.

Uropods. Small, two-branched. The minute endopodite is difficult to detect and only about one-third as long as the exopodite.

Remarks. My specimens differ from *Paramunna serrata* as described by RICHARDSON (1908) only in having somewhat longer antennulae. It is possible that *Paramunna glacialis* (HODGSON, 1910) (= *Austronanus glacialis* HODGSON) is identical with *Paramunna serrata* (RICHARDSON). It differs from *Paramunna serrata* in having the head slightly longer, with frontal margin markedly convex, and in having a sligthly longer pleotelson. The antennae, which are characteristic in *Paramunna glacialis* (HODGSON), have not been described in *Paramunna serrata* (RICHARDSON). The species of *Paramunna* described by STEPHENSEN (1927) as *Paramunna* (*serrata* (RICHARDSON)?) differs in having the carpus of the first pereiopod broader than it is long. Possibly it is identical with *Paramunna dentata* n. sp. (see p. 241).

Localities and Material.

St. 46. Falkland Islands, Port Louis, Carenage Creek, lat. 51° 32′ S., long. 58° 7′ W. 1 m. Sandy bottom with plenty of *Codium*. 9/8 1902. Male specimen, about 1 mm. in length.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/9 1902. Female, about 1 mm. in length.

Distribution. Falkland Islands (Sw. Ant. Exped.). Graham Region (RICHARDSON 1908, 1913), (?) Victoria Land (HODGSON 1910).

Not previously recorded from the Falkland Islands.

Paramunna subtriangulata (RICHARDSON, 1908).

Text figs. 63 a—d.

Austrimunna subtriangulata. RICHARDSON, 1908, p. 7, Fig. 8.
Paramunna subtriangulata. MONOD, 1926, p. 16, Figs. 7 A, B, C.

Supplementary Description.

General shape of body[1] (Fig. 63 a). Oblong-ovate, about twice as long as it is broad, broader in the ovigerous female than in the male.

Head. The frontal part is produced into one anterior rounded lobe in the middle and two lateral rounded lobes, neither being very distinct. Posterior part of the head immersed in the first segment of the pereion.

Pereion. Lateral margins of the pereion segments almost continuous. Last three segments short.

In the male the first five segments are subequal in width. The first segment is the longest, being in the adult male about as long as the second and third segments together; in immature males it is shorter, being, in a male specimen 1.3 mm. in length about half as long again as the second segment.

In the ovigerous female (Fig. 63 a) the first segment is the shortest of the anterior four segments, but it widens out laterally to more than twice its length in the middle. The third segment is slightly longer than the second and fourth, which are subequal in length. The greatest width of the body is across the third pereion segment.

[1] Cf. RICHARDSON (1908, Fig. 8) and MONOD (1926, Fig. 7 A).

Abdomen. About as long as the last four pereion segments together plus half the third segment; anteriorly with a free segment. Pleotelson subtriangular, tapering towards the rounded end.

Antennulae. Short and broad, a little longer than the eye-peduncles. First and second joints large, subequal in length and width and together slightly longer than

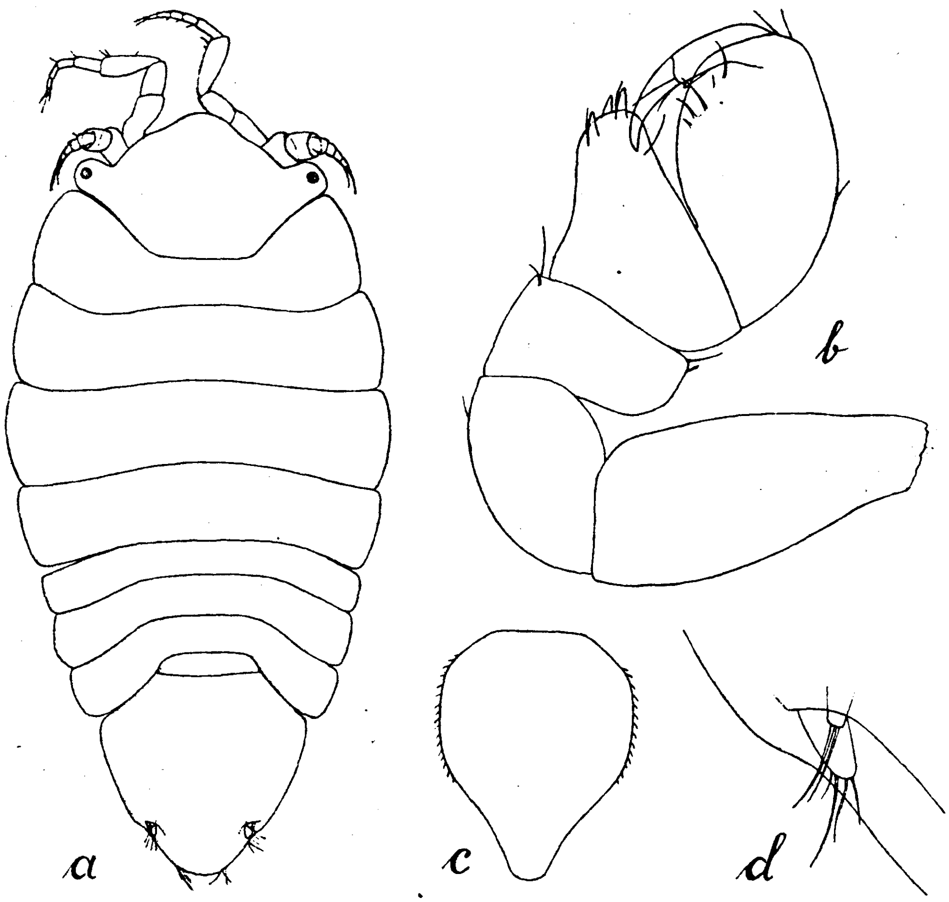

Fig. 63. *Paramunna subtriangulata* (RICH.). a. Female, from above, 65 ×. b. Left first pereiopod, female, 235 ×. c. Female operculum, 65 ×. d. Uropod, 315 ×.

the remaining part of the antennula. The last four joints, of which the last two belong to the flagellum, decrease slightly in size from the first to the last.

Antennae. Of the usual type in the genus. The flagellum consists usually of five joints in adult specimens.

First pair of pereiopods (Fig. 63 b). Exactly similar in males and females and very characteristic. They are broad and strong. The merus is approximately twice as broad as it is long. The carpus is very broad and increases considerably in width towards its distal end; its lower distal angle is broadly rounded; at the lower margin near the lower distal angle there are generally two, sometimes three submarginal two-pointed setae. The propodus is broadly oval; its lower margin is provided with some slender submarginal setae. Dactylus furnished with one long and one short claw.

First pair of pleopods, male. Typical of the genus.

Operculum, female (Fig. 63 c). About cordate; distal margin broadly rounded.[1]

Uropods (Fig. 63 d)[2]. Very short. Exopodite about twice as large as the endopodite.

Localities and Material.

South Georgia, Cumberland Bay, May Bay. — Haul among algae in and below the tidal zone. $^{5}/_{5}$ 1902. 2 females. Length of largest specimen 1.8 mm. — Haul among algae above a stony bottom. 1—2 m. $^{9}/_{5}$ 1902. 2 specimens, male and female. Length of largest specimen 1.6 mm. (ovigerous female). — In a rock-hollow within the tidal zone. Shaken out from a colony of Bryozoa. $^{8}/_{5}$ 1902. Immature male specimen 1 mm. in length.

Distribution. Magellan Straits (MONOD 1926), South Georgia (Sw. Ant. Exped.), Graham Region (RICHARDSON 1908).

Not previously recorded from South Georgia.

Paramunna rostrata (HODGSON, 1910).

Text figs. 64 a—c.

Austromunna rostrata. HODGSON, 1910, p. 61—63, Pl. X, Fig. 3.
Austrimunna rostrata. RICHARDSON, 1913, p. 21.
Paramunna rostrata. VANHÖFFEN, 1914, p. 572—573, Fig. 102; MONOD, 1926, p. 16—17, Fig. 8.
(?) *Paramunna dilatata.* VANHÖFFEN, 1914, p. 573, Fig. 103.

Supplementary Description.

General shape of body (Fig. 64 a). In the figured specimen, a female 1.4 mm. in length, the pleotelson was slightly longer than broad, agreeing in that respect with *Paramunna dilatata* VANHÖFFEN. In a small 1 mm. long female specimen the pleotelson was broader, being about as wide as it is was long.

Antennulae. About one-third as long again as the eye-peduncles; peduncle consisting of four joints, flagellum of two joints.

Antennae. The third peduncular joint is the broadest. In two specimens 1.4 and 1 mm. in length the flagellum consisted of seven joints.

Right mandible. Molar tubercle considerably widening towards the truncate end. Palp short, three-jointed.

First pair of pereiopods (Fig. 64 b and c). Carpal joint oval, almost twice as long as it is broad, with greatest width across the middle; the lower margin of the joint is provided with two stout two-pointed setae. Propodus about three-fourths as long as the carpus; its lower part is not attenuate; the lower margin is provided with some slender setae. Dactylus furnished with one long and one short claw. For other details see the figures.

Operculum, female. Somewhat longer than broad; distal margin narrowly rounded.

Uropods. Consisting of two small joints. The endopodite is very minute, being about one-fourth as long as the exopodite.

Remarks. The two specimens examined by me differ from *Paramunna rostrata* as described and figured by HODGSON (1910), VANHÖFFEN (1914), and MONOD (1926) in having

[1] Cf. MONOD, 1926, Fig. 7 B.
[2] Cf. MONOD, 1926, Fig. 7 C.

a slightly longer pleotelson, agreeing in this respect with *Paramunna dilatata* VANHÖFFEN (1914). As mentioned above the pleotelson was slightly longer than broad in a specimen 1.4 mm. in length, whereas in another 1 mm. long specimen it was about as wide as it was long. On comparing the available figures of *P. rostrata* it appears that there exists a considerable variation within this species in the shape of the pleotelson as well as in the

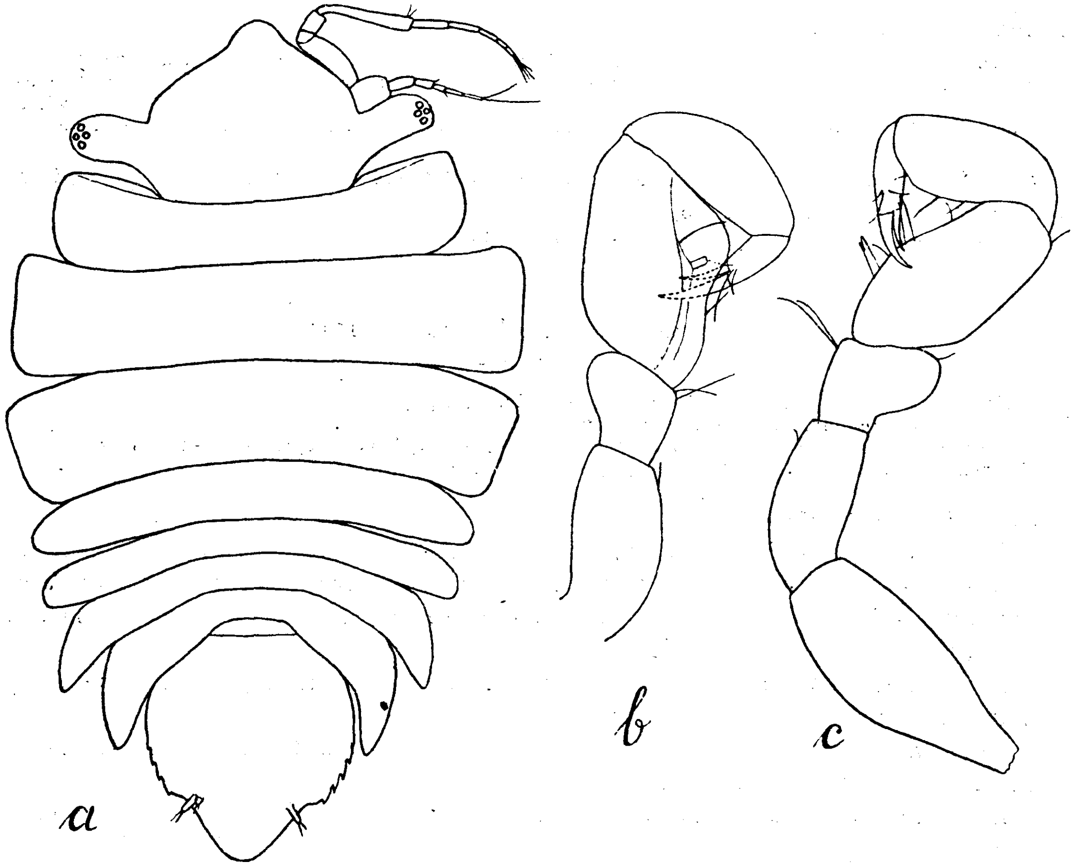

Fig. 64. *Paramunna rostrata* (HODGS.). a. Female from above, 80 ×. b. Right first pereiopod, immature female, 315 ×. c. First pereiopod, adult female, 240 ×.

shape of the rostrum[1]. In view of the variation in the shape of the pleotelson, it seems very probable that *P. dilatata* is identical with *P. rostrata*. *P. dilatata* was established as a species differing from *P. rostrata* by VANHÖFFEN (1914) on account of the slightly different shape of the pleotelson and the greater width of the last three pereion segments. The unusual shape of the last three pereion segments in the species of VANHÖFFEN may perhaps be explained by his specimens being in a moulting condition, the shedding of the chitin having been accomplished on the posterior part of the body but not yet anteriorly.

[1] The great variation in the shape of the rostrum was pointed out by VANHÖFFEN (1914).

Localities and Material.

St. 23. South Georgia, off the mouth of Morain Bay, lat. 54° 23′ S., long. 36° 26′ W. 64—74 m. Bottom temp. + 1.65°. Gray clay with gravel and stones. 16/5 1902. 2 female specimens, one exhibiting an empty marsupium 1.4 mm. in length and one without marsupium 1 mm. in length.

Distribution. South Georgia (Sw. Ant. Exped.), Kerguelen (VANHÖFFEN 1914), Graham Region (RICHARDSON 1913), Antarctic Ocean west of Graham Region (MONOD 1926), Victoria Land (HODGSON 1910).

Not previously recorded from South Georgia.

Paramunna dentata n. sp.

Text figs. 65 a—i.

Diagnosis. Frontal part of the head subtriangular, obtusely pointed anteriorly. Eye-peduncles short, with small eyes of reddish-brown colour. Pleotelson almost semicircular, its lateral margins denticulated, its distal tip between the uropods with broadly rounded margin. Antennulae about twice the length of the eye-peduncles, consisting of a four-jointed peduncle and a single-jointed flagellum. First pereiopod with a very broad carpus, being distally about one-third as broad again as it is long, its lower margin furnished with two conspicuous setae and a few teeth. Female operculum slightly longer than broad, with distal end broadly rounded.

Description.

Types. Male and female, length about 1 mm.

Head. (Fig. 65 a). About as long as the first three pereion segments together. Frontal part subtriangular, obtusely pointed anteriorly. Eye-peduncles short and broad. Eyes small, reddish brown. Posterior part of the head immersed in the first pereion segment.

Pereion (Fig. 65 a). Segments in the female with their lateral margins continuous and the first four segments subequal in length and width. In the male, only the last three segments have their lateral margins continuous and the first segment is the longest. The last three pereion segments are shorter than the others in both sexes and decrease slightly in width from the fifth to the seventh segment.

Abdomen (Fig. 65 a). About as long as the last four pereion segments together, anteriorly with a small free segment. Pleotelson somewhat broader than long, its lateral and posterior margins forming almost a semi-circle, interrupted only by the indentations for the uropods. Lateral margins denticulated with about eight teeth on each side, the number somewhat varying.

Antennulae. About twice as long as the eye-peduncles Consisting of five joints. First joint stout, second joint about as long as the first, but narrower. Third and fourth joints small, about as long as they are broad, subequal in length and together about as long as the second joint. The flagellum consists of one joint, which is about as long as the third and fourth joints together, and is furnished apically with one sensory filament and one seta.

Antennae (Fig. 65 b). Peduncle consisting of six joints, flagellum of seven.

Mandibles (Fig. 65 c). Normal. Incisive part with five points. Setal row with four or five setae. Palp short, consisting of three joints, of which the first two are subequal in length and the third about two-thirds as long as the second.

First pair of maxillae. Inner lobe decreasing in width towards the distal rounded end, which is provided with one conspicuous and three slender, hair-like setae.

Lower lip See Fig. 65 d.

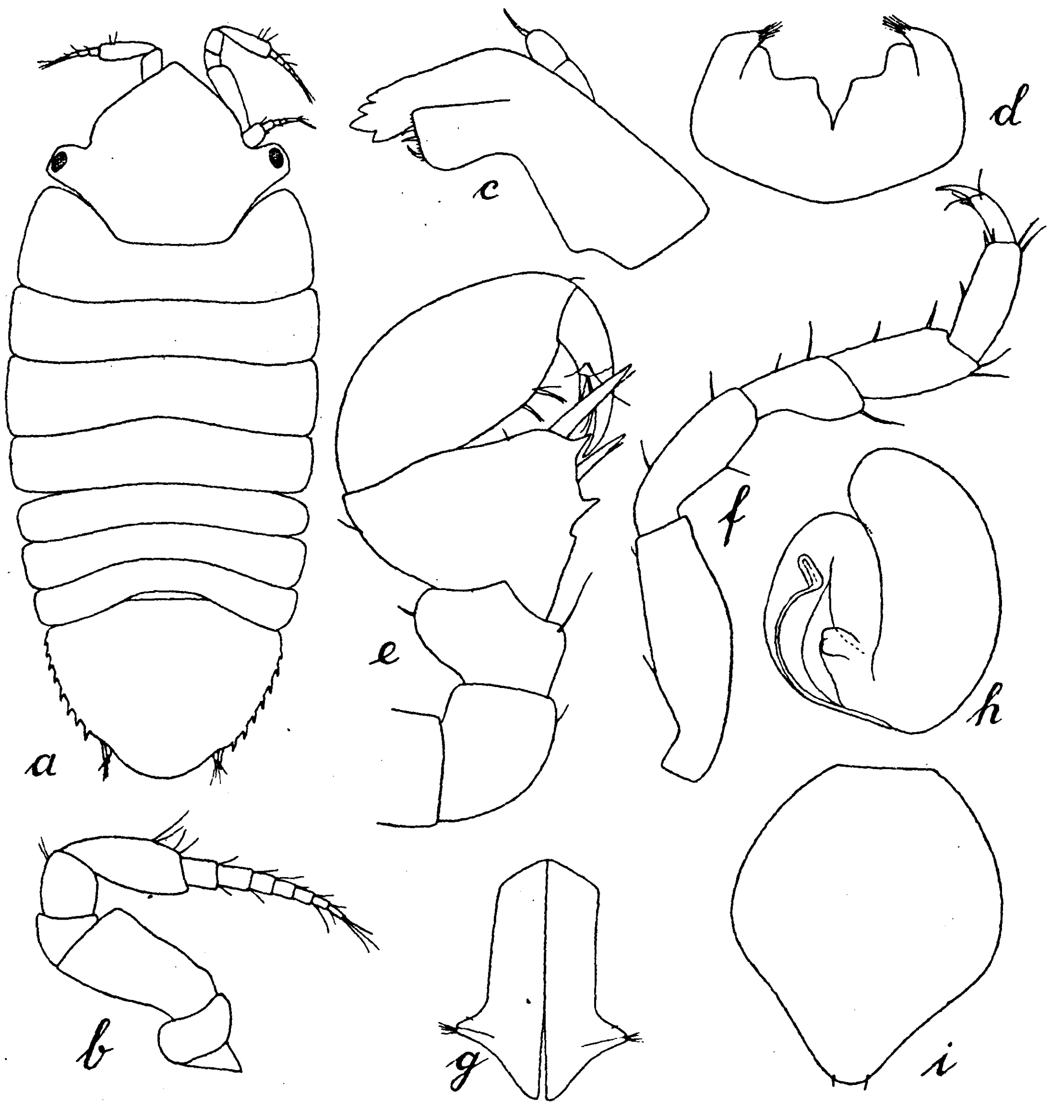

Fig. 65. *Paramunna dentata* n. sp. a. A specimen from above, 80 ×. b. Left antenna, female, 240 ×. c. Mandible, 315 ×. d. Lower lip, 235 ×. e. First pereiopod, (except the larger part of the basipodite), female, 240 ×. f. Second pereiopod, female, 235 ×. g. First pleopods, male, 140 ×. h. Second male pleopod, 240 ×. i. Female operculum, 140 ×.

Maxillipeds. Typical of the genus.

First pair of pereiopods (Fig. 65 e). Characterized by its very broad carpus, which increases in width towards the distal end, where it is about one-third as broad again as it is long. Its lower margin is furnished with two long and stout two-pointed setae and some teeth-like projections; one of the setae is situated at the lower distal angle. The propodus is about as long as the meral and carpal joints together. Its lower margin is furnished with two small two-pointed setae, situated near each other.

The other pereiopods. All similar. The second pereiopod is shown in fig. 65 f. Dactylus provided with one long and one short claw.

First and second pairs of pleopods, male. See Figs. 65 g and h.

Operculum, female (Fig. 65 i). Slightly longer than broad, distal margin rounded.

Uropods. Very short; the exopodite is about twice as long as the endopodite.

Remarks. In its general shape, *Paramunna dentata* shows some resemblance to *Paramunna subtriangulata* (RICHARDSON), but it differs in having the lateral margins of the pleotelson denticulated and in its first pereiopods, which are very characteristic. The first pereiopods agree with those in the species of *Paramunna* from the Auckland Islands named *Paramunna* (*serrata* [RICHARDSON]?) by STEPHENSEN (1928), but *P. dentata* differs from that species in other details, especially in the triangularly prolonged frontal part of the head.

Localities and Material.

St. 51. Falkland Islands. Port William, lat. 51° 40′ S., long. 57 °42′ W. 22 m. Sand. 3/9 1902. 8 specimens, males and females. Length of the largest specimens about 1 mm.

Distribution. Falkland Islands (Sw. Ant. Exped.).

Genus **Austrosignum** HOGDSON, 1910.

Diagnosis. Body oblong with a distinct »waist» between the first four and the last three pereion segments. Eyes small on slender eye-peduncles. Pleotelson slightly bulbous, distally pointed. Coxae visible from above on the last three pereion segments. Antennulae with the first two peduncular joints subequal in length to, or longer than, the remaining part. Mandibles with a strong subcylindrical molar tubercle widening towards the end; mandibular palp short, three-jointed. Maxillipeds with first, second and third joints of the palp wider than the last two joints, being about two-thirds as wide as the endite. First pair of pereiopods prehensile. Uropods minute consisting of two branches.

The genus comes close to *Paramunna* G. O. SARS, but differs in having a distinct »waist» between the fourth and fifth pereion segments, in having the pleotelson pointed and to a slight degree bulbous, and in having the coxae visible from above on the last three pereion segments.

Austrosignum glaciale HOGDSON, 1910.

Text figs. 66 a—c.

Austrosignum glaciale. HODGSON, 1910, p. 68—69 Pl. X, Fig. 2; VANHÖFFEN[1], 1914, p. 578, Figs. 109 a—f; MONOD 1931, p. 12 Figs. 2 a, 2 b, 9 a.

Supplementary Description.

General shape of body. As figured by MONOD (1931, Figs. 2 a and b), the female has a more oval shape of body than the male. The body is in both sexes, however, propor-

[1] MONOD (1931) doubts whether the specimens referred by VANHÖFFEN (1914) to *Austrosignum glaciale* are correctly determined.

tionately longer and narrower than figured by MONOD (1931). The angles between the anterior margin of the eye-peduncles and the head are not so sharp as figured by HODGSON, in that respect agreeing with the figures by MONOD (1931).

Pereion. The first pereion segment in the male is about as long as the second and half the third segment together; in the female the first four pereion segments are subequal in length in one specimen, in another specimen the second and third are the largest.

Abdomen. The pleotelson in the male is broader than in the female. The indentations for the uropods are more marked in the female than in the male.

Antennulae[1]. First two joints stout and long, together slightly longer than the remaining part of the antennula. The third and fourth peduncular joints are small, but the third is about twice as long as the fourth. The flagellum consists of two slender joints, the last of which is furnished with a long sensory filament and a few setae.

Antennae. Short. Peduncle composed of six joints; first and second joints very short, subequal in length; third joint somewhat longer than first and second together; fourth joint about half as long again as the first; the fifth joint is somewhat longer than the third; and the sixth joint, which is the longest, is about as long as the fourth and fifth together. The flagellum is about as long as the sixth and half the fifth peduncular joints together, and consists in one specimen, 1.1 mm. long, of six joints, of which the first two joints are very long, each twice as long as the third joint and together longer than the four other small joints in the flagellum.

Mandibles (Fig. 66 a). Incisive part with five teeth. Lacinia (on the left mandible) three-dentated, situated very close to the incisive part. Setal row consisting of about four setae. Molar tubercle strong, subcylindrical, widening towards the end and directed somewhat forwards, distally abruptly cut off and provided with a row of marginal teeth. Palp very short, about half as long as the mandible corpus. It consists of three joints the first two of which are subequal in length; the last joint is about half as long as the second.

First and second pairs of maxillae. Of the usual type. Inner lobe of the first pair tapering towards the end and provided with three apical setae.

Maxillipeds. Slightly different from the figure by VANHÖFFEN (1914)[2], inasmuch as the epipodite is broader, being about half as broad again as the third joint of the palp; its lateral margin is strongly convex, its distal end narrowly rounded. The first second and third joints of the palp are subequal in width; the second joint widens out distally, whilst the third decreases slightly in width towards its distal end. The fourth and fifth joints of the palp — as figured by VANHÖFFEN (1914) — are much narrower than the others. Endite with two coupling-hooks.

First pair of pereiopods[3]. Similar in the male and the female. Carpus and propodus subequal in length; carpus with two large two-pointed and a few slender single-pointed setae as well as with some small tooth-like projections on its lower margin; propodus with two double-pointed setae and one slender single-pointed seta on its lower margin. Dactylus provided with one long and one short claw.

[1] Cf. VANHÖFFEN, 1914, Fig. 109 a.
[2] VANHÖFFEN, 1914, Fig. 109 f.
[3] Cf. VANHÖFFEN (1914, Fig. 109 b) and MONOD (1931 Fig. 9 a).

The other pereiopods (Fig. 66 b). Not prehensile, all with a short dactylus, furnished with one long dorsal claw about as long as the dactylus and one extremely short ventral claw.

First pair of pleopods, male. Shape as illustrated by VANHÖFFEN 1914 in his Fig. 109 c.

Operculum, female (Fig. 66 c). Subtriangularly produced distally and with a narrowly rounded end.

Uropods. Consisting of two small joints. The exopodite is about two and a half times as long as the very small endopodite.

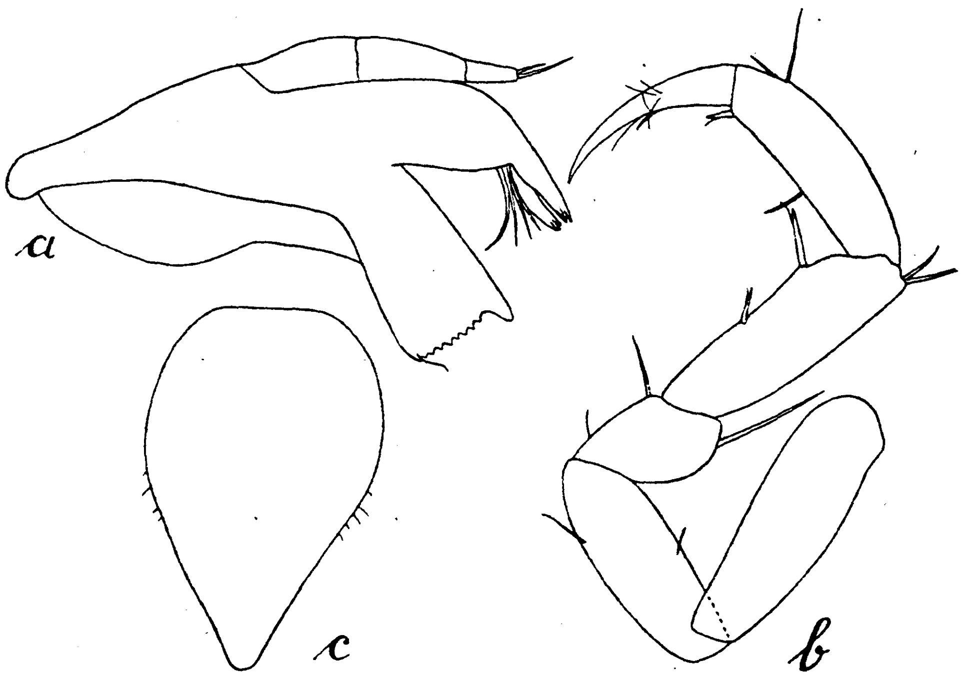

Fig. 66. *Austrosignum glaciale* HODGS. a. Left mandible, male, 350 ×. b. Right second pereiopod, immature female, 225 ×. c. Female operculum 180 ×.

Remarks. The species is very similar to, perhaps identical with *Austrosignum grande* HODGSON, differing from that species only in having the head not so deeply immersed in the first pereion segment and in having the first pereion segment shorter. In the male of *Austrosignum glaciale*, however, this segment attains almost the same length as in *Austrosignum grande.*

Localities and Material.

St. 28. South Georgia, mouth of Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 12—15 m. Sand and algae. 24/6 1902. 3 specimens, one male and two females. Length of the largest specimen, a female, about 1.7 mm.

Distribution. South Georgia (MONOD 1931), Victoria Land (HODGSON 1910), Gauss station (VANHÖFFEN 1914).

Austrosignum falklandikum n. sp.

Text figs. 67 a—d.

Diagnosis. Body about three times as long as broad. Head not immersed in the first pereion segment, of an almost semi-circular shape. Eye-peduncles very short reaching only to about one-third the length of the first peduncular joint of the antennulae. First pereiopod with carpus slightly shorter than propodus and increasing in width in distal direction. All pereiopods with the dorsal claw longer than the dactylus; on the second, sixth and seventh about twice as long as the dectylus.

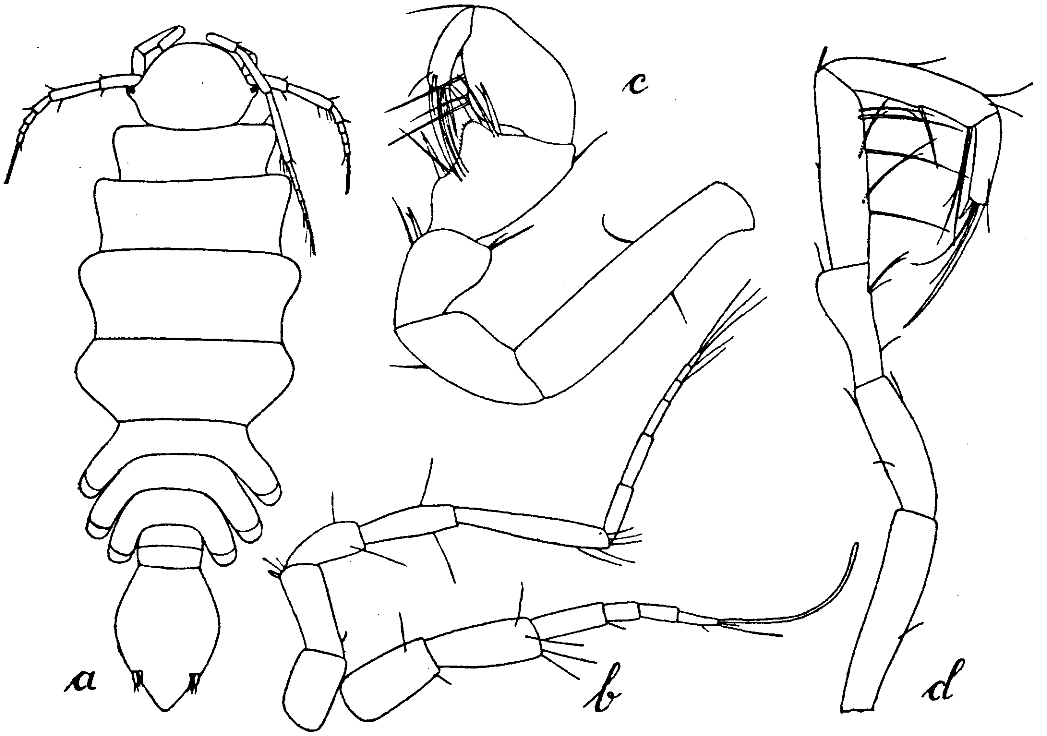

Fig. 67. *Austrosignum falklandicum* n. sp. a. Female, from above, 45 ×. b. Antennula and antenna, 185 ×. c. First pereiopod, female, 185 ×. d. Second pereiopod, female, 160 ×.

Description.

Types. Male about 1.6 mm. in length, and female (Fig. 67 a) about 1.9 mm. in length.

General shape of body (Fig. 67 a). Oblong, about three times as long as it is broad.

Head (Fig. 67 a). Not immersed in the first pereion segment, small, almost circular, with anterior margin convex. The length of the head is subequal to the length of the first plus half the second pereion segment. Eye-peduncles very short, reaching only to about one-third the length of the first peduncular joint of the antennulae. Eyes small of reddish-brown colour.

Pereion (Fig. 67 a). The figure illustrates a female specimen. It will be seen from the figure that the first segment is the shortest and narrowest of the anterior four segments. The second, third and fourth segments are subequal in length and width, the third being slightly longer than the others.

Between the fourth and fifth segments there is a distinct »waist». The last three segments are strongly curved backwards.

The pereion of the male differs from that in the female in having the first segment shorter and wider. In the male this segment is only about half as long as, but subequal in width to, the second segment.

Abdomen. Anteriorly with two free segments. Pleotelson similar in shape to that in *Austrosignum glaciale*, with greatest width across the middle and distally pointed. In the male the pleotelson is very slightly broader than in the female.

Antennulae. See Fig. 67 b. Six-jointed. About one-third shorter than the antennae. First two joints stout and long, the second slightly longer. Together they are slightly longer than the remaining part of the antennula. Second and third joints small, the second about twice as long as the third. Last joint furnished with a long apical sensory filament.

Antennae. See Fig. 67 b. About as in *Austrosignum glaciale.* The flagellum consists of six joints.

Mandibles. Mandibles with molar tubercle widening considerably towards the truncate end. Palp short, three-jointed.

Maxillipeds. As in *Austrosignum glaciale*, but differing in having the distal margin of the epipodite broadly rounded. Endite with a single coupling-hook.

First pair of pereiopods (Fig. 67 c). Carpus and propodus broader than in *Austrosignum glaciale.* Carpus increasing in width towards the distal end. There is one strong two-pointed seta at the lower distal angle of the carpus, one on the lower margin, and one on the distal edge of the carpus. Propodus broad; its lower margin provided with three long single-pointed setae, situated near each other. Dactylus furnished with two claws and with two setae between the claws; the dorsal claw is longer than the joint itself. For details see the figure.

The other pereiopods (Fig. 67 d). The third to fifth pairs are broken. On the second, sixth and seventh pereiopod the lower margins of the carpus and propodus provided with long single-pointed setae, most of them on the carpus. The dorsal claw is very long, about twice as long as the dactylus. For details see the figure.

First pair of male pleopods and female operculum. About as in *Austrosignum glaciale.*

Uropods. Exopodite about three times as long as the endopodite, tapering towards the setiferous end. Endopodite with two apical setae.

Remarks. The new species somewhat resembles *Austrosignum glaciale* HODGSON, but is easily distinguished, especially by its much shorter eye-peduncles, its longer body and the longer dorsal claw on the pereiopods.

Localities and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. 3/6 1902. Female specimen, (type), about 1.9 mm. in length.

St. 59. South of West Falkland, on the Burdwood Bank, lat. 53° 45′ S., long. 61° 10′ W. 137—150 m. Broken shells with stones. 12/6 1902. Male specimen, (type), about 1.6 mm. in length.

Distribution. Falkland Islands (Sw. Ant. Exped.), Burdwood Bank (Sw. Ant. Exped.).

Sub-group **Pleurogoniini,** new sub-group.

For diagnosis see p. 199.

Genus **Pleurosignum** VANHÖFFEN, 1914.

Diagnosis[1]. Body flattened. Head posteriorly immersed in the first pereion segment. Eyes small on slender eye-peduncles. Second to seventh pereion segments with long spine-like coxal plates. Pleotelson much narrower than the pereion and having its posterior part subtriangularly produced. Antennulae and antennae short, subequal in length; antennulae few-jointed (composed of five or six joints), the last joint furnished with one long sensory filament. Mandibles with a slender pointed molar tubercle directed somewhat forwards; palp missing. Maxillipeds with the first three joints of the palp about as broad as the endite, the last two joints narrower than the others; epipodite with distal margin rounded. First pereiopods in both sexes prehensile. First male pleopods each with a lateral subtriangular projection. Female operculum with its distal part subtriangularly prolonged. Uropods consisting of two very small branches.

The genus comes close to *Pleurogonium* G. O. SARS, as is shown by the fact that its characteristic mandibles have a narrow molar tubercle, very similar to that in *Pleurogonium*, and that its maxillipeds are shaped exactly as in the latter genus. The genus *Dendrotium* G. O. SARS, whose shape of body still more closely resembles that of *Pleurosignum*, shows in its mandibles and maxillipeds a closer relation to *Paramunna* than to *Pleurosignum*. This is also the case with *Austrosignum* (cf. p. 241).

Both the known species belonging to *Pleurosignum* were obtained by the Swedish Antarctic Expedition, but very few specimens of each (*Pl. magnum* VANH., two specimens, and *Pl. elongatum* VANH., one specimen). VANHÖFFEN (1914) does not figure the anterior four pereion segments in *Pl. magnum*. In his figure of *Pl. elongatum*[2], however, all the pereion segments are provided with spine-like epimeral processes, and this is stated by VANHÖFFEN to be the case also in *Pl. magnum*. But in the specimens of *Pleurosignum* examined by me I found, the spine-like epimera only on the second to seventh pereion segments, whilst on the first segment each lateral margin was provided with a small seta. The epimera on the second to seventh segments are strictly delimited from the segments by dorsal sutures. They are thus to be regarded as coxal plates. These spine-like coxal plates are somewhat obliquely truncate distally and are provided near their distal end with a short hair-like seta. At first sight they thus resemble two-pointed setae of the type regularly found in the Parasellids. In exceptional cases they are provided with two hair-like setae.

Pleurosignum magnum VANHÖFFEN, 1914.

Text figs. 68 a—c.

Pleurosignum magnum. VANHÖFFEN, 1914, p. 577—578, Figs. 108 a—g.

Supplementary Description.

Head. Posteriorly slightly immersed in the first pereion segment.

Pereion. First segment short, measured along the middle line one-third to one-half as long as the second. The second, third and fourth segments are the longest

[1] Cf. VANHÖFFEN (1914, p. 576).
[2] VANHÖFFEN (1914, Fig. 107 a).

and subequal in length. Each lateral margin of the first segment is furnished with a minute seta.

Pereion. Coxal plates developed on all segments except the first. They are spine-like and marked off from the terga by distinct dorsal sutures. The coxal plates of the second third and fourth segments are almost exactly as figured by VANHÖFFEN[1] (1914) in the case of *Pl. elongatum.* Those on the last three segments are larger, there being a broader proximal part dorsally delimited from the tergum by a slightly convex suture;

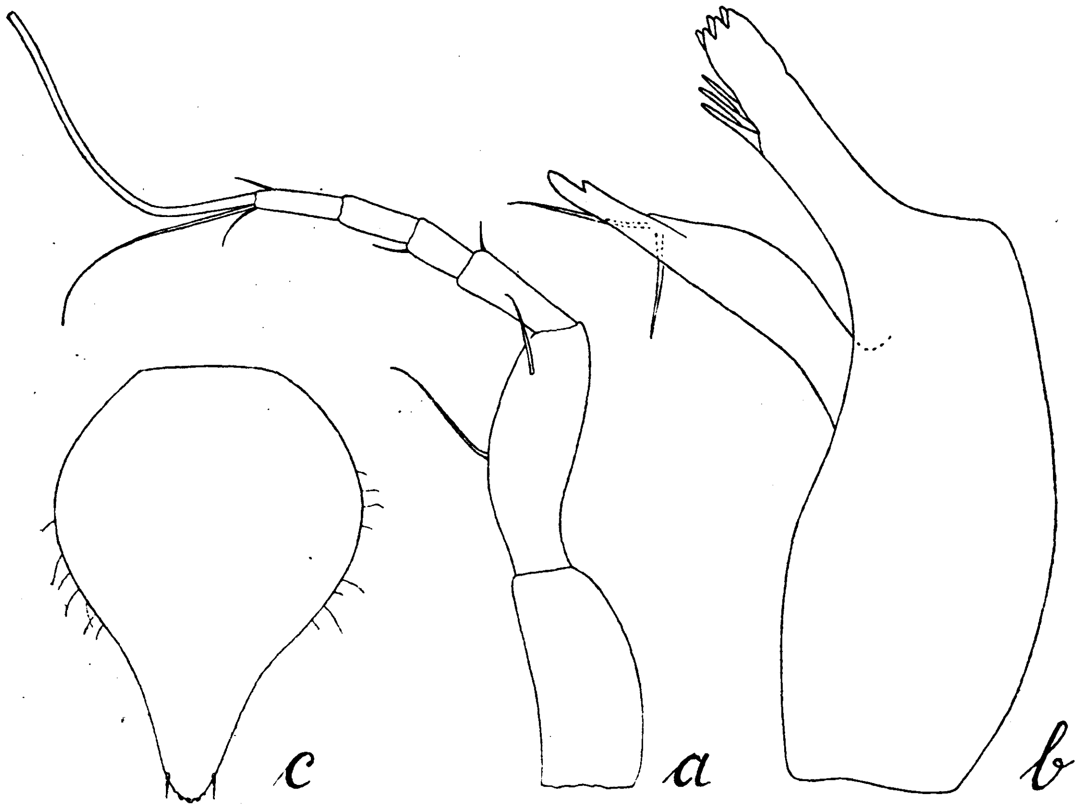

Fig. 68. *Pleurosignum magnum* VANHÖFF. a. Left antennula, 240 ×. b. Left mandible, 650 ×. c. Female operculum, 175 ×.

but laterally the coxal plates gradually narrow and are produced into spine-like projections similarly shaped to those on the second to fourth segments.

Abdomen. Anteriorly with one free segment.

Antennulae. See Fig. 68 a and VANHÖFFEN (1914, Fig. 108 c).

Antennae. Broken.

Mandibles (Fig. 68 b). Slender. Incisive part and lacinia, on the left mandible, situated close together, each with many points. Setal row on the left mandible with three setae. Molar tubercle long and slender, directed slightly forwards, distally prolonged into a long pointed projection.

[1] VANHÖFFEN (1914, Fig. 107 a).

First pair of maxillae. Normal. Inner lobe provided with two apical setae.

Maxillipeds[1]. Epipodite short, reaching about to the distal margin of the first joint of the palp. Its distal margin is broadly rounded.

Operculum, female (Fig. 68 c). Its distal part is subtriangularly prolonged.

Uropods. Consisting of two small joints, of which the endopodite is extremely small.

Remarks. This species is well distinguished from *Pl. elongatum* by its short abdomen and by its characteristic first pereiopods, which have a narrow propodus, furnished with two stout setae on its lower margin and the lower margin of the dactylus dentated.

Localitias and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. $^{3}/_{9}$ 1902. Female specimen about 1.2 mm. in length.

St. 59. South of West Falkland, on the Burdwood Bank, lat. 53° 45′ S., long. 61° 10′ W. 137—150 m. Broken shells with stones. $^{12}/_{9}$ 1902. Female specimen about 1.5 mm. in length.

Distribution. Falkland Islands and Burdwood Bank (Sw. Ant. Exped.), Gauss Station (VANHÖFFEN 1914).

The species has previously been found only in the East Antarctic (Gauss Station); it is here recorded from the Falkland Islands and Burdwood Bank.

Pleurosignum elongatum VANHÖFFEN, 1914.

Text fig. 69.

Pleurosignum elongatum. VANHÖFFEN, 1914, p. 576—577, Abb. 107 a—f.

Supplementary Description.

Head. Posteriorly immersed in the first pereion segment.

Pereion. First segment short, strongly curved in anterior direction, but of uniform length. Measured along the middle line it is half as to two-fifths as long as the second segment. Each of its lateral margins is provided with a short hair-like seta. The second, third and fourth segments are the longest and subequal in length and width. The last three segments are short and curved backwards.

Coxal plates developed on all segments, except the first. They are spine-like and similar to those in *Pl. magnum*. In the single specimen examined they were somewhat shorter than in *Pl. magnum*.

Abdomen. About as long as the last four pereion segments plus half the third segment. Pleotelson about twice as long as the anterior part of the abdomen. In the anterior part two segments are indicated, one short first segment and one second segment, which is almost fused with the pleotelson, the suture-line between this segment and the pleotelson being very faint.

Antennulae and antennae. As in *Pl. magnum*. The antennal flagellum consists of seven joints.

Maxillipeds. As in *Pl. magnum*.

First pair of pereiopods (Fig. 69)[2]. Propodal joint broad and oval in outline, with its lower part very thin. For details see the figure.

[1] See VANHÖFFEN (1914, Abb. 108 d).
[2] See also VANHÖFFEN (1914, Figs. 107 b and c).

Operculum, female. Its distal part is prolonged into a subtriangular extension with a rounded distal end.

Uropods. Consisting of two small branches, each furnished with apical setae.

Remarks. Of this species only a single damaged specimen was collected during the Swedish Antarctic Expedition. It is easily recognized as *Pleurosignum elongatum* by its long abdomen and characteristic first pereiopods. It differs from VANHÖFFEN's figures and description of *Pl. elongatum* in being devoid of coxal plates on the first pereion segment, in having the spine-like coxal plates on the other pereion segments slightly shorter and in having the anterior part of the abdomen slightly shorter than figured by VANHÖFFEN (1914).

Localities and Material.

St. 49. Falkland Islands, Berkeley Sound, lat. 51° 35′ S., long. 57° 56′ W. 25—30 m. Shells and stones. 10/8 1902. Female specimen, about 1 mm. in length.

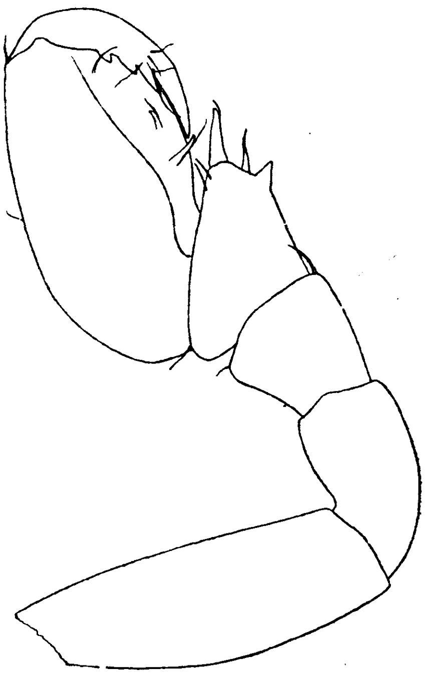

Fig. 69. *Pleurosignum elongatum* VANHÖFF. Left first pereiopod, 315 ×.

Distribution. Falkland Islands (Sw. Ant. Exped.), Gauss Station (VANHÖFFEN 1914).

The species has not previously been recorded from the Falkland Islands.

Genus **Antennulosignum** n. gen.

Diagnosis. Body flattened. Head posteriorly immersed in the first pereion segment. Eyes small on long and slender eye-peduncles. Pereion segments, except the first, provided with long spine-like coxal plates. Abdomen narrow. Pleotelson posteriorly subtriangular and prolonged, much narrower than the pereion. Antennulae and antennae short, antennulae with two stout peduncular joints, of which the second is prolonged distally into a spine-like curved projection, which is longer than the flagellum; last joint of flagellum furnished with one long apical sensory filament. Mandibles with a slender molar tubercle and a short three-jointed palp. Maxillipeds with the palp slender. First pereiopods prehensile. The first pleopods in male each with a lateral triangularly projecting extension. Uropods consisting of two very small branches.

Though similar to *Pleurosignum,* this genus differs in the extremely prolonged second peduncular joint of the antennula, which at first sight gives the antennula the appearance of having two flagella, and also in the mandible, which is furnished with a short palp. The genus comprises only one species, which was represented in the material by three male specimens.

Antennulosignum elegans n. sp.

Text. figs. 70 a—e.

Diagnosis. Body about twice as long as it is broad. Pleotelson about one-fourth as long again as its greatest width, tapering towards the end. Antennae with the first four peduncular joints small and subequal in length. First pereiopod prehensile, with carpus trapezoidal and furnished at the tip with three two-pointed setae; propodus broadly oval; dactylus one-half to two-thirds the length of propodus, its dorsal claw about one-third as long as the joint itself.

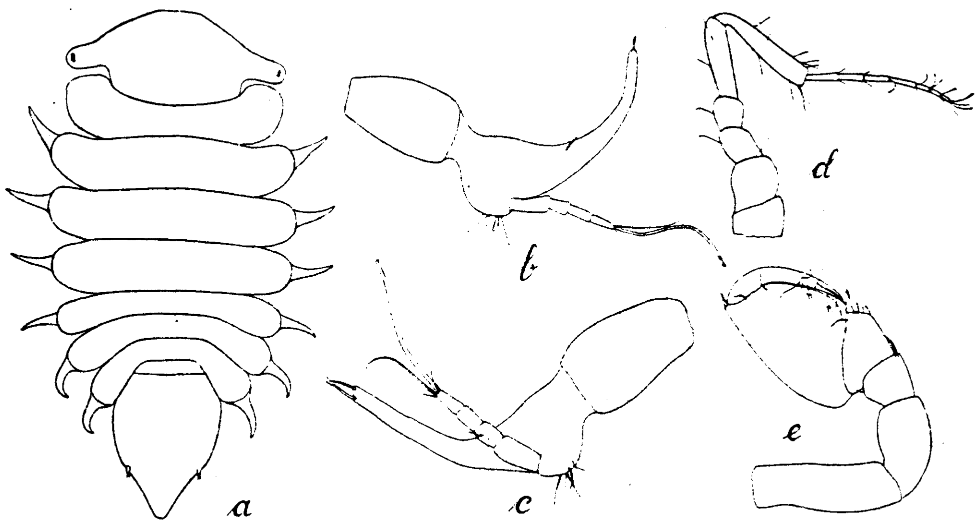

Fig. 70. *Antennulosignum elegans* n. sp. a. Animal, from above, 50 ×. b. Left antennula, male, from below, 100 ×. c. Antennula of another specimen, 120 ×. d. Left antenna, male, 100 ×. e. First pereiopod, 120 ×.

Description.

Type. Male, about 1 mm. in length.

General shape of body (Fig. 70 a). Oblong-ovate; the body is about twice as long as it is broad.

Head. Frontal margin between the eye-peduncules rounded. Eyes distinct, but without pigment, consisting of five ocelli, on slender, laterally directed eye-peduncles, extending about as far as the lateral margins of the first pereion segment. Head posteriorly slightly immersed in the first pereion segment.

Pereion. The first five segments are subequal in width, the sixth and seventh somewhat narrower than the others. First segment curved forwards, narrow in the middle, laterally increasing in width. Second, third and fourth segments long, subequal in length. The last three segments are short, curved backwards, subequal in length, but decreasing in width from the fifth to the seventh; the fifth segment is, in the middle, only about one-third as long as the fourth.

Abdomen. Anteriorly with a short free rectangular segment. Pleotelson about one-fourth as long again as its greatest width, tapering towards the end; its posterior part is produced into an obtusely rounded triangular tip.

Antennulae (Figs. 70 b and c). Peduncle consisting of two very stout joints, of which the second distally produced into a long curved and spine-like prolongation with its concave side directed anteriorly. The flagellum is small and situated posterior to the long prolongation of the second peduncular joint. Its length is only about half the length of this joint including the distal prolongation of the joint.

Antennae (Fig. 70 d). The six-jointed peduncle has four short proximal joints of about equal length. The fifth and sixth peduncular joints are long and increase slightly in width towards their distal ends. Flagellum, seven-jointed.

Mandibles. Molar tubercle slender. Palp short, three-jointed.

Maxillipeds. About as in *Pleurosignum magnum* VANHÖFFEN: The palp is narrow. Endite with two coupling-hooks.

First pair of pereiopods (Fig. 70 e). Basipodite, ischium and merus subequal in width; the basipodite is about as long as the ischium and merus together. The ischium is about twice as long as the merus, which joint somewhat widens distally. The carpus and propodus are broader than the other joints. The carpus is trapezoidal in outline, and provided with three two-pointed setae at the tip. The propodus, which is about twice as broad as the basipodite and about as long as the ischial and meral joints together, is broadly oval and is provided with two submarginal short two-pointed setae close to its lower margin. The dactylus is one-half to two-thirds the length of the carpus; its dorsal claw is about one-third as long as the joint itself.

The other pereiopods. About as in *Pleurosignum.* The dactylus is provided with one long dorsal and one short ventral claw. The dorsal claw is about half as long as the dactylus.

First pair of pleopods, male. As in *Pleurosignum elongatum*[1], except that the distal ends of the fused pleopods is slightly more narrowly rounded.

Uropods. Short, two-branched; the inner branch is minute.

Locality and Material.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand. $^{3}/_{9}$ 1902. 3 small male specimens about 1 mm. in length.

Distribution. Falkland Islands (Sw. Ant. Exped.).

D. Group **Nannoniscini** HANSEN, 1916.

For diagnosis see HANSEN 1916, p. 83. In his diagnosis of this group HANSEN (1916) says as in regard to the mandibles: »The molar process tapers strongly to the narrow, obtuse, setiferous end, and is directed somewhat backwards». In this characteristic the southern genus *Austrofilius* HODGSON forms an exception. In *Austrofilius furcatus* HODGSON I always found the mandible as illustrated in Fig. 71 b, having the molar tubercle truncate. In the second known species of the genus, *Austrofilius serratus* VANHÖFFEN, the molar tubercle is of the same type, except that it tapers more markedly towards the end[2]. HODGSON (1910), however, figures the mandible in *Austrofilius furcatus* as having a molar tubercle with an obtusely rounded end, thus conforming with HANSEN's diagnosis of the group. In his diagnosis of the group HANSEN (1916) moreover

[1] Cf. VANHÖFFEN (1914, Fig. 107 e).
[2] VANHÖFFEN, 1914, Fig. 83 c.

states that eyes are wanting. This is not the case in *Austrofilius*, in which genus both the known species have eyes, but in a very vestigial stage. HANSEN's definition of the group must, consequently, be revised in the two respects mentioned.

Genus **Austrofilius**, HODGSON, 1910.

HODGSON 1910, VANHÖFFEN 1914.

Diagnosis[1]. Anterio-lateral angles of the head somewhat elongated in anterior direction. Front area with its anterio-lateral angles produced into one forward-directed point on each side. Eyes vestigial. All pereion segments marked off from each other by distinct sutures. Antennulae short consisting of about six joints. Antennae with distinct squama. Palp of maxilliped with first three joints expanded, second joint about half again as broad as the endite, third and fourth joints without lobes. First pairs of pereiopods ambulatory, with two claws.

Austrofilius furcatus HODGSON, 1910.

Text fig. 71 a—c.

Austrofilius furcatus. HODGSON, 1910, p. 51—52, Pl. VIII Figs. 2, 2 a, 2 b, 2 c, 2 d; VANHÖFFEN, 1914, p. 554—555, Figs. 81 a—d.

Supplementary Description.

Eyes. Vestigial, generally consisting of two ocelli; in one specimen the right eye had four ocelli.

Antennulae (Fig. 71 a)[2]. Consisting of six joints.

Antennae. Third joint with a distinct, pointed, distally setiferous squama.

Mandibles (Fig. 71 b)[3]. Incisive part with five points. Lacinia (on the left mandible) with three points. Row of setae consisting of four setae on the left mandible, on the right mandible of seven. Molar tubercle slightly tapering towards the end, directed somewhat backwards, distal margin almost straight.

Second pair of maxillae[4]. Outer lappet of outer lobe with four apical setae and inner lappet of the same lobe with three apical setae.

Maxillipeds. As figured by HODGSON (1910)[5], except that the lateral margin of the exopodite is evenly convex.

Pereiopods. All about equal, furnished with two subequal claws.

First and second pairs of pleopods, male. Exactly as figured by VANHÖFFEN (1914)[6].

Operculum, female (Fig. 71 c). Small, subquadrate Lateral margins somewhat convex; distal margin slightly concave in the middle; the lateral parts of the distal margin are provided with long setae and the concave part of distal margin is furnished with very short setae.

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[1] Cf. HODGSON (1910, p. 51) and VANHÖFFEN (1914, p. 554).
[2] Cf. VANHÖFFEN (1914, Fig. 81 a).
[3] Cf. HODGSON (1910, Pl. VIII, Fig. 2 a).
[4] See HODGSON (1910, Pl. VIII, Fig. 2 c).
[5] HODGSON (1910, Pl. VIII, Fig. 2 d).
[6] VANHÖFFEN (1914, Figs. 81 b and c).

Localities and Material.

St. 6. Graham Region, S. W. of Snow Hill Island, lat. 64° 36′ S., long. 57° 42′ W. 125 m. Stones and gravel. $^{20}/_{1}$ 1902. Male specimen 2.4 mm. in length.

St. 33. South Georgia, Grytviken, lat. 54° 22′ S., long. 36° 28′ W. 22 m. Clay and algae. $^{30}/_{5}$ 1902. Damaged female specimen about 3 mm. long.

St. 51. Falkland Islands, Port William, lat. 51° 40′ S., long. 57° 42′ W. 22 m. Sand $^{3}/_{9}$ 1902. Damaged male specimen (head missing).

St. 64. Fuegian Archipelago, north beach of the Beagle Channel, between Ushuaia and Lapataia. 35 m. Shells and algae. $^{13}/_{10}$ 1902. Female specimen about 2 mm. in length.

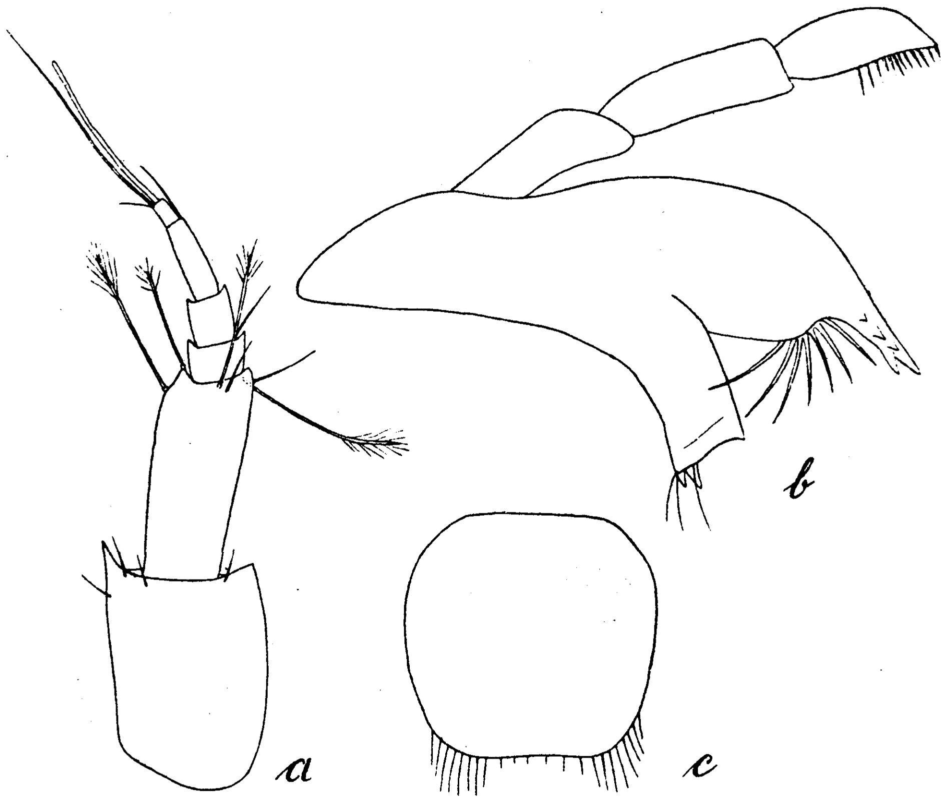

Fig. 71. *Austrofilius furcatus* HODGS. a. Left antennula, 235 ×. b. Right mandible, 240 ×. c. Female operculum, 120 ×.

Distribution. Fuegian Archipelago (Sw. Ant. Exped.), Falkland Islands (Sw. Ant. Exped.), South Georgia (Sw. Ant. Exped.), South Africa (VANHÖFFEN 1914), Kerguelen (VANHÖFFEN 1914), Graham Region (Sw. Ant. Exped.), Victoria Land (HODGSON 1910).

Not previously recorded from the Fuegian Archipelago, the Falkland Islands, South Georgia or the Graham Region.

E. Group **Desmosomatini** HANSEN, 1916.

Genus **Desmosoma** G. O. SARS, 1863.

Desmosoma. MEINERT 1890, BONNIER 1896, G. O. SARS 1899, STEPHENSEN 1915, HANSEN 1916, MONOD 1926.
Eugerda. MEINERT 1890, VANHÖFFEN 1914.

For diagnosis see G. O. SARS (1899, p. 124—125) and HANSEN (1916, p. 106—107). The majority of the species belonging to this well defined genus have been collected in the northern area; from Antarctic or subantarctic waters only one species has been described, *D. longimanum*, VANHÖFFEN, 1914. During the Belgian Antarctic Expedition 1897—1899 another species of *Desmosoma* was found, but as it was represented by one damaged specimen only, MONOD (1926) did not establish it as a new species. It is quite probable that the genus *Desmosoma* is common also in the southern areas. The Swedish Antarctic Expedition collected not less than four species, three of them from South Georgia and one from the Falkland Islands. Presumably none of these species is identical with MONOD's *Desmosoma* sp. MONOD gives only one figure, viz. of the uropods of his *Desmosoma* sp.; the lengths of the uropodal joints agree most closely with my species *D. modestum* and *D. brevipes.*

The classification of the genus *Desmosoma* has been dealt with most satisfactorily by HANSEN (1916).[1] Very valuable characteristics, according to HANSEN are, to be found in the first and second pair of pereiopods. As regards the setal armature, on these pereiopods it should, however, be observed that there is some variation within one and the same species, as will be seen by comparing Figs. 72 c, d, and e, illustrating the first pereiopod of different specimens of *D. australis* n. sp. The setae on the pereiopods are either, single-pointed or double-pointed, a fact to which attention was drawn by BONNIER (1896) when describing his species *D. elongatum.*

Desmosoma australis n. sp.

Text. figs. 72 a—n.

Diagnosis. First pereion segment about as long as the fourth segment and about half as long as the third (the fourth somewhat longer in the female). Second and third pereion segments subequal in length in the female, the second being somewhat longer than the third in the male. Fifth pereion segment in adult specimens increasing in width forwards. Sixth and seventh pereion segments of uniform width, and with their lateral margins straight. Abdomen with its greatest width proximally, decreasing in width towards the distal end. Last joint of the antennula longer than the penultimate joint. First pereiopods narrow; carpal joint provided on its lower margin with three or four slender setae, of which two or three are situated at the lower distal angle; all the setae are shorter than half the length of the propodus. Second pereiopod very strong; carpal joint increasing in width towards the distal end, approximately, twice as long as its greatest width; the lower row of setae on the carpus consists of eleven to thirteen setae, of which the two distal ones extend to about two-thirds the length of the propodus; upper row of setae on the carpus with twelve to seventeen setae. First pleopods in the male with distal margins of the rami convex. Female operculum broader than it is long, with distal margin concave and furnished with

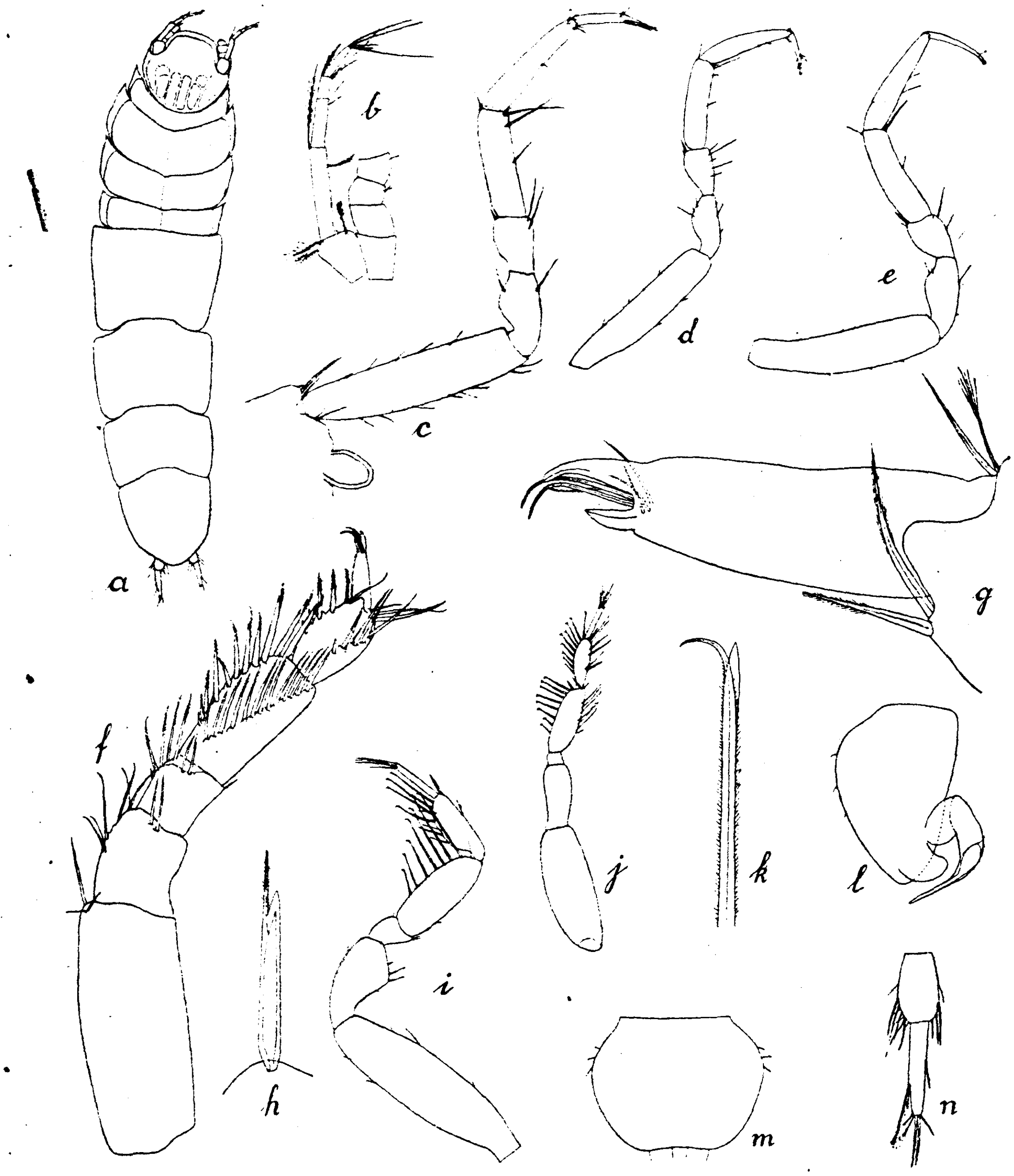

Fig. 72. *Desmosoma australis* n. sp. a. Male, from above, 20 ×. b. Antennula, and proximal joints of the antenna, female, 60 ×. c. Right first pereiopod, female, 60 ×. d. Right first pereiopod, female, 40 ×. e. First pereiopod, male, 60 ×. f. Right second pereiopod, female, 60 ×. g. Dactylus of the same pereiopod, 400 ×. h. Seta from the carpus of the second pereiopod, 180 ×. i. Left seventh pereiopod, female, 40 ×. j. Seventh pereiopod, adult female, 20 ×. k. Distal part of a seta from the carpus of the seventh pereiopod, 400 ×. l. Left second male pleopod, from the caudal side, 50 ×. m. Female operculum, 35 ×. n. Left uropod, 60 ×.

four setae at about equal distances from each other. Uropod about half as long as the abdomen, single-branched, its second joint about one-third as long again as the first.

Description.

Types. Male, length about 4.1 mm.; and female with young, length about 5.1 mm.

Head. Of the usual shape, posteriorly with a faint sculpturing (see Fig. 72 a).

Pereion. In the male (Fig. 72 a) the first and fourth segments are subequal in length. The second segment, which is the longest of the first four segments, is more than twice as long as the first and somewhat longer than the third. The fifth segment is the largest of all the segments; in adult specimens it increases in width towards the anterior margin, where it is not fully half as broad again as it is long; its anterio-lateral angles are narrowly rounded.

In the female the first segment is about half as long as the second; the second and third are subequal in length; the fourth segment is almost half as long again as the first.

The proportion between the lengths of the first four pereion segments is: in the adult male 5: 12: 10: 6, in the adult female[1] 9: 18: 19: 13.

Coxal plates of medium size, anteriorly pointed and of about the same shape in males and females.

Abdomen. In the female with a small free segment anteriorly from the pleotelson. This segment is missing or at least very indistinct in the male. Pleotelson with its greatest width anteriorly.

Antennulae (Fig. 72 b). Consist of five joints. The first joint is the broadest[2], being about twice as broad as the second. It increases in width towards the distal end. The second joint is about twice as long as the third. The fifth joint is longer than the fourth.

The proportion between the lengths of the joints is, in a female 9: 14.5: 7.5: 3.5: 5.5.

Antennae. Broken. For the first four joints see Fig. 72 b.

Mandibles. Incisive part of the left mandible with two, that of the right with three points. Lacinia (left mandible) with two points. Setal row on the left mandible with ten, on the right mandible with twelve setae of the usual kind; between the setae in the row there are sparse, very slender »hairs». Palp three-jointed.

First and second pairs of maxillae and maxillipeds. Normal.

First pair of pereiopods (Figs. 72 c, d, e). Slender, not expanded. The carpus is about three and a half times as long as it is broad. Its lower distal angle is usually furnished with one long and one short seta. The long seta does not extend to half the length of the propodus. Sometimes there are three setae at the lower distal angle. Also the setae on the other joints show some variation, see the figures. The propodus is somewhat longer than the carpus and is provided with a few short setae.

Second pair of pereiopods (Fig. 72 f). Broad and strong, the strongest of the four anterior pairs of pereiopods. The carpus increases somewhat in width towards its distal end and is furnished with two longitudinal rows of stout setae, the lower row consisting of 11—13, the upper of 12—17 setae. The three distal setae in the lower row are the

[1] Female specimen about 5.1 mm. in length.

[2] Thus in this species the »peduncle» generally speaking is single-jointed. HANSEN (1916) reckous three joints to the peduncle in the genus *Desmosoma*. I have found it more natural to include into the peduncle of the Parasellids the more differentiated proximal joints (normally four in number) which lack sensory filaments of the simple non-ciliated type.

longest. Their length is about two-thirds the length of the propodus. There are two kinds of setae, single-pointed and two-pointed. The first kind have their slender distal parts equipped with delicate »hairs». One seta of the latter kind is shown in Fig. 72 h[1]. In the lower row of setae the six proximal ones are of the single-pointed type, the seventh is two-pointed, but the eighth is again single-pointed. The other distal setae in this row are two-pointed. In the upper row the setae consist only of the single-pointed kind. The propodus also carries two longitudinal rows of setae; in the lower row there are six, in the upper about eight setae, all single-pointed. For the dactylus see Fig. 72 g.

Third pair of pereiopods. About the same as the second, but not quite so strong.

Seventh pair of pereiopods (Figs. 72 i and j). The proportion between the lengths of the joints is 56: 25.5 :7: 27: 19: 13. The setae on the lower margin of the carpus and the propodus are two-pointed. Fig. 72 k shows the distal part of such a two-pointed seta.

First pair of pleopods, male. The distal margins of the rami are convex and setiferous.

Second pair of pleopods, male. See fig. 72 l.

Operculum, female (Fig. 72 m). Distal margin somewhat concave and furnished with four setae at about equal distances from each other.

Third, fourth and fifth pairs of pereiopods. Normal, and of the same shape in males and females.

Uropods (Fig. 72 n). A little less than half as long as the abdomen. Second joint about one-third as long again as the first, distally furnished with three setae and two sensory filaments. The proportion between the lengths of the joints in the female type specimen is about 12: 15, in another specimen (see Fig. 72 n) 13: 18.

Remarks. *D. australis* is similar to the northern species *D. lineare* G. O. SARS, which it resembles in its first and second pereiopods, the first being slender and furnished with only a few setae on the carpus, in having single-branched uropods, and in the absence of projections on the pleotelson anteriorly to the uropods. It differs from the species mentioned especially in the different length of the first four pereion segments, in the setal armature on the first pereiopod, in the shape of the female operculum and the first pleopods of the male, and in having longer proximal joints of the uropods.

Localities and Material.

St. 22. South Georgia, off May Bay, lat. 54° 22′ S., long. 36° 28′ W. 75 m. Bottom temp. + 1.5°. Clay with some algae. 14/5 1902. Fragments of specimens.

St. 23. South Georgia, off the mouth of Morain Bay, lat. 54° 23′ S., long. 36° 26′ W. 64—74 m. Bottom temp. + 1.65°. Gray clay with gravel and stones. 16/5 1902. Fragments of specimens.

St. 30. South Georgia, Morain Bay, lat. 54° 24′ S., long. 36° 26′ W. 125 m. Bottom temp. — 0.25°. Clay with sparse stones. 26/5 1902. 2 specimens, female with young (type) about 5.1 mm. in length, and male about 4.1 mm. in length.

South Georgia, Morain Bay. 148 m. Bottom temp. — 0.35°. 15/5 1902. Male (type), 4.1 mm. in length.

Distribution. South Georgia (Sw. Ant. Exped).

Desmosoma brevipes n. sp.

Pl. II Fig. 21; Text. figs. 73 a—i.

Diagnosis. First pereion segment about half as long as the fourth and about one-third as long as the third. Second pereion segment the longest of the first four pereion seg-

[1] Cf. also BONNIER, 1896, Pl. 34, Fig. 3 m.

ments and one-third to one-fourth as long again as the third. The fifth segment of the pereion is widest posteriorly and slightly decreases in width towards the anterior margin. Abdomen with greatest width near the anterior margin. Last joint of the antennula shorter than the penultimate joint. First pair of pereiopods slender, with a few setae on the lower margin of the carpus, the seta at the lower distal angle being the longest but not extending to half the length of the lower margin of the propodus. Second pair of pereiopods broad and strong; the carpus with its greatest width near the distal margin; not fully twice as long

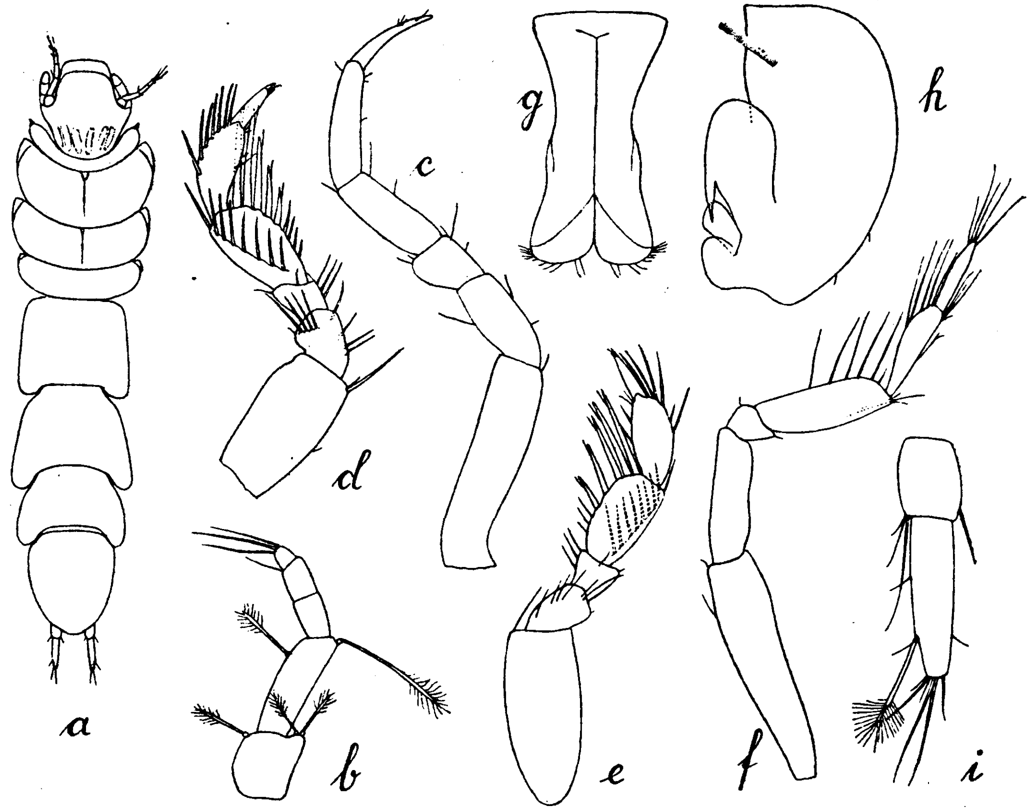

Fig. 73. *Desmosoma brevipes* n. sp. a. Femalé from, above, 35 ×. b. Left antennula, 160 ×. c. Right first pereiopod, adult male, 115 ×. d. Right second pereiopod, seen from the caudal side, female, 80 ×. e. Right second pereiopod, seen from the rostral side, female, 80 ×. f. Seventh pereiopod, 95 ×. g. First male pleopods, 160 ×. h. Right second male pleopod, from the caudal side, 240 ×. i. Left uropod, female, 235 ×.

as its greatest width and furnished with two longitudinal rows of setae with eight or nine setae in each row, the two distal setae in the lower row extend to about half the length of the dactylus. First pleopods of the male with distal margins of the rami evenly convex. Female operculum with the distal margin slightly concave and furnished with four setae. Uropods single-branched, with second joint about twice as long as the first.

Description.

Types. Adult male, and female with an empty marsupium, both about 2 mm. in length.

Head (Fig. 73 a). Of the usual shape in the genus; posteriorly with six faint oblong elevations.

Pereion (Fig. 73 a). First segment short, about half as long as the fourth. The second segment is the longest of the first four pereion segments and about twice as long as the fourth. The third segment is about three-fourths as long as the second. The fifth pereion segment decreases slightly in width in anterior direction.

The coxal plates on the first four segments are small and triangular and have the same shape in males and females.

Abdomen (Fig. 73 a). Anteriorly with a faintly indicated short free segment. The shape of the pleotelson is slightly different in males and females. In the first sex its posterior part between the uropods is slightly more projecting.

Antennulae (Fig. 73 b). Normal and consisting of five joints. The first joint is the broadest; it increases slightly in width towards the distal end. The second joint is more than half as long again as the first and about as long as the last three joints together. Of these the third and fourth are subequal in length and about twice as long as the fifth. The proportion between the lengths of the joints is 15: 25: 10: 9: 5.

Antennae. Normal. The peduncle consists of six joints, of which the first four are short and of about equal length; together they are subequal in length to the fourth joint or somewhat shorter. The fifth joint is slightly longer than the fourth. The flagellum consists of nine joints (in a female about 2.1 mm. in length and a male about 2 mm. in length). In the male it is, as usual in *Desmosoma*, stronger and broader than in the female.

First pair of pereiopods (Fig. 73 c). Very similar to those in *D. australis* but comparatively shorter and broader. The carpus is about two and a half times as long as it is broad; its lower distal angle is usually furnished with one long and one short seta (on the figured specimen only one seta). The propodal joint is slightly longer than the carpus. The proportion between the lengths of the joints is 17: 7: 5: 7.5: 9.5: 6.5.

Second pair of pereiopods (Figs. 73 d and e). They are the broadest of all the pereiopods. The carpus increases on width towards the distal end and carries two longitudinal rows of setae with eight setae in the lower and eight or nine setae in the upper row. In the lower row the three or four proximal setae are single-pointed, the others two-pointed. The two most distally situated setae extend to half the length of the dactylus. In the upper row there are only single-pointed setae. The propodal joint has an upper longitudinal row of seven setae; on the lower margin there are four setae, of which two at the lower distal angle.

Third pair of pereiopods. Much as the second pair, but somewhat more slender.

Seventh pair of pereiopods (Fig. 73 f). The proportion between the lengths of the joints is 23: 11: 3: 11.5: 9: 7.

First pair of pleopods, male (Fig. 73 g). Distal margin of the rami convex and furnished with setae.

Second pair of pleopods, male. See Fig. 73 h.

Operculum, female. Of the same shape as in *D. australis;* distal margin slightly concave and furnished with four setae; lateral margins smooth.

Uropods (Fig. 73 i). Single-branched, as in *D. australis*, but the second joint is longer, being twice as long as the first.

Remarks. *D. brevipes* comes very close to *D. australis*, but is a smaller species. It differs from *D. australis* especially in its smaller size, in having another shape of the fifth pereion segment, which decreases in width in anterior direction, in having a relatively greater width of the carpus of the first and second pereiopods, in having the second joint of the uropods longer, and the terminal joint of the antennulae shorter.

Localites and Material.

St. 23. South Georgia, off the mouth of Morain Bay, lat. 54° 23′ S., long. 36° 26′ W. 64—74 m. Bottom temp. + 1.65°. Gray clay with gravel and stones. 16/5 1902. Female with empty marsupium (type), 2 m. in length.

St. 24. South Georgia, off the mouth of Grytviken, lat. 54° 22′ S., long. 36° 27′ W. 95 m. Clay. 20/5 1902. Female with young; length about 2.2 mm.

St. 30. South Georgia, Morain Bay, lat. 54° 24′ S., long. 36° 26′ W. 125 m. Bottom temp. — 0.25°. Clay with sparse stones. 28/5 1902. 9 specimens. Length of largest specimen about 2.1 mm.; a male (type) and a female with embryos had the length of 2 mm.

South Georgia, Morain Bay. 148 m. Bottom temp. — 0.35°. 15/6 1902. 7 female specimens. Length of largest specimen 2.4 mm. (ovigerous female).

Distribution. South Georgia (Sw. Ant. Exped.).

Desmosoma modestum n. sp.

Text. figs. 74 a—h.

Diagnosis. First pereion segment about half as long as the fourth, which is slightly shorter than the third. Second pereion segment slightly longer than the third. Fifth pereion segment with its broadest part near the anterior margin and thence decreasing somewhat in width posteriorly. Last three joints of the antennula subequal in length. First pair of pereiopods about as strong as the second; lower margin of carpal joint with four long setae at about equal distances from each other; the lower distal angle of the propodus with two short setae. Second pair of pereiopods with carpus and propodus about equal in width and with carpal joint 2—2$^1/_2$ times as long as it is broad; its two rows of setae consist of nine setae in the lower row, eleven in the upper, of which the two distal ones in the lower row are the longest. Female operculum broader than it is long, distal margin slightly concave in the middle and furnished with about five setae. Uropods about as long as one-third the length of the abdomen, single-branched, with second joint about twice as long as the first.

Description.

Type. Female with an empty marsupium, 2.2 mm. in length.

Head. Of the usual shape, with faint sculpturing on its hinder part.

Pereion. Decreasing in width in females without a marsupium continuously backwards. In females with a marsupium (Fig. 74 a) the second, third and fourth segments are slightly broader than the first. The first segment is the shortest, being about as long as the fourth segment. The third segment is somewhat longer than the fourth. The second segment is the longest of the first four segments, but is only slightly longer than the third. The long fifth segment has its broadest part very near the anterior margin and decreases from there in width slightly in a posterior direction. Sixth and seventh segments of the usual shape; lateral margins slightly convex.

The coxal plates on the first four segments are triangular, pointed on the first two segments, and are slightly more rounded anteriorly on the following two segments.

Abdomen. Comparatively narrower than in *D. australis* and *brevipes*, being one-half to one-third as long again as the sixth pereion segment. The proportion between the length and the breadth of the abdomen is about as 11: 8. Anteriorly it has an indication of a faint first segment.

The pleotelson is broadest anteriorly, its lateral margins are slightly convex; distal margin between the uropods evenly convex.

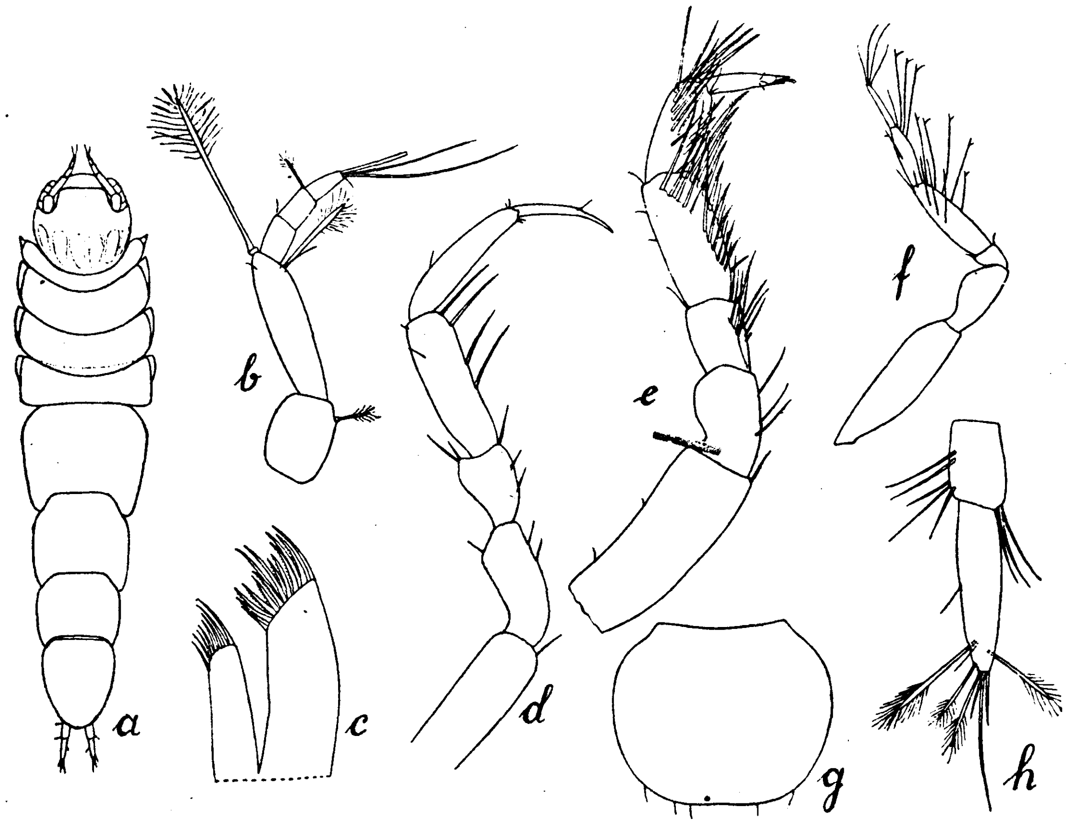

Fig. 74. *Desmosoma modestum* n. sp. a. Female with a marsupium, 27 ×. b. Antennula, female, 230 ×. c. First maxilla (except its proximal part), female, 230 ×. d. Right first pereiopod (except the proximal end of the basipodite), female, 140 ×. e. Right second pereiopod, female, 95 ×. f. Seventh pereiopod, female, 95 ×. g. Female operculum, 117 ×. h. Right uropod, from below, female, 230 ×.

Antennulae (Fig. 74 b). The proportion between the lengths of the joints is 12: 20: 5: 5: 5. The second joint is thus almost twice as long as the first, and the last three joints are subequal in length.

Antennae. Normal. First four joints short. The sixth joints is one-third as long again as the fifth but more slender. The flagellum is about one-third as long again as the last peduncular joint and, in a specimen measuring 1.6 mm. in length, consists of eight joints; but the suture between the first two joints is extremely faint.

First pair of maxillae. See Fig. 74 c.

First pair of pereiopods (Fig. 74 d). Almost as strong as the second pair. The carpus is about three times as long as it is broad and slightly longer than the propodus.

A very characteristic feature of the species is that the carpus is furnished on its lower margin with four long setae. These setae are single-pointed and equipped with very fine »hairs»[1], the length of the setae exceeds half the length of the propodus. The propodus is provided with a few setae; two short ones are situated at the lower distal angle. For details see figure.

Second pair of pereiopods (Fig. 74 e). Carpal joint of uniform width, 2—2 $^1/_2$ times as long as it is broad. In the lower row there are nine setae, the length of the most distal one exceeding that of the propodus. In the upper row there are eleven setae. Propodus with a lower row of about five setae (of which one seta is situated at the lower distal angle) and with an upper row of eight setae.

Third pair of pereiopods. About as the second.

Seventh pair of pereiopods. See Fig. 74 f.

Operculum, female (Fig. 74 g). Distal margin slightly concave in the middle, and furnished with about five setae.

Uropods (Fig. 74 h). Single-branched; second joint about twice as long as the first.

Remarks. The most characteristic feature of *D. modestum* is the structure of the first pair of pereiopods, which are almost as strong as the second pair and have the lower margin of the carpus furnished with four long setae. In these feature *D. modestum* differs very sharply from *D. australis* and *brevipes*, which two species it otherwise somewhat resembles. The proportion of the thoracic segments, the shape of abdomen etc., are also characteristic. The male of the species is unknown.

Localities and Material.

St. 18. South Georgia, mouth of Westfjord, Cumberland Bay, lat. 54° 15′ S., long. 36° 25′ W. 250 m. Bottom temp. + 1.2°. Soft clay. $^{22}/_4$ 1902. 4 female specimens, one of them broken. Length of largest specimen 2 mm.

St. 30. South Georgia, Morain Bay, lat. 54° 24′ S., long. 36° 26′ W. 125 m. Bottom temp. — 0.25°. Clay with sparse stones. $^{26}/_5$ 1902. 9 females, partly broken. Length of largest specimen 2.2 mm (type specimen).

Distribution. South Georgia (Sw. Ant. Exped.).

Desmosoma falklandicum n. sp.

Text. figs. 75 a—f.

Diagnosis. First three pereion segments subequal in length, the fourth shorter and narrower than the third. Fifth pereion segment sub-rectangular with lateral margins concave. Abdomen oblong, being broadest about across the middle and with sparse short setae on the lateral sides. Last antennular joint about one-third as long as the penultimate joint. First pair of pereiopods much stronger than second pair; carpal joint very much expanded, only about one-third as long again as it is broad, its lower margin with eight strong setae; the propodus is shorter than the carpus and only somewhat more than half as broad as this joint. Second pair of pereiopods with carpus about three times as long as it is broad and provided with a lower setal row consisting of ten setae and an upper row with sparse (two) setae. Female operculum sub-circular in outline, its lateral and distal margins furnished with sparse setae.

[1] Only visible on high magnification.

Description.

Type. Female with semi-developed oostegits (Fig. 75 a), length 2.5 mm.

Head (Fig. 75 a). Of the shape usual in the genus, about as long as the first plus two-thirds the length of the second pereion segment.

Pereion (Fig. 75 a). Greatest width across the first segment; second segment almost as broad as the first, the third somewhat narrower than the second; fourth segment considerably narrower than the third. The first three segments are subequal in length. The fourth segment is the shortest of all the pereion segments. The fifth segment is subrec-

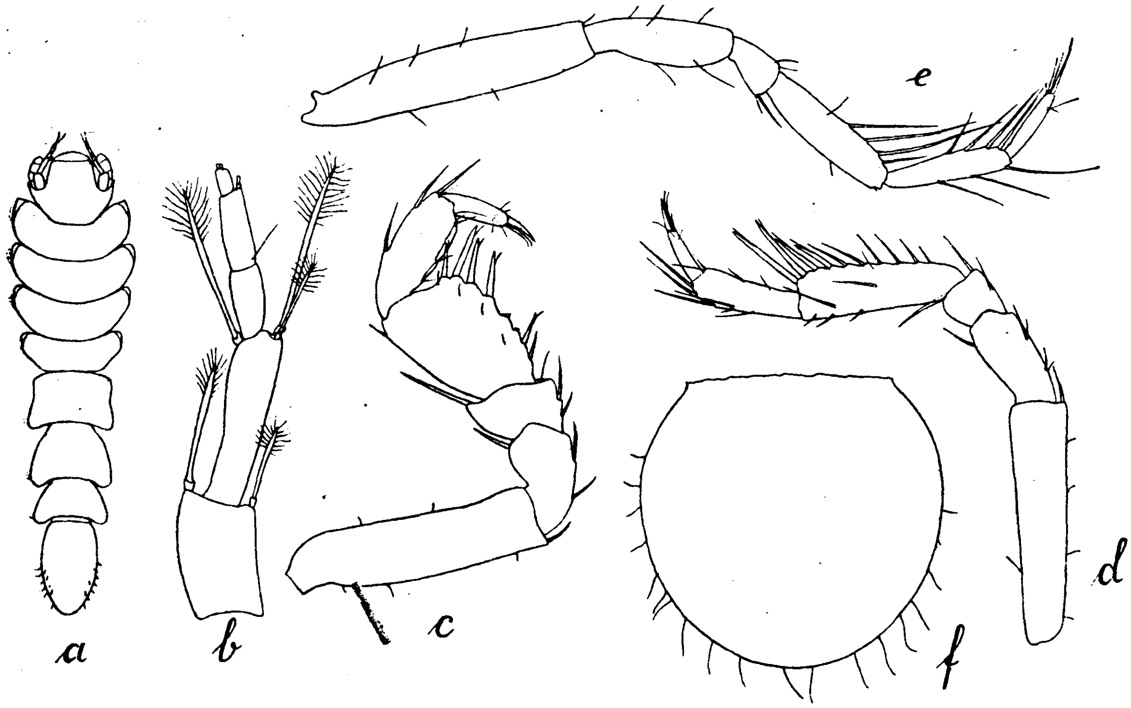

Fig. 75. *Desmosoma falklandicum* n. sp. a. Female, from above, 24 ×. b. Right antennula, female, 230 ×. c. Right first pereiopod, female, 95 ×. d. Right second pereiopod, female, 95 ×. e. Right seventh pereiopod, female, 95 ×. f. Female operculum, 125 ×.

tangular and has a slightly convex anterior margin; its posterior margin is slightly concave; its lateral margins are concave; its anterio-lateral and posterio-lateral angles are rounded. The sixth and seventh pereion segments are of the shape usual in the genus.

Coxal plates small, on the first segment pointed, on the second to third segments rounded anteriorly.

Abdomen (Fig. 75 a). About as long as the seventh and sixth pereion segments together. Anteriorly there is a distinct free segment. Pleotelson oblong, being broadest about across the middle, somewhat more than half as long again as it is broad; its lateral sides provided with a few short setae.

Antennulae (Fig. 75 b). The proportion between the lengths of the joints is 17: 24: 10: 11: 4.

Antennae. Broken; only the first four short joints remain.

First pair of pereiopods (Fig. 75 c). They are the strongest of all the pereiopods and very characteristic. The carpus is very broad and expanded, sub-oval, about one-fifth as long again as the propodus. It increases somewhat in width towards its distal end. The proportion between its length and its greatest width is 12: 9 and, consequently its greatest width is three-fourths of its length. The distal margin in its lower part is free to about half its length, the proximal margin of the propodus being in contact only with the upper half of the distal margin of the carpus. The lower margin of the carpus is furnished with a longitudinal row of eight stout setae, most of them two-pointed. Submarginally at the lower margin there are four short, hair-like setae. The propodus is only slightly more than half as wide the carpus, the proportion between the width of the propodus and that of the carpus being 9: 16. Its upper margin is provided with three long single-pointed setae, one of them situated at the upper distal angle. The marginal part of the lower side of the propodus is very thin; it is furnished with four setae. Dactylus provided at the tip with a distinct claw and two setae.

Second pair of pereiopods (Fig. 75 d). More slender than the first pair. The basipodite and the carpus increase slightly in width towards their distal ends. The carpus is about three times as long as it is broad and approximately one-third as long again as the propodus, the proportion between its length and its width being 28: 9; the proportion between the lengths of the carpus and the propodus is 28: 20. The lower margin of the carpus is provided with 10 stout setae; upper setal row with sparse setae (two). The propodus is provided with four setae on its lower margin; two of which are situated at its lower distal angle. The upper row of setae consists of five long and some short setae. For other details see the figure.

Third pair of pereiopods. About as the second. Carpus with a lower row of 9 setae and an upper row of 4 setae.

Seventh pair of pereiopods. See fig. 75 e.

Operculum, female (Fig. 75 f). Almost circular; distal and lateral margins sparsely furnished with setae.

Uropods. Broken.

Remarks. *Desmosoma falklandicum* is especially characterized by its strong first pereiopods, which have the carpal joint expanded and furnished with stout setae. In contradistinction from the three above described species of *Desmosoma,* it thus belongs to Section II in HANSEN's analytical table of the genus[1]. *Desmosoma falklandikum* is easily recognized by its characteristic first pereiopods and the shape of its pereion, the first three segments of which are long, the third shorter and narrower, whilst the lateral margins of the fifth segment are concave. The shape of the abdomen is also characteristic.

Only a single specimen of this characteristic species was obtained by the Swedish Antarctic Expedition.

Locality and Material.

St. 40. Falkland Islands, Berkeley Sound, lat. 51° 33′ S., long. 58° 0′ W. 16 m. Bottom temp. + 2.75°. Gravel and shells with algae. 19/7 1902. One female specimen, about 2.5 mm. in length (type).

Distribution. Falkland Islands (Sw. Ant. Exped.).

[1] HANSEN (1916, p. 107).

F. Group **Ilyarachnini** HANSEN, 1916.

For diagnosis see HANSEN (1916, p. 120—121).

Genus **Ilyarachna** G. O. SARS, 1863.

G. O. SARS, 1899, HANSEN 1916, BARNARD 1920.

For diagnosis see G. O. SARS (1899, p. 134—135) and HANSEN (1916, p. 121—122).

Ilyarachna antarctica VANHÖFFEN, 1914.

Text. figs. 76 a—d.

Ilyarachna antarctica. VANHÖFFEN, 1914 p. 591—592, Figs. 124 a and b.

Supplementary Description.

Antennulae (Fig. 76 a). First joint broad, its outer distal part triangularly produced and furnished with a ciliated seta at the tip; its lateral margin furnished with a row of two-pointed setae of the usual type; inner margin devoid of setae, except one short seta at the inner distal angle. Second joint much smaller than the first The third joint

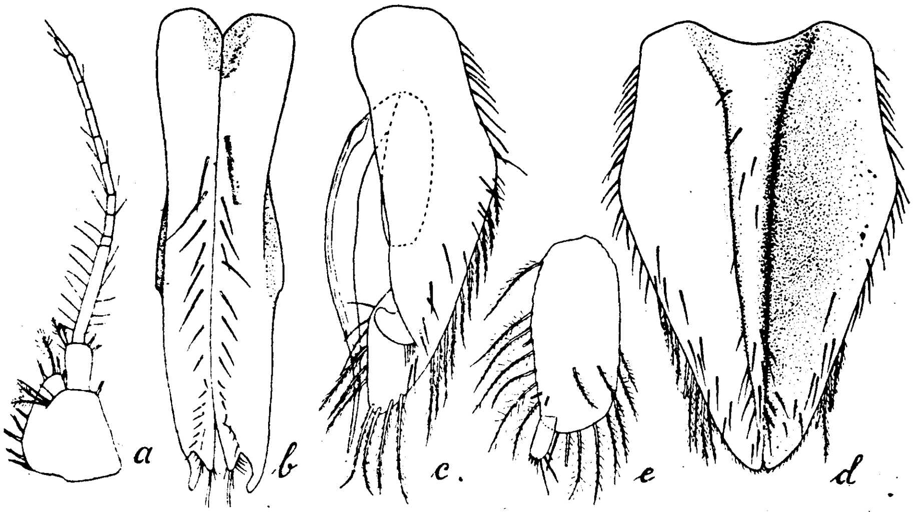

Fig. 76. *Ilyarachna antarctica* VANHÖFF. a. Left antennula, ovigerous female, 25 ×. b. First male pleopods 70 ×. c. Left second male pleopod, from the rostral side, 70 ×. d. Female operculum, 50 ×. e. Uropod, 70 ×.

is very long and narrow, whilst the fourth is minute. The remaining part of the antennula is composed of eight narrow joints in the female, nine or ten in the male.

Antennae. Broken in most of the specimens, so that only the first four short joints remain. In one ovigerous female, however, almost the whole of one antenna remains, the flagellum having been broken off only at the tip. In this specimen, in spite of the broken tip, the antenna attains a length of about three times the body length. The squama on the third joint is distinct but small. The fifth peduncular joint is provided with sparse setae; the sixth joint is almost smooth.

Mandibles. Of the usual type in the genus. Mandible corpus provided on its anterior side with a broad somewhat bright-golden carina. The lacinia is distinctly developed on the left mandible. The setal row consists of seven setae, on the left mandible. Molar tubercle tapering conically towards the end, which is furnished with three setae. Palp long and narrow, consisting of three joints, of which the second is the longest; the last joint is provided with two apical setae.

Maxillipeds. Of the usual type in the genus, having the second and third joints of the palp very broad. The epipodite is obtusely pointed distally. Coupling-hooks, five on the right, six on the left maxilliped.

First pair of pleopods, male (Fig. 76 b). Almost of uniform width. The anterior surface of the fused sympodites is provided with two longitudinal rows of setae, one on either side of the middle line. Both the digitiform exopodites and the subtriangular endopodites have coalesced with the sympodites, so that the sutures have been effaced.

Second pair of pleopods, male. See Fig. 76 c.

Operculum, female (Fig. 76 d). Provided with a sharp longitudinal carina along the middle line.

Uropods (Fig. 76 e). Exopodite completely wanting.

Locality and Material.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. $^5/_6$ 1902. 5 specimens (2 small male specimens and 3 adult females, two of them with eggs). Length of largest specimen 5.3 mm. (female).

Distribution. South Georgia (Sw. Ant. Exped.), Gauss Station (VANHÖFFEN 1914).
The species has not previously been recorded from South Georgia.

Genus **Echinozone** G. O. SARS, 1899.

For diagnosis see G. O. SARS (1899, p. 139).

Of this genus, which is closely allied to *Ilyarachna* G. O. SARS, only five species have been described; two of them, *E. coronata* G. O. SARS and *E. arctica* HANSEN, are from the northern area, whilst three species *E. quadrispinosa* (BEDDARD), *spinosa* HODGSON and *magnifica* VANHÖFFEN are Antarctic or subantarctic. E. *spinosa* HODGSON will be shown below to be synonymous with *E. quadrispinosa* (BEDDARD). The known southern forms of *Echinozone* are thus reduced to only two species.

Echinozone quadrispinosa BEDDARD, 1886.

Text figs. 77 a—l.

Ilyarachna quadrispinosa. BEDDARD, 1886, p. 76—78, Pl. XII, Figs. 2—6.
Echinozone spinosa. HODGSON, 1902, p. 255—256, Pl. XXXVIII and XXXIX, Figs. 1—10; MONOD, 1926, p. 23—25, Figs. 16, 17 a—f, 18.

Supplementary Description.

Antennulae. Extending to about half the length of the fourth peduncular joint of the antennae. First joint larger and broader than the others; its outer distal angle is triangularly produced and provided with a plumose seta at the tip. Second joint only about one-third as broad as the first, inserted at the inner part of the distal margin of the first joint. The remaining part of the antennula consists of about 24 joints, the first of which is very long, being about one-fourth the length of the others taken together.

Antennae (Figs. 77 a and b). First four peduncular joints very short, first and second laterally (posteriorly) produced and obtusely pointed, the third with a distinct, distally setiferous squama. Ventrally the distal margins of the second and third joints are each furnished with a row of two-pointed setae.

Mandibles (Fig. 77 c)[1]. Mandible corpus with a broad slightly bright-golden carina on its anterior side (not to be seen in the figure, which shows the posterior surface of the mandible). None of the mandibles have any lacinia (as is the case also in *Echinozone arctica* HANSEN)[2], but the ventral seta in the setal row is stronger in the left than in the right mandible and is probably homologous with the lacinia[3].

Maxillipeds. Endite with five coupling-hooks, distally with two submarginal rows of setae. The dorsal row consists of five broad setae, each with two rows of sub-branches[4]. The ventral row consists of a large number of slender setae.

Pereiopods. First pereiopod see Fig. 77 d. On the fifth and sixth pereiopods the basipodite is furnished with single-pointed setae without sub-branches, while the ischium is provided on its upper margin with a row of plumose setae, on its lower margin with branchless setae. The carpus and the propodus are furnished both on the upper and lower margins with plumose setae. I did not find a spine on the dorsal margin of the ischial joint, a feature which BEDDARD (1886) states to be characteristic of the species[5]; the spine is not figured by HODGSON (1902). On the seventh pereiopod the setal armature is similar to that of the fifth and sixth, except that the setae fringing the margins of the joints are more sparse. The small ischial joint of the last three pairs of pereiopods is furnished only with branchless setae.

First pair of pleopods, male (Figs. 77 e and f). They are inserted in the first abdominal segment. The fused sympodites are provided with a sharp longitudinal carina along the median line on the rostral side, gradually vanishing somewhat distally from the middle. The carina is furnished with one row of long setae, situated almost alternating with each other on either side of the middle line. This row has presumably been formed by the coalescence of two rows, as on the distal half of the sympodites it gradually divides into two distinct rows, where the setae gradually diminish in size. The exopodites and endopodites are fused with the sympodites. The exopodites are distally hook-shaped.

Second pair of pleopods, male (Fig. 77 g). Inserted in the pleotelson. The sympodite has the distal half of its lateral margin furnished with a row of plumose setae, which continues on the distal tip, where the setae are situated submarginally on the anterior side. The distal half of the anterior surface of the sympodite is moreover provided with long scattered branchless setae. The distal margin itself is covered with fine »hairs» lacking a setal canal. The rami (see the figure) are both short.

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[1] Cf. also HODGSON (1902, Pl. XXXIX, Fig. 8) and MONOD (1926, Fig. 18).
[2] See HANSEN, 1916, p. 129.
[3] Cf. MONOD, 1926, Fig. 18.
[4] The setae have the same construction as those from the same place in *Ianira* (*Iathrippa*) *longicauda* (CHILTON). See Fig. 40 e.
[5] See BEDDARD, 1886, Pl. XII Fig. 6.

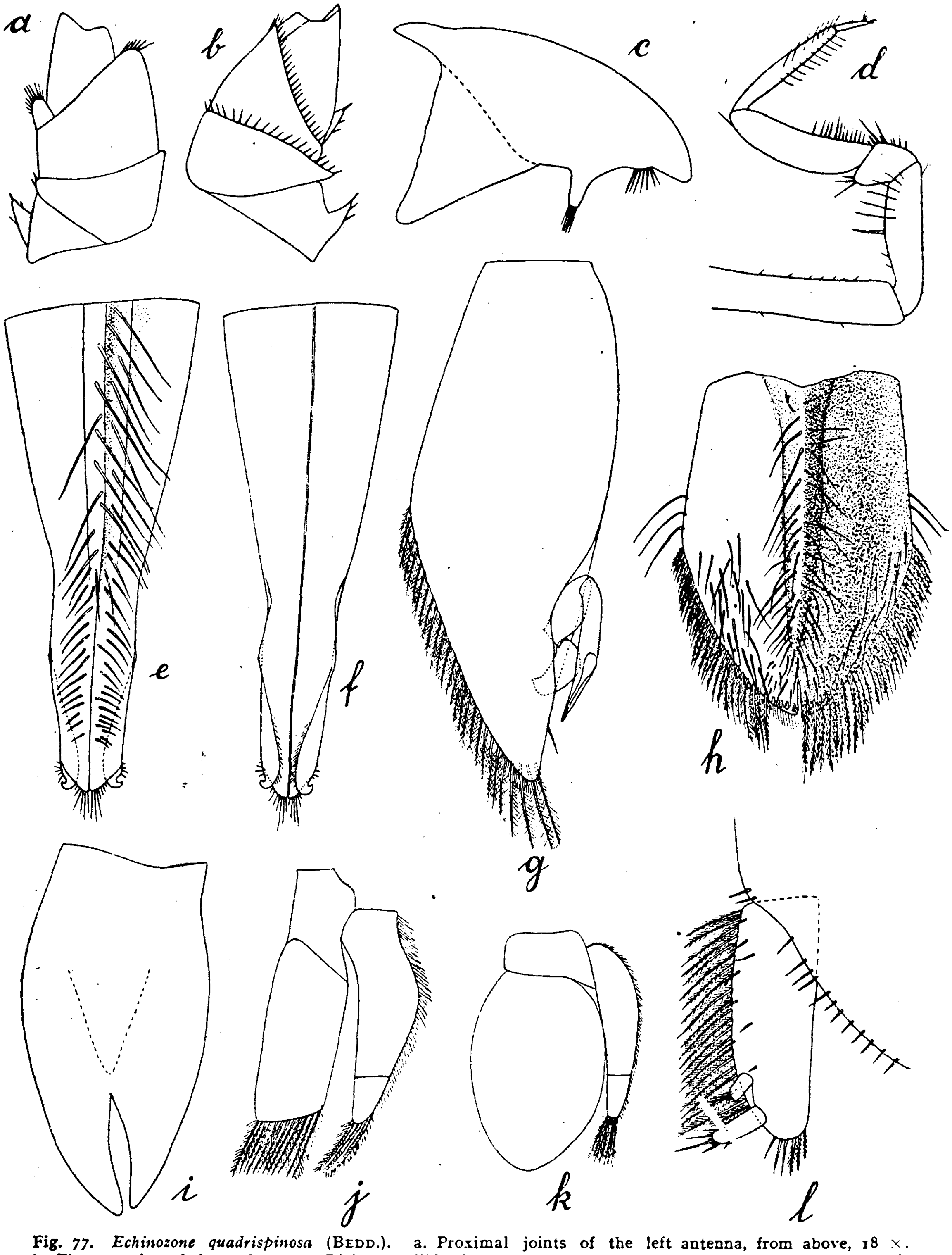

Fig. 77. *Echinozone quadrispinosa* (BEDD.). a. Proximal joints of the left antenna, from above, 18 ×. **b.** The same from below, 18 ×. c. Right mandible, from the posterios side, male, 50 ×. d. First pereiopod. adult female, 18 ×. e. First male pleopods, seen from the rostral side, 80 ×. f. First male pleopods, seen from the caudal side, 80 ×. g. Left second male pleopod, from the caudal side, 80 ×. h. Female operculum, 25 ×. i. Female operculum from immature specimen taken out of the marsupium, 240 ×. j. Third pleopod, 30 ×. k. Fourth pleopod, 30 ×. l. Left uropod, seen from the ventral side, female, 80 ×.

Operculum, female (Fig. 77 h). Inserted in the pleotelson. It is strongly vaulted. Lateral margin in its proximal half straight, in its distal half convex. Distal margin at the tip with a short but distinct incision. The operculum is provided along the median line of its anterior surface with a sharp longitudinal carina furnished with long setae, which proximally are situated approximately alternating with each other on the right and left side of the middle line, but distally are arranged in two distinct longitudinal rows. The longitudinal carina narrows towards its distal end and is marked off by grooves; also its distal end is abruptly delimited from the rest of the operculum. The distal halves of the lateral margins are furnished with rows of plumose setae, increasing in length towards the distal end and continuing on the distal tips (exactly as in the second male pleopods) with some submarginal setae on the anterior side; the distal margin itself is furnished with fine »hairs».

In young individuals taken out of the marsupium (Fig. 77 i) the longitudinal carina of the operculum is only slightly indicated, and the incision in the distal margin is longer and much more marked than in adult individuals, thus indicating that the operculum was originally formed by the coalescence of two distinct plates.

Third pair of pleopods (Fig. 77 j). Similar in both sexes. Basipodite longer than broad; proximal and inner margins straight; outer margin irregularly curved; distal margin straight, oblique. The exopodite has its outer margin convex and inner margin slightly concave. It is two-jointed, being divided by a suture into two plates, one large proximal and one small distal one. The second joint of the exopodite is furnished with about six plumose setae at the tip. The whole lateral margin of the exopodite is provided with »fine hairs». The endopodite is almost rectangular; its distal margin is furnished with about twelve plumose setae.

Fourth pair of pleopods (Fig. 77 k). Basipodite broader than long. Exopodite indistinctly two-jointed; its lateral margin provided with short, fine »hairs»; distal tip of the exopodite with about six plumose setae. Endopodite broad, ovate.

Fifth pair of pleopods. Basipodite small, vestigial, about rectangular. Exopodite wanting. Endopodite oval.

Uropods (Fig. 77 l)[1]. Inserted in small incisions on the lateral margin of the pleotelson and usually folded in below the pleotelson.

Variation. Of this species BEDDARD (1886) says that it is of small size. The largest specimen, an ovigerous female, seen by BEDDARD was only 6 mm. in length. HODGSON (1902) describes a species of *Echinozone* (*E. spinosa*), closely allied to *E. quadrispinosa*, but differing from the latter species in having a pair of spines on the dorsal side of the last two pereion segments. Regarding the size and sex of his specimens HODGSON gives no particulars.

As the difference indicated by HODGSON (1902) between his species *E. spinosa* and *E. quadrispinosa* is minute, VANHÖFFEN (1914, in describing *E. magnifica*) very properly makes the suggestion that the species of HODGSON is possibly identical with *E. quadrispinosa*.

MONOD (1926) examined three female specimens from the Antarctic, the largest 11 mm. in length, yet with only rudiments of oostegits. All his three specimens had

[1] See also MONOD, 1926, Fig. 17 E.

a considerably greater length than that previously stated by BEDDARD (1886) to be characteristic of *E. quadrispinosa*. As in their spine-armature they essentially agreed with the figure and description by HODGSON (1902, *E. spinosa*), he refers them[1] to the species of HODGSON.

They also differ from HODGSON's specimens (1902) in another respect; they all have the last peduncular joint of the antennae about as long as the body, whereas in the figure by HODGSON (1902) it is only about equal in length to the head and the first five pereion segments together. MONOD therefore presumes that the length of the last peduncular joint of the antennae varies in specimens of different size.

The Swedish Antarctic Expedition collected a large amount of material of *Echinozone quadrispinosa*, so that I have been in a position to study the variation within the species. As regards spine-armature, the variation is considerable. This will be illustrated by the tabular view below, which comprises 35 specimens (14 males, 21 females), all from South Georgia.

Spine-armature on the fifth to seventh pereion segments of Echinozone quadrispinosa (BEDDARD).

	Number of specimens. Males	Females
1. Fifth, sixth and seventh pereion segments smooth or almost smooth (quadrispinosa-specimens, typical)	0	9
2. Fifth pereion segment spinous, sixth and seventh smooth (quadrispinosa-specimens, non-typical)	1	7
3. Fifth and sixth pereion segments spinous, seventh smooth (spinosa-specimens, non-typical)	9	1[2]
4. Fifth, sixth and seventh pereion segments spinous (spinosa-specimens, typical)	4	4[3]

As shown by the tabular view the examined material contains both specimens which agree with *quadrispinosa* (BEDDARD) and with *spinosa* (HODGSON), as well as all manner of transitional forms between the two supposed species. I therefore regard *spinosa* HODGSON as synonymous with *quadrispinosa* BEDDARD. It will also be seen that the males are generally more spinous than the females. All the males examined, but only 12 of the females, had spines or distinct tuberculae on the fifth pereion segment, nine females having no spines or tuberculae on that segment. Whether abundant and distinct spine-armature of the male sex always occurs in this species is a question which cannot be settled on the basis of the table. After comparing the spine-armature of specimens with their size, I came to the conclusion that larger specimens are generally more spinous than smaller ones. But from this rule there were many exceptions. Thus one female, only 3 mm. in

[1] Their spine-armature is, however, very similar to that characteristic of *E. quadrispinosa* according to BEDDARD (1886), as »les tubercules spiniformes dorseaux de la division postérieure du péréion sont ici à peine perceptible et moins développés que sur la figure de HODGSON» (MONOD, 1926, p. 24).

[2] Distinct spines on the fifth, tuberculae on the sixth segment.

[3] Distinct spines on the sixth, tuberculae on the seventh segment.

length, had spines on the fifth pereion segment, whilst in one adult female, 5 mm. in length, spines were wanting on that as well as on the following segments.

As mentioned above, MONOD (1926) observed a considerably greater length of the last peduncular joint of the antennae in his examined specimens than was stated by HODGSON in 1902; he presumes that the length of the last peduncular joint varies with the size of the specimens. I investigated this matter by comparing the length of the last peduncular antennal joint with the lengths of the specimens examined. In my material only eleven specimens (two males, nine females) had one or both of the antennae still adhering to the head. The lengths of their last peduncular joints, as well as their size, are given in the table below.

Length of the last peduncular joint of the antennae and the size of the specimens in Echinozone quadrispinosa (BEDDARD).

Length of the specimens in mm.	*Length of the last peduncular joint of the antennae in mm.*	*Loc.*
Females.		
3.5 (without oosteg.)	Extending to the anterior margin of the seventh pereion segment.	St. 34
3.5 » »	Extending to the anterior margin of the abdomen	St. 34
4.4 » »	Extending to the middle of the seventh pereion segment	St. 34
4.4 » »	Extending to the anterior margin of the abdomen	St. 34
6.0 (oostegits semi-developed)	» » » » » » » »	St. 22
6.3 »	» » » » » » » »	St. 22
6.4 »	» » » » » » » »	St. 34
6.8 »	» » » » » » » »	St. 34
7.2 (rudiments of oostegits)	» » » » » » » »	St. 34
Males.		
(3.9[1]	Extending to the end of abdomen	St. 24)
4.0	Extending to half the length of the abdomen	St. 34
6.0	Extending behind the body (the joint was one-fourth longer than the specimen)	St. 34

From this table it will be seen that most of the female specimens have the last peduncular joint of the antennae about as long as the head plus the pereion. This was observed in female specimens of a length ranging from 3.5 to 7.2 mm., which gives support to the view that the length of the last peduncular antennal joint, does not increase in length with age. It must be brought in view, however, that I have not examined specimens of such great length as those investigated by MONOD (1926). That a considerable variation in the length of the last peduncular joint of the antennae is found in the species, even in specimens of the same size, is shown by the table; in the two smallest specimens, both 3.5 mm. in length, the joint in one case extended to the anterior margin of the seventh

[1] The antenna was not found adhering to the head, but it probably belongs to that specimen.

pereion segment, and in the other to the anterior margin of the abdomen. In no specimen, however, was the joint so short as in the specimen figured by HODGSON (1902), where the last peduncular joint of the antenna only reached the anterior margin of the sixth pereion segment. The males (only three specimens) show a considerable difference from the females. The length of the last antennal peduncular joint, in all specimens, is much greater than in the females, amounting in the small specimen (4 mm.) to half the length of the abdomen; in the largest specimen (6 mm.) the joint is of a remarkable length, being about one-fourth longer than the body. The measurements show that in the males the last antennal peduncular joint is longer than in the females, and that its length in the specimens examined increases with size. But, as only three male specimens were examined it cannot be decided whether the difference in length of the last peduncular antennal joint is not due to a considerable individual variation.

A characteristic feature of those specimens of *Echinozone quadrispinosa* which have been collected in the Antarctic, is their larger size compared with specimens found in subantarctic waters (see MONOD, 1926). The largest specimen from the Expédition Antarctique Belge 1897—99 was a female 11 mm. in length and was not yet mature, being furnished only with rudiments of oostegits, whilst BEDDARD (1886) gives the length of his largest specimen (ovigerous female) collected off the Kerguelen as only 6 mm.

As the material from the Swedish Antarctic Expedition contains only one specimen collected in the Antarctic (Graham Region), I cannot say anything about the variation of Antarctic specimens of *Echinozone quadrispinosa*. The specimen from Graham Region, is, however, the largest of all the specimens collected during the Expedition and the largest of all specimens of *Echinozone* hitherto caught. It is a female about 17 mm. long and yet having only semi-developed oostegits. The largest specimen from South Georgia obtained by the Expedition is a female with semi-developed oostegits 9.7 mm. in length. Some of the specimens collected at the same time and locality are only about 5 mm. in length, but have, however, a fully developed marsupium. This considerable variation of size in adult specimens from the same material gives support to the supposition that the females may survive the laying of offspring and may mature several times; thus, increasing in size after every moult, they may attain, comparatively speaking, gigantic proportions.

Remarks. The female and the male operculum show a remarkable resemblance to each other. Though the male operculum is formed by three plates (the fused first pair of pleopods and the second pleopods), these three plates lie so very close together that without separating the plates it is difficult on a superficial view to determine the sex by observing the pleopods.

The shape of the female and male operculum is quite the same, and in both sexes there is a distinct longitudinal carina on the anterior side. The setal armature is similar in almost every detail (cf. Figs. 77 e, g and h). Thus the longitudinal carina is furnished with long setae, which distally are arranged in two distinct longitudinal rows. The lateral margins in both the male and female operculum are likewise furnished each with a row of plumose setae, distally continuing in a submarginal row on the anterior side, whilst the distal margins themselves are equipped with fine »hairs». This similarity between the male and the female operculum is partly due to the fact that the first pleopods in the male have assumed a carinated shape, almost the same as the carina in the female operculum. That the parts of the female operculum other than the carina, on the other hand, show a detailed resemblance to the second pleopods of the male, is presumably due to the homology between the sympodites of the second male pleopods with the female operculum.

Echinozone quadrispinosa very closely resembles *Echinozone magnifica* VANHÖFFEN (1914), which differs merely in having a larger number of spines in the transverse spine-rows on the first four pereion segments, but this only in specimens about 5 mm. in length, whilst the spine-armature of small specimens up to 2 mm. is just as in *Echinozone quadrispinosa.* Another difference which VANHÖFFEN mentions, viz. that the lateral margins of the pleotelson in *Echinozone magnifica* are furnished with incisions, does not hold good; also in *Echinozone quadrispinosa* there occur the same incisions for the insertions of the uropods.

Localities and Material.

St. 8. Graham Region. Situation of the station as well as depth uncertain, lat. 64°, 3′ S., long. 56°, 37′ W (360 m?). Soft clay. 11/1 1902. Large female specimen possessing semi-developed marsupial plates; length about 17 mm.

St. 18. South Georgia, mouth of Westfjord, Cumberland Bay, lat. 54°, 15′ S., long. 36°, 25′ W. 250 m. Bottom temp. + 1.2°, Soft clay. 22/4 1902. A large, damaged female specimen with head and first pereion segment missing.

St. 24. South Georgia, off Grytviken, lat. 54°, 22′ S., long. 36°, 27′ W. 95 m. Clay. 20/5 1902. 3 specimens; length of the largest specimen, 8.3 mm., (female with semi-developed oostegits).

St. 33. South Georgia, Grytviken, lat. 54°, 22′ S., long. 36° 28′ W. 22 m. Clay and algae. 30/5 1902. Female possessing semi-developed oostegits; length about 4.7 mm.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54°, 11′ S., long. 36°, 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. About 72 specimens. Length of the largest specimen, a female with the oostegits semi-developed, 9.7 mm.

Distribution. South Georgia (Sw. Ant. Exped.), Kerguelen (BEDDARD 1886), West of Graham Region (MONOD 1926), Graham Region (Sw. Ant. Exped.), Victoria Land (HODGSON 1902).

The species has not previously been recorded from South Georgia; nor has it been taken at Graham Region, though the Belgian Antarctic Expedition 1897—99 collected material at stations situated slightly west of Graham Region.

G. Group **Eurycopini**, HANSEN, 1916.

For diagnosis see HANSEN (1916, p. 129—130).

Genus **Eurycope** G. O. SARS, 1863.

G. O. SARS, 1899; VANHÖFFEN, 1914.

For diagnosis see G. O. SARS (1899, p. 144).

Eurycope sp. (cf. **frigida**, VANHÖFFEN, 1914).

Text figs. 78 a—h.

Description.

General shape of body (Fig. 78 a). As in *Eurycope frigida* VANHÖFFEN.

Head. With a trapezoidal »front area». See Fig. 78 a, which illustrates a female specimen with semi-developed oostegits, about four mm. in length. The shape of the »front

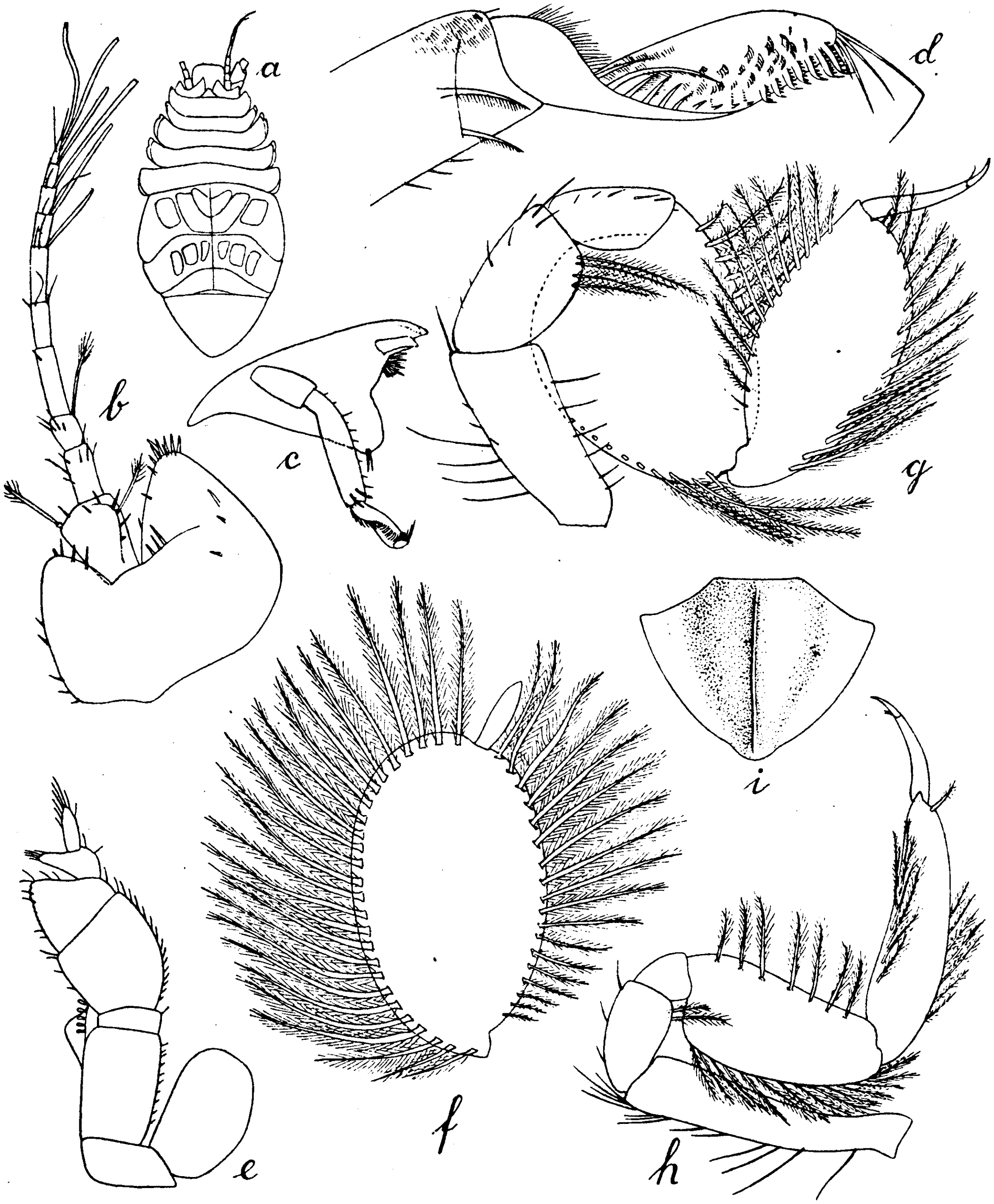

Fig. 78. *Eurycope* sp. (cf. *frigida* VANHÖFF.). a. Female, from above, 10 ×. b. Antennula, female, 80 ×. c. Left mandible, female, 50 ×. d. Third joint and distal part of the second joint of the mandibular palp, 240 ×. e. Maxilliped, female, 45 ×. f. Propodus and dactylus of the fifth pereiopod, female, 80 ×. g. Sixth pereiopod female, 80 ×. h. Left seventh pereiopod, female, 80 ×. i. Female operculum, 30 ×.

area» is the same as that in *Eurycope frigida* (see VANHÖFFEN, 1914, Figs. 122 a and b). But in his description of *Eurycope frigida* VANHÖFFEN (1914, p. 590) says of the head »vorn etwas wellig abgeschnitten».

Pereion. See Fig. 78 a. Similar in shape to that in *Eurycope frigida* VANHÖFF. The last three segments decrease in length from the fifth to the seventh; the seventh is slightly longer than figured by VANHÖFFEN; they are immovably attached to one another but distinctly delimited; along their middle line there is a faint longitudinal groove. The fifth and sixth segments are faintly sculptured in the way shown in Fig. 78 a.

Coxal plates distinct on the first four pereion segments. On the first three segments they are in contact with the whole lateral margin, whilst on the fourth they are smaller, being in contact with the posterior part of the lateral margin of the segment and leaving the anterior part of the margin free. The coxal plates on the second and third pereion segments have a distinct lateral incision.

Antennulae (Fig. 78 b). First peduncular joint very broad, broader than long; outer distal and inner distal parts triangularly produced, the inner distal projection being the largest. The comparatively small second peduncular joint is longer than it is broad and increases slightly in width towards the distal end. The two following joints are narrow but more setose than the joints of the flagellum. Third peduncular joint only about half as broad as the second joint and half as long again as the fourth. The flagellum consists of eight joints, of which the first is the longest.

Antennae. Only the first four short peduncular joints remain. Squama with distal margin evenly rounded, furnished with six setae.

Mandibles (Figs. 78 c and d). Incisive part with two large points and two smaller points[1]. Lacinia (on the left mandible) with two points. Row of setae on the left mandible with six to eight setae. Molar tubercle strong, subconical, proximally very broad, distally truncate, and provided with five or six small teeth[1]. There are two small setae at the tip of the molar tubercle. Palp consisting of three joints, of which the second is the longest, being about twice as long as the first; it is furnished with two distal plumose setae. The third joint, which is slightly longer than the first, forms a thin plate (Fig. 76 d) of peculiar shape. Its upper side is vaulted, the lower side hollowed. Proximal part of the rostral margin with fine »hairs»; middle part of the rostral margin with stout setae decreasing in length distally. Distal part of the rostral margin furnished with seven projecting pectinate scales increasing in size towards the distal end. The lower surface is covered with pectinate scales of typical form. The distal end of the joint is provided with three long setae.

First pair of maxillae. Typical of the genus. Inner lobe distally provided with a large number of slender setae.

Second pair of maxillae. Typical of the genus. Lappets of outer lobe together about as broad as the inner lobe, each with three long apical setae. Inner lobe with a large number of apical setae, situated in two rows.

Maxillipeds (Fig. 78 e). Typical of the genus. Epipodite oval, with distal margin broadly rounded. Endite with five coupling-hooks. In *Eurycope frigida* VANHÖFFEN

[1] Not to be seen in the figure.

the epipodite is pointed[1]. In one of VANHÖFFEN's specimens[2] of *Eurycope frigida*, re-examined by me, I found that the epipodite was still more pointed than figured by VANHÖFFEN, extending to the end of the second joint of the palp.

Upper lip. About semi-circular, with front margin evenly convex.

Pereiopods. The first four pereiopods were all broken. The fifth pereiopod (Fig. 78 f) with the first three joints decreasing in length. Carpal joint expanded, slightly longer than broad. Propodus expanded, about half as long again as broad. Dactylus very short, vestigial, about one-fourth as long as the propodus. Sixth pereiopod (Fig. 78 g) like the fifth, but the propodal joint is a little narrower and about twice as long as it is broad; dactylus well developed, furnished with a distinct claw. The seventh pereiopod (Fig. 78 h) has its carpal and propodal joints slightly expanded and provided with sparse plumose setae on its upper and lower margins.

Operculum, female (Fig. 78 i). Sub-pentagonal. Proximal margin divided into a median and two lateral parts forming obtuse angles with each other. Lateral margins convex, except distally, where they are slightly concave. Distal tip obtusely rounded. A sharp carina stretches along the middle line on the anterior side; the carina is sharpest in the middle and widens out somewhat distally.

Uropods. Broken.

Remarks. The species is closely allied to *Eurycope frigida* VANHÖFFEN. I have compared my specimens with the type specimen of *Eurycope frigida* VANHÖFFEN, from the Museum in Berlin. The described species agrees with *Eurycope frigida* VANHÖFFEN in the shape of the head and the pereion; also the same sculpturing of the fourth and fifth pereion segments was found in the type specimen. It differs, however, from *Eurycope frigida* VANHÖFFEN in its maxillipeds, which have their epipodites broadly rounded distally.

Locality and Material.

St. 34. South Georgia, off the mouth of Cumberland Bay, lat. 54° 11′ S., long. 36° 18′ W. 252—310 m. Bottom temp. + 1.45°. Gray clay with a few stones. 5/6 1902. 2 small damaged female specimens.

Distribution. South Georgia (Sw. Ant. Exped.).

The closely allied species *Eurycope frigida* VANHÖFFEN has been found in the East Antarctic (Gauss Station).

II. Fam. **Stenetriidae.**

Genus **Stenetrium,** HASWELL, 1881.

Stenetrium acutum VANHÖFFEN, 1914.

Stenetrium acutum. VANHÖFFEN, 1914, p. 546—548, Figs. 72, 73 a—h.

Locality and Material.

St. 5. Graham Region. S. E. of Seymour Island, lat. 64°, 20′ S., long. 56°, 38′ W. 150 m. Sand and gravel. 16/1 1902. Male specimen; 8.6 mm. in length, large specimen with the abdomen missing, head and pereion together about 8.9 mm. in length.

Distribution. Gauss Station (VANHÖFFEN 1914), Graham Region (Sw. Ant. Exped.).

The species has not previously been recorded from the West Antarctic.

[1] See VANHÖFFEN, 1914, Fig. 122 b.

[2] Some specimens of *Eurycope frigida* VANHÖFFEN were kindly sent to me for investigation from the Museum in Berlin.

SECTION VI.

Table of Distribution.

	Coast of Central Chile	Argentina	Patagonia	Tierra del Fuego and Mag. Straits	Burdwood Bank	Falkland Islands	Shag Rock Bank	South Georgia	West Antarctic	East Antarctic	Other localities
Serolis paradoxa	+		+	+		+		+			
Serolis schythei	+	+	+	+		+		+	+		
Serolis polaris		+									South Sandwich Islands.
Serolis trilobitoides			+	+					+	+	Kerguelen.
Serolis septemcarinta								+			South Atlantic E of Patag. N. of Falkl. Isl., Prince Edw. Isl., Crozet Isl., Kerguelen.
Serolis polita								+	+		S. Atlantic. N. of Falkl. Isl. E. of Patagonia, S. Sandw. Isl.
Serolis glacialis var. austrogeorgiensis								+			
Serolis exigua						+					
Serolis gaudichaudii	+										
Serolis convexa				+		+		+			S. Sandw. Isl.
Serolis minuta var. eugeniae											Australia.
Serolis pagenstecheri								+			
Serolis pagenstecheri var. albida							+				
Serolis bouvieri									+		
Serolis australiensis											Australia.
Serolis longicaudata											Australia.
Idothea metallica			+	+						+	Almost universal.
Edotia tuberculata			+	+		+		+			
Edotia magellanica			+	+							
Edotia bilobata						+					
Cleantis linearis	+		+								
Cleantis granulosa		+		+							St. Paul.
Glyptonotus antarcticus								+	+		
Glyptonotus antarcticus var. acutus								+	+	+	
Macrochiridothea stebbingi var. multituberculata						+					
Pseudidothea bonnieri			+			+					
Neastacilla falclandica						+					N. Zealand.
Neastacilla magellanica				+		+					
Antarcturus furcatus							+	+	+	+	Kerguelen, Heard Island.
Antarcturus americanus			+	+		+					
Antarcturus brunneus var. spinulosus							+	+			
Antarcturus franklini						+			+	+	
Antarcturus antarcticus							+	+	+		S. Sandw. Islands.
Antarcturus granulosus							+	+			
Microarcturus stebbingi							+	+			Kerguelen.
Microarcturus rugosus							+		+		
Microarcturus digitatus							+	+			
Ianira (Iathrippa) longicauda	+		+	+	+	+		+			Campbell Isl., N. Zealand.

	Coast of Central Chile	Argentina	Patagonia	Tierra del Fuego and Mag. Region	Burdwood Bank	Falkland Islands	Shag Rock Bank	South Georgia	West Antarctic	East Antarctic	Other localities
Iantra (Iathrippa) sarsi							+	+	+	+	S. Atlantic. E. of Patagonia. N. of Falkl. Isl., Kerguelen.
Iais pubescens				+		+					Widely distributed up to Cameroon and Ceylon.
Ianthopsis bovalli			+			+		+		+	Kerguelen.
Ianthopsis nasicornis								+		+	
Ectias turqueti								+	+	+	
Neojaera antarctica				+		+		+			Juan Fernandez, S. Atl. E. of Pat. N. of Falkl. Isl., Kerguelen.
Jaeropsis patagoniensis			+	+	+	+					
Jaeropsis intermedius		+		+	+	+					
Antias hispidus						+			+		St. Paul, Auckl. Isl.
Antias marmoratus								+			St. Paul, Kerguelen.
Antias Hofsteni								+			
Munna maculata						+					Kerguelen.
Munna pallida						+					Kerguelen.
Munna antarctica								+		+	
Munna neglecta						+			+		S. Orkney Isl.
Munna affinis								+			
Munna bituberculata								+			
Munna nana						+					
Coulmannia australis								+	+	+	
Paramunna integra					+	+					
Paramunna antarctica								+	+		
Paramunna serrata						+			+		
Paramunna subtriangulata				+				+	+		
Paramunna rostrata								+	+	+	Kerguelen.
Paramunna dentata						+					
Austrosignum glaciale								+		+	
Austrosignum falklandicum					+	+					
Pleurosignum magnum					+	+				+	
Pleurosignum elongatum						+				+	
Antennulosignum elegans						+					
Austrofilius furcatus				+		+		+	+	+	S. Africa, Kerguelen.
Desmosoma australis								+			
Desmosoma brevipes								+			
Desmosoma modestum								+			
Desmosoma falklandicum						+					
Ilyarachna antarctica								+		+	
Echinozone quadrispinosa								+	+	+	Kerguelen.
Eurycope sp. cf. frigida								+			
Stenetrium acutum									+	+	

SECTION VII.

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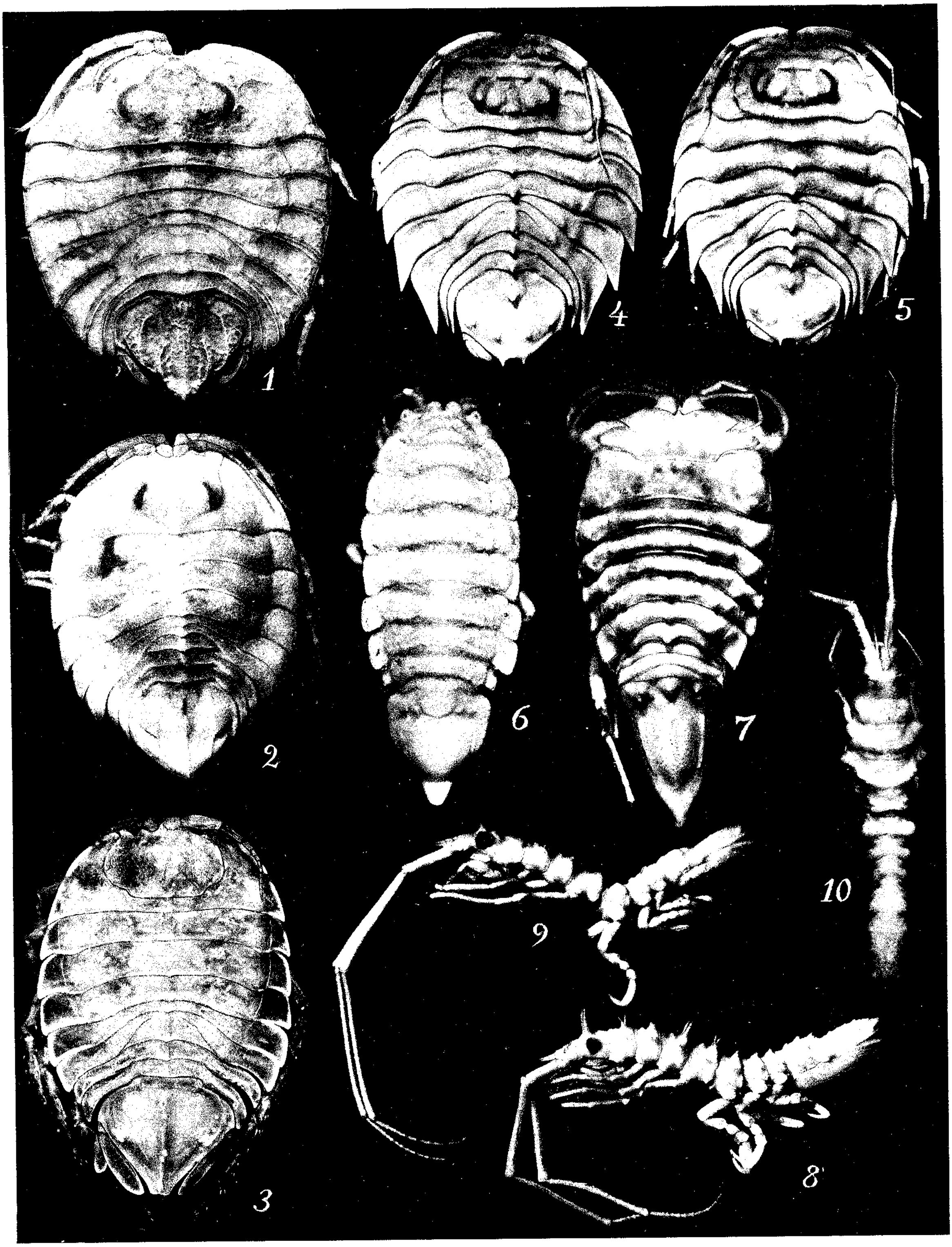
PLATES

EXPLANATION OF PLATE I.

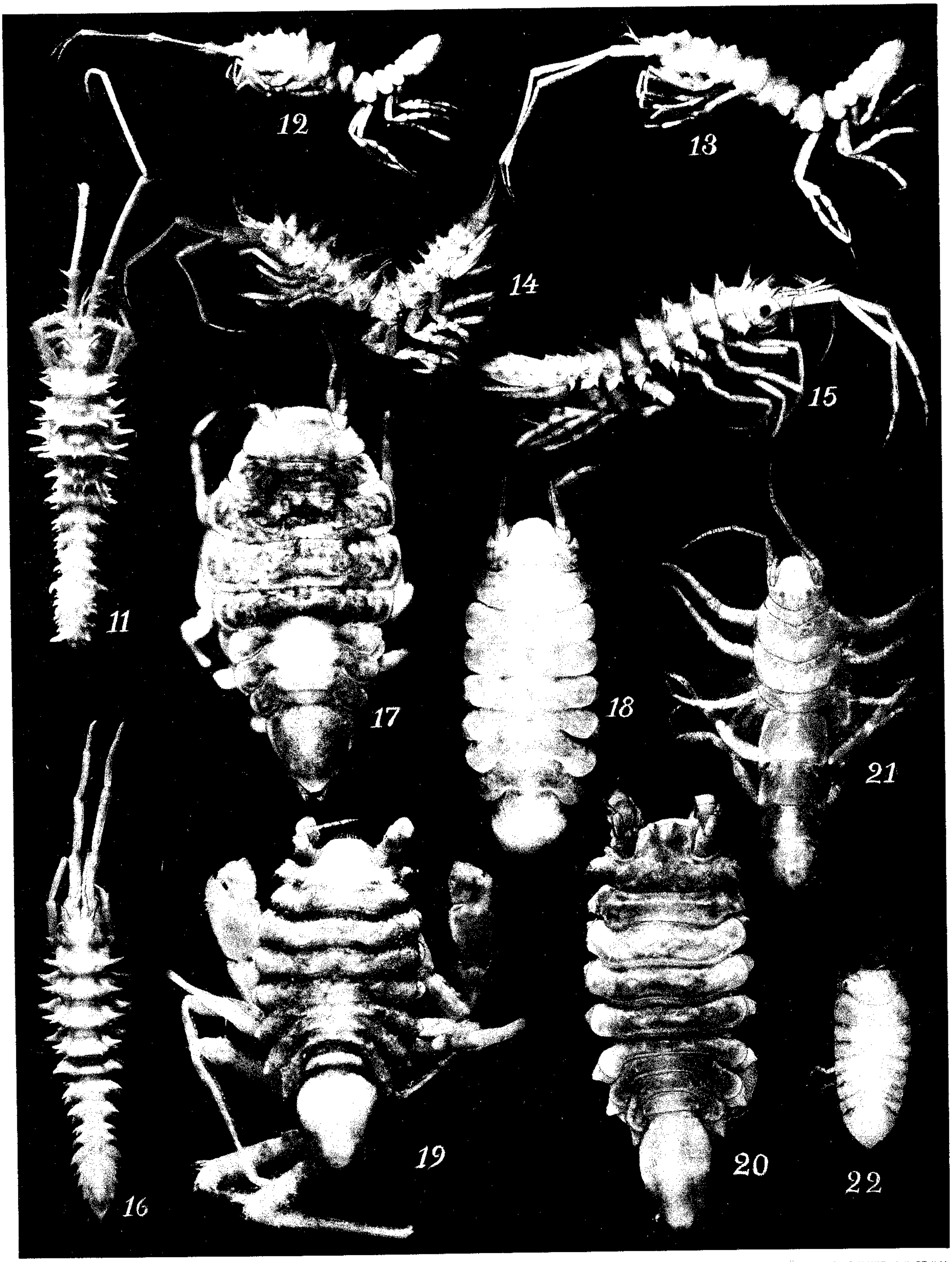
Fig. 1. Serolis glacialis TATTERSALL var. austrogeorgiensis n. var., ♀ with marsupial plates semi-developed. $5^1/_2$ ×.
Fig. 2. Serolis exigua n. sp. ♀ with young. 8 ×.
Fig. 3. Serolis minuta BEDDARD var. eugeniae n. var., ♀ with young. $7^1/_2$ ×.
Fig. 4. Serolis pagenstecheri PFEFFER var. albida n. var., adult ♂. 2 ×.
Fig. 5. Serolis pagenstecheri PFEFFER var. albida n. var., ♀ with a marsupium. 2×.
Fig. 6. Edotia bilobata n. sp. $7^1/_2$ ×.
Fig. 7. Macrochiridothea stebbingi OHLIN var. multituberculata n. var., ♀ with an empty marsupium. 5.7 ×.
Fig. 8. Antarcturus franklini (HODGSON), ♂. 3 ×.
Fig. 9. Antarcturus granulosus n. sp., immature ♀. $5^1/_2$ ×.
Fig. 10. Antarcturus granulosus n. sp., ♀ with young. $4^1/_2$ ×.

EXPLANATION OF PLATE II.

Fig. 11. Antarcturus brunneus (BEDDARD) var. spinulosus n. var., ♀ with semi-developed oostegits. $4^1/_2$ ×.
Fig. 12. Microarcturus stebbingi (BEDDARD), ♀ with a marsupium. 7.6 ×.
Fig. 13. Microarcturus stebbingi (BEDDARD), adult ♂. 7.6 ×.
Fig. 14. Microarcturus rugosus n. sp., ♂. 8 ×.
Fig. 15. Microarcturus digitatus n. sp., immature ♂ in a lateral view. 5 ×.
Fig. 16. Microarcturus digitatus n. sp., the same specimen seen from above. 5 ×.
Fig. 17. Antias marmoratus VANHÖFFEN, ♀ with a marsupium. 40 ×.
Fig. 18. Antias Hofsteni n. sp., ♂. 35 ×.
Fig. 19. Munna affinis n. sp., sub-adult ♂. 18 ×.
Fig. 20. Munna bituberculata n. sp., ♀. 18 ×.
Fig. 21. Desmosoma brevipes n. sp., ♀ with an empty marsupium. 28 ×.
Fig. 22. Paramunna integra n. sp. 30 ×.



E. Swedén phot.



E. Swedén phot.

A BÖRTZELLS TRYCKERI A. B. STHLM

ERRATA.

Page 58 Line 6. In place of *Magellanian Region* read *Magellan Straits.*
» 82 » 24. In place of *Magellanian Region* read *Magellan Straits.*